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November 27, 2023

Mick Leat
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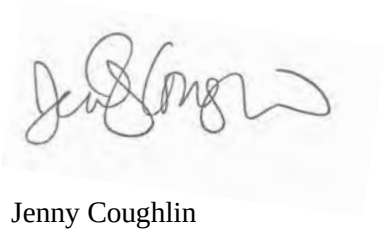
Subject: Closure Construction Documentation – Lansing Ash Disposal Landfill
Lansing Generating Station, Lansing, Iowa
Permit #03-SDP-05-01P

Mr. Leat:

On behalf of Interstate Power and Light Company (IPL), Alliant Energy is submitting the enclosed closure construction documentation report for the Lansing Ash Disposal Landfill Closure Project. The final cover system for the landfill was completed on September 15, 2023, in general accordance with the approved closure plan and construction quality assurance plan.

Thank you for your review of this report. If you have any questions or concerns, please contact me via email (jennycoughlin@alliantenergy.com) or by phone (515-558-9704).

Sincerely,



Jenny Coughlin
Senior Environmental Specialist
Alliant Energy Corporate Services, Inc.

CC: Brian Rath, IDNR
Robin Nelson, Environmental and Safety Specialist, IPL – Lansing Generating Station
Chad Wall, Alliant Energy
Mark Huber, SCS Engineering

Construction Documentation Report Ash Disposal Landfill 2023 Final Cover Construction

Lansing Generating Station
2320 Power Plant Drive
Lansing, Iowa 52151

Prepared for:

Interstate Power and Light Company
2320 Power Plant Drive
Lansing, Iowa 52151

SCS ENGINEERS

25222159.00 | November 27, 2023

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CERTIFICATION PAGE

Mark R. Huber, a licensed Professional Engineer in the State of Iowa, has overseen the performance of the quality assurance observation and testing program during the Ash Disposal Landfill Final Cover Construction at the Interstate Power and Light Company Lansing Generating Station. Based upon the information presented within this report, SCS Engineers has observed that the following items have been accomplished in general accordance with the Construction Quality Assurance Plan and the project specifications:

- CCR/material placement, grading, and grade verification.
- Select clay fill installation.
- Rooting zone placement.
- Topsoil placement.
- Perimeter drainage swale construction.
- Storm water infrastructure installation.
- Seeding and restoration.

Our professional services have been provided using the level of care and skill ordinarily exercised, under similar circumstances, by engineering professionals currently practicing in this locality. No other representation, express or implied, and no warranty or guarantee is included or intended.

Respectfully Submitted,

SCS ENGINEERS



11/22/2023

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Mark R. Huber, PE — 11/22/2023 (date)

Iowa License No. 15325

My license renewal date is: 12/31/2024

Pages or sheets covered by this seal: Construction Documentation Report for closure of the Ash Disposal Landfill at the Lansing Generating Station

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1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

This Construction Documentation Report for the Ash Disposal Landfill (landfill) Final Cover Construction at the Lansing Generating Station (LAN) has been prepared by SCS Engineers (SCS) on behalf of Interstate Power and Light Company (IPL) to certify the final cover construction has been implemented in compliance with the following:

- Permit 03-SDP-05-01P, Revision No. 3, Issued by State of Iowa Department of Natural Resources (IDNR), December 5, 2022.
- Closure Plan Drawings prepared by SCS dated November 2022.
- Issued for Permitting Drawings prepared by SCS dated March 2022.
- Issued for Construction Ash Pond Closure Revision 1 prepared by SCS dated February 2023.
- Construction Quality Assurance (CQA) Plan Revision No. 3 prepared by SCS dated May 2022.
- Coverage under IDNR National Pollutant Discharge Elimination System (NPDES) General Permit No. 2 IA – 409957 - 40586 for Storm Water Discharge Associated with Construction Activities effective May 2, 2021, to May 2, 2025.
- Nationwide Permit No. 43 authorized by U.S. Army Corps of Engineering (USACE) in August 2023.
- IDNR Flood Plain Development Permit No. 2022-0482FP-01 issued on April 24, 2023.
- Sovereign Lands Construction Permit 2022-04825L-01 issued by IDNR, May 1, 2023.
- Flood Plain Development Permit 20230508A issued by Allamakee County on May 8, 2023.
- NPDES Permit No. 0300100 issued by IDNR dated June 1, 2016, and Amendment March 1, 2021.

This report provides a record of observations, test results, and documentation survey data related to activities for the construction of the landfill final cover and supporting infrastructure. This report is intended to support certification of the Ash Disposal Landfill closure pursuant to 40 CFR 257.102.

The results of surveying, field testing, and laboratory testing completed by SCS are summarized in **Tables 1** through **5**. The location of samples collected and field tests completed to verify the closure construction are shown on **Figures 1** and **2**. **Plan Sheets 1** through **17** accompany this report to document record conditions. **Appendices A** through **I** include supporting information such as correspondence, construction material testing results, and field observations. Copies of construction-related correspondence and approval letters are presented in **Appendix A**. Photographs of construction activities are included in **Appendix B**.

1.2 BACKGROUND

The LAN Ash Disposal Landfill (Permit #03-SDP-05-01P) is located in the Southwest ¼ of Section 2, Township 98 North, Range 3 West, of Allamakee County. The Ash Disposal Landfill received bottom ash, fly ash, and scrubber by-product from the plant. Additional coal combustion residuals (CCR), coal, and coal-impacted soil were placed in the landfill during closure activities. Final cover was previously constructed on the western portion of the landfill in 2014 and 2015. The location of the

generating station and the project site are shown on **Plan Sheet 1**. The pre-construction site conditions of the project area are shown on **Plan Sheets 2** and **3**.

1.3 SUMMARY OF WORK

The final cover construction in the Ash Disposal Landfill included the following tasks:

- Waste placement, grading, and grade verification.
- Select clay fill installation.
- Rooting zone placement.
- Topsoil placement.
- Perimeter drainage swale construction.
- Storm water infrastructure installation.
- Seeding and restoration.

CCR placement in the Ash Disposal Landfill from plant generation operations ceased in December 2022. Relocated CCR from the Upper Ash Pond and coal and coal-impacted material from the coal yard was disposed of in the Ash Disposal Landfill to achieve final cover subgrades in 2022 and 2023. The majority of the final cover construction for the Ash Disposal Landfill closure occurred from May 2023 through September 2023. Closure of the Ash Disposal Landfill was substantially completed by September 15, 2023. The site plan with post-construction site conditions is shown on **Plan Sheet 13**.

1.4 ROLES AND RESPONSIBILITIES

Several parties were involved with the construction. Each party and their role are described below.

IPL – Owner of the facility. IPL was responsible for maintaining compliance with IDNR and Federal regulations during closure activities. IPL selected the parties that were charged with implementing the design, Construction Quality Assurance (CQA), and construction activities. IPL had the authority to accept or reject drawings and specifications, CQA Plans, reports and recommendations of the CQA Officer and Engineer, and the materials and workmanship of the Construction Contractor. IPL is responsible for the continued maintenance of the facility after closure.

SCS Engineers of Madison, Wisconsin – Engineer for the project. SCS was responsible for the design of the Ash Disposal Landfill final cover to meet the requirements of the IDNR-issued permit and 40 CFR 257.102. SCS was responsible for revising design components to meet unexpected site conditions or as changes in construction methods were required. SCS was responsible for specification of corrective measures where there were deviations from the drawings and specifications. SCS was responsible for management of CQA documentation including reviewing the field testing, measurements, and laboratory analysis. In addition, SCS attended construction progress meetings, reviewed product submittal information provided by the construction contractor, and responded to inquiries raised by the construction contractor. Also, SCS was responsible for verifying the final work product conformed to applicable permit, drawings, specifications, and CQA Plan.

SCS coordinated with the construction contractor to implement CQA Plan activities. Other responsibilities included:

- Preparing daily reports.
- On-site observation during construction.

- Survey documentation of the Ash Disposal Landfill final cover system.
- Sampling and testing of cover materials.
- Recommending corrective actions when necessary.
- Photographic documentation.

Subcontractors that assisted SCS with construction tasks include the following:

- **Atlantic Coast Consulting, Associates (ACC) of Roswell, Georgia:** Provided oversight personnel to observe construction activities.

- **Mohn Surveying, Inc. (Mohn) of Lansing, Iowa:** Performed surveying of the Ash Disposal Landfill final cover system for final cover material thickness verification and documentation.

- **Team Services, Inc. of Cedar Rapids, Iowa:** Provided geotechnical laboratory testing of earthen construction materials throughout the project.

- **Eurofins of Cedar Falls, Iowa:** Provided analytical laboratory testing of imported soil materials throughout the project.

Mr. Tim Maloy and Mr. Bill Johnson of ACC acted as the primary Resident Project Representatives (RPRs) and provided the majority of on-site construction documentation and oversight throughout the project. Oversight was provided during CCR excavation and consolidation, soil fill placement, subgrade preparation, and final cover system construction. Ms. Rachael Huempfner (SCS), Mr. Brandon Suchomel (SCS), and various other SCS personnel also provided assistance with oversight and project documentation, as needed. This combination of personnel provided on-site construction observation during the duration of construction activities.

Ames Construction (Ames) of Burnsville, Minnesota – Construction contractor for the Ash Disposal Landfill final cover construction. Ames was responsible for performing the construction and installation work in accordance with the IDNR permit, design drawings, CQA Plan, and specification requirements. Work performed by Ames included but was not limited to the following:

- Site preparation and erosion control installation/maintenance.
- CCR and CCR-impacted soil excavation and consolidation in the Ash Disposal Landfill.
- CCR filling, grading, and compaction within the Ash Disposal Landfill.
- Coal and coal-impacted soil filling, grading, and compaction within the Ash Disposal Landfill.
- Ash Disposal Landfill final cover subgrade preparation.
- Ash Disposal Landfill final cover compacted select clay soil cover, rooting zone, and topsoil placement.
- Stormwater management infrastructure installation.
- Seeding and restoration.
- Construction progress meetings.

Subcontractors assisted Ames with specific activities during the project. Each subcontractor and the work performed are listed below:

- **Tomah Environmental Contractors, Inc (TEC) of Tomah, Wisconsin:** Performed seeding, fertilization, hydro mulch, and erosion mat installation after topsoil placement for the Ash Disposal Landfill final cover.

2.0 DEVIATIONS FROM APPROVED PLAN

Deviations from the approved plan occurring during the Ash Disposal Landfill final cover construction at LAN are described below.

- Due to the anticipated timing for seeding of the final cover areas, the landfill closure contractor used Iowa Department of Transportation (DOT) Type 2 (Permanent Cool Season Mixture for Slopes and Ditches) in place of the seed mixes previously provided in the initial and revised Closure Plan submittal.

3.0 FIELD MODIFICATIONS

Field changes or modifications were made to construction items after approval by the Owner and/or the Engineer for more effective implementation and better results. The sections below describe field modifications that were executed during the project.

3.1 FINAL COVER DIVERSION BERM LOCATION

The approved final closure design included a diversion berm running the length of the old and new final cover areas. At the northern end of the final cover area, the diversion berm flow line was shown to run along the peak of the design grades. The diversion berm alignment on the slope was shifted to the south to allow the flow to have the full 2-foot minimum design capacity leading to the downslope flume inlet.

3.2 EXISTING STORMWATER PIPE ABANDONMENT

During an annual landfill inspection, an existing stormwater pipe outlet was observed on the west slope of the landfill outside of the waste limits. It is assumed this pipe used to drain stormwater from the previously built final cover and has since been abandoned. SCS and Ames tracked the pipe to just west of the landfill access road. The pipe was excavated, and a section removed by Independence Demolition of Independence, Ohio, who were on-site performing additional work for IPL. Expandable foam was injected to fill approximately 15 feet of the pipe from the outlet end. Product information for the expandable foam used for the abandonment is provided in **Appendix G**. The cut section of the pipe was then capped and reburied. This work was done as part of annual landfill maintenance during the cover construction.

3.3 GRASSED AREA RESTORATION

An Iowa DOT standard cool season seed mix was used instead of a warm season prairie grass mix due to the warm season mix not being conducive to the Iowa climate during the proposed seeding schedule. A letter from the seed mix provider is provided in **Appendix H** explaining the seed mix recommendation.

4.0 GENERAL PRE-CONSTRUCTION ACTIVITIES

Ames implemented various activities before starting major construction items for the project. The pre-construction activities are described in the following sections.

4.1 SURVEYING BENCHMARKS AND SITE CALIBRATION

The project site included multiple existing permanent and supplemental control monuments, control points, and benchmarks. The locations of site control monuments, control points, and benchmarks are shown and listed in a table on Plan Sheet 2. Permanent benchmarks used for the Ash Disposal Landfill closure work included locations 16002, 16003, 16004, 16005, 16006, and 16025. Documentation surveying was completed by Ames or SCS third-party surveyor Mohn utilizing real-time kinematic global positioning systems (RTK GPS).

4.2 CLEARING AND GRUBBING

Clearing and grubbing throughout the closure construction area was performed by Ames, as necessary. The Ash Disposal Landfill did not have significant vegetation impeding construction access requiring clearing prior to major earthwork activities.

4.3 EROSION CONTROLS

Erosion control measures were installed by Ames and inspected by Ames and SCS per the NPDES General Permit No. 2 and following the Construction Storm Water Pollution Prevention Plan (SWPPP) for stormwater associated with land disturbing construction activity. These plans were developed and implemented to:

- Identify and address potential sources of erosion and sedimentation at the site that may reasonably be expected to affect the quality of storm water discharges during and following the completion of the construction.

- Establish storm water management practices following construction.

4.3.1 Installation

Tomah Environmental Contractors, Inc (TEC) installed perimeter silt fence around the limits of disturbance of the site prior to construction activities. Perimeter silt fence was installed at the locations identified on Plan Sheet 4. The erosion controls were supplemented or repaired, as needed, throughout the project by Ames.

4.3.2 Inspection

Inspections of the erosion controls were performed primarily by Ames. Inspections were performed a minimum of every 7 days throughout construction, and after liquid precipitation events exceeding 0.5 inches. Issues or deficiencies identified during the 7-day inspections were discussed with Ames and addressed in a timely manner. Ames completed inspection reports until vegetation was established.

5.0 ASH DISPOSAL LANDFILL FINAL COVER SYSTEM

The final cover system installed over the Ash Disposal Landfill consisted of the following materials (from bottom to top):

- Twenty-four inches of select clay soil.
- Six inches of rooting zone.
- Six inches of topsoil.

A typical detail is shown on **Plan Sheet 15.**

5.1 RIPRAP REMOVAL AND REUSE

Existing riprap at the transitions of the existing final cover from Phase 1 and Phase 2 final cover construction was removed and relocated for reuse elsewhere on-site. The riprap was repurposed as revetment stone for stormwater drainage rock chutes during restoration activities.

5.2 SUBGRADE PREPARATION

Material consolidation and filling to final cover subgrades was completed primarily by IPL during plant operation. Upon termination of plant operations, residual ash or scrubber by-product was relocated to the landfill by IPL. Ames relocated CCR and CCR-impacted soil from the Upper Ash Pond as well as coal and coal-impacted material from the coal yard to the landfill for disposal. Ames graded the final surface of waste to approved design subgrades prior to final cover construction. Once final cover subgrades were established, Mohn surveyed the top of the waste surface to document final cover subgrade elevation on a minimum 50-foot grid. Documented subgrade elevations are provided in **Table 2**. The final cover subgrades are shown on **Plan Sheets 4**, **5**, and **6**.

5.3 SELECT CLAY FILL

Construction of the compacted select clay fill layer for the final cover system started after the CCR subgrade was prepared by Ames and documented by SCS. Placement of the compacted select clay soil was substantially completed on July 31, 2023. Details of compacted select clay soil placement activities are described below.

5.3.1 Select Clay Fill Placement

The compacted select clay fill material for constructing the 24-inch-thick compacted select clay soil layer was hauled from the Strong borrow site using side dump trucks. The borrow site was located at 1958 Dry Ridge Road, Lansing, Iowa, and was approximately 4.8 miles from the facility. Material was tested from the borrow site prior to use in the final cover system.

The compacted select clay fill was placed in four, 6-inch lifts. Each lift of the compacted select clay fill was graded using CAT-D6T dozers. Compacted select clay fill cover lifts were compacted using a CAT-815 sheepsfoot roller. If compacted select clay soil cover moisture was too low, the area was watered, regraded, and re-compacted. SCS tested each select clay lift with a nuclear density gauge for compaction and moisture. If the compacted select clay soil cover moisture was too high, the area was disturbed, allowed to dry, and re-compacted. This process was repeated until passing field moisture and density test results were obtained as described in **Section 5.3.3**.

The select clay was tied into the existing select clay layer along the edge of existing final cover using a stepped splice. A detail of the tie-in is shown on **Sheet 15**.

5.3.2 Select Clay Fill Sampling and Testing Results

During construction of the compacted select clay fill, ACC collected bulk samples and undisturbed compacted select clay fill samples for laboratory testing. Per the requirements of the CQA Plan, four initial bulk samples were collected from the select clay soil borrow source. These samples were analyzed prior to construction. During final cover installation, select clay soil routine samples were collected for every 5,000 cubic yards of material placed. Each bulk sample was tested for grain size, Atterberg limits, soil classification, maximum dry density, and optimum moisture content. In addition,

one undisturbed compacted select clay soil sample was collected for each acre or less for every 1-foot thickness of select clay soil placed. ACC used Shelby tubes to obtain undisturbed samples of the compacted select clay soil. Holes created by the Shelby tube samples were backfilled with granular bentonite.

A total of four initial borrow samples, four in-place bulk samples, and twenty-one undisturbed samples from the compacted select clay soil were collected for laboratory testing. Undisturbed compacted select clay soil sample locations are shown on **Figures 1** and **2**. Reports for testing completed by Team Services are provided in **Appendix C.**

During the installation of the first foot of select clay fill, two undisturbed samples (ADL-T1-2 and ADL-T1-7) had test results that did not meet grain size requirements for the #200 sieve. The lab reported a rock had been retained in the 1-inch or greater sieve, causing the percentage by weight to fall under the minimum 50 percent finer than the #200 sieve. At this location, the Atterberg plasticity indicates the soil was clay. Additional undisturbed samples were collected at both locations. Both samples were then tested for Atterberg limits, grain-size distribution, soil classification, maximum dry density, optimum moisture content, and permeability. The second set of samples confirmed the material in those areas of the final cover met select clay requirements. Results of laboratory testing (Atterberg limits, grain-size distribution, soil classification, maximum dry density, optimum moisture content, and permeability) are contained in **Appendix C** and are summarized in **Tables 3** and **4**. Laboratory test results confirm that the compacted select clay soil material was classified in accordance with the USCS as "CL" or "CH" soil and the permeability values were less than 1×10^{-7} cm/s, which meets project requirements.

5.3.3 Moisture and Density Testing Select Clay Fill

Seventy-eight field moisture-density tests were performed at pre-determined locations using a nuclear density gauge (NDG) during compacted select clay fill cover construction. Per the requirements of the CQA Plan, moisture-density tests were performed on an approximate 100-foot grid pattern offset for each 1-foot thickness of compacted select clay cover.

The moisture-density tests were performed by ACC at the approximate locations shown on **Figures 1** and **2.** Tests were performed during compacted select clay fill cover placement to document the compaction of the compacted select clay soil cover. Holes created in the compacted select clay fill layer by field moisture-density testing (NDG source rod) were backfilled with granular bentonite.

A summary of the compacted select clay soil field moisture-density test results is provided in **Table 5**. Percent compaction of the compacted select clay soil materials ranged from 90 to 100+ percent. Based on these results, the compaction effort achieved the required minimum 90 percent of the maximum dry density using the modified proctor method (ASTM D1557) and acceptable moisture content of at least 2 percent above optimum moisture content. Proctor curves used for NDG testing of the select clay soil and reports for laboratory testing completed by Team Services are provided in **Appendix C**.

5.3.4 Select Clay Fill Thickness Documentation

The thickness of the compacted select clay layer was monitored by Ames during placement primarily using a GPS system mounted on the construction equipment. Upon completion of compacted select clay fill placement, the top of the compacted select clay fill surface was surveyed by Mohn on a minimum 50-foot grid and breaks in grade using the same survey points used to document the final cover subgrade. The top of compacted select clay fill grades are shown on **Plan Sheets 7**, **8**, and **9**.

Surveyed elevations were compared to the documented subgrade elevations to determine the thickness of the compacted select clay fill at each documentation point. Additional thickness verification measurements were completed with hand augers to support survey data. Holes created from the hand augers were filled with granular bentonite. Compacted select clay fill cover thickness measurements are summarized in Table 2. The total compacted select clay fill cover thickness meets the minimum required thickness of 2.0 feet at the documentation points.

5.4 ROOTING ZONE

Following the completion of the compacted select clay soil layer, a minimum of 6 inches of rooting zone, acquired from the USACE dredge sand stockpile, was placed using haul trucks. The stockpile source was located on the east side of the Hwy 82 bridge in Lansing, Iowa. The rooting zone was primarily graded using bulldozers equipped with a GPS system. The rooting zone was not actively compacted during placement. Placement and grading of the rooting zone began on August 2, 2023, and was substantially completed by August 14, 2023.

5.4.1 Rooting Zone Sampling and Testing

Samples of the sand were collected by ACC and SCS to be tested in accordance with the State of Iowa uncontaminated rubble designation pursuant to 567 IAC 108.4(12). Composite samples were obtained for every 10,000 cubic yards of USACE sand imported to site and consisted of at least four representative (grab) samples collected throughout a workday from individual truckloads of imported sand. The samples were composited by the laboratory for testing. A summary table and the analytical laboratory reports for the USACE dredge sand samples are provided in Appendix D.

5.4.2 Rooting Zone Thickness Documentation

The thickness of the rooting zone layer was monitored by Ames during placement primarily using a GPS system mounted on the construction equipment. Upon completion of rooting zone placement, the top of the rooting zone surface was surveyed by Mohn on a 50-foot grid and breaks in grade using the same survey points used to document the top of select clay fill. Surveyed elevations were compared to the documented top of select clay fill elevations to determine the thickness of the rooting zone at each documentation point. Additional thickness verification measurements were completed with hand augers to support survey data. Rooting zone thickness measurements are summarized in Table 2. The total rooting zone thickness meets the minimum required thickness of 6 inches at the documentation points.

5.5 TOPSOIL

Following the completion of the rooting zone layer, a minimum of 6 inches of topsoil from approved off-site borrow sources was placed using haul trucks. Approved topsoil borrow source locations are provided in Appendix E. The topsoil was primarily graded using bulldozers equipped with a GPS system. Placement and grading of the topsoil began on August 16, 2023, and was substantially completed by September 15, 2023.

5.5.1 Topsoil Sampling and Testing

Prior to placement of the vegetative soil cover, Ames collected bulk samples for laboratory testing. Samples were analyzed for grain size, total organic matter content, pH, mineral and plant-nutrient content, and cationic exchange capacity. The analysis was used for identifying any amendments needed to produce satisfactory topsoil. Results of laboratory testing are contained in Appendix E. The

topsoil was visually inspected for uniformity and changed conditions by ACC and SCS technicians as it was delivered to the site.

5.5.2 Topsoil Thickness Documentation

The topsoil was surveyed by Mohn on a 50-foot grid and brakes in grade using the same survey points used to document the final cover subgrade, top of compacted select clay fill layer, and top of rooting zone elevations. The final top of topsoil grades are shown on **Plan Sheets 10**, **11**, and **12.** Surveyed elevations were compared to the documented top of rooting zone elevations to determine the thickness of the topsoil at each documentation point. Additional thickness verification measurements were completed with hand augers to support survey data. Topsoil thickness measurements are summarized in **Table 2.** The total topsoil thickness meets the minimum required thickness of 6 inches at the documentation points.

6.0 PERIMETER ACCESS ROAD

Ames constructed additional sections of access road on the northwest and southeast ends of the Ash Disposal Landfill final cover area. The access road sections connected to existing access roads to the north and along the southwestern perimeter of the landfill. The prepared subgrade for the access road consisted of general fill or existing soil.

Ames installed a nonwoven geotextile, WINFAB 700N manufactured by Willacoochee Industrial Fabrics Inc or SKAPS GT170 manufactured by SKAPS Industries, above the prepared access road subgrade. An approximate 8-inch layer of gravel surface course was placed above the geotextile. The gravel surface course was graded using a CAT-D6T dozer and compacted using a CAT-CS56 smooth drum roller. The road aggregates were obtained from Wexford Quarry of Harpers Ferry, Iowa, and the Waukon/McCabe Quarry in Waukon, Iowa. Gradation results for the gravel surface course are provided in **Appendix F.**

7.0 SURFACE WATER MANAGEMENT FEATURES

7.1 FINAL COVER DRAINAGE

The Ash Disposal Landfill closure surface runoff is managed by diversion berms and perimeter ditches discharging to north of the Ash Disposal Landfill closure area.

7.1.1 Diversion Berms

The Ash Disposal Landfill closure surface water runoff on the southwest side of the closure area is managed by a diversion berm. The berm was constructed with compacted select clay fill material. The diversion berm swale side slopes are approximately 2H:1V and 4H:1V with a minimum depth of 2 feet. The diversion berm directs surface water runoff to the north downslope flume on the final cover. The location of the Ash Disposal Landfill diversion berm is shown on **Plan Sheet 13.** Typical details are shown on **Plan Sheet 15**, **Details 3** and **4.**

7.1.2 Downslope Flumes and Energy Dissipators

Downslope Flume 4, a 30-inch-diameter corrugated polyethylene pipe (CPEP), was installed on the Ash Disposal Landfill final cover for surface water management. Flume 4 was installed and connected to the existing downslope flume corrugated metal pipe (CMP), Flume 5. Flume 4 is located on the north slope of the Ash Disposal Landfill, collecting water that discharges from the diversion

berm. Flume 5 was installed during previous final cover construction and is located at the toe of the slope north of the Ash Disposal Landfill. Flume 5 discharges surface runoff collected in the south and west perimeter ditch. Both Flume 4 and Flume 5 merge and discharge into a single concrete energy dissipator to reduce the water velocity before entering the outfall swale north of the Ash Disposal Landfill. The location of the energy dissipator and flumes are shown on **Plan Sheet 13.** Typical details are shown on **Plan Sheet 16**, **Details 2** and **3.** Product information is included in **Appendix G.**

7.1.3 Final Cover Perimeter Swales

The Ash Disposal Landfill closure area manages stormwater in flat bottom perimeter swales. The perimeter swales convey stormwater that runs off the final cover to the north outfall swale which discharges to the rock chute to the northwest of the Ash Disposal Landfill. The ditch side slopes vary between approximately 2H:1V and 4H:1V and the flat bottom swale has a bottom width of approximately 8 feet. The locations of the perimeter swales are shown on **Plan Sheet 13** and in cross sections on **Plan Sheet 14**. Details for the perimeter swales are shown on **Plan Sheet 15**, **Details 5**, **6**, and **7**.

7.1.4 Culverts

Two, 30-inch-diameter CPEP culverts were installed for surface water management off of the Ash Disposal Landfill final cover. The locations of the culverts are shown on **Plan Sheet 13**. The culverts convey surface water from the north perimeter swale under the perimeter access road to the outfall swale. A typical detail of the culvert installation is shown on **Plan Sheet 17.** Product information is included in **Appendix G.**

7.1.5 Rock Chutes

Rock Chute No. 1 was constructed to the northwest of the Ash Disposal Landfill closure area. The rock chute was installed to be flush with the surrounding final grades. Embankment erosion control geotextile was deployed, and salvaged revetment stone was placed on top of the geotextile. Perimeter swales discharge to the rock chute before draining to Unnamed Creek One. The rock chute is shown on **Plan Sheet 13.** A typical detail is shown on **Plan Sheet 16**, **Detail 4**.

7.1.6 Check Dams

Rock check dams were constructed in the perimeter swales of the Ash Disposal Landfill closure area. The rock check dams were spaced approximately every 200 linear feet starting from the high point of the swale. Rock check dams were installed by excavating approximately 6 inches of topsoil from the final cover. Embankment erosion control geotextile was installed after excavation, and approximately 1.5 feet of erosion stone was installed the full width of the bottom of the swale at each location. A typical detail is shown on **Plan Sheet 16, Detail 5**.

8.0 SITE RESTORATION

The closure area and other disturbed areas were seeded and covered with an erosion control product. Site restoration activities were performed by TEC of Tomah, Wisconsin, between August 23, 2023, and October 18, 2023. Cut sheets with seed mixes and restoration materials used are located in **Appendix H.**

8.1 SEED AND EROSION CONTROL PRODUCTS

Per recommendation from TEC, a 17-17-17 (N-P-K) fertilizer was applied to the Ash Disposal Landfill closure area and restored area topsoil prior to spreading the seed mixture. The recommended fertilizer rate on new turf seeding was 100 pounds per acre. Additional details on topsoil and fertilizer are provided in **Appendix E**. Construction areas that received vegetation restoration are shown on **Plan Sheet 13**.

Iowa DOT Type 2 (Permanent Cool Season Mixture for Slopes and Ditches) seed mix was applied to the restoration area. Seed mixtures and application rates used are outlined in **Appendix H**. Seed mixtures were applied using a spreader pulled by a John Deere 740 tractor. The topsoil was raked prior to seeding using a skid steer attachment.

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Tables

1 Select Clay Testing Frequency Summary
2 Survey Documentation Summary
3 Select Clay Source Test Results Summary
4 Select Clay Undisturbed Sample Test Results Summary
5 Select Clay Fill Layer Moisture / Density Test Results Summary

Table 1
Ash Disposal Landfill Construction Documentation - LAN Generating Station
Testing Frequency Summary

Soil Type	Approx. Quantity	Test	Testing Frequency	# Tests Required	# Tests Performed
Select Clay					
Representative Samples	28,000 cy	Modified 5-Point Proctor (ASTM D1557)	1/ 5,000 cy	7	8
	28,000 cy	Atterberg Limits (ASTM D4318)	1/ 5,000 cy	7	8
	28,000 cy	Grain-Size (ASTM D7928)	1/ 5,000 cy	7	8
Undisturbed Samples[1]	17.4 acre-ft	Moisture content/Dry density (ASTM D2216/D7263)	1/ 1 acre-ft	18	19
	17.4 acre-ft	Atterberg Limits (ASTM D4318)	1/ 1 acre-ft	18	19
	17.4 acre-ft	Grain-Size (ASTM D7928/D6913)	1/ 1 acre-ft	18	19
	17.4 acre-ft	Undisturbed Hydraulic Conductivity (ASTM D5084)	1/ 3 acre-ft	6	9
Field Testing[2]	100-ft grid	Moisture Content and Soil Density (ASTM D6938)	1/ 1 ft thickness	76	78
Topsoil					
Pre Construction Samples[3]	-	Organic Content	-	-	2
	-	pH	-	-	2

Notes:
1. Resampled tests not included
2. See Figures 1 and 2.
3. Contractor provided, see Appendix E.

Created By: REH 10/20/23
Checked By: RR 10/23/23

Table 2
Ash Disposal Landfill Construction Documentation - LAN Generating Station
Survey Documentation Summary

Point Number	Location		Top of Waste		Top Select Clay Fill Elevation (ft)	Select Clay Fill Thickness (ft)	Top Rooting Zone Elevation (ft)	Rooting Zone Thickness (ft)	Top of Topsoil Elevation (ft)	Topsoil Thickness (ft)	Comments
	Northing	Easting	Proposed Elevation (ft)	Documented Elevation (ft)							
8001	3,956,205.47	5,541,987.36	678.3	678.4	680.4	2.0	680.9	0.5	681.4	0.5	Swale
8002	3,956,225.81	5,541,990.72	678.1	678.1	680.2	2.1	680.7	0.5	681.3	0.6	Swale
8003	3,956,206.21	5,541,992.55	678.3	678.3	680.4	2.1	680.9	0.5	681.5	0.6	Swale
8004	3,956,222.90	5,541,995.31	678.1	678.1	680.2	2.1	680.8	0.6	681.4	0.6	Break
8005	3,956,207.00	5,541,999.49	680.0	679.9	681.9	2.0	682.4	0.5	683.0	0.6	Break
8006	3,956,200.00	5,542,002.80	680.0	679.9	681.9	2.0	682.5	0.6	683.1	0.6	Break
8007	3,956,161.88	5,542,008.21	678.9	678.9	680.9	2.0	681.5	0.6	682.0	0.5	Swale
8008	3,956,244.56	5,542,017.87	677.7	677.7	679.8	2.1	680.3	0.5	680.9	0.6	Swale
8009	3,956,167.99	5,542,017.94	680.0	680.0	682.0	2.0	682.6	0.6	683.2	0.6	Break
8010	3,956,240.22	5,542,020.39	677.7	677.7	679.8	2.1	680.3	0.5	680.9	0.6	Swale
8011	3,956,232.05	5,542,024.42	680.0	680.1	682.1	2.0	682.6	0.5	683.1	0.5	Break
8012	3,956,132.53	5,542,031.70	679.4	679.5	681.5	2.0	682.1	0.6	682.6	0.5	Limits of Cover/Tie-in
8013	3,956,134.03	5,542,036.90	679.4	679.5	681.6	2.1	682.1	0.5	682.6	0.5	Swale/Tie-in
8014	3,956,250.00	5,542,049.77	678.3	678.3	680.4	2.1	681.0	0.6	681.5	0.5	Grid
8015[1]	3,956,197.30	5,542,050.00	690.4	690.2	692.2	2.0	692.8	0.6	693.4	0.6	Break
8016	3,956,160.73	5,542,050.00	686.5	686.4	688.4	2.0	689.0	0.6	689.5	0.5	Break
8017	3,956,150.00	5,542,050.00	684.9	684.8	686.8	2.0	687.4	0.6	687.9	0.5	Grid
8018[1]	3,956,130.20	5,542,050.00	682.0	681.7	683.8	2.1	684.5	0.7	685.1	0.6	Tie-in
8019	3,956,245.37	5,542,056.04	680.0	680.0	682.1	2.1	682.6	0.5	683.2	0.6	Break
8020	3,956,261.58	5,542,056.55	677.0	677.1	679.1	2.0	679.7	0.6	680.3	0.6	Swale
8021	3,956,256.70	5,542,069.30	680.0	680.1	682.2	2.1	682.7	0.5	683.3	0.6	Break
8022	3,956,266.62	5,542,069.38	678.8	678.9	680.9	2.0	681.4	0.5	682.0	0.6	Swale/Break
8023	3,956,273.34	5,542,070.31	679.0	679.0	681.1	2.1	681.7	0.6	682.2	0.5	Swale/Break
8024	3,956,221.36	5,542,071.07	687.0	687.1	689.1	2.0	689.6	0.5	690.1	0.5	Break
8025	3,956,250.00	5,542,078.24	682.8	682.7	684.8	2.1	685.4	0.6	685.9	0.5	Break
8026	3,956,183.16	5,542,087.92	697.4	697.4	699.4	2.0	699.9	0.5	700.4	0.5	Break
8027	3,956,239.49	5,542,092.26	687.0	687.1	689.1	2.0	689.7	0.6	690.3	0.6	Break
8028	3,956,135.31	5,542,099.72	691.5	691.2	693.2	2.0	693.7	0.5	694.3	0.6	Tie-in
8029[1]	3,956,292.53	5,542,100.00	681.3	680.7	683.0	2.3	683.6	0.6	684.1	0.5	Limtis of Cover
8030[1]	3,956,271.74	5,542,100.00	685.9	685.4	687.4	2.0	687.9	0.5	688.4	0.5	Break
8031[1]	3,956,250.00	5,542,100.00	687.9	687.8	689.8	2.0	690.4	0.6	690.9	0.5	Break
8032	3,956,234.10	5,542,100.00	689.3	689.4	691.4	2.0	692.0	0.6	692.6	0.6	Break
8033[1]	3,956,150.00	5,542,100.00	694.2	693.9	696.1	2.2	696.6	0.5	697.3	0.7	Grid
8034	3,956,200.00	5,542,101.48	696.0	696.0	698.0	2.0	698.5	0.5	699.0	0.5	Grid
8035	3,956,215.87	5,542,126.19	697.0	697.1	699.1	2.0	699.7	0.6	700.2	0.5	Break
8036[1]	3,956,178.49	5,542,144.02	707.0	706.5	708.7	2.2	709.3	0.6	710.0	0.7	Break
8037[1]	3,956,150.00	5,542,150.00	702.4	705.3	707.3	2.0	707.8	0.5	708.4	0.6	Grid
8038	3,956,123.00	5,542,150.00	697.0	696.8	698.8	2.0	699.3	0.5	699.8	0.5	Tie-in
8039	3,956,250.00	5,542,151.57	694.8	694.8	696.8	2.0	697.4	0.6	697.9	0.5	Grid
8040[1]	3,956,300.00	5,542,153.06	682.6	681.8	683.8	2.0	684.6	0.8	685.7	1.1	Grid
8041[1]	3,956,308.60	5,542,153.32	680.5	679.8	681.8	2.0	682.5	0.7	683.6	1.1	Limits of Cover
8042	3,956,187.75	5,542,154.75	707.0	707.1	709.1	2.0	709.6	0.5	710.2	0.6	Break

Table 2
Ash Disposal Landfill Construction Documentation - LAN Generating Station
Survey Documentation Summary

Point Number	Location		Top of Waste		Top Select Clay Fill Elevation (ft)	Select Clay Fill Thickness (ft)	Top Rooting Zone Elevation (ft)	Rooting Zone Thickness (ft)	Top of Topsoil Elevation (ft)	Topsoil Thickness (ft)	Comments
	Northing	Easting	Proposed Elevation (ft)	Documented Elevation (ft)							
8043	3,956,215.75	5,542,157.29	702.8	702.7	704.7	2.0	705.2	0.5	705.8	0.6	Break
8044[1]	3,956,237.16	5,542,166.62	697.0	696.9	698.9	2.0	699.5	0.6	700.0	0.5	Break
8045	3,956,250.00	5,542,172.22	693.5	693.6	695.6	2.0	696.1	0.5	696.6	0.5	Break
8046[1]	3,956,296.64	5,542,192.55	681.0	680.4	682.4	2.0	683.4	1.0	684.1	0.7	Limits of Cover
8047[1]	3,956,112.40	5,542,199.98	702.3	704.5	706.6	2.1	707.1	0.5	708.2	1.1	Tie-in
8048	3,956,250.00	5,542,200.00	689.8	689.7	691.8	2.1	692.3	0.5	692.9	0.6	Grid
8049	3,956,200.00	5,542,200.00	700.3	700.2	702.2	2.0	702.8	0.6	703.3	0.5	Grid
8050	3,956,151.82	5,542,200.00	710.4	710.3	712.3	2.0	712.8	0.5	713.3	0.5	Grid/Break
8051	3,956,135.93	5,542,223.86	710.5	710.4	712.4	2.0	712.9	0.5	713.4	0.5	Break
8052	3,956,150.00	5,542,231.91	706.5	706.5	708.5	2.0	709.0	0.5	709.5	0.5	Break
8053[1]	3,956,250.00	5,542,250.00	683.0	682.4	684.6	2.2	685.1	0.5	686.2	1.1	Grid
8054	3,956,200.00	5,542,250.00	693.5	693.5	695.6	2.1	696.1	0.5	696.6	0.5	Grid
8055	3,956,181.62	5,542,250.00	697.4	697.3	699.4	2.1	699.9	0.5	700.5	0.6	Break
8056	3,956,150.00	5,542,250.00	704.5	704.4	706.4	2.0	707.0	0.6	707.6	0.6	Grid
8057[1]	3,956,121.30	5,542,250.00	711.1	710.4	712.5	2.1	713.0	0.5	713.9	0.9	Break
8058[1]	3,956,092.90	5,542,250.04	705.1	708.3	710.3	2.0	710.8	0.5	711.3	0.5	Tie-in
8059	3,956,200.00	5,542,260.52	692.1	692.0	694.0	2.0	694.5	0.5	695.1	0.6	Break
8060	3,956,100.00	5,542,288.62	711.9	711.8	713.8	2.0	714.3	0.5	714.8	0.5	Break
8061[1]	3,956,226.91	5,542,300.00	681.8	681.6	683.6	2.0	684.3	0.7	685.1	0.8	Limits of Cover
8062[1]	3,956,200.00	5,542,300.00	688.0	687.9	689.9	2.0	690.5	0.6	691.0	0.5	Grid
8063[1]	3,956,150.00	5,542,300.00	699.3	699.3	701.3	2.0	701.9	0.6	702.4	0.5	Grid
8064	3,956,100.00	5,542,300.00	710.7	710.8	712.9	2.1	713.4	0.5	713.9	0.5	Grid
8065[1]	3,956,081.32	5,542,300.08	709.6	709.6	711.6	2.0	712.1	0.5	712.9	0.8	Tie-in
8066	3,956,084.96	5,542,315.88	712.5	711.5	713.9	2.4	714.5	0.6	715.7	1.2	Break
8067	3,956,100.00	5,542,319.62	708.7	708.7	710.8	2.1	711.3	0.5	711.8	0.5	Break
8068	3,956,150.00	5,542,332.06	696.0	696.0	698.0	2.0	698.6	0.6	699.1	0.5	Break
8069[1]	3,956,063.09	5,542,349.92	712.8	712.6	714.7	2.1	715.3	0.6	716.0	0.7	Tie-in
8070[1]	3,956,200.25	5,542,350.00	683.2	683.0	685.1	2.1	685.6	0.5	686.4	0.8	Limits of Cover
8071	3,956,150.00	5,542,350.00	695.8	695.7	697.8	2.1	698.4	0.6	698.9	0.5	Grid
8072	3,956,100.00	5,542,350.00	708.2	708.2	710.3	2.1	710.8	0.5	711.3	0.5	Grid
8073	3,956,073.23	5,542,350.00	714.9	712.7	715.7	3.0	716.4	0.7	717.8	1.4	Break
8074[1]	3,956,190.11	5,542,400.00	685.0	684.6	686.8	2.2	687.3	0.5	688.0	0.7	Limits of Cover
8075	3,956,150.00	5,542,400.00	695.0	695.0	697.1	2.1	697.6	0.5	698.1	0.5	Grid
8076	3,956,100.00	5,542,400.00	707.5	707.4	709.4	2.0	710.0	0.6	710.5	0.5	Grid
8077	3,956,056.64	5,542,400.00	718.7	715.5	718.9	3.4	719.6	0.7	721.4	1.8	Break
8078[1]	3,956,039.90	5,542,400.61	715.5	715.1	717.2	2.1	717.7	0.5	718.4	0.7	Tie-in
8079	3,956,050.00	5,542,421.68	720.5	717.7	720.5	2.8	721.2	0.7	723.3	2.1	Break
8080	3,956,182.86	5,542,449.21	687.0	687.0	689.1	2.1	689.7	0.6	690.3	0.6	Break
8081[1]	3,956,150.00	5,542,450.00	695.2	695.2	697.2	2.0	697.7	0.5	698.4	0.7	Grid
8082[1]	3,956,100.00	5,542,450.00	707.7	707.3	709.3	2.0	709.9	0.6	710.8	0.9	Grid
8083[1]	3,956,050.00	5,542,450.00	720.3	719.2	722.3	3.1	722.9	0.6	723.4	0.5	Grid

Table 2
Ash Disposal Landfill Construction Documentation - LAN Generating Station
Survey Documentation Summary

Point Number	Location		Top of Waste		Top Select Clay Fill Elevation (ft)	Select Clay Fill Thickness (ft)	Top Rooting Zone Elevation (ft)	Rooting Zone Thickness (ft)	Top of Topsoil Elevation (ft)	Topsoil Thickness (ft)	Comments
	Northing	Easting	Proposed Elevation (ft)	Documented Elevation (ft)							
8084	3,956,041.32	5,542,450.00	722.8	719.4	723.1	3.7	723.7	0.6	725.5	1.8	Break
8085	3,956,028.53	5,542,450.31	720.3	718.4	722.2	3.8	722.8	0.6	723.3	0.5	Tie-in
8086	3,956,150.00	5,542,452.55	695.2	695.2	697.3	2.1	697.8	0.5	698.4	0.6	Break
8087	3,956,063.05	5,542,461.37	717.0	717.1	719.2	2.1	719.7	0.5	720.2	0.5	Break
8088	3,956,186.47	5,542,468.43	687.0	687.0	689.3	2.3	689.8	0.5	690.3	0.5	Break
8089	3,956,150.00	5,542,471.17	696.1	696.0	698.2	2.2	698.7	0.5	699.2	0.5	Break
8090	3,956,100.00	5,542,474.95	708.5	708.6	710.6	2.0	711.2	0.6	711.7	0.5	Break
8091	3,956,066.09	5,542,477.57	717.0	717.0	719.1	2.1	719.6	0.5	720.2	0.6	Break
8092	3,956,177.63	5,542,492.06	689.0	689.0	691.1	2.1	691.6	0.5	692.2	0.6	Break
8093[1]	3,956,188.61	5,542,500.00	687.3	687.2	689.5	2.3	690.3	0.8	690.8	0.5	Swale
8094	3,956,174.82	5,542,500.00	689.7	689.8	691.8	2.0	692.3	0.5	692.8	0.5	Break
8095	3,956,150.00	5,542,500.00	695.9	695.9	698.0	2.1	698.5	0.5	699.0	0.5	Grid
8096[1]	3,956,100.00	5,542,500.00	708.4	708.1	710.2	2.1	710.8	0.6	711.4	0.6	Grid
8097[1]	3,956,050.00	5,542,500.00	720.9	720.7	722.8	2.1	723.4	0.6	723.9	0.5	Grid
8098	3,956,026.00	5,542,500.00	726.8	724.4	727.2	2.8	727.7	0.5	729.7	2.0	Break
8099	3,956,015.85	5,542,500.01	724.7	723.5	726.9	3.4	727.4	0.5	727.9	0.5	Tie-in
8100[1]	3,955,994.82	5,542,549.99	727.4	725.5	729.6	4.1	730.1	0.5	730.6	0.5	Tie-in
8101[1]	3,956,176.94	5,542,550.00	691.4	690.3	693.1	2.8	693.7	0.6	694.4	0.7	Swale
8102	3,956,157.46	5,542,550.00	693.9	693.3	695.9	2.6	696.5	0.6	697.0	0.5	Break
8103	3,956,150.00	5,542,550.00	695.8	695.7	697.8	2.1	698.4	0.6	698.9	0.5	Grid
8104	3,956,100.00	5,542,550.00	708.2	708.1	710.1	2.0	710.6	0.5	711.1	0.5	Grid
8105	3,956,050.00	5,542,550.00	720.8	720.8	722.8	2.0	723.4	0.6	723.9	0.5	Grid
8106[1]	3,956,008.63	5,542,550.00	730.3	729.3	731.5	2.2	732.0	0.5	732.9	0.9	Break
8107[1]	3,955,966.76	5,542,599.93	728.7	728.1	730.7	2.6	731.3	0.6	731.8	0.5	Tie-in
8108	3,956,151.96	5,542,600.00	695.8	695.8	697.9	2.1	698.4	0.5	699.0	0.6	Grid/Swale
8109	3,956,138.33	5,542,600.00	698.2	697.8	700.2	2.4	700.7	0.5	701.6	0.9	Break
8110	3,956,100.00	5,542,600.00	707.8	707.7	709.8	2.1	710.4	0.6	711.0	0.6	Grid
8111	3,956,050.00	5,542,600.00	720.3	720.2	722.3	2.1	722.8	0.5	723.4	0.6	Grid
8112[1]	3,955,991.16	5,542,600.00	733.7	732.4	735.0	2.6	735.7	0.7	736.5	0.8	Break
8113	3,956,000.00	5,542,600.01	731.9	731.3	733.9	2.6	734.4	0.5	735.0	0.6	Grid
8114	3,955,957.83	5,542,616.04	729.1	728.8	730.9	2.1	731.5	0.6	732.1	0.6	Tie-in
8115	3,956,087.65	5,542,624.26	711.0	710.9	713.0	2.1	713.5	0.5	714.1	0.6	Break
8116	3,955,940.84	5,542,649.84	730.4	730.1	732.2	2.1	732.7	0.5	733.2	0.5	Tie-in
8117[1]	3,956,128.60	5,542,650.00	700.5	700.0	702.4	2.4	703.0	0.6	703.8	0.8	Swale
8118	3,956,112.83	5,542,650.00	703.2	701.9	705.1	3.2	705.6	0.5	707.1	1.5	Break
8119[1]	3,956,100.00	5,542,650.00	706.3	704.4	708.3	3.9	708.8	0.5	709.7	0.9	Grid
8120	3,956,050.00	5,542,650.00	718.5	718.4	720.5	2.1	721.1	0.6	721.7	0.6	Grid
8121	3,956,000.00	5,542,650.00	730.7	730.6	732.7	2.1	733.2	0.5	733.8	0.6	Grid
8122[1]	3,955,950.00	5,542,650.00	732.3	732.2	734.3	2.1	734.9	0.6	735.5	0.6	Grid
8123	3,956,105.26	5,542,700.00	704.8	704.0	706.0	2.0	706.6	0.6	708.4	1.8	Swale
8124[1]	3,956,099.62	5,542,700.00	705.0	704.8	706.8	2.0	707.4	0.6	708.5	1.1	Swale
8125	3,956,085.20	5,542,700.00	707.5	706.4	709.9	3.5	710.5	0.6	711.2	0.7	Break

Table 2
Ash Disposal Landfill Construction Documentation - LAN Generating Station
Survey Documentation Summary

Point Number	Location		Top of Waste		Top Select Clay Fill Elevation (ft)	Select Clay Fill Thickness (ft)	Top Rooting Zone Elevation (ft)	Rooting Zone Thickness (ft)	Top of Topsoil Elevation (ft)	Topsoil Thickness (ft)	Comments
	Northing	Easting	Proposed Elevation (ft)	Documented Elevation (ft)							
8126[1]	3,956,050.00	5,542,700.00	716.2	715.8	718.1	2.3	718.6	0.5	719.5	0.9	Grid
8127	3,956,000.00	5,542,700.00	728.6	728.6	730.6	2.0	731.1	0.5	731.7	0.6	Grid
8128	3,955,950.00	5,542,700.00	739.3	738.4	740.5	2.1	741.8	1.3	742.4	0.6	Grid
8129	3,956,075.16	5,542,700.02	710.0	709.6	712.1	2.5	712.6	0.5	713.4	0.8	Break
8130[1]	3,955,907.02	5,542,709.37	731.8	731.5	733.6	2.1	734.1	0.5	734.9	0.8	Tie-in
8131	3,956,083.69	5,542,749.05	709.0	708.3	710.3	2.0	711.6	1.3	713.9	2.3	Swale
8132	3,956,079.99	5,542,750.00	709.1	708.5	710.6	2.1	711.9	1.3	713.7	1.8	Swale
8133	3,956,066.55	5,542,750.00	711.4	710.4	713.5	3.1	714.0	0.5	715.4	1.4	Break
8134	3,956,050.00	5,542,750.00	715.6	715.6	717.6	2.0	718.2	0.6	718.8	0.6	Grid
8135	3,956,000.00	5,542,750.00	728.1	728.1	730.1	2.0	730.6	0.5	731.2	0.6	Grid
8136	3,955,950.00	5,542,750.00	740.9	740.9	743.0	2.1	743.5	0.5	744.0	0.5	Grid
8137	3,955,900.00	5,542,750.00	736.1	736.0	738.1	2.1	738.6	0.5	739.2	0.6	Grid
8138	3,956,057.59	5,542,750.10	713.7	711.3	715.7	4.4	716.2	0.5	717.0	0.8	Toe of Slope/Break
8139	3,955,881.58	5,542,752.61	732.6	732.6	734.6	2.0	735.1	0.5	735.6	0.5	Tie-in
8140	3,956,060.89	5,542,799.86	714.2	713.7	715.7	2.0	717.2	1.5	719.2	2.0	Swale
8141	3,956,033.07	5,542,799.88	720.5	720.2	722.2	2.0	722.8	0.6	723.9	1.1	Break
8142	3,956,052.26	5,542,800.00	715.7	714.9	717.0	2.1	718.4	1.4	719.6	1.2	Break
8143	3,956,000.00	5,542,800.00	728.7	728.7	730.7	2.0	731.2	0.5	731.7	0.5	Grid
8144	3,955,950.00	5,542,800.00	741.3	741.3	743.3	2.0	743.8	0.5	744.3	0.5	Grid
8145[1]	3,955,922.87	5,542,800.00	747.8	746.5	748.7	2.2	749.3	0.6	750.2	0.9	Break
8146	3,955,900.00	5,542,800.00	743.0	743.1	745.1	2.0	745.6	0.5	746.2	0.6	Grid
8147[1]	3,955,854.47	5,542,802.84	734.0	733.9	735.9	2.0	736.6	0.7	737.1	0.5	Tie-in
8148	3,956,016.14	5,542,843.72	724.2	724.0	726.0	2.0	726.6	0.6	727.2	0.6	Break
8149	3,956,020.58	5,542,845.88	723.0	719.8	724.7	4.9	725.5	0.8	726.1	0.6	Toe of Slope/Break
8150[1]	3,956,000.00	5,542,850.00	728.1	727.9	729.9	2.0	730.6	0.7	731.4	0.8	Grid
8151[1]	3,955,950.00	5,542,850.00	740.5	740.1	742.1	2.0	742.9	0.8	743.7	0.8	Grid
8152[1]	3,955,904.45	5,542,850.00	750.8	750.1	752.2	2.1	752.7	0.5	753.7	1.0	Break
8153[1]	3,955,875.00	5,542,850.00	744.8	744.8	746.8	2.0	747.4	0.6	747.9	0.5	Break
8154	3,955,850.00	5,542,850.00	739.6	739.6	741.6	2.0	742.1	0.5	742.6	0.5	Grid
8155[1]	3,956,042.23	5,542,852.34	718.4	719.9	722.2	2.3	722.7	0.5	723.5	0.8	Swale
8156[1]	3,955,828.50	5,542,853.36	735.6	735.4	737.4	2.0	738.2	0.8	738.7	0.5	Tie-in
8157	3,956,024.66	5,542,900.00	722.1	722.2	724.2	2.0	725.2	1.0	727.9	2.7	Swale
8158	3,956,000.00	5,542,900.00	727.2	725.0	728.7	3.7	729.3	0.6	730.4	1.1	Grid
8159	3,955,950.00	5,542,900.00	739.5	739.5	741.5	2.0	742.0	0.5	742.5	0.5	Grid
8160	3,955,900.00	5,542,900.00	751.1	751.2	753.2	2.0	753.7	0.5	754.2	0.5	Grid
8161	3,955,850.00	5,542,900.00	746.5	746.6	748.6	2.0	749.1	0.5	749.6	0.5	Grid
8162[1]	3,955,800.49	5,542,904.24	736.7	736.5	738.5	2.0	739.0	0.5	739.8	0.8	Tie-in
8163	3,956,020.93	5,542,909.52	723.0	723.0	725.1	2.1	726.0	0.9	728.5	2.5	Swale
8164[1]	3,956,005.23	5,542,950.00	728.5	727.8	729.8	2.0	730.6	0.8	731.5	0.9	Swale
8165[1]	3,955,994.58	5,542,950.00	726.9	727.4	729.4	2.0	730.2	0.8	731.1	0.9	Swale
8166	3,955,950.00	5,542,950.00	736.8	736.9	738.9	2.0	739.4	0.5	740.0	0.6	Grid
8167[1]	3,955,900.00	5,542,950.00	749.1	748.9	750.9	2.0	751.4	0.5	752.2	0.8	Grid

Table 2
Ash Disposal Landfill Construction Documentation - LAN Generating Station
Survey Documentation Summary

Point Number	Location		Top of Waste		Top Select Clay Fill Elevation (ft)	Select Clay Fill Thickness (ft)	Top Rooting Zone Elevation (ft)	Rooting Zone Thickness (ft)	Top of Topsoil Elevation (ft)	Topsoil Thickness (ft)	Comments
	Northing	Easting	Proposed Elevation (ft)	Documented Elevation (ft)							
8168[1]	3,955,850.00	5,542,950.00	753.3	753.1	755.1	2.0	755.7	0.6	756.3	0.6	Grid
8169[1]	3,955,800.00	5,542,950.00	742.8	742.4	744.5	2.1	745.2	0.7	745.9	0.7	Grid
8170[1]	3,955,867.58	5,542,950.12	757.0	756.6	758.7	2.1	759.4	0.7	759.9	0.5	Break
8171	3,955,772.70	5,542,953.12	737.5	737.5	739.5	2.0	740.1	0.6	740.6	0.5	Tie-in
8172	3,955,756.11	5,542,983.29	738.1	738.1	740.1	2.0	740.6	0.5	741.1	0.5	Tie-in
8173[1]	3,955,839.35	5,542,999.43	757.8	757.6	759.6	2.0	760.1	0.5	760.7	0.6	Top of Slope/Break
8174[1]	3,955,858.23	5,542,999.56	758.2	757.9	759.9	2.0	760.7	0.8	761.4	0.7	Top of Slope/Break
8175	3,955,981.19	5,543,000.00	732.9	728.3	730.3	2.0	732.2	1.9	734.2	2.0	Swale
8176[1]	3,955,976.81	5,543,000.00	731.0	728.5	731.9	3.4	733.4	1.5	734.0	0.6	Swale
8177	3,955,956.71	5,543,000.00	733.7	731.4	735.1	3.7	736.1	1.0	737.5	1.4	Break
8178	3,955,950.00	5,543,000.00	735.4	735.3	737.3	2.0	737.8	0.5	738.4	0.6	Grid
8179	3,955,900.00	5,543,000.00	747.8	747.8	749.8	2.0	750.3	0.5	750.9	0.6	Grid
8180[1]	3,955,800.00	5,543,000.00	749.6	749.2	751.5	2.3	752.0	0.5	752.5	0.5	Grid
8181[1]	3,955,745.88	5,543,002.95	738.6	738.4	740.7	2.3	741.2	0.5	741.7	0.5	Tie-in
8182	3,955,951.62	5,543,050.00	735.1	734.3	736.4	2.1	737.9	1.5	738.4	0.5	Swale
8183	3,955,946.09	5,543,050.00	735.2	734.6	736.7	2.1	737.8	1.1	738.4	0.6	Swale
8184	3,955,900.00	5,543,050.00	744.6	744.7	746.8	2.1	747.3	0.5	747.9	0.6	Grid
8185	3,955,850.00	5,543,050.00	756.4	756.3	758.4	2.1	759.0	0.6	759.5	0.5	Grid
8186[1]	3,955,826.37	5,543,050.00	761.9	761.4	763.4	2.0	763.9	0.5	764.6	0.7	Break
8187	3,955,800.00	5,543,050.00	756.4	756.4	758.4	2.0	758.9	0.5	759.5	0.6	Grid
8188	3,955,750.00	5,543,050.00	745.9	745.9	747.9	2.0	748.4	0.5	749.0	0.6	Grid
8189	3,955,720.44	5,543,054.71	740.4	740.2	742.2	2.0	742.7	0.5	743.3	0.6	Tie-in
8190[1]	3,955,928.00	5,543,100.00	736.2	735.4	737.4	2.0	738.5	1.1	739.3	0.8	Swale
8191	3,955,908.09	5,543,100.00	738.4	737.4	739.5	2.1	741.2	1.7	741.7	0.5	Break
8192[1]	3,955,900.00	5,543,100.00	740.3	739.7	741.8	2.1	742.8	1.0	743.4	0.6	Grid
8193	3,955,850.00	5,543,100.00	752.1	752.2	754.2	2.0	754.7	0.5	755.2	0.5	Grid
8194[1]	3,955,801.47	5,543,100.00	763.6	762.9	764.9	2.0	765.5	0.6	766.3	0.8	Break
8195[1]	3,955,750.00	5,543,100.00	752.9	752.7	754.8	2.1	755.4	0.6	755.9	0.5	Grid
8196[1]	3,955,700.00	5,543,100.00	742.6	742.4	744.4	2.0	745.0	0.6	745.6	0.6	Grid
8197	3,955,909.62	5,543,150.00	739.3	737.2	739.2	2.0	739.8	0.6	740.4	0.6	Swale
8198	3,955,885.83	5,543,150.00	739.5	738.7	740.8	2.1	742.3	1.5	742.9	0.6	Break
8199	3,955,850.00	5,543,150.00	748.0	748.1	750.1	2.0	750.6	0.5	751.2	0.6	Grid
8200	3,955,800.00	5,543,150.00	759.8	759.9	761.9	2.0	762.4	0.5	763.0	0.6	Grid
8201	3,955,750.00	5,543,150.00	760.0	760.0	762.1	2.1	762.6	0.5	763.1	0.5	Grid
8202[1]	3,955,700.00	5,543,150.00	750.1	749.7	751.7	2.0	752.3	0.6	753.1	0.8	Grid
8203	3,955,658.74	5,543,155.27	742.7	742.8	744.8	2.0	745.3	0.5	745.8	0.5	Tie-in
8204	3,955,889.01	5,543,200.00	740.4	738.9	740.9	2.0	742.5	1.6	743.1	0.6	Swale
8205	3,955,850.00	5,543,200.00	743.5	743.5	745.5	2.0	746.0	0.5	746.6	0.6	Grid
8206	3,955,800.00	5,543,200.00	755.1	755.1	757.2	2.1	757.7	0.5	758.3	0.6	Grid
8207[1]	3,955,750.00	5,543,200.00	766.3	766.1	768.1	2.0	768.6	0.5	769.4	0.8	Grid
8208[1]	3,955,700.00	5,543,200.00	757.7	757.5	759.5	2.0	760.1	0.6	760.6	0.5	Grid

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	Northing	Easting	Proposed Elevation (ft)	Documented Elevation (ft)							
8209[1]	3,955,650.00	5,543,200.00	748.0	747.8	749.9	2.1	750.5	0.6	751.0	0.5	Grid
8210[1]	3,955,623.84	5,543,204.83	743.8	743.2	745.5	2.3	746.2	0.7	746.7	0.5	Tie-in
8211	3,955,857.90	5,543,217.73	741.0	739.6	741.6	2.0	743.4	1.8	744.0	0.6	Break
8212	3,955,877.32	5,543,228.35	741.0	739.3	741.3	2.0	743.0	1.7	743.6	0.6	Break
8213	3,955,857.33	5,543,250.00	739.6	739.5	741.8	2.3	743.1	1.3	743.7	0.6	Swale
8214	3,955,851.24	5,543,250.00	739.6	740.0	742.0	2.0	743.3	1.3	743.8	0.5	Grid/Swale
8215	3,955,800.00	5,543,250.00	749.5	749.4	751.5	2.1	752.1	0.6	752.7	0.6	Grid
8216	3,955,750.00	5,543,250.00	760.5	760.5	762.6	2.1	763.1	0.5	763.7	0.6	Grid
8217[1]	3,955,700.00	5,543,250.00	765.6	765.5	767.5	2.0	768.1	0.6	768.6	0.5	Break
8218[1]	3,955,650.00	5,543,250.00	756.0	755.6	757.6	2.0	758.2	0.6	759.0	0.8	Grid
8219[1]	3,955,600.00	5,543,250.00	746.5	746.0	748.2	2.2	748.9	0.7	749.4	0.5	Grid
8220	3,955,827.76	5,543,250.13	743.1	741.8	743.9	2.1	745.9	2.0	746.5	0.6	Toe of Slope/Break
8221	3,955,589.84	5,543,256.01	745.6	745.5	747.5	2.0	748.1	0.6	748.6	0.5	Tie-in
8222	3,955,794.34	5,543,299.93	744.9	743.6	745.6	2.0	747.9	2.3	748.4	0.5	Toe of Slope/Break
8223	3,955,816.35	5,543,300.00	740.9	741.4	743.4	2.0	745.1	1.7	745.7	0.6	Swale
8224	3,955,800.71	5,543,300.00	743.0	742.7	744.7	2.0	745.9	1.2	746.5	0.6	Break
8225	3,955,750.00	5,543,300.00	754.8	754.8	756.9	2.1	757.4	0.5	758.0	0.6	Grid
8226	3,955,700.00	5,543,300.00	766.0	766.1	768.1	2.0	768.6	0.5	769.2	0.6	Grid
8227[1]	3,955,650.00	5,543,300.00	764.1	763.8	765.9	2.1	766.4	0.5	767.2	0.8	Grid
8228[1]	3,955,600.00	5,543,300.00	754.7	754.4	756.4	2.0	757.0	0.6	757.6	0.6	Grid
8229	3,955,554.66	5,543,306.28	746.8	746.5	748.6	2.1	749.2	0.6	749.7	0.5	Tie-in
8230[1]	3,955,787.97	5,543,350.00	742.0	743.0	745.0	2.0	745.6	0.6	746.3	0.8	Swale
8231	3,955,750.00	5,543,350.00	749.5	749.5	751.5	2.0	752.0	0.5	752.6	0.6	Grid
8232	3,955,700.00	5,543,350.00	760.8	760.9	762.9	2.0	763.4	0.5	764.0	0.6	Grid
8233[1]	3,955,650.21	5,543,350.00	772.2	771.9	773.9	2.0	774.4	0.5	775.2	0.8	Break/Grid
8234[1]	3,955,600.00	5,543,350.00	762.5	762.4	764.5	2.1	765.0	0.5	765.5	0.5	Grid
8235[1]	3,955,550.00	5,543,350.00	752.7	752.3	754.3	2.0	755.2	0.9	755.7	0.5	Grid
8236	3,955,763.55	5,543,350.05	746.4	745.1	747.6	2.5	749.0	1.4	749.6	0.6	Toe of Slope/Break
8237	3,955,522.68	5,543,355.72	748.2	748.1	750.2	2.1	750.7	0.5	751.3	0.6	Tie-in
8238[1]	3,955,737.26	5,543,399.97	747.2	746.4	748.8	2.4	749.6	0.8	750.1	0.5	Toe of Slope/Break
8239	3,955,760.41	5,543,400.00	743.1	743.7	745.8	2.1	747.1	1.3	747.6	0.5	Break
8240	3,955,700.00	5,543,400.00	755.7	755.7	757.7	2.0	758.3	0.6	758.8	0.5	Grid
8241	3,955,650.00	5,543,400.00	767.1	767.2	769.2	2.0	769.8	0.6	770.3	0.5	Grid
8242	3,955,600.00	5,543,400.00	770.2	770.2	772.3	2.1	772.8	0.5	773.4	0.6	Grid
8243	3,955,550.00	5,543,400.00	760.4	760.5	762.5	2.0	763.0	0.5	763.6	0.6	Grid
8244[1]	3,955,500.00	5,543,400.00	750.5	750.2	752.3	2.1	752.8	0.5	753.5	0.7	Grid
8245	3,955,500.00	5,543,421.93	753.9	753.8	755.9	2.1	756.4	0.5	757.0	0.6	Break
8246	3,955,514.22	5,543,424.02	757.0	757.0	759.1	2.1	759.6	0.5	760.1	0.5	Break
8247	3,955,550.00	5,543,429.52	764.9	764.9	766.9	2.0	767.4	0.5	768.0	0.6	Break
8248	3,955,493.81	5,543,445.92	750.3	750.1	752.1	2.0	752.7	0.6	753.3	0.6	Tie-in
8249	3,955,733.01	5,543,450.00	744.3	745.0	747.1	2.1	748.4	1.3	748.9	0.5	Swale

Table 2
Ash Disposal Landfill Construction Documentation - LAN Generating Station
Survey Documentation Summary

Point Number	Location		Top of Waste		Top Select Clay Fill Elevation (ft)	Select Clay Fill Thickness (ft)	Top Rooting Zone Elevation (ft)	Rooting Zone Thickness (ft)	Top of Topsoil Elevation (ft)	Topsoil Thickness (ft)	Comments
	Northing	Easting	Proposed Elevation (ft)	Documented Elevation (ft)							
8250	3,955,718.19	5,543,450.00	746.4	745.7	747.7	2.0	749.7	2.0	750.2	0.5	Break
8251[1]	3,955,700.00	5,543,450.00	750.6	750.5	752.5	2.0	753.0	0.5	753.7	0.8	Grid
8252	3,955,650.00	5,543,450.00	762.3	762.3	764.4	2.1	764.9	0.5	765.4	0.5	Grid
8253[1]	3,955,600.00	5,543,450.00	774.0	773.7	775.8	2.1	776.3	0.5	776.8	0.5	Grid
8254[1]	3,955,550.00	5,543,450.00	763.4	763.2	765.3	2.1	765.9	0.6	766.4	0.5	Grid
8255	3,955,500.00	5,543,450.00	751.5	751.4	753.4	2.0	754.0	0.6	754.5	0.5	Grid
8256	3,955,703.83	5,543,476.20	747.0	746.3	748.3	2.0	750.3	2.0	750.8	0.5	Break
8257	3,955,715.53	5,543,481.89	745.0	745.4	747.8	2.4	749.1	1.3	749.6	0.5	Swale
8258	3,955,512.85	5,543,495.88	751.5	751.4	753.4	2.0	754.0	0.6	754.5	0.5	Tie-in
8259	3,955,707.79	5,543,500.00	745.4	745.5	747.6	2.1	749.2	1.6	749.8	0.6	Swale
8260	3,955,693.65	5,543,500.00	747.5	746.4	748.5	2.1	750.8	2.3	751.3	0.5	Break
8261	3,955,650.00	5,543,500.00	757.9	757.9	760.0	2.1	760.6	0.6	761.2	0.6	Grid
8262[1]	3,955,600.00	5,543,500.00	769.7	769.4	771.5	2.1	772.0	0.5	772.7	0.7	Grid
8263[1]	3,955,550.00	5,543,500.00	760.2	760.1	762.2	2.1	762.8	0.6	763.3	0.5	Grid
8264	3,955,527.13	5,543,546.72	752.2	752.0	754.1	2.1	754.7	0.6	755.3	0.6	Tie-in
8265[1]	3,955,686.42	5,543,550.00	746.4	747.1	749.9	2.8	750.4	0.5	751.2	0.8	Swale
8266[1]	3,955,672.28	5,543,550.00	748.5	748.0	750.1	2.1	751.4	1.3	752.2	0.8	Break
8267	3,955,650.00	5,543,550.00	753.9	753.8	756.0	2.2	756.5	0.5	757.0	0.5	Grid
8268[1]	3,955,600.00	5,543,550.00	765.9	765.9	767.9	2.0	768.4	0.5	769.2	0.8	Grid
8269	3,955,550.00	5,543,550.00	757.6	757.7	759.7	2.0	760.2	0.5	760.7	0.5	Grid
8270	3,955,661.69	5,543,574.78	749.0	748.9	751.0	2.1	752.2	1.2	752.7	0.5	Break
8271	3,955,674.76	5,543,577.28	747.0	748.1	750.6	2.5	751.2	0.6	751.7	0.5	Swale
8272	3,955,679.78	5,543,578.24	747.0	748.2	750.5	2.3	751.1	0.6	751.6	0.5	Swale
8273[1]	3,955,541.13	5,543,599.96	753.0	752.8	754.8	2.0	755.4	0.6	756.0	0.6	Tie-in
8274	3,955,675.35	5,543,600.00	747.4	748.9	751.0	2.1	751.5	0.5	752.2	0.7	Swale
8275	3,955,662.34	5,543,600.00	749.5	749.6	751.6	2.0	752.7	1.1	753.3	0.6	Break
8276	3,955,650.00	5,543,600.00	752.7	752.8	754.8	2.0	755.4	0.6	755.9	0.5	Grid
8277[1]	3,955,596.83	5,543,600.00	766.4	765.2	767.4	2.2	767.9	0.5	768.6	0.7	Break
8278	3,955,550.00	5,543,600.00	755.2	755.1	757.2	2.1	757.8	0.6	758.3	0.5	Grid
8279[1]	3,955,537.52	5,543,649.79	749.5	749.0	751.3	2.3	752.0	0.7	752.5	0.5	Tie-in
8280[1]	3,955,676.64	5,543,650.00	748.4	749.4	751.5	2.1	752.0	0.5	752.9	0.9	Swale
8281	3,955,663.64	5,543,650.00	750.5	750.6	752.6	2.0	753.1	0.5	753.6	0.5	Break
8282[1]	3,955,650.00	5,543,650.00	753.9	753.6	755.6	2.0	756.2	0.6	757.0	0.8	Grid
8283[1]	3,955,604.29	5,543,650.00	765.3	764.7	766.8	2.1	767.4	0.6	767.9	0.5	Break
8284	3,955,550.00	5,543,650.00	752.5	752.6	754.6	2.0	755.1	0.5	755.6	0.5	Grid
8285[1]	3,955,606.48	5,543,664.67	765.0	763.8	766.0	2.2	766.7	0.7	767.5	0.8	Break
8286	3,955,660.16	5,543,673.28	752.0	751.9	753.9	2.0	754.5	0.6	755.0	0.5	Break
8287[1]	3,955,677.34	5,543,676.86	749.0	750.5	752.6	2.1	753.1	0.5	753.7	0.6	Swale
8288	3,955,605.45	5,543,684.94	763.0	763.0	765.0	2.0	765.5	0.5	766.1	0.6	Break
8289[1]	3,955,607.29	5,543,699.37	761.0	760.9	762.9	2.0	763.4	0.5	764.0	0.6	Break
8290[1]	3,955,529.83	5,543,699.83	744.0	743.6	745.9	2.3	746.6	0.7	747.1	0.5	Tie-in

Table 2
Ash Disposal Landfill Construction Documentation - LAN Generating Station
Survey Documentation Summary

Point Number	Location		Top of Waste		Top Select Clay Fill Elevation (ft)	Select Clay Fill Thickness (ft)	Top Rooting Zone Elevation (ft)	Rooting Zone Thickness (ft)	Top of Topsoil Elevation (ft)	Topsoil Thickness (ft)	Comments
	Northing	Easting	Proposed Elevation (ft)	Documented Elevation (ft)							
8291[1]	3,955,671.57	5,543,700.00	749.5	751.7	753.7	2.0	754.2	0.5	754.7	0.5	Swale
8292	3,955,650.00	5,543,700.00	751.7	751.7	753.7	2.0	754.7	1.0	755.2	0.5	Grid
8293	3,955,550.00	5,543,700.00	748.7	748.8	750.8	2.0	751.3	0.5	751.8	0.5	Grid
8294	3,955,643.55	5,543,707.19	752.0	752.0	754.1	2.1	754.7	0.6	755.3	0.6	Break
8295[1]	3,955,589.42	5,543,709.81	757.0	757.0	759.0	2.0	759.6	0.6	760.1	0.5	Break
8296	3,955,513.53	5,543,710.73	738.5	738.5	740.5	2.0	741.1	0.6	741.7	0.6	Swale/Tie-in
8297	3,955,512.45	5,543,716.45	738.8	738.8	740.8	2.0	741.3	0.5	741.8	0.5	Swale/Tie-in
8298	3,955,634.75	5,543,725.15	752.0	752.0	754.0	2.0	754.5	0.5	755.1	0.6	Swale
8299	3,955,639.93	5,543,730.14	751.2	751.3	753.3	2.0	753.8	0.5	754.3	0.5	Swale
8300	3,955,550.00	5,543,733.20	745.7	745.6	747.7	2.1	748.2	0.5	748.7	0.5	Break
8301	3,955,544.17	5,543,733.43	744.3	744.4	746.5	2.1	747.0	0.5	747.6	0.6	Swale
8302	3,955,541.98	5,543,735.91	742.7	742.7	744.7	2.0	745.3	0.6	745.8	0.5	Swale
8303	3,955,539.15	5,543,740.08	742.7	742.7	744.8	2.1	745.4	0.6	745.9	0.5	Swale
8304	3,955,627.53	5,543,744.97	749.1	749.2	751.2	2.0	751.8	0.6	752.3	0.5	Swale
8305	3,955,603.66	5,543,745.03	749.6	749.7	751.7	2.0	752.2	0.5	752.7	0.5	Swale
8306	3,955,623.92	5,543,745.64	749.0	749.1	751.1	2.0	751.6	0.5	752.2	0.6	Swale
8307	3,955,600.00	5,543,749.25	747.6	747.6	749.6	2.0	750.1	0.5	750.7	0.6	Swale
8308	3,955,624.58	5,543,750.37	749.0	749.1	751.1	2.0	751.6	0.5	752.2	0.6	Swale
8309	3,955,575.28	5,543,752.72	746.2	746.3	748.3	2.0	748.8	0.5	749.4	0.6	Swale
8310	3,955,600.00	5,543,754.31	747.6	747.6	749.6	2.0	750.1	0.5	750.7	0.6	Swale
8311	3,955,574.37	5,543,757.89	746.2	746.3	748.3	2.0	748.8	0.5	749.4	0.6	Swale

Notes:
1. Additional final cover material thickness verification were performed at this point. Elevations for these points calculated based on physical measurement of material thicknesses.

Created by: BSS, 11/10/2023
Checked by: REH 11/10/2023

Table 3
Select Clay Source Test Results Summary
Lansing Generating Station

Date Sampled	Sample Number	Sample Type	Location	ASTM D7928 Grain Size Analysis % Fines <#200	ASTM D4318 Atterberg Limits (%) Liquid Limit	Plastic Limit	Plasticity Index	ASTM D1557 Modified Proctor Max. Dry Density (pcf)	Opt. Moisture (%)	U.S.C.S.
5/10/2023	LAN-CL-BS4	B	Proposed Strong Borrow	86.9	65.0	28.0	37.0	100.7	22.9	CH
5/10/2023	LAN-CL-BS5	B	Proposed Strong Borrow	79.3	65.0	28.0	37.0	102.2	20.1	CH
6/14/2023	LAN-CL-BS7	B	Onsite during Placement	67.1	43.0	21.0	22.0	103.0	20.7	CL
6/21/2023	LAN-CL-BS8	B	Onsite During Placement	60.1	36.0	18.0	18.0	103.4	20.2	CL
6/26/2023	ADL-B1-1	B	Onsite During Placement	68.1	43.0	23.0	19.0	94.9	25.3	CL
6/29/2023	ADL-B1-2	B	Onsite During Placement	51.3	39.0	20.0	19.0	107.2	17.6	CL
6/20/2023	ADL-B1-3	B	Onsite During Placement	61.3	41.0	20.0	21.0	94.5	24.3	CL
6/21/2023	ADL-B1-4	B	Onsite During Placement	78.0	48.0	25.0	23.0	96.1	23.3	CL
Requirements (Value)				≥50	--	--	--	--	--	CL/CH
Average				69.0	47.5	22.9	24.5	100.3	21.8	--
Standard Deviation				11.7	11.3	3.8	7.9	4.6	2.6	--
High				86.9	65.0	28.0	37.0	107.2	25.3	--
Low				51.3	36.0	18.0	18.0	94.5	17.6	--

Prepared by: REH 6/30/23

Checked by: RPR 10/19/23

Table 4
Select Clay Undisturbed Test Results Summary
Lansing Generating Station

Date Sampled	Sample Number	Sample Type	Location		ASTM D7928 Grain Size Analysis	ASTM D4318 Atterberg Limits (%)			ASTM D2216 & D7263		ASTM D5084 Coefficient Permeability	U.S.C.S.
			Northing	Easting	% Fines <#200	Liquid Limit	Plastic Limit	Plasticity Index	Dry Density (pcf)	Moisture (%)	(cm/sec)	
6/29/2023	ADL-T1-1(K)	T	3,956,200	5,542,100	67.1	60.0	27.0	33.0	87.0	31.2	1.5E-08	CH
6/29/2023	ADL-T1-2	T	3,956,100	5,542,500	46.3	44.0	21.0	24.0	94.2	19.9	nt	SC
7/21/2023	ADL-T1-2R	T	3,956,100	5,542,500	62.0	43.0	20.0	23.0	96.7	22.7	6.8E-08	CL
6/28/2023	ADL-T1-3(K)	T	3,956,000	5,542,700	69.5	52.0	23.0	29.0	95.5	20.5	1.7E-08	CH
6/28/2023	ADL-T1-4	T	3,955,900	5,543,000	65.9	54.0	26.0	28.0	98.9	22.5	nt	CH
6/28/2023	ADL-T1-5	T	3,955,800	5,543,300	55.1	42.0	20.0	22.0	87.0	27.5	nt	CL
6/30/2023	ADL-T1-6(K)	T	3,955,700	5,543,100	62.7	43.0	20.0	23.0	96.3	22.9	1.2E-08	CL
6/28/2023	ADL-T1-7	T	3,955,700	5,543,500	39.8	35.0	16.0	19.0	104.9	15.6	nt	SC
7/21/2023	ADL-T1-7R	T	3,955,700	5,543,500	55.5	37.0	19.0	18.0	93.0	27.9	1.4E-08	CL
6/30/2023	ADL-T1-8(K)	T	3,955,600	5,543,700	59.4	40.0	20.0	20.0	89.5	25.0	5.8E-08	CL
6/30/2023	ADL-T1-9	T	3,955,500	5,543,400	55.5	44.0	21.0	23.0	92.1	23.7	nt	CL
7/18/2023	ADL-T2-1	T	3,956,150	5,542,050	74.4	60.0	28.0	32.0	89.0	29.2	nt	CH
7/18/2023	ADL-T2-2(K)	T	3,956,250	5,542,250	64.7	44.0	24.0	20.0	90.0	29.3	1.3E-08	CL
7/18/2023	ADL-T2-3	T	3,956,150	5,542,550	68.2	51.0	24.0	27.0	90.4	29.7	nt	CH
7/11/2023	ADL-T2-4	T	3,956,050	5,542,650	67.4	50.0	24.0	27.0	89.7	30.2	nt	CH
7/11/2023	ADL-T2-5(K)	T	3,955,950	5,542,850	65.7	52.0	24.0	28.0	91.1	24.0	1.1E-08	CH
7/10/2023	ADL-T2-6	T	3,955,850	5,543,050	73.8	40.0	20.0	21.0	89.7	29.7	nt	CL
7/10/2023	ADL-T2-7	T	3,955,750	5,543,350	73.6	51.0	25.0	26.0	93.6	27.0	nt	CH
7/11/2023	ADL-T2-8(K)	T	3,955,650	5,543,250	65.9	47.0	22.0	25.0	96.5	22.6	3.6E-08	CL
7/7/2023	ADL-T2-9	T	3,955,550	5,543,550	79.6	52.0	26.0	26.0	91.4	28.3	nt	CH
7/7/202	ADL-T2-10	T	3,955,650	5,543,650	73.0	51.0	24.0	27.0	93.3	26.3	nt	CH
Requirements (Value)					≥50	--	--	--	--	--	≤1E-07	CL/CH
Average					64.1	47.2	22.6	24.8	92.8	25.5	2.7E-08	--
Standard Deviation					9.6	6.9	3.0	4.1	4.3	4.1	2.2E-08	--
High					79.6	60.0	28.0	33.0	104.9	31.2	6.8E-08	--
Low					39.8	35.0	16.0	18.0	87.0	15.6	1.1E-08	--

Notes:

1. Initial samples ADL-T1-2 and ADL-T1-7 did not meet project requirements for grain size. These locations were re-sampled and samples were also tested for permeability.
2. nt - not tested

Prepared by: REH 7/21/23
Checked by: RPR 10/19/23

Table 5
Select Clay Fill Layer Moisture / Density Test Results Summary
Ash Disposal Landfill Closure
Lansing Generating Station

Field Sample ID	Lift	Date	Northing	Easting	Wet Density from NDG (lb/ft^3)	Water Weight (pcf)	Moisture Content (%)	Dry Density Of Sample (lb/ft^3)	Modified Proctor Used Density (lb/ft^3)	Modified Proctor Used Optimum Mositure (%)	% Compaction	Pass/Fail
Ash Disposal Landfill												
ADL-101	1	06/29/23	3,956,200	5,542,000	127.0	24.8	24.3%	102.2	103.4	20.2%	98.8%	**PASS**
ADL-102	1	06/29/23	3,956,200	5,542,100	121.5	26.5	27.9%	95.0	103.4	20.2%	91.9%	**PASS**
ADL-103	1	06/29/23	3,956,200	5,542,200	118.8	25.7	27.6%	93.1	103.4	20.2%	90.0%	**PASS**
ADL-104	1	06/29/23	3,956,200	5,542,300	120.2	26.1	27.7%	94.1	103.4	20.2%	91.0%	**PASS**
ADL-105	1	06/29/23	3,956,200	5,542,500	120.2	23.8	24.7%	96.4	103.4	20.2%	93.2%	**PASS**
ADL-106	1	06/30/23	3,956,100	5,542,200	122.3	28.2	30.0%	94.1	103.4	20.2%	91.0%	**PASS**
ADL-107	1	06/29/23	3,956,100	5,542,300	125.9	24.9	24.7%	101.0	103.4	20.2%	97.7%	**PASS**
ADL-108	1	06/29/23	3,956,100	5,542,400	121.4	24.3	25.0%	97.1	103.4	20.2%	93.9%	**PASS**
ADL-109	1	06/29/23	3,956,100	5,542,500	127.2	25.1	24.6%	102.1	103.4	20.2%	98.7%	**PASS**
ADL-110	1	06/28/23	3,956,100	5,542,600	125.8	23.6	23.1%	102.2	103.4	20.2%	98.8%	**PASS**
ADL-111	1	06/27/23	3,956,100	5,542,700	113.1	23.6	26.4%	89.5	96.1	23.3%	93.1%	**PASS**
ADL-112	1	06/26/23	3,956,000	5,542,600	123.7	24.7	24.9%	99.0	102.2	20.1%	96.9%	**PASS**
ADL-113	1	06/28/23	3,956,000	5,542,700	124.3	23.4	23.2%	100.9	103.4	20.2%	97.6%	**PASS**
ADL-114	1	06/28/23	3,956,000	5,542,800	123.7	24.5	24.7%	99.2	103.4	20.2%	95.9%	**PASS**
ADL-115	1	06/28/23	3,956,000	5,542,900	116.4	27.6	31.1%	88.8	96.1	23.3%	92.4%	**PASS**
ADL-116	1	06/29/23	3,955,900	5,542,800	124.8	24.6	24.6%	100.2	103.4	20.2%	96.9%	**PASS**
ADL-117	1	06/26/23	3,955,900	5,542,900	127.4	23.8	23.0%	103.6	102.2	20.1%	101.4%	**PASS**
ADL-118	1	06/28/23	3,955,900	5,543,000	128.8	23.8	22.7%	105.0	103.4	20.2%	101.5%	**PASS**
ADL-119	1	06/28/23	3,955,900	5,543,100	124.4	23.0	22.7%	101.4	103.4	20.2%	98.1%	**PASS**
ADL-120	1	06/29/23	3,955,800	5,542,900	127.7	25.2	24.6%	102.5	103.4	20.2%	99.1%	**PASS**
ADL-121	1	06/29/23	3,955,800	5,543,000	116.3	22.0	23.3%	94.3	103.4	20.2%	91.2%	**PASS**
ADL-122	1	06/26/23	3,955,800	5,543,100	126.3	24.4	23.9%	101.9	102.2	20.1%	99.7%	**PASS**
ADL-123	1	06/28/23	3,955,800	5,543,200	122.1	25.8	26.8%	96.3	103.4	20.2%	93.1%	**PASS**
ADL-124	1	06/28/23	3,955,800	5,543,300	130.5	25.7	24.5%	104.8	103.4	20.2%	101.4%	**PASS**
ADL-125	1	06/30/23	3,955,700	5,543,100	126.3	26.1	26.0%	100.2	103.4	20.2%	96.9%	**PASS**
ADL-126	1	06/29/23	3,955,700	5,543,200	123.4	22.6	22.4%	100.8	103.4	20.2%	97.5%	**PASS**
ADL-127	1	06/28/23	3,955,700	5,543,300	122.5	28.9	30.9%	93.6	102.2	20.1%	91.6%	**PASS**
ADL-128	1	06/28/23	3,955,700	5,543,400	126.2	24.9	24.6%	101.3	103.4	20.2%	98.0%	**PASS**
ADL-129	1	06/28/23	3,955,700	5,543,500	127.0	23.4	22.6%	103.6	103.4	20.2%	100.2%	**PASS**
ADL-130	1	06/30/23	3,955,600	5,543,300	127.2	24.3	23.6%	102.9	103.4	20.2%	99.5%	**PASS**
ADL-131	1	06/26/23	3,955,600	5,543,400	122.8	23.3	23.4%	99.5	102.2	20.1%	97.4%	**PASS**
ADL-132	1	06/26/23	3,955,600	5,543,500	126.8	24.5	23.9%	102.3	102.2	20.1%	100.1%	**PASS**
ADL-133	1	06/26/23	3,955,600	5,543,600	117.7	22.8	24.0%	94.9	102.2	20.1%	92.9%	**PASS**
ADL-134	1	06/30/23	3,955,600	5,543,700	123.8	25.8	26.3%	98.0	103.4	20.2%	94.8%	**PASS**
ADL-135	1	06/30/23	3,955,500	5,543,400	123.5	24.7	25.0%	98.8	103.4	20.2%	95.6%	**PASS**
ADL-136	1	06/30/23	3,955,500	5,543,500	129.5	26.3	25.5%	103.2	103.4	20.2%	99.8%	**PASS**
ADL-201	2	07/18/23	3,956,250	5,542,050	121.7	24.9	25.7%	96.8	107.2	17.6%	90.3%	**PASS**
ADL-202	2	07/18/23	3,956,250	5,542,150	124.5	26.9	27.6%	97.6	107.2	17.6%	91.0%	**PASS**
ADL-203	2	07/18/23	3,956,250	5,542,250	123.2	24.0	24.2%	99.2	107.2	17.6%	92.5%	**PASS**
ADL-204	2	07/18/23	3,956,150	5,542,050	122.4	25.0	25.7%	97.4	107.2	17.6%	90.9%	**PASS**
ADL-205	2	07/18/23	3,956,150	5,542,150	122.9	26.1	27.0%	96.8	107.2	17.6%	90.3%	**PASS**
ADL-206	2	07/18/23	3,956,150	5,542,250	124.9	22.9	22.5%	102.0	107.2	17.6%	95.1%	**PASS**

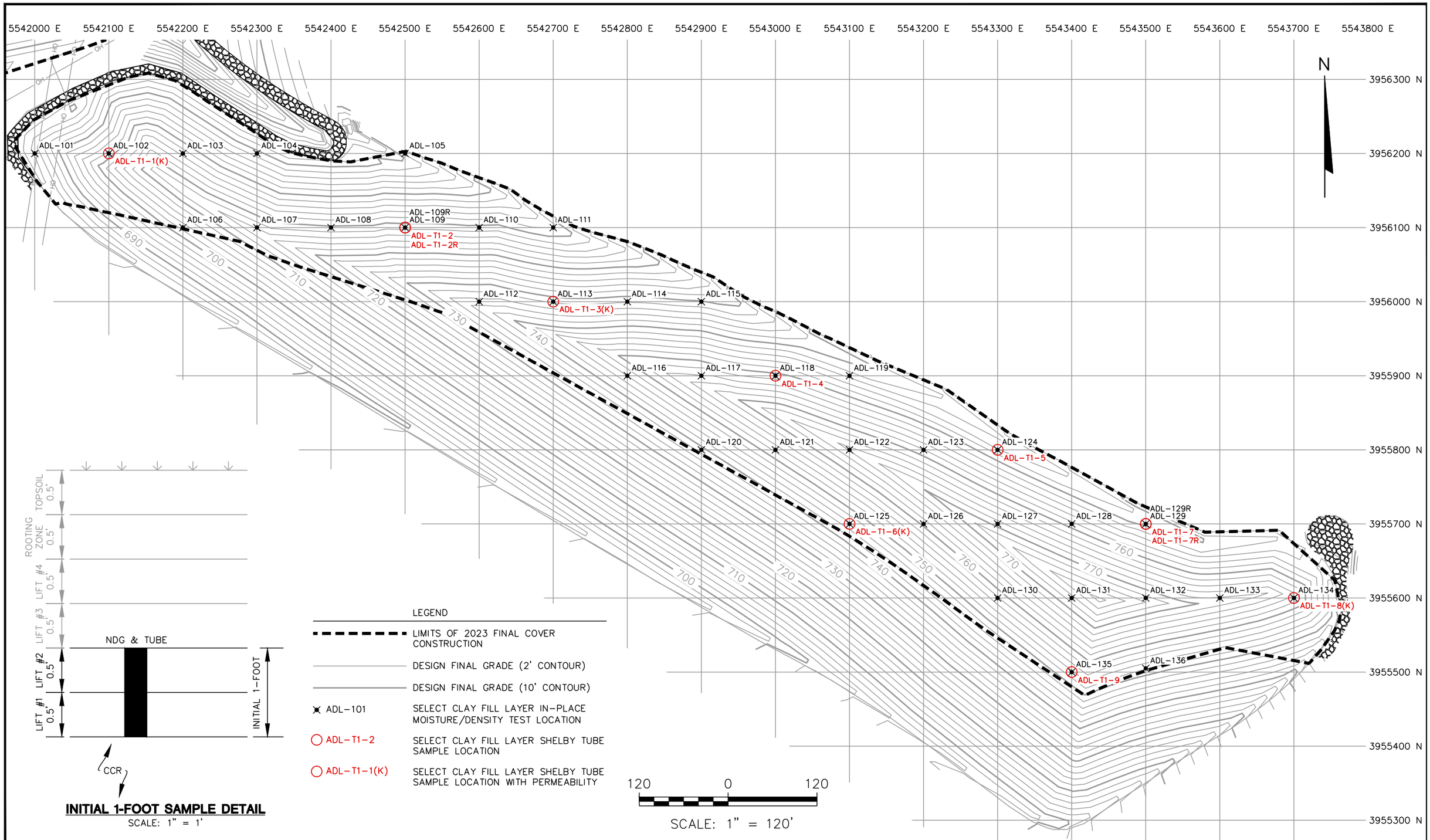
Table 5
Select Clay Fill Layer Moisture / Density Test Results Summary
Ash Disposal Landfill Closure
Lansing Generating Station

Field Sample ID	Lift	Date	Northing	Easting	Wet Density from NDG (lb/ft^3)	Water Weight (pcf)	Moisture Content (%)	Dry Density Of Sample (lb/ft^3)	Modified Proctor Used Density (lb/ft^3)	Modified Proctor Used Optimum Mositure (%)	% Compaction	Pass/Fail
ADL-207	2	07/18/23	3,956,150	5,542,350	123.6	21.7	21.3%	101.9	107.2	17.6%	95.1%	**PASS**
ADL-208	2	07/18/23	3,956,150	5,542,450	122.7	24.3	24.7%	98.4	107.2	17.6%	91.8%	**PASS**
ADL-209	2	07/18/23	3,956,150	5,542,550	121.4	23.9	24.5%	97.5	107.2	17.6%	91.0%	**PASS**
ADL-210	2	07/18/23	3,956,050	5,542,350	123.2	26.2	27.0%	97.0	107.2	17.6%	90.5%	**PASS**
ADL-211	2	07/18/23	3,956,050	5,542,450	127.9	24.2	23.3%	103.7	107.2	17.6%	96.7%	**PASS**
ADL-212	2	07/18/23	3,956,050	5,542,550	124.5	24.9	25.0%	99.6	107.2	17.6%	92.9%	**PASS**
ADL-213	2	07/11/23	3,956,050	5,542,650	125.7	24.9	24.7%	100.8	107.2	17.6%	94.0%	**PASS**
ADL-214	2	07/11/23	3,956,050	5,542,750	124.9	24.6	24.5%	100.3	107.2	17.6%	93.6%	**PASS**
ADL-215	2	07/11/23	3,956,050	5,542,850	124.3	22.5	22.1%	101.8	107.2	17.6%	95.0%	**PASS**
ADL-216	2	07/18/23	3,955,950	5,542,650	129.8	22.5	21.0%	107.3	107.2	17.6%	100.1%	**PASS**
ADL-217	2	07/18/23	3,955,950	5,542,750	125.0	23.3	22.9%	101.7	107.2	17.6%	94.9%	**PASS**
ADL-218	2	07/11/23	3,955,950	5,542,850	124.5	24.7	24.7%	99.8	107.2	17.6%	93.1%	**PASS**
ADL-219	2	07/10/23	3,955,950	5,542,950	123.9	27.2	28.1%	96.7	107.2	17.6%	90.2%	**PASS**
ADL-220	2	07/10/23	3,955,950	5,543,050	121.0	22.2	22.5%	98.8	107.2	17.6%	92.2%	**PASS**
ADL-221	2	07/18/23	3,955,850	5,542,850	130.7	24.1	22.6%	106.6	107.2	17.6%	99.4%	**PASS**
ADL-222	2	07/18/23	3,955,850	5,542,950	122.6	21.2	20.9%	101.4	107.2	17.6%	94.6%	**PASS**
ADL-223	2	07/10/23	3,955,850	5,543,050	122.6	25.8	26.7%	96.8	107.2	17.6%	90.3%	**PASS**
ADL-224	2	07/10/23	3,955,850	5,543,150	127.1	24.3	23.6%	102.8	107.2	17.6%	95.9%	**PASS**
ADL-225	2	07/10/23	3,955,850	5,543,250	127.0	21.9	20.8%	105.1	107.2	17.6%	98.0%	**PASS**
ADL-226	2	07/11/23	3,955,750	5,543,050	127.5	22.4	21.3%	105.1	107.2	17.6%	98.0%	**PASS**
ADL-227	2	07/11/23	3,955,750	5,543,150	125.3	24.8	24.7%	100.5	107.2	17.6%	93.8%	**PASS**
ADL-228	2	07/10/23	3,955,750	5,543,250	126.2	25.9	25.8%	100.3	107.2	17.6%	93.6%	**PASS**
ADL-229	2	07/10/23	3,955,750	5,543,350	124.3	24.7	24.8%	99.6	107.2	17.6%	92.9%	**PASS**
ADL-230	2	07/11/23	3,955,650	5,543,150	127.7	24.4	23.6%	103.3	107.2	17.6%	96.4%	**PASS**
ADL-231	2	07/11/23	3,955,650	5,543,250	127.9	24.0	23.1%	103.9	107.2	17.6%	96.9%	**PASS**
ADL-232	2	07/10/23	3,955,650	5,543,350	121.5	21.0	20.9%	100.5	107.2	17.6%	93.8%	**PASS**
ADL-233	2	07/10/23	3,955,650	5,543,450	125.5	24.3	24.0%	101.2	107.2	17.6%	94.4%	**PASS**
ADL-234	2	07/07/23	3,955,650	5,543,550	123.7	26.7	27.5%	97.0	103.4	20.2%	93.8%	**PASS**
ADL-235	2	07/07/23	3,955,650	5,543,650	122.8	26.3	27.3%	96.5	103.4	20.2%	93.3%	**PASS**
ADL-236	2	07/11/23	3,955,550	5,543,350	118.5	21.5	22.2%	97.0	107.2	17.6%	90.5%	**PASS**
ADL-237	2	07/11/23	3,955,550	5,543,450	128.6	25.4	24.6%	103.2	107.2	17.6%	96.3%	**PASS**
ADL-238	2	07/07/23	3,955,550	5,543,550	122.2	28.3	30.1%	93.9	94.9	25.3%	98.9%	**PASS**
ADL-239	2	07/07/23	3,955,550	5,543,650	120.2	29.6	32.7%	90.6	94.9	25.3%	95.5%	**PASS**
ADL-240	2	07/07/23	3,955,550	5,543,750	127.5	24.8	24.1%	102.7	103.4	20.2%	99.3%	**PASS**

Prepared By: REH 7/21/23
Checkd By: RPR 10/19/23

Figures

1 Select Clay Fill Layer Testing and Sampling Locations – Ash Disposal Landfill – Lower 1-foot
2 Select Clay Fill Layer Testing and Sampling Locations – Ash Disposal Landfill – Upper 1-foot



INITIAL 1-FOOT SAMPLE DETAIL

SCALE: 1" = 1'

PROJECT NO.	25222159.00	DRAWN BY:	KP/RR
DRAWN:	05/08/2023	CHECKED BY:	BSS
REVISED:	11/02/2023	APPROVED BY:	MRS 11/21/2023

ENGINEER

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

CLIENT

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

SITE

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SELECT CLAY FILL LAYER TESTING AND SAMPLING LOCATIONS ASH DISPOSAL LANDFILL – LOWER 1-FOOT

FIGURE 1

I:\25222159.00\Drawings\Figures for Documentation Report\Soil Testing Locations.dwg, 11/2/2023 10:03:32 AM

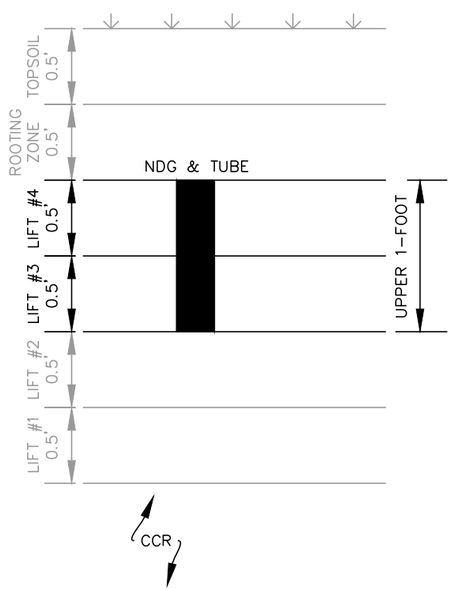
5542000 E 5542100 E 5542200 E 5542300 E 5542400 E 5542500 E 5542600 E 5542700 E 5542800 E 5542900 E 5543000 E 5543100 E 5543200 E 5543300 E 5543400 E 5543500 E 5543600 E 5543700 E 5543800 E

3956300 N
3956200 N
3956100 N
3956000 N
3955900 N
3955800 N
3955700 N
3955600 N
3955500 N
3955400 N
3955300 N

N

ADL-201 ADL-202 ADL-203 ADL-T2-2(K)
ADL-204 ADL-T2-1 ADL-205 ADL-206 ADL-207 ADL-208 ADL-209 ADL-T2-3
ADL-210 ADL-211 ADL-212 ADL-213 ADL-T2-4 ADL-214 ADL-215
ADL-216 ADL-217 ADL-218 ADL-T2-5(K) ADL-219 ADL-220
ADL-221 ADL-222 ADL-223 ADL-T2-6 ADL-224 ADL-225
ADL-226 ADL-227 ADL-228 ADL-229 ADL-T2-7
ADL-230 ADL-231 ADL-T2-8(K) ADL-232 ADL-233 ADL-234 ADL-235 ADL-T2-10
ADL-236 ADL-237 ADL-238 ADL-T2-9 ADL-239 ADL-240

690 700 710 720 730 740 750 760 770



UPPER 1-FOOT SAMPLE DETAIL
SCALE: 1" = 1'

LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- DESIGN FINAL GRADE (2' CONTOUR)
- DESIGN FINAL GRADE (10' CONTOUR)
- ADL-201 — SELECT CLAY FILL LAYER IN-PLACE MOISTURE/DENSITY TEST LOCATION
- ADL-T2-1 — SELECT CLAY FILL LAYER SHELBY TUBE SAMPLE LOCATION
- ADL-T2-2(K) — SELECT CLAY FILL LAYER SHELBY TUBE SAMPLE LOCATION WITH PERMEABILITY

120 0 120

SCALE: 1" = 120'

PROJECT NO.	25222159.00	DRAWN BY:	KP/RR
DRAWN:	05/08/2023	CHECKED BY:	BSS
REVISED:	11/02/2023	APPROVED BY:	MRS 11/21/2023

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

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

SITE: 2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SELECT CLAY FILL LAYER
TESTING AND SAMPLING LOCATIONS
ASH DISPOSAL LANDFILL – UPPER 1-FOOT

FIGURE 2

I:\25222159.00\Drawings\Figures for Documentation Report\Soil Testing Locations.dwg, 11/2/2023 9:59:57 AM

Appendix A

Correspondence and Permits

A1 Operation Permit

IOWA DEPARTMENT OF NATURAL RESOURCES
SANITARY DISPOSAL PROJECT PERMIT

I. **Permit Number:** 03-SDP-05-01P

II. **Permitted Agency:** Interstate Power and Light-Lansing Power Station

III. **Project Location:** SW ¼ of Section 2, T98N, R3W, Allamakee County; 2320 Power Station Drive, Lansing, IA 52151-7539

IV. **Responsible Official**

Name:	Marty Mensen
Address:	Lansing Power Station 2320 Power Plant Drive Lansing, Iowa 52151-7539
Phone:	(641) 422-1740

V. **Licensed Design Engineer**

Name:	Mark E. Huber, P.E.
Address:	SCS Engineers 2830 Dairy Drive Madison, WI 53718
Phone:	(608) 216-7376
FAX:	(608) 224-2839
Iowa License Number:	15325

VI. **Date Permit Issued:** October 10, 2013
Date 3rd Permit Revision: December 5, 2022

VII. **Permit Expiration Date:** October 10, 2023

VIII. **Issued by: _____**
Iowa Department of Natural Resources

IX. **General Provisions**

The above named permitted agency is hereby authorized to operate a Coal Combustion Residue (CCR) monofill at the described location in conformance with Iowa Code Chapter 455B, the rules pursuant thereto existing at the time of issuance, and any subsequent new rules which may be duly adopted, and any provisions contained in Section X of this permit.

The project shall be operated according to the engineering plans and specifications approved by the Iowa Department of Natural Resources (DNR) and these shall become a part of this permit. Any modifications or deviations from the engineering plans and specifications must have prior approval by the DNR and an amendment to this permit issued.

The issuance of this permit in no way relieves the applicant of the responsibility for complying with all other local, state, and federal statutes, ordinances, and rules or other requirements applicable to the establishment and operation of this CCR monofill.

No legal or financial responsibility arising from the construction or operation of the approved project shall attach to the State of Iowa or the DNR due to the issuance of this permit.

If title to this project is transferred, the new owner must apply to the DNR for a transfer of this permit within thirty days of the date of title transfer. This permit is void sixty days after the date of title transfer unless the DNR has transferred the permit.

In accordance with Iowa Code section 455B.310, the permit holder is exempted from solid waste tonnage fees for CCR disposal at the permitted monofill. This exemption does not relieve the permit holder from the tonnage reporting requirements listed below.

The permit holder shall file a quarterly Fee-Exempt Material Quarterly Report utilizing the DNR's Form 542-3276FE for all wastes received, recycled/reused, and disposed at the CCR landfill in accordance with Iowa Code section 455B.310.

The Fee-Exempt Material Quarterly Reports will be due January 1, April 1, July 1 and October 1 for the quarters ending September 30, December 31, March 31 and June 30, respectively. The permit holder shall mail the completed form to the Solid Waste Section, Wallace State Office Building, 502 East Ninth Street, Des Moines, Iowa 50319. This reporting procedure supersedes any previous conflicting permit provisions.

CCR disposed at this site shall not exhibit free liquids, toxic or hazardous properties. No hazardous wastes as defined by Iowa Code section 455B.411 may be disposed at this landfill.

Failure to comply with Iowa Code Chapter 455B, or any rule of order promulgated pursuant thereto, or any or all provisions of this permit may result in 1) a civil penalty of up to $5000 for each day of violation, pursuant to Iowa Code section 455B.307, or 2) the suspension or revocation of this permit, pursuant to Iowa Code section 455B.305.

X. Special Provisions

1. The permit holder is authorized to accept Coal Combustion Residue for disposal at this facility.

   The permitted monofill is limited to CCR generated at the Interstate Power and Light-Lansing Power Station in accordance with the provisions of this permit.

2. The permit holder shall develop and operate the site in accordance with the hereby approved Permit Renewal Application, dated May 29, 2013, as submitted by SCS Engineers and the following:

   a. The approved site shall not exceed a maximum waste elevation of 775 feet in the vicinity of N12850, E4200.

b. The approved site development is limited to the area shown on Figure 2 as contained in Appendix C of the Permit Renewal Application, dated May 29, 2013, as submitted by SCS Engineers.

c. The permit holder shall maintain a method of CCR transportation that prevents blowing CCR and a method for controlling dust and air emissions when the CCR is unloaded pursuant to fugitive dust standards.

d. The permit holder shall hydrate the CCR, as necessary, for controlling blowing dust and air emissions from the working face. On windy days, the unloading operations shall be halted until wind conditions allow resumption of controlled disposal activities.

e. The active work face area shall be kept to a minimum and shall be smoothed out and compacted to promote drainage of precipitation while reducing erosion and infiltration.

f. The review comments, dated April 2, 2001 from the DNR's Conservation and Recreation Division relative to the comprehensive listing of plant and animal species for all development and soil borrow areas, are incorporated as part of the permit documents.

g. The review comments, dated August 6, 2001 from the State Historical Society relative to the determination of the presence of and assessment of the impact on any archaeological, historical, or architecturally significant properties for all development and soil borrow areas on the proposed site is incorporated as part of the permit documents.

   The permit holder shall heed to the additional recommendations and restrictions set forth in the August 6, 2001 review by the State Historical Society.

h. The determination, dated May 29, 2002 by the Corps of Engineers that this is not a wetland, is incorporated as part of the permit documents.

i. In accordance with the variance approval of August 22, 2003, the permit holder is not required to install a perimeter fence in accordance with 567 IAC 103.1(3)"d" and "f". The existing natural and man-made barriers are sufficient to prevent unauthorized entry into the site. No site fence is required with the exception of a gate across the site entrance road.

3. Surface water shall be diverted around the fill area and surface drainage shall be provided at the toe of the working face.

4. An all weather fill area accessible during all weather conditions under which CCR is received and disposed at the site shall be provided at all times.

5. The permit holder shall operate the site in conformance with the following standards for placement of daily and intermediate soil cover. If problems develop relative to erosion control, air particulate emission releases off site, runoff releases off site, or violations of

water quality standards, the DNR's Main and Field offices shall be immediately notified by telephone and in writing. Any problem shall be remedied in accordance with a remedial action plan and schedule approved by the DNR. The remedial action plan may include placement of daily or intermediate soil cover.

a. The permit holder is not required to place daily cover as long as the above requirements are met.

b. The permit holder is not required to place one foot of intermediate cover at the end of each week as long as the above requirements are met.

6. Hydrologic monitoring at the site shall be conducted in accordance with the Hydrologic Monitoring System Plan (HMSP) contained in Appendix C (Operations Plan) of the Permit Renewal Application, dated May 29, 2013, as submitted by SCS Engineers, and the following:

   a. The HMSP shall include upgradient groundwater monitoring point MW-6 and downgradient groundwater monitoring points MW-11R, MW-12, MW-13, MW-14, MW-12P, MW-15, and TW-18.

   b. Monitoring points not retained for groundwater analysis may be retained as water level measuring points.

   c. DNR construction documentation form 542-1277 and boring logs for all monitoring wells and piezometers shall be submitted within 30 days of installation. DNR construction documentation form 542-1323 shall be submitted within 30 days of establishing surface water monitoring points.

      Abandonment of any monitoring point requires prior approval by the DNR. The permit holder is authorized to properly plug and abandon water level gauging points not proposed for water quality analysis. The permit holder shall submit DNR Form 542-1226 for the abandonment of each well within 30 days of abandonment.

      The well abandonment documention for piezometers PZ-18 and PZ-19, dated January 3, 2018, as submitted by SCS Engineers, is incorporated into the permit.

      The well abandonment documentation for monitoring wells MW-4 and MW-5, dated June 22, 2018, as submitted by the permit holder, is incorporated into the permit.

   d. Quarterly sampling of all new monitoring wells and analysis for the parameters specified in paragraph 103.1(2)"f", dissolved oxygen, and redox potential shall commence within one year of initiating operations for the purpose of establishing average baseline concentrations for each well. Quarterly sampling is not required for wells installed as part of the 2013-2014 Groundwater Quality Assessment.

Annual sampling of all monitoring wells for total alkalinity, arsenic, barium, boron, calcium, chlorides, cobalt, copper, dissolved oxygen, iron, magnesium, manganese, nickel, potassium, redox potential, selenium, sodium, strontium, sulfate, and field measurements of pH and specific conductance, shall commence within one year of completing the quarterly baseline monitoring. Additional sampling or a site assessment may be required by the DNR when there is an exceedance of any primary or secondary Maximum Contaminant Level (MCL) or the Health Advisory Level (HAL) of the Drinking Water Standards and Health Advisories of the federal Environmental Protection Agency.

When an MCL or HAL does not exist for a parameter and a sample analysis exceeds the average value for that parameter for the most recent two years of data, the DNR will require the collection and analysis of a sample for three consecutive months. If the average result of those sample analyses equals or exceeds the value that required the monthly samples to be collected, the DNR may require a site assessment.

e. The Groundwater Assessment Report, dated August 29, 2013 and prepared by SCS Engineers, is incorporated into the permit. Supplemental work as reported in documents #81313 and #84065, dated September 29, 2014 and August 11, 2015, respectively, are also incorporated into the permit. The groundwater assessment was approved and documented as complete in the DNR letter dated September 16, 2015.

f. The elevation of water in each monitoring well shall be measured and recorded during each sampling event.

g. The Method Detection Limit (MDL) for the test parameters shall not exceed action levels as defined by any primary or secondary Maximum Contamination Level (MCL) or the Health Advisory Level (HAL) of the Drinking Water Standards and Health Advisories of the Federal Environmental Protection Agency.

h. In accordance with the variance granted on December 10, 2015, the permit holder is not required to collect filtered groundwater samples and report metals analyses as dissolved. Groundwater samples shall <u>not</u> be filtered prior to analyses and the analytical results for those constituents listed in permit special provision #6d shall be reported as total recoverable as applicable.

i. Surface monitoring points must be clearly marked in the field and a method for measuring the flow rate at each sampling point shall be devised.

j. An Annual Water Quality Report (AWQR) summarizing the effects the facility is having on groundwater and surface water quality shall be submitted to the DNR's Main and local Field offices by November 30 each year. This report shall be prepared in accordance with 567 IAC 103.1(4)"e" by a Professional Engineer licensed in the State of Iowa. The AWQR shall include the results of the monthly groundwater measurements and the routine groundwater analyses conducted at the monitoring points.

7. The permit holder is responsible to perform Toxicity Characteristic Leaching Procedure (TCLP) testing, as necessary, for any future new waste type additions and process modifications resulting in waste type and characteristic changes from that defined in the original application. New waste type and process modification descriptions and supporting TCLP test results shall be submitted to the DNR's Main and Field offices and approved prior to disposal.

8. The permit holder is not required to monitor and report methane gas, however, if the waste stream is modified to include organic materials which may produce methane during degradation the DNR may require methane gas monitoring and reporting.

9. The Alternative Weighing Procedure, outlined in a letter from Ted Shonts the Senior Environmental/Safety Specialist for the Interstate Power and Light-Lansing Power Station dated October 27, 2003 and approved on November 24, 2003, calls for an annual weighing of 5 representative dump-truck loads of ash at an off-site State of Iowa Certified single draft weight scale to determine an average annual weight. This average annual weight will be used to calculate the annual tonnage amounts of CCR waste placed in the landfill. This Alternative Weighing Procedure is incorporated as part of the permit documents. The permit holder shall be responsible for attaching the supporting documentation for tonnage calculations to the Fee-Exempt Material Quarterly Report on a semiannual basis.

10. The Emergency Response and Remedial Action Plan (ERRAP), as contained in Appendix D of the Permit Renewal Application, dated May 29, 2013, as submitted by SCS Engineers in compliance with 567 IAC 103.2(455B) is hereby approved. An updated ERRAP shall be submitted at the time of each permit renewal application. An updated ERRAP shall be included with any request for permit modification to incorporate a facility expansion or significant changes in facility operation that require modification of the currently approved ERRAP.

11. The permit holder shall close the CCR monofill in accordance with the Closure Plan- Ash Disposal Landfill (doc #104674), dated November 22, 2022, as submitted by SCS Engineers, and the following:

    a. The Final Cover Construction Documentation Report – Phase 1, covering the 3.7 acres of final cover constructed in 2014-2015, dated July 29, 2015 (doc#83992) and approved on September 16, 2015, is incorporated into the permit.

    b. The Final Cover Construction Documentation Report – Phase 2, covering the 2.4 acres of final cover constructed in 2015, dated November 17, 2015 (doc#84684) and approved on December 14, 2015, is incorporated into the permit.

December 5, 2022

ROBIN NELSON
INTERSTATE POWER AND LIGHT COMPANY
2320 POWER PLANT DRIVE
LANSING IA 52151-9733

Re: Interstate Power and Light Company - Coal Combustion Residue Landfill
Revised Permit #3
Permit #03-SDP-05-01P

Dear Ms. Nelson:

Enclosed is a revised permit for the Interstate Power and Light-Lansing Power Station Sanitary Landfill. The permit and the approved plans must be kept at the sanitary disposal project. Please review the permit with your operators, as they must become familiar with it.

The permit has been revised to incorporate DNR approval of the recently submitted Closure Plan (permit special provision #11).

Note that the permit may contain special provisions that require responses or actions by you, which if not properly complied with, may prompt enforcement action.

If you have any questions, please contact me at (515) 725-8345 or mick.leat@dnr.iowa.gov.

Sincerely,

Michael B. "Mick" Leat
Land Quality Bureau

cc: Jeff Maxted
Alliant Energy
4902 Biltmore Lane
Madison, WI 53718

Jenny Coughlin
Alliant Energy
500 East Court Avenue, Suite 300
Des Moines, IA 50309

Mark Huber, P.E.
SCS Engineers
2830 Dairy Drive
Madison, WI 53718-6751

Field Office #1

A2 Joint Application

4/24/2023

C/O ROBIN NELSON
INTERSTATE POWER AND LIGHT COMPANY
4282 SULLIVAN SLOUGH ROAD
LANSING, IA 52151

Project Description: This project is required to comply with the federal CCR Rule. IPL will cease coal-fired operations at the plant and will no longer be utilizing the coal yard, intake structure, outfall structure or discharging to the Upper Ash Pond after decommissioning of the plant begins in early 2023. The CCR surface impoundment is required to be closed in accordance with 40 CFR 257.102. See attached Plan Set for details; (Mississippi River)

Project Latitude / Longitude Location(s): Excavations 43.3331/-91.1678; Allamakee County
Other Structures, Obstructions, Fill, Spoil, Deposits 43.3331/-91.1678; Allamakee County
Fill 43.3331/-91.1678; Allamakee County
Streambank/Shoreline Protective Devices 43.3377/-91.1699; Allamakee County

Iowa DNR Project Tracking Number: 2022-0482

Dear Robin Nelson:

The application for an Iowa DNR Flood Plain Development Permit for the above referenced project has been approved. Flood Plain Development Permit Number 2022-0482FP-01 and an approved copy of the Iowa DNR Approved Plans are enclosed. You may download additional copies, or verify the Iowa DNR Flood Plain and Dam Safety Section (Department) official response document(s) for this project at the Iowa DNR Flood Plain PERMT website using the tracking number above. (PERMT Website Address: https://programs.iowadnr.gov/permt/)

Please review all permit conditions. If you don't agree with any of the permit conditions, you have 30 days from the date of mailing of the permit to appeal. If you wish to appeal, it is suggested that you contact David Scott at 319-653-2135, Iowa DNR Legal Services Bureau, within 15 days to determine the correct procedure and format. Also, you should be aware of the fact that any person can appeal the issuance of this permit within the same 30 day period.

Within 30 days of the completion of construction, proper completion of construction notice shall be provided to the Department. Notice may be provided through the Department PERMT website https://programs.iowadnr.gov/permt/, or by certified mail. Certified mail requirements are provided in permit document post construction condition section.

The project may require a local flood plain development permit(s) from Allamakee County. If you have not yet done so, please contact the following local Flood Plain Manager(s) for assistance in applying for the local flood plain permit(s):

A land or water, under the jurisdiction of the State of Iowa, is involved in the project area; therefore, a Sovereign

Lands Construction Permit pursuant to Chapter 461A of the Iowa Code is required for this project. It is my understanding that the Construction Permit has been completed and will be mailed to you in the same packet as this flood plain response. The Construction Permit contains conditions and instructions that the applicant is required to follow. You should be aware that construction may not begin until all necessary permits are obtained.

The permittee is responsible for complying with all other local, state, and federal statutes, ordinances, rules, and permit requirements applicable to the construction, operation, and maintenance of the approved works. Approval through the Corps of Engineers Section 404 Permit Program may be required for this project. The Corps of Engineers will contact you separately regarding their approval. Questions can be directed to the Corps by phone at 309-794-5057 or by email at iowaregulatory@usace.army.mil.

Please contact me by phone at 319-777-2147 or by email at payam.aghsaee@dnr.iowa.gov with any questions.

Sincerely,

Payam Aghsaee
Iowa DNR, Flood Plain Management and Dam Safety Section

CC: John Watts; Interstate Power and Light Company, 2320 Power Plant Drive, Lansing, IA, 52151, JohnWatts@alliantenergy.com
Jeff Maxted; Alliant Energy, 4902 North Biltmore Lane, Madison, IA, 53718, jeffreymaxted@alliantenergy.com
Rick Guenther; SCS Engineers, 2830 Dairy Drive, Madison, WI, 53718, rguenther@scsengineers.com
Jenny Coughlin; Alliant Energy, 500 East Court Ave., Des Moines, IA, 50309, JennyCoughlin@alliantenergy.com

Attachments

Iowa Department of Natural Resources

Flood Plain Development Permit

I.	Permit Number	2022-0482FP-01
II.	Project Latitude / Longitude Location(s)	Excavations 43.3331/-91.1678; Allamakee County Other Structures, Obstructions, Fill, Spoil, Deposits 43.3331/-91.1678; Allamakee County Fill 43.3331/-91.1678; Allamakee County Streambank/Shoreline Protective Devices 43.3377/-91.1699; Allamakee County
III.	Approved Activity	This project is required to comply with the federal CCR Rule. IPL will cease coal-fired operations at the plant and will no longer be utilizing the coal yard, intake structure, outfall structure or discharging to the Upper Ash Pond after decommissioning of the plant begins in early 2023. The CCR surface impoundment is required to be closed in accordance with 40 CFR 257.102. See attached Plan Set for details; (Mississippi River)
IV.	Applicant(s) / Permittee(s)	JOHN WATTS
	Company(s)	INTERSTATE POWER AND LIGHT COMPANY
	Address(s)	2320 POWER PLANT DRIVE
	City State Zip	LANSING, IA 52151
V.	Authorized Agent	ROBIN NELSON
	Company	INTERSTATE POWER AND LIGHT COMPANY
	Address	4282 SULLIVAN SLOUGH ROAD
	City State Zip	LANSING, IA 52151
VI.	Basis for Issuance	The decision to issue this permit was based on a staff review of the project with respect to relevant approval criteria contained in 567 IAC 72 and applicable provisions of Iowa Code Sections 455B.262, .264, .275 and .277.
VII.	General Permit Conditions	
	a. Responsibility	No legal or financial responsibility arising from the construction or maintenance of the approved works shall attach to the state of Iowa or the agency due to the issuance of a permit, order, or administrative waiver.
	b. Lands	The permittee shall be responsible for obtaining such government licenses, permits, and approvals, and lands, easements, and rights-of-way which are required for the construction, operation, and maintenance of the authorized works prior to construction.
	c. Change in plans	No material change from the plans and specifications approved by the Department shall be made unless authorized by the Department.
	d. Revocation of order	A Department permit may be revoked if construction is not completed within the permit construction period of time specified in the Department permit, or extended by official post permit response letter from this Department.
	e. Appeal of Initial Decision	Per 567 IAC 70.5(4), this permit represents the initial decision of the Department.

You have 30 days from the date of mailing of the permit to appeal. If you wish to appeal, it is suggested that you contact our Legal Services Section within 15 days to determine the correct procedure and format. Also, you should be aware of the fact that any person can appeal the issuance of this permit within the same 30 day period.

VIII. Permit Special Construction Conditions

a. Permit Construction Period Covered	4/24/2023 to 4/24/2026
b. Temporary Flood Plain Obstruction Requirement	All temporary flood plain obstructions to be used during construction shall comply with all sections of 567 IAC 72.1(6).
c. Spoil Deposit and fill Requirements	The excess spoil material from the project shall be removed from the delineated floodway.
d. Revetment Requirements	Acceptable riprap material includes: field stone, quarry rock, and broken concrete. If any broken concrete is used, all exposed reinforcing steel must be cut off flush with the surface of the concrete prior to placing the riprap. Also, any concrete pieces larger than three feet across shall either be broken into smaller pieces prior to placement or not used as riprap material. The use of asphalt or other solid waste is prohibited. The finished bank slope on the riprap revetment shall be no steeper than two feet horizontal to one foot vertical (2H:1V). In locations to receive revetment, the area shall be over excavated as required so that the finished surface elevation of the revetment shall not be elevated above the plan elevation. The thickness of the blanket of armoring materials shall not exceed three feet. In no case shall the material be placed so that the resulting channel cross-section is more restrictive than the adjacent natural upstream and downstream channel cross-section. The armoring material shall not extend vertically above the elevation of the adjacent top of bank.

IX. Permit Post Construction Conditions

a. Certification of Completion of Construction Requirement	The permittee is required to provide notice to the Iowa DNR that construction of the project authorized by the Iowa Department of Natural Resources was completed in accordance with Iowa DNR Approved Plans and specifications. 1. This notice may be provided on the Iowa DNR PERMT Website Iowa DNR PERMT Website (use Permit Number) https://programs.iowadnr.gov/permt/ 2. If computer access is unavailable, the permittee shall submit a signed certification of project construction completion. The certification(s) shall be submitted to: FLOOD PLAIN PERMITS IOWA DNR 502 E 9TH ST DES MOINES IA 50319
b. General Maintenance and Storm Damage Restoration Requirement	The permittee, and any successor, in interest to the real estate on which the permitted project or activity is located shall be responsible for proper maintenance of the project until this permit is revoked, or replaced with a new permit. The required maintenance shall include, but is not limited to, the restoration of the project back to the permit condition shown on the enclosed Iowa DNR Approved Plan document.

X. Permit Issued By:

Payam Aghsaee; Iowa DNR, Flood Plain Management and Dam Safety Section
Date: 4/24/2023

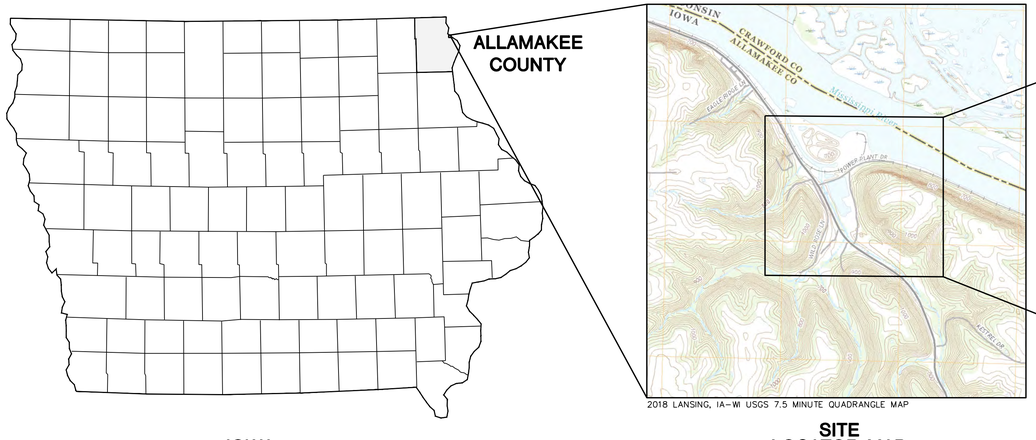
UPPER ASH POND CLOSURE

LANSING GENERATING STATION
LANSING, IOWA

PREPARED FOR: INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IOWA

PREPARED BY: SCS ENGINEERS
MADISON, WISCONSIN

DATE: DECEMBER 2022

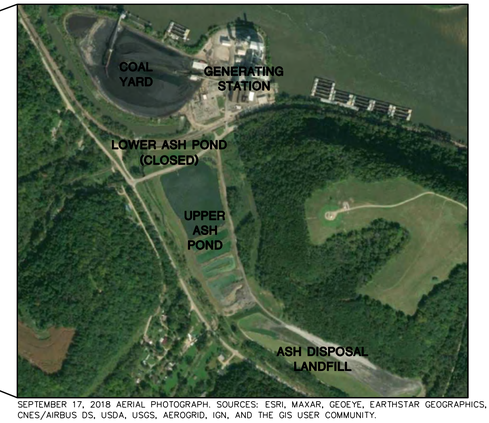


IOWA

2018 LANSING, IA–WI USGS 7.5 MINUTE QUADRANGLE MAP

SITE LOCATOR MAP

APPROXIMATE SCALE: 1" = 2,000'



SEPTEMBER 17, 2018 AERIAL PHOTOGRAPH. SOURCES: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

SITE AERIAL

SCALE: 1" = 700'

MARK HUBER 15325 LICENSED PROFESSIONAL ENGINEER IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

Mark R Huber 04/21/2023
Mark R Huber, PE (date)

Iowa License No. 15325

My license renewal date is: 12/31/2023

Pages or sheets covered by this seal: Joint Permit Application - Upper Ash Pond Closure Plan Set.

INDEX

Sheet Number	Sheet Title
1	TITLE SHEET
2	OVERALL SITE PLAN
3	EXISTING CONDITIONS
4	SITE PREPARATION AND DEMOLITION PLAN
5	IN-SITU STABILIZATION WALL OVERVIEW
6	IN-SITU STABILIZATION WALL AUGER SPACING
7	GEOTEXTILE TUBE SCOUR PROTECTION LAYER SITE PREPARATION
8	PROPOSED NORTH POND EXCAVATION GRADES
9	PROPOSED CLOSURE AREA SUBGRADES
10	PROPOSED FINAL GRADES
11	RESTORATION PLAN
12	PROPOSED COAL YARD EXCAVATION GRADES
13	PROPOSED COAL YARD RESTORATION
14	CROSS SECTIONS A AND B
15	CROSS SECTIONS C AND D
16	CROSS SECTIONS E AND F
17	DETAILS
18	DETAILS
19	DETAILS
20	DETAILS

PROJECT NO. 25220100.00 | DRAWN BY: BSS/KP
DRAWN: 03/25/2021 | CHECKED BY: BSS
REVISED: 12/23/2022 | APPROVED BY: MRH 12/23/2022

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

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

ENGINEER

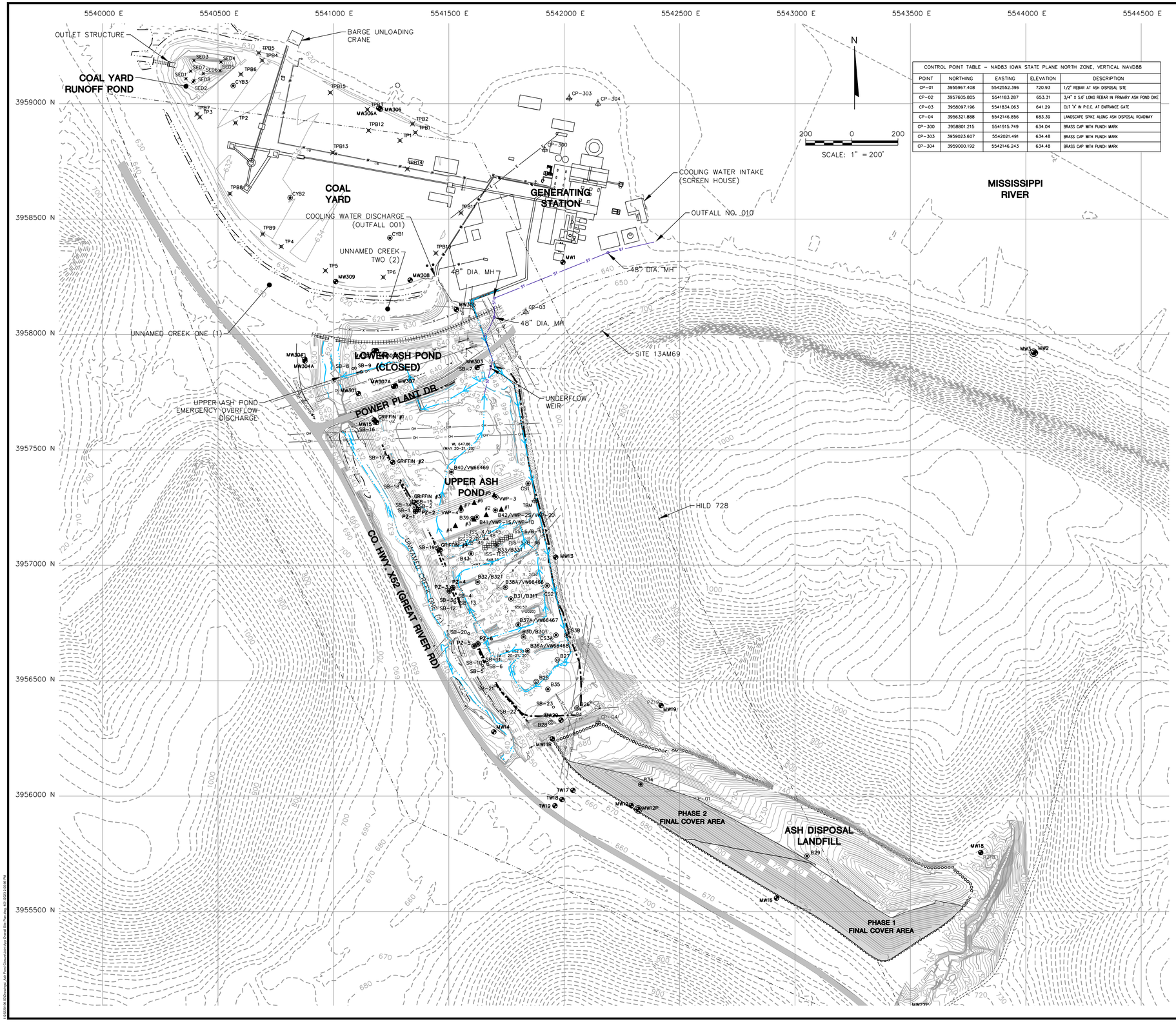
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

TITLE SHEET

SHEET 1 of 20

I:\2522\0100.00\Drawings\ Ash Pond Closure\ Issued for Permit\ 2522100 Title Sheet.dwg, 4/21/2023 10:14:01 AM



CONTROL POINT TABLE – NAD83 IOWA STATE PLANE NORTH ZONE, VERTICAL NAVD88				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
CP-01	3955967.408	5542552.396	720.93	1/2" REBAR AT ASH DISPOSAL SITE
CP-02	3957605.805	5541183.287	653.31	3/4" X 5.0' LONG REBAR IN PRIMARY ASH POND DIKE
CP-03	3958097.196	5541834.063	641.29	CUT 'X' IN P.C.C. AT ENTRANCE GATE
CP-04	3956321.888	5542146.856	683.39	LANDSCAPE SPIKE ALONG ASH DISPOSAL ROADWAY
CP-300	3958801.215	5541915.749	634.04	BRASS CAP WITH PUNCH MARK
CP-303	3959023.607	5542021.491	634.48	BRASS CAP WITH PUNCH MARK
CP-304	3959000.192	5542146.243	634.48	BRASS CAP WITH PUNCH MARK

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
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- FENCE
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- B30/B30T SOIL BORING (MAY 2015/SEPTEMBER 2021)
- B26 SOIL BORING (SEPTEMBER 2014)
- SB-1 SOIL BORING (2015 BY HARD HAT SERVICES)
- SED1 SEDIMENT PROBE
- TP1 TEST PIT
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- GRIFFIN #1 DEWATERING PUMP TEST WELL (PUMPING WELL/MONITORING WELL)
- #1 SETTLEMENT PLATE
- ISS-1/B-49 IN-SITU STABILIZATION TEST COLUMN AND BORING
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- ARCHAEOLOGICAL/CULTURAL RESOURCE SITE
- WETLAND

NOTES:

1. DRAWING COORDINATES IN IOWA STATE PLANE, NORTH ZONE, US FOOT, NAD 83 DATUM. VERTICAL DATUM IS NAVD 88.
2. EXISTING CONTOURS FOR OUTSIDE THE ASH DISPOSAL LANDFILL AND ASH PONDS ARE FROM ALLAMAKEE COUNTY DATED SPRING 2008.
3. EXISTING CONTOURS FOR THE CREEK AREA WEST OF THE ASH PONDS ARE FROM 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
4. EXISTING CONTOURS IN THE LOWER ASH POND AREA BASED ON HARD HAT SERVICES LOWER POND CLOSURE AS-BUILT DRAWINGS DATED JANUARY 2016.
5. EXISTING CONTOURS FOR THE ASH DISPOSAL LANDFILL PHASE 1 FINAL COVER AREA ARE FROM APRIL 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
6. EXISTING CONTOURS FOR THE ASH DISPOSAL LANDFILL PHASE 2 FINAL COVER ARE FROM MARCH 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
7. EXISTING CONTOURS FOR THE OPEN ASH DISPOSAL LANDFILL, SOUTHEAST OF THE ASH DISPOSAL LANDFILL, AND UPPER ASH POND AREAS ARE FROM MAY 2020 TOPOGRAPHIC/BATHYMETRIC SURVEY AND JANUARY 2022 TOPOGRAPHIC/DRONE SURVEY BY MOHN SURVEYING, INC.
8. EXISTING CONTOURS IN THE COAL YARD AND COAL YARD RUNOFF POND ARE BASED ON JANUARY 2020 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC. AND NOVEMBER 2021 SEDIMENT PROBES COMPLETED BY AMES. CONTOURS REPRESENT ANTICIPATED GRADES AFTER COAL PILES HAVE BEEN REMOVED.
9. EDGE OF WATER IN THE UNNAMED CREEK FROM 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC. AND EDGE OF WATER IN THE UPPER ASH POND AREA FROM MAY 20–21, 2020 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
10. UTILITIES SHOWN FROM 2015 SURVEY BY MOHN SURVEYING, INC. AS SHOWN ON HARD HAT SERVICES LOWER POND CLOSURE AS-BUILT DRAWINGS DATED JANUARY 2016 AND MAY 2020 SURVEY BY MOHN SURVEYING, INC. UTILITIES SHOWN ARE APPROXIMATE AND NOT ALL UTILITIES ARE SHOWN ON THIS DRAWING.
11. STRUCTURES AND UTILITIES IN THE COAL YARD AND GENERATING STATION AREA ARE APPROXIMATE AND BASED ON 2007 LANSING POWER STATION-PLOT PLAN (EIO NO. 92-2686) AND NOVEMBER 5, 2014 COAL YARD FIRE PROTECTION SITE PLAN (DRAWING NO. 17692-LAN-M-001 AND 17692-LAN-M-002) PROVIDED BY IPL.
12. 2015 BORINGS, PIEZOMETERS, AND SLURRY WALL BY HARD HAT SERVICES LOCATIONS BASED ON MAY 2015 SEEPAGE CONTROL CUT-OFF WALL DRAWINGS BY HARD HAT SERVICES.
13. SOIL BORINGS (B41, B42, AND B43) COMPLETED BY AMERICAN ENGINEERING TESTING IN SEPTEMBER 2021. VWPs IN B42 AND B43 INSTALLED BY AMERICAN ENGINEERING TESTING IN SEPTEMBER 2021. VWP-3 AND VWP-4 INSTALLED BY AMERICAN ENGINEERING TESTING IN MARCH 2022. LOCATIONS SURVEYED BY AMES.
14. TEST PITS AND SEDIMENT PROBES WERE INSTALLED BY AMES IN NOVEMBER 2021. LOCATIONS SURVEYED BY AMES.
15. WEIR STRUCTURE INFORMATION IS FROM A COMBINATION OF THE WEIR BOX SECTIONS & DETAILS ASH SETTLING BASIN DESIGN DRAWINGS BY SARGENT & LUNDY DATED FEBRUARY 25, 1975/JANUARY 30, 1976 (DRAWINGS S-213 AND S-214) AND THE LOWER POND CLOSURE AS-BUILT DRAWINGS BY HARD HAT SERVICES DATED JANUARY 2016.
16. APPROXIMATE LIMITS OF UPPER ASH POND BASED ON JUNE 5, 1974 SARGENT & LUNDY SITE DEVELOPMENT DRAWINGS AND MARCH 15, 1993 SARGENT & LUNDY DRAWING (ALLIANT DRAWING NO. 1-0110-4-5-C8002).
17. UPPER ASH POND OUTFALL REROUTE BASED ON UPPER ASH POND OUTFALL REROUTE ISSUED FOR CONSTRUCTION SET BY HARD HAT SERVICES DATED OCTOBER 2020.
18. ARCHAEOLOGICAL/CULTURAL RESOURCE SITE BOUNDARIES ARE APPROXIMATE BASED ON SHAPE FILE PROVIDED BY IMPACT7G WITH NOVEMBER 8, 2022 PRELIMINARY PHASE IA CULTURAL RESOURCES ASSESSMENT.
19. WETLANDS WERE DELINEATED BY IMPACT 7G, INC. ON APRIL 19, 2021.

DRAWN BY: BSS/KP/RJG
CHECKED BY: EJN
APPROVED BY: EJN 03/9/23

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 03/09/23

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

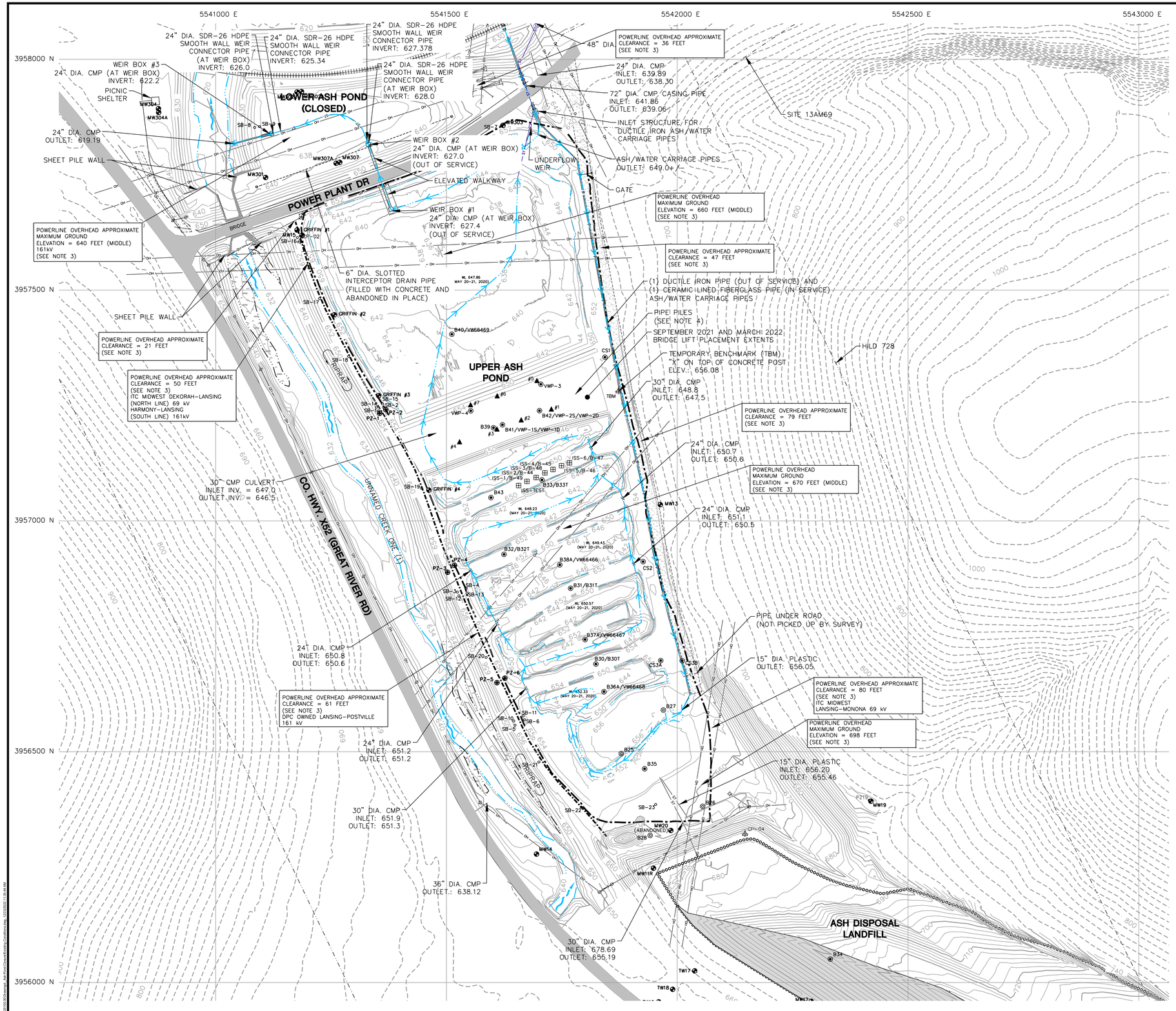
ENGINEER
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

SITE
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SHEET
OVERALL SITE PLAN

2 of 20

L:\2025\100\00\Drawings_Ash Pond Closure\Ash Pond Overall Site Plan.dwg, 4/21/2023 2:00:08 PM



LEGEND

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NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. IN–SITU STABILIZATION (ISS) TEST COLUMNS COMPLETED OCTOBER 2021 BY SEVENSON. ISS–1 WAS AUGERED WITH WATER AND THEN GROUTED WITH 12% CEMENT GROUT AFTER. ISS–2 AND ISS–3 WERE AUGERED WITH 12% CEMENT GROUT ADDITION. ISS–4 AND ISS–5 WERE AUGERED WITH 10% CEMENT GROUT ADDITION. ISS–6 AND ISS–7 WERE AUGERED WITH 8% CEMENT GROUT ADDITION. BORINGS THROUGH THE ISS TEST COLUMNS WERE COMPLETED BY AMERICAN ENGINEERING TESTING IN NOVEMBER/DECEMBER 2021.
3. OVERHEAD POWERLINE MAXIMUM ELEVATION INFORMATION OBTAINED FROM ITC AND DAIRYLAND POWER COOPERATIVE. ELEVATION CLEARANCES APPLY FOR TYPICAL VEHICLE ACCESS (CARS, TRACTORS, COMBINES, ETC.) BUT LARGER EQUIPMENT MAY REQUIRE ADDITIONAL CLEARANCE (I.E. EXCAVATOR). APPROXIMATE CLEARANCE HEIGHTS FROM MAY 2015 SEEPAGE CONTROL CUT–OFF WALL DRAWINGS BY HARD HAT SERVICES. A MINIMUM OF 20 FEET OVERHEAD SEPARATION DISTANCES IS REQUIRED FOR EQUIPMENT OPERATING UNDER OR AROUND OVERHEAD POWERLINES.
4. THE FOUR EXISTING PIPE PILES WERE CUT DOWN DURING INITIAL BRIDGE LIFT PLACEMENT. EACH PIPE WAS CUT DOWN APPROXIMATELY 87.5 TO 88 INCHES. APPROXIMATE TOP OF PILE ELEVATION IS NOW 642.63.
5. BRIDGE LIFT FILL AREA TOP WAS SURVEYED BY AMES AND ASSUMED TO HAVE APPROXIMATELY 2H:1V SLOPE ON SOUTH SIDE AND 4H:1V SLOPE ON NORTH SIDE DOWN TO EXISTING TOP OF SEDIMENT.
6. SETTLEMENT PLATES #1–#7 IN THE BRIDGE LIFT FILL AREA WERE INSTALLED BY AMES. LOCATIONS SURVEYED BY AMES.
7. PUMP TESTING WELLS (GRIFFIN #1–#4) INSTALLED BY GRIFFIN IN OCTOBER 2021. WELL #4 WAS A PUMPING WELL AND WELLS #1–#3 WERE MONITORING WELLS FOR THE PUMP TEST. LOCATIONS SURVEYED BY AMES.

N

100 0 100

SCALE: 1" = 100'

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/15/2022

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

CLIENT

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

ENGINEER

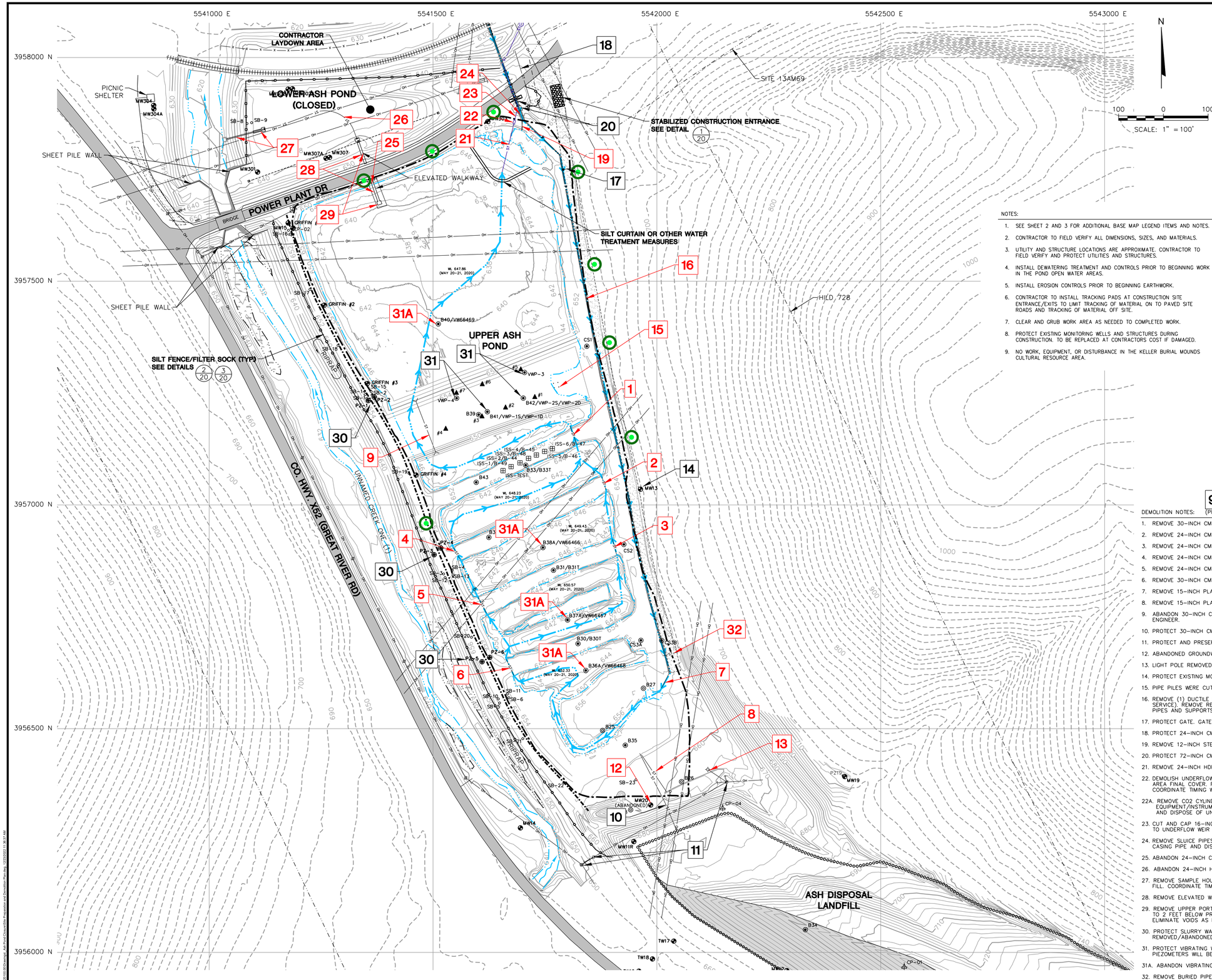
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

EXISTING CONDITIONS

SHEET
3 of 20

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NOTES:

1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS, SIZES, AND MATERIALS.
3. UTILITY AND STRUCTURE LOCATIONS ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY AND PROTECT UTILITIES AND STRUCTURES.
4. INSTALL DEWATERING TREATMENT AND CONTROLS PRIOR TO BEGINNING WORK IN THE POND OPEN WATER AREAS.
5. INSTALL EROSION CONTROLS PRIOR TO BEGINNING EARTHWORK.
6. CONTRACTOR TO INSTALL TRACKING PADS AT CONSTRUCTION SITE ENTRANCE/EXITS TO LIMIT TRACKING OF MATERIAL ON TO PAVED SITE ROADS AND TRACKING OF MATERIAL OFF SITE.
7. CLEAR AND GRUB WORK AREA AS NEEDED TO COMPLETED WORK.
8. PROTECT EXISTING MONITORING WELLS AND STRUCTURES DURING CONSTRUCTION. TO BE REPLACED AT CONTRACTORS COST IF DAMAGED.
9. NO WORK, EQUIPMENT, OR DISTURBANCE IN THE KELLER BURIAL MOUNDS CULTURAL RESOURCE AREA.

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- PROCESS TRANSPORT WATER, PLANT AREA RUNOFF, AND DIRECT RAINFALL FLOW DIRECTION
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- CP-02 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- B40/VW66469 SOIL BORING WITH VWP
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- #1 SETTLEMENT PLATE
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- ARCHAEOLOGICAL/CULTURAL RESOURCE SITE
- PROPOSED SILT FENCE/FILTER SOCK
- LIMITS OF PIPE REMOVAL/ABANDONMENT
- PROPOSED DEWATERING PUMPING WELL AND SILT BARRIER

9 (PROTECT) 7 (REMOVE)

DEMOLITION NOTES:

1. REMOVE 30-INCH CMP PIPE AND DISPOSE OFF SITE.
2. REMOVE 24-INCH CMP PIPE AND DISPOSE OFF SITE.
3. REMOVE 24-INCH CMP PIPE AND DISPOSE OFF SITE.
4. REMOVE 24-INCH CMP PIPE AND DISPOSE OFF SITE.
5. REMOVE 24-INCH CMP PIPE AND DISPOSE OFF SITE.
6. REMOVE 30-INCH CMP PIPE AND DISPOSE OFF SITE.
7. REMOVE 15-INCH PLASTIC PIPE AND DISPOSE OFF SITE.
8. REMOVE 15-INCH PLASTIC PIPE AND DISPOSE OFF SITE.
9. ABANDON 30-INCH CMP PIPE IN-PLACE WITH FLOWABLE FILL. TIME FOR ABANDONMENT TO BE COORDINATED WITH ENGINEER.
10. PROTECT 30-INCH CMP PIPE. SEE SHEET 11 FOR MODIFICATIONS.
11. PROTECT AND PRESERVE UTILITY POLES AND GUYED WIRES.
12. ABANDONED GROUNDWATER MONITORING WELL (BY OTHERS).
13. LIGHT POLE REMOVED BY OTHERS.
14. PROTECT EXISTING MONITORING WELL. ASSIST OTHERS WITH RAISING OF MONITORING WELL TO ABOVE FINAL GRADES.
15. PIPE PILES WERE CUT DOWN DURING BRIDGE LIFT CONSTRUCTION. REMAINING PILES TO REMAIN.
16. REMOVE (1) DUCTILE IRON PIPE (OUT OF SERVICE) AND SUPPORTS. REROUTE (1) CERAMIC LINED FIBERGLASS PIPE (IN SERVICE). REMOVE REROUTED PIPE AND SUPPORTS AFTER PLANT IS SHUTDOWN (COORDINATE WITH OWNER). DISPOSE PIPES AND SUPPORTS OFFSITE.
17. PROTECT GATE. GATE CAN BE REMOVED DURING CONSTRUCTION IF TEMPORARY SITE ACCESS CONTROL IS PROVIDED.
18. PROTECT 24-INCH CMP PIPE.
19. REMOVE 12-INCH STEEL AND 8-INCH PLASTIC PIPES AND DISPOSE OFF SITE.
20. PROTECT 72-INCH CMP CASING PIPE AND INLET STRUCTURE.
21. REMOVE 24-INCH HDPE PIPE AND DISPOSE OFF SITE.
22. DEMOLISH UNDERFLOW WEIR STRUCTURE TO A MINIMUM 2 FEET BELOW FINAL GRADE AND DISPOSE OF UNDER CLOSURE AREA FINAL COVER. FILL REMAINING BELOW GRADE STRUCTURE WITH FLOWABLE FILL TO ELIMINATE VOIDS AS NECESSARY. COORDINATE TIMING WITH OWNER.

22A. REMOVE CO2 CYLINDERS, STOP LOGS, STOP LOG GUIDE FRAME, RAILINGS, AND OTHER ASSOCIATED EQUIPMENT/INSTRUMENTATION AND PROVIDE TO OWNER. DEMOLISH CO2 CYLINDERS AS NECESSARY TO COMPLETE WORK AND DISPOSE OF UNDER CLOSURE AREA FINAL COVER.

23. CUT AND CAP 16-INCH HDPE PIPE AT PROPOSED ABANDONMENT LIMIT. ABANDON REMAINING 16-INCH HDPE PIPE BACK TO UNDERFLOW WEIR STRUCTURE IN PLACE WITH FLOWABLE FILL.
24. REMOVE SLUICE PIPES OF VARIOUS SIZE AND MATERIAL (STEEL, HDPE, AND FIBERGLASS) LEADING TO THE 72-INCH CMP CASING PIPE AND DISPOSE OFF SITE.
25. ABANDON 24-INCH CMP PIPE IN PLACE WITH FLOWABLE FILL.
26. ABANDON 24-INCH HDPE PIPE IN PLACE WITH FLOWABLE FILL. COORDINATE TIMING WITH OWNER.
27. REMOVE SAMPLE HOUSE AND PROVIDE TO OWNER. ABANDON WEIR BOX #3 AND OUTFALL STRUCTURE WITH FLOWABLE FILL. COORDINATE TIMING WITH OWNER.
28. REMOVE ELEVATED WALKWAY AND DISPOSE OFF SITE. COORDINATE TIMING WITH OWNER.
29. REMOVE UPPER PORTION OF FOUNDATIONS/STRUCTURES FOR ELEVATED WALKWAY AND WEIR BOX #1 AND WEIR BOX #2 TO 2 FEET BELOW PROPOSED FINAL GRADES. FILL REMAINING BELOW GRADE STRUCTURE WITH FLOWABLE FILL TO ELIMINATE VOIDS AS NECESSARY. COORDINATE TIMING WITH OWNER.
30. PROTECT SLURRY WALL AND PIEZOMETERS IN UPPER ASH POND WESTERN BERM. PIEZOMETERS TO BE REMOVED/ABANDONED POST CLOSURE BY OTHERS.
31. PROTECT VIBRATING WIRE PIEZOMETERS THROUGHOUT CONSTRUCTION. TIMING OF ABANDONMENT OF VIBRATING WIRE PIEZOMETERS WILL BE DETERMINED BY ENGINEER.

31A. ABANDON VIBRATING WIRE PIEZOMETER BY CUTTING CABLE AT GRADE

32. REMOVE BURIED PIPE AND DISPOSE OFF SITE.

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/15/2022

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

CLIENT

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

ENGINEER

UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

SITE PREPARATION AND DEMOLITION PLAN

SHEET
4 of 20

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NOTES:

1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 47 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 660 FEET

RELOCATE IN SERVICE CERAMIC LINED FIBERGLASS PIPE (COORDINATE WITH OWNER)

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 79 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 670 FEET

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 80 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 698 FEET

POWERLINE OVERHEAD TO REMAIN

SCALE: 1" = 60'

LOWER ASH POND (CLOSED)

POWER PLANT DR

NORTH POND CLOSURE AREA

SOUTH POND CLOSURE AREA

ASH DISPOSAL LANDFILL

SILT CURTAIN OR OTHER WATER TREATMENT MEASURES

REMOVE MATERIAL FROM NORTH CLEAN CLOSE AREA

CREATE IN-SITU STABILIZED ZONE WITH AUGER MIXING

SEE SHEET 6 FOR AUGER SPACING

ISS TO BE INSTALLED THROUGH CMP PIPE LOCATION. RE-INSTALL CMP PIPE TO MANAGE PLANT SLUICE FLOWS UNTIL FINAL ABANDONMENT.

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 50 FEET

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 21 FEET

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 61 FEET

SILT FENCE/FILTER SOCK (TYP.) SEE DETAILS 2 20 3 20

PROPOSED LOCATION FOR DATA LOGGER RELOCATION

SEQUENCE OF WORK:

1. COORDINATE WITH ENGINEER TO DISCONNECT VWP CABLING AND RELOCATE DATA LOGGER TO LOCATION OUTSIDE OF IN-SITU STABILIZED (ISS) WALL. PROTECT DATA LOGGER THROUGHOUT CONSTRUCTION.
2. ABANDON VWP-1S/VWP-1D AND VWP-2S/VWP-2D IN-PLACE BY CUTTING CABLE AT GRADE.
3. REROUTE VWP CABLE FOR VWP-3 AND VWP-4 TO RELOCATED DATA LOGGER AND COORDINATE WITH ENGINEER TO RECONNECT VWP CABLE TO DATA LOGGER. PROTECT CABLING THROUGHOUT CONSTRUCTION.
4. REMOVE SETTLEMENT PLATES AS NEEDED FOR IN-SITU STABILIZED (ISS) WALL CONSTRUCTION.
5. CREATE ISS WALL WITH AUGER MIXING.
6. INSTALL REMAINING VWPs AND INCLINOMETERS. INCLINOMETERS TO BE INSTALLED THROUGH ISS WALL. VWP-9 AND VWP-10 TO BE INSTALLED AFTER GEOTEXTILE TUBE SCOUR PROTECTION GRADING (SEE SHEET 7). ROUTE VWP CABLE TO DATA LOGGER AND COORDINATE WITH ENGINEER TO RECONNECT VWP CABLE TO DATA LOGGER. PROTECT CABLING THROUGHOUT CONSTRUCTION.
7. REMOVE MATERIAL FROM NORTH POND CLOSURE AREA.

LEGEND

- EXISTING VIBRATING WIRE PIEZOMETER (VWP)
- EXISTING VIBRATING WIRE PIEZOMETER CABLE
- EXISTING SETTLEMENT PLATE
- PROPOSED VIBRATING WIRE PIEZOMETER (VWP)
- PROPOSED VIBRATING WIRE PIEZOMETER CABLE
- PROPOSED INCLINOMETER

A

A'

ELEVATION

700
680
660
640
620
600

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 660 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 670 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 698 FEET

POWERLINE OVERHEAD TO REMAIN (ACTUAL ELEVATION UNKNOWN)

~170'

~100'

EXISTING IN-SITU STABILIZATION WORKING PLATFORM

BOTTOM ASH FROM SOUTH POND CLOSURE AREA OR GENERAL FILL

FILL

FILL OR ASH

ASH

NATIVE

THIXOTROPIC

???

???

CREATE IN-SITU STABILIZED WALL WITH AUGER MIXING

~10' INTO NATIVE

~50'

ESTIMATED BOTTOM OF ASH

SCALE: 1" = 60'

5X VERTICAL EXAGGERATION

SCS ENGINEERS
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PHONE: (608) 224-2830

DRAWN BY:	BSS/KP
CHECKED BY:	BSS
APPROVED BY:	MRH 12/23/2022
PROJECT NO.	25220100.00
DRAWN:	03/25/2021
REVISED:	11/07/2022

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

ENGINEER

SITE: UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

IN-SITU STABILIZATION WALL OVERVIEW

SHEET 5 of 20

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NOTES:

1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.

POWER PLANT DR

NORTH POND CLOSURE AREA

SOUTH POND CLOSURE AREA

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 660 FEET

RELOCATE IN SERVICE CERAMIC LINED FIBERGLASS PIPE (COORDINATE WITH OWNER)

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 79 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 670 FEET

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 80 FEET

POWERLINE OVERHEAD APPROXIMATE MAXIMUM GROUND ELEVATION = 698 FEET

POWERLINE OVERHEAD TO REMAIN

SILT CURTAIN OR OTHER WATER TREATMENT MEASURES®

IN-SITU STABILIZATION AUGER LAYOUT

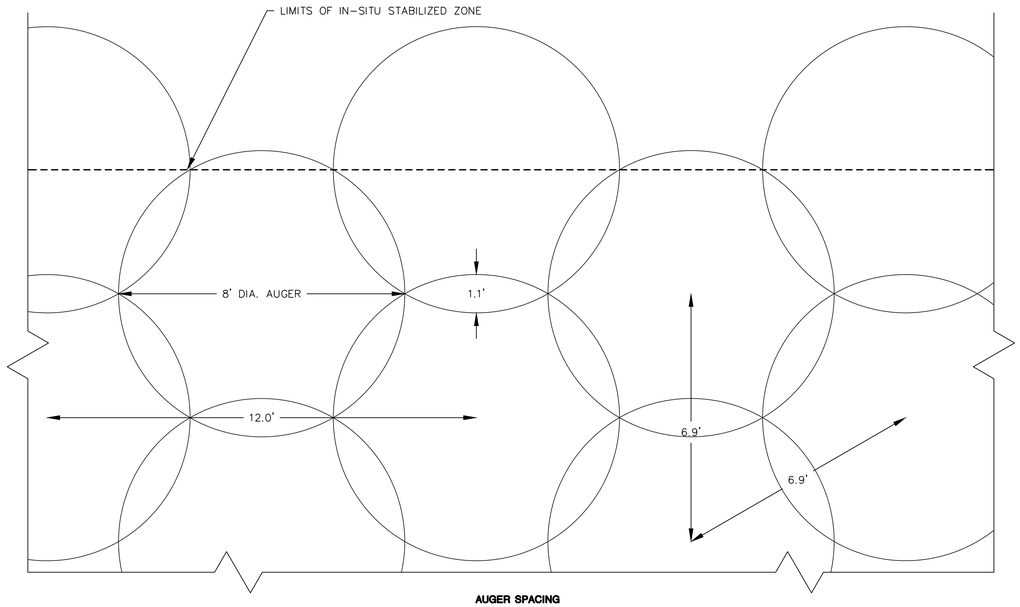
SILT FENCE/FILTER SOCK (TYP.) SEE DETAILS 2/20 3/20

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 50 FEET

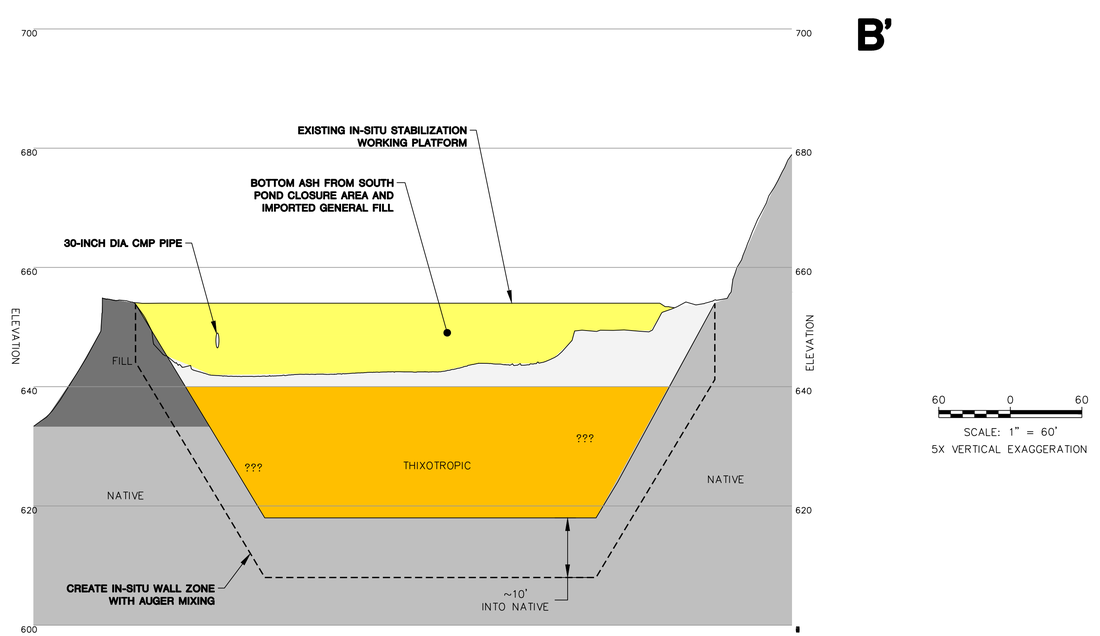
POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 21 FEET

POWERLINE OVERHEAD APPROXIMATE CLEARANCE = 61 FEET

SCALE: 1" = 60'



AUGER SPACING
(SCALE: 1" = 2')



SCALE: 1" = 60'
5X VERTICAL EXAGGERATION

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

ENGINEER

UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

IN-SITU STABILIZATION WALL AUGER SPACING

SHEET
6 or 20

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/07/2022

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

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

CLIENT

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5541000 E
5541500 E
5542000 E
5542500 E
5543000 E
3958000 N
3957500 N
3957000 N
3956500 N
3956000 N

LOWER ASH POND (CLOSED)
PICNIC SHELTER
MW304
MW304A
SHEET PILE WALL
POWER PLANT DR
BRIDGE
MW307A
MW307
MW301
ELEVATED WALKWAY
GRIFFIN #1
MW15
CP-02
WL 647.86 (MAY 20-21, 2020)
SITE 13AM69
HILD 728
GRIFFIN #2
ANCHOR TRENCH GEOMEMBRANE AT LIMITS AS NECESSARY
UPPER ASH POND
ISS WALL SEE SHEETS 5 AND 6
RELOCATE IN SERVICE CERAMIC LINED FIBERGLASS PIPE (COORDINATE WITH OWNER)
CUT A MINIMUM 3 FOOT WIDE STRIP IN LINER PRIOR TO FILLING IN SUMP AREA
APPROXIMATE SUMP AREA (0.5% SLOPE EAST TO WEST)
GRIFFIN #3
PZ-2
VWP-3
VWP-4
VWP-5
VWP-6
VWP-7
VWP-8
VWP-9
VWP-10
GRIFFIN #4
MW13
WL 649.23 (MAY 20-21, 2020)
WL 649.43 (MAY 20-21, 2020)
WL 650.52 (MAY 20-21, 2020)
WL 650.33 (MAY 20-21, 2020)
PZ-3
PZ-4
PZ-5
PZ-6
GEOTEXTILE TUBE SCOUR PROTECTION LAYER
AGGREGATE TRENCH (TYP.) SEE DETAIL A
RIPRAP
UNNAMED CREEK ONE (1)
CO. HWY X52 (GREAT RIVER RD)
PZ19
MW19
MW20
CP-04
MW14
MW11R
ASH DISPOSAL LANDFILL
TW17
TW18
CP-01

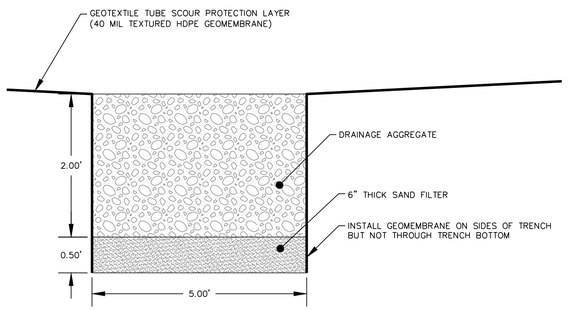
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100 0 100
SCALE: 1" = 100'

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- PROCESS TRANSPORT WATER, PLANT AREA RUNOFF, AND DIRECT RAINFALL FLOW DIRECTION
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- CP-02 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- VWP-3 VIBRATING WIRE PIEZOMETER (VWP)
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- ARCHAEOLOGICAL/CULTURAL RESOURCE SITE
- PROPOSED SILT FENCE/FILTER SOCK
- 650 PROPOSED GRADE (10' CONTOUR)
- 652 PROPOSED GRADE (2' CONTOUR)
- LIMITS OF SCOUR PROTECTION GEOMEMBRANE
- APPROXIMATE GEOMEMBRANE LINED WATER MANAGEMENT SUMP
- PROPOSED VIBRATING WIRE PIEZOMETER (VWP)
- PROPOSED VIBRATING WIRE PIEZOMETER CABLE
- PROPOSED INCLINOMETER

NOTES:

1. SEE SHEET 2 OF THE POND CLOSURE PLAN SET FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. MATERIAL WITHIN THE UPPER ASH POND TO BE MANAGED WITHIN THE FOOTPRINT OF THE POND.
3. VWP-9 AND VWP-10 TO BE INSTALLED AFTER GEOTEXTILE TUBE SCOUR PROTECTION GRADING.



A AGGREGATE TRENCH
SCALE: 1" = 1'

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/15/2022

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733
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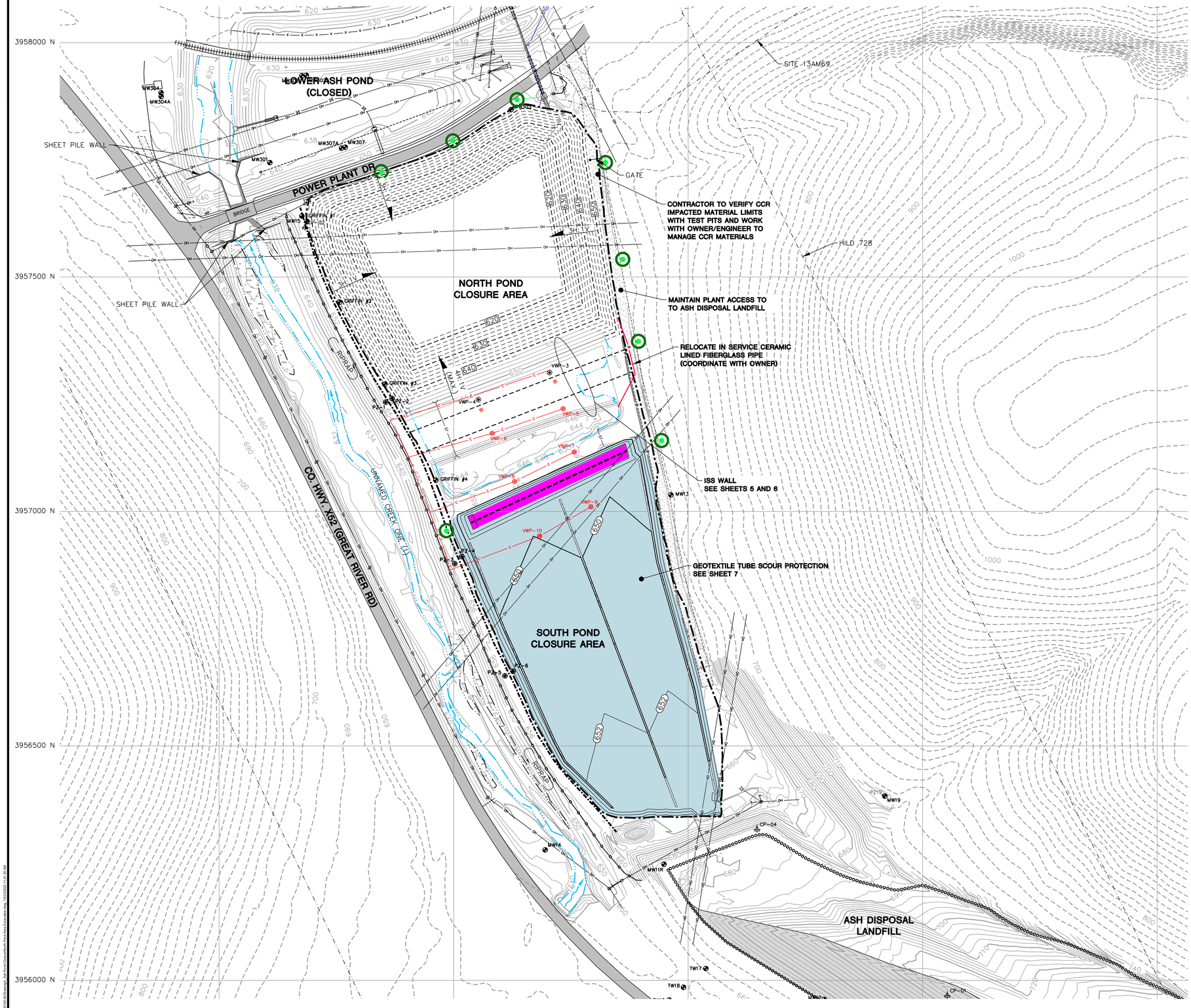
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830
ENGINEER

UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA
SITE

GEOTEXTILE TUBE SCOUR PROTECTION LAYER SITE PREPARATION

SHEET
7 of 20

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LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- CP-02 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- VWP-3 VIBRATING WIRE PIEZOMETER (VWP)
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- ARCHAEOLOGICAL/CULTURAL RESOURCE SITE
- PROPOSED SILT FENCE
- 650 PROPOSED GRADE (10' CONTOUR)
- 652 PROPOSED GRADE (2' CONTOUR)
- LIMITS OF SCOUR PROTECTION GEOMEMBRANE
- APPROXIMATE GEOMEMBRANE LINED WATER MANAGEMENT SUMP
- 620 PROPOSED EXCAVATION GRADE (10' CONTOUR)
- 618 PROPOSED EXCAVATION GRADE (2' CONTOUR)
- PROPOSED DEWATERING PUMPING WELL AND SILT BARRIER
- PROPOSED VIBRATING WIRE PIEZOMETER (VWP)
- PROPOSED VIBRATING WIRE PIEZOMETER CABLE
- PROPOSED INCLINOMETER

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. BERM STABILIZATION TO BE COMPLETED PRIOR TO EXCAVATION/DREDGE. SEE SHEETS 5 AND 6.
3. PROPOSED GRADES REPRESENT ANTICIPATED BOTTOM OF CCR REMOVAL LIMITS. ACTUAL LIMITS WILL BE DETERMINED BY THE ENGINEER/OWNER BASED ON FIELD CONDITIONS.
4. PROPOSED EXCAVATION GRADES SLOPE NORTH OF THE BERM STABILIZATION TO BE NO STEEPER THAN 4H:1V. THE SLOPE MAY BE SHALLOWED BASED ON FIELD CONDITIONS.
5. MATERIAL REMOVED FROM THE PROPOSED EXCAVATION AREA TO BE MANAGED IN THE GEOTEXTILE TUBE SCOUR PROTECTION AREA ON ASH DISPOSAL LANDFILL.

100 0 100
SCALE: 1" = 100'

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DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/15/2022

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

CLIENT

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

ENGINEER

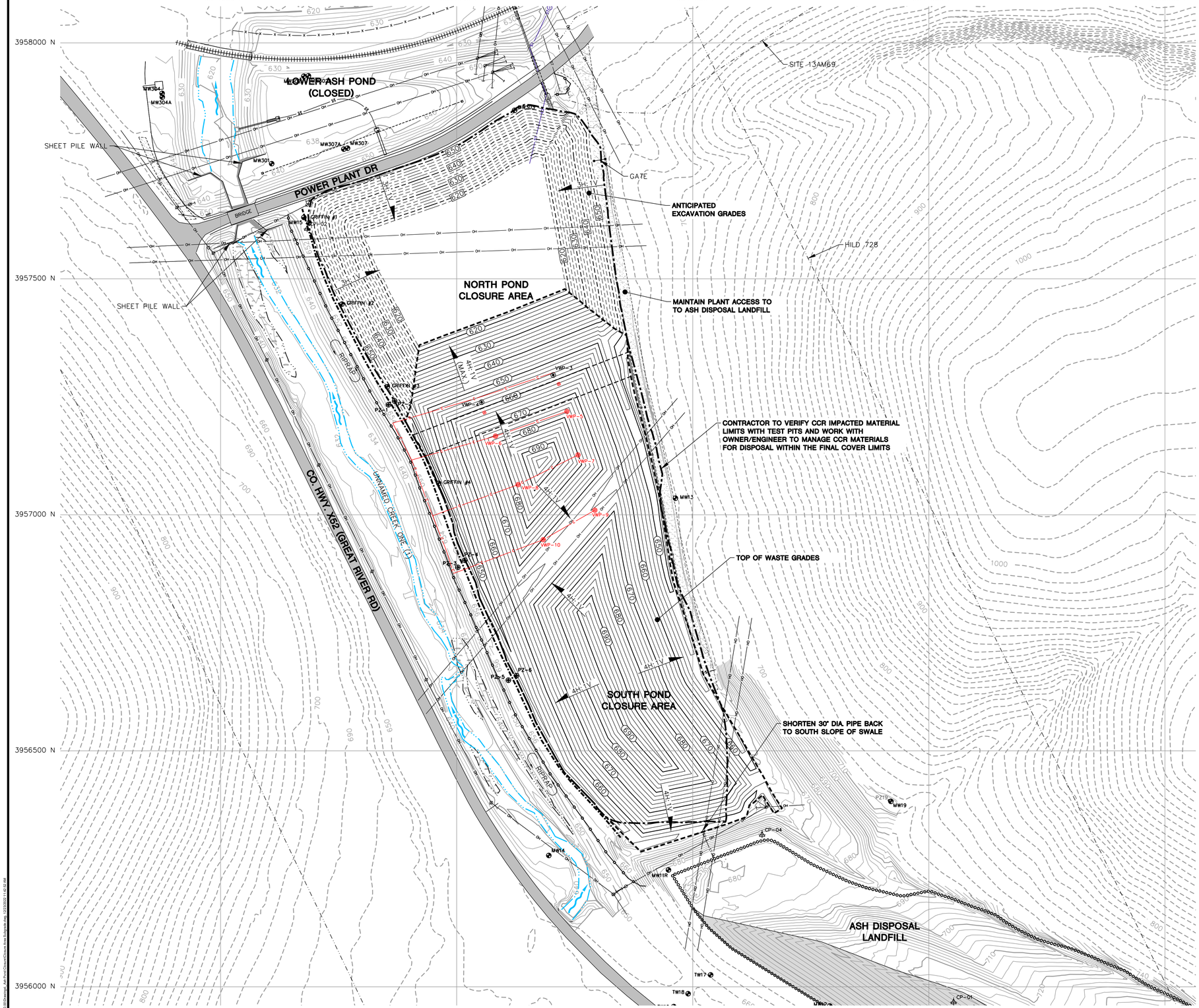
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

PROPOSED NORTH POND EXCAVATION GRADES

SHEET 8 of 20

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LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- CP-02 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- VWP-3 VIBRATING WIRE PIEZOMETER (VWP)
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- ARCHAEOLOGICAL/CULTURAL RESOURCE SITE
- PROPOSED SILT FENCE
- PROPOSED EXCAVATION GRADE (10' CONTOUR)
- PROPOSED EXCAVATION GRADE (2' CONTOUR)
- PROPOSED GRADE (10' CONTOUR)
- PROPOSED GRADE (2' CONTOUR)
- PROPOSED FINAL COVER LIMITS
- PROPOSED VIBRATING WIRE PIEZOMETER (VWP)
- PROPOSED VIBRATING WIRE PIEZOMETER CABLE
- PROPOSED INCLINOMETER

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. PROPOSED GRADES IN THE NORTH POND CLOSURE AREA REPRESENT ANTICIPATED BOTTOM OF CCR REMOVAL LIMITS. ACTUAL LIMITS WILL BE DETERMINED BY THE ENGINEER/OWNER BASED ON FIELD CONDITIONS.
3. PROPOSED GRADES IN THE SOUTH POND CLOSURE AREA REPRESENT PROPOSED TOP OF RELOCATED CCR FILL.
4. PROPOSED GRADES IN THE SOUTH POND CLOSURE AREA ARE SUBJECT TO CHANGE DEPENDENT ON VOLUME REMOVED FROM THE NORTH POND CLOSURE AREA AND ON-SITE MATERIAL BALANCING.
5. PROTECT VIBRATING WIRE PIEZOMETERS AND INCLINOMETERS THROUGHOUT CONSTRUCTION. INCLINOMETER CASINGS TO BE EXTENDED AS NECESSARY TO BRING ABOVE FILL GRADE.
6. TIMING OF ABANDONMENT OF VIBRATING WIRE PIEZOMETERS AND INCLINOMETERS WILL BE DETERMINED BY ENGINEER.

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/15/2022

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

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

SITE
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SHEET
PROPOSED CLOSURE AREA SUBGRADES

9 of 20

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5541000 E | 5541500 E | 5542000 E | 5542500 E | 5543000 E

3958000 N | 3957500 N | 3957000 N | 3956500 N | 3956000 N

LOWER ASH POND (CLOSED)

SITE 13AM69

HILD 728

SHEET PILE WALL

POWER PLANT DR

BRIDGE

GATE

NORTH POND CLOSURE AREA

PLACE GENERAL FILL TO ACHIEVE PROPOSED GRADES AND RESTORE WITH 6-INCHES TOPSOIL

ACCESS ROAD AT NORTH ROAD CLOSURE AREA SEE DETAIL 6/17

10" THICK EROSION STONE

ROCK CHUTE RC2

ROCK CHUTE RC3

RIPRAP

FLUME 3

DOWNSLOPE FLUME (TYP) SEE DETAIL 1/19

FLUME 2

DIVERSION BERM (TYP) SEE DETAIL 2/17

FINAL GRADES

ACCESS ROAD AT SOUTH ROAD CLOSURE AREA SEE DETAIL 7/17

PERIMETER SWALE SEE DETAIL 3/17

FLAT BOTTOM PERIMETER SWALE (TYP) SEE DETAIL 4/17

SOUTH POND CLOSURE AREA

ACCESS ROAD SEE DETAIL 5/17

LIMITS OF POND CLOSURE ACCESS ROAD

CO. HWY X52 (GREAT RIVER RD)

UNNAMED CREEK (INT. 1)

FLUME 1

ROCK CHUTE (TYP.) SEE DETAIL 9/17

ENERGY DISSIPATOR (TYP) SEE DETAIL 3/19

ROCK CHUTE RC1

FLUME 5

SHORTEN 30" DIA. PIPE BACK TO ENERGY DISSIPATOR

ASH DISPOSAL LANDFILL

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MONITORING WELL
- ABANDONED MONITORING WELL
- PIEZOMETER
- ABANDONED PIEZOMETER
- ABANDONED SHALLOW PIEZOMETER
- WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- ARCHAEOLOGICAL/CULTURAL RESOURCE SITE
- PROPOSED SILT FENCE
- PROPOSED GRADE (10' CONTOUR)
- PROPOSED GRADE (2' CONTOUR)
- PROPOSED FINAL COVER LIMITS
- PROPOSED DRAINAGE SWALE
- PROPOSED DIVERSION BERM
- PROPOSED DOWNSLOPE FLUME
- PROPOSED ENERGY DISSIPATOR
- PROPOSED ROCK CHUTE
- PROPOSED ACCESS ROAD

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. PROPOSED NORTH POND CLOSURE AREA GRADES REPRESENT PROPOSED FINAL GRADES (TOP OF TOPSOIL).
3. PROPOSED SOUTH POND CLOSURE AREA GRADES REPRESENT PROPOSED FINAL COVER GRADES (TOP OF TOPSOIL).
4. PROPOSED GRADES IN THE SOUTH POND CLOSURE AREA ARE SUBJECT TO CHANGE DEPENDENT ON VOLUME REMOVED FROM THE NORTH POND CLOSURE AREA AND ON-SITE MATERIAL BALANCING.

100 0 100

SCALE: 1" = 100'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/22/2022

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

CLIENT

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

ENGINEER

UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

PROPOSED FINAL GRADES

SHEET 10 of 20

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LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL APPROVED LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER
- UNNAMED CREEK FLOW PATH
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MONITORING WELL
- ABANDONED MONITORING WELL
- PIEZOMETER
- ABANDONED PIEZOMETER
- ABANDONED SHALLOW PIEZOMETER
- WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- ARCHAEOLOGICAL/CULTURAL RESOURCE SITE
- PROPOSED SILT FENCE
- PROPOSED GRADE (5' CONTOUR)
- PROPOSED GRADE (1' CONTOUR)
- PROPOSED FINAL COVER LIMITS
- PROPOSED DRAINAGE SWALE
- PROPOSED DIVERSION BERM
- PROPOSED DOWNSLOPE FLUME
- PROPOSED ENERGY DISSIPATOR
- PROPOSED ROCK CHUTE
- PROPOSED ACCESS ROAD RESTORATION
- PROPOSED VEGETATED RESTORATION
- PROPOSED CHANNEL EROSION MAT

NOTES:

1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. PLACE NON-CHANNEL EROSION MAT ON RESTORED SLOPES STEEPER OR EQUAL TO 4:1 OR AS NOTED.
3. PLACE CHANNEL EROSION MAT IN DRAINAGE SWALES.
4. PROPOSED NORTH POND CLOSURE AREA GRADES REPRESENT PROPOSED FINAL GRADES (TOP OF TOPSOIL).
5. PROPOSED SOUTH POND CLOSURE AREA GRADES REPRESENT PROPOSED FINAL COVER GRADES (TOP OF TOPSOIL).
6. PROPOSED GRADES IN THE SOUTH POND CLOSURE AREA ARE SUBJECT TO CHANGE DEPENDENT ON VOLUME REMOVED FROM THE NORTH POND CLOSURE AREA AND ON-SITE MATERIAL BALANCING.

100 0 100
SCALE: 1" = 100'

N

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CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/22/2022

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

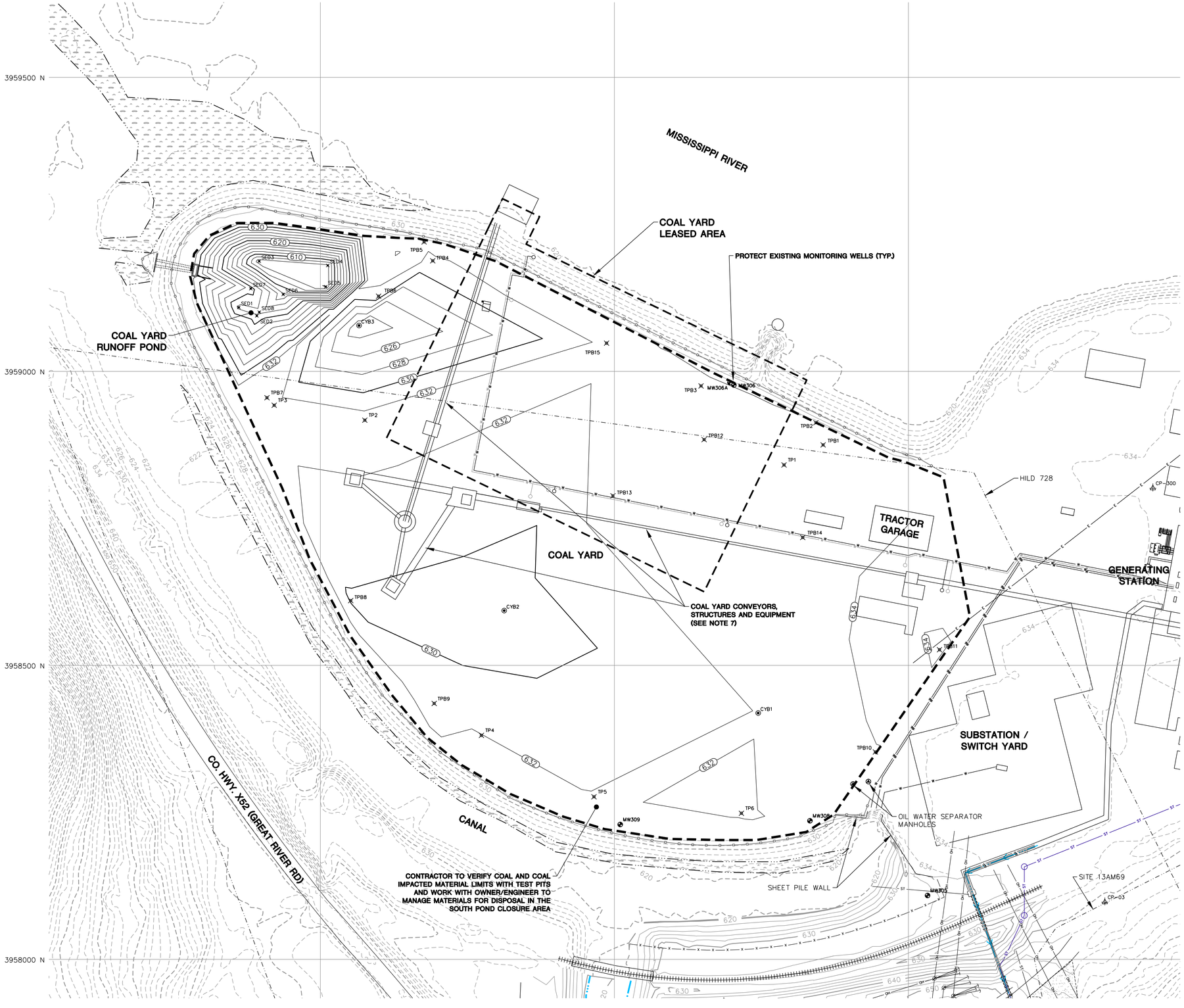
ENGINEER
SCS ENGINEERS
2830 DAIRY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

SITE
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

RESTORATION PLAN

SHEET
11 of 20

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LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2008 EXISTING GRADE (2' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- BURIED ELECTRIC
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- WATER
- ABANDONED WATER
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- CP-02 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- CYB1 SOIL BORING
- SED1 SEDIMENT PROBE
- TP1 TEST PIT
- ARCHAEOLOGICAL/CULTURAL RESOURCE SITE
- WETLAND
- OIL WATER SEPARATOR MANHOLE
- COAL YARD LEASED AREA
- 630 PROPOSED EXCAVATION GRADE (10' CONTOUR)
- 632 PROPOSED EXCAVATION GRADE (2' CONTOUR)
- PROPOSED SILT FENCE/FILTER SOCK
- ANTICIPATED LIMITS OF COAL YARD EXCAVATION

NOTES:

1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. EXISTING CONTOURS IN THE COAL YARD AND COAL YARD RUNOFF POND ARE BASED ON JANUARY 2020 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC. AND NOVEMBER 2021 SEDIMENT PROBES COMPLETED BY AMES. CONTOURS REPRESENT ANTICIPATED GRADES AFTER COAL PILES HAVE BEEN REMOVED.
3. STRUCTURES AND UTILITIES IN THE COAL YARD AND GENERATING STATION AREA ARE APPROXIMATE AND BASED ON 2007 LANSING POWER STATION – PLOT PLAN (EIQ NO. 92-2686) AND NOVEMBER 5, 2014 COAL YARD FIRE PROTECTION SITE PLAN (DRAWING NO. 17692-LAN-M-001 AND 17692-LAN-M-002) PROVIDED BY IPL.
4. COAL YARD LEASE AREA LIMITS BY MOHN SURVEYING, INC. BASED ON LEASE INFORMATION PROVIDED BY IPL. LEASE LIMITS TO BE FIELD LOCATED BY A LICENSED PROFESSIONAL SURVEYOR AFTER EXCAVATION.
5. COAL AND COAL IMPACTED MATERIAL FROM THE COAL YARD AND COAL YARD RUNOFF POND TO BE DISPOSED UNDER THE FINAL COVER IN THE POND CLOSURE AREA.
6. ENGINEER WILL TEST SOIL IN LEASED AREA. CONTRACTOR TO REMOVE ADDITIONAL MATERIAL AS REQUIRED BY TEST RESULTS BEFORE RESTORATION
7. COAL YARD CONVEYORS, STRUCTURES, AND EQUIPMENT TO BE DEMOLISHED/ABANDONED/REMOVED BY OTHERS. UTILITY AND STRUCTURE LOCATIONS ARE APPROXIMATE. CONTRACTOR TO FIELD VERIFY AND PROTECT UTILITIES AND STRUCTURES THAT REMAIN.

80 0 80
SCALE: 1" = 80'

N

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APPROVED BY: MRH 12/23/2022

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DRAWN: 03/25/2021
REVISED: 11/15/2022

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

CLIENT

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

ENGINEER

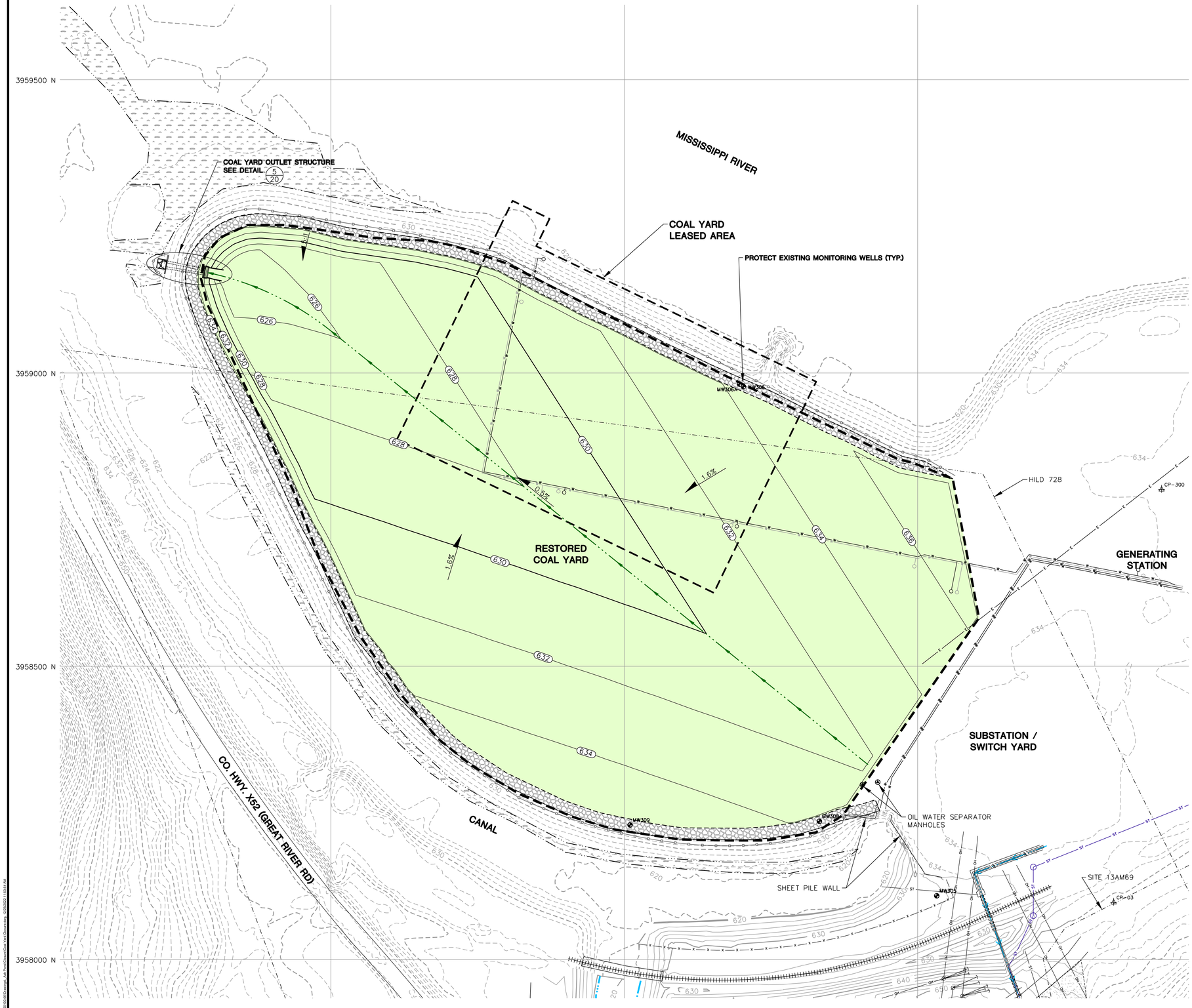
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

PROPOSED COAL YARD EXCAVATION GRADES

SHEET
12 of 20

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LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2008 EXISTING GRADE (2' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- BURIED ELECTRIC
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- WATER
- ABANDONED WATER
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- CP-02 SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- CYB1 SOIL BORING
- SED1 SEDIMENT PROBE
- TP1 TEST PIT
- ARCHAEOLOGICAL/CULTURAL RESOURCE SITE
- WETLAND
- COAL YARD LEASED AREA
- PROPOSED COAL YARD RESTORATION GRADE (10' CONTOUR)
- PROPOSED COAL YARD RESTORATION GRADE (2' CONTOUR)
- PROPOSED SILT FENCE
- PROPOSED DRAINAGE SWALE
- PROPOSED ROCK CHUTE
- PROPOSED ACCESS ROAD RESTORATION
- PROPOSED VEGETATED RESTORATION
- ANTICIPATED LIMITS OF COAL YARD EXCAVATION

NOTES:

1. SEE SHEET 2 AND 3 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. STRUCTURES AND UTILITIES IN THE COAL YARD AND GENERATING PLANT AREA ARE APPROXIMATE AND BASED ON 2007 LANSING POWER STATION – PLOT PLAN (EIQ NO. 92-2686) AND NOVEMBER 5, 2014 COAL YARD FIRE PROTECTION SITE PLAN (DRAWING NO. 17692-LAN-M-001 AND 17692-LAN-M-002) PROVIDED BY IPL.
3. COAL YARD LEASE AREA LIMITS BY MOHN SURVEYING, INC. BASED ON LEASE INFORMATION PROVIDED BY IPL. LEASE LIMITS TO BE FIELD LOCATED BY A LICENSE PROFESSIONAL SURVEYOR AFTER EXCAVATION COMPLETED.
4. CONTOURS IN RESTORED COAL YARD REPRESENT TOP OF TOPSOIL.
5. RESTORED COAL YARD TO BE COVERED WITH A MINIMUM 4-INCHES OF TOPSOIL, SEED, FERTILIZER, AND MULCH/EROSION MAT.
6. PLACE NON-CHANNEL EROSION MAT ON RESTORED SLOPES STEEPER OR EQUAL TO 4:1 OR AS NOTED.
7. PLACE CHANNEL EROSION MAT IN DRAINAGE SWALES.

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APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/15/2022

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9735

CLIENT

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

ENGINEER

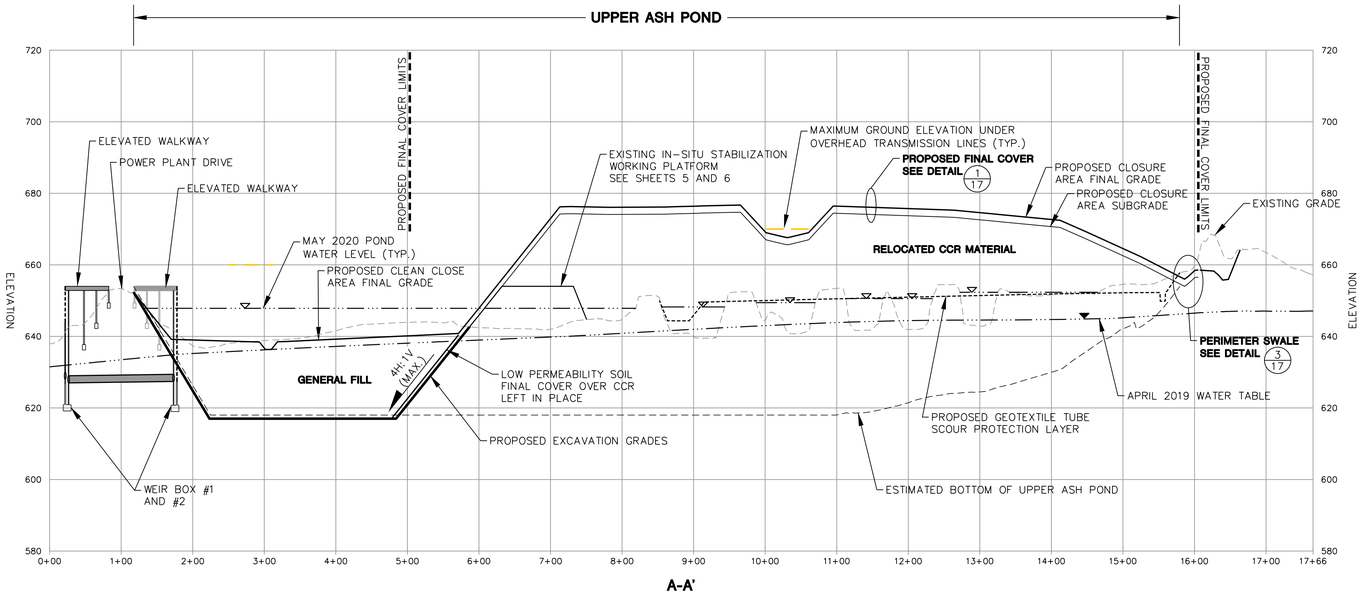
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

PROPOSED COAL YARD RESTORATION

SHEET
13 of 20

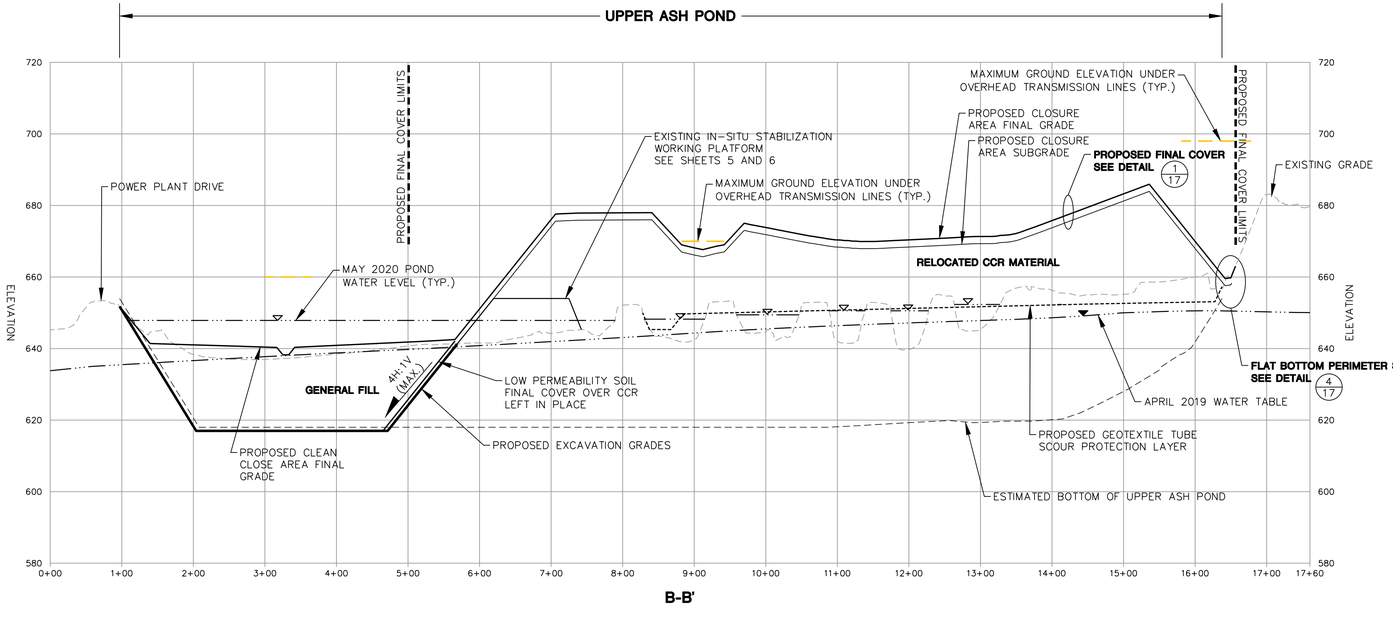
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A-A'

NOTES:

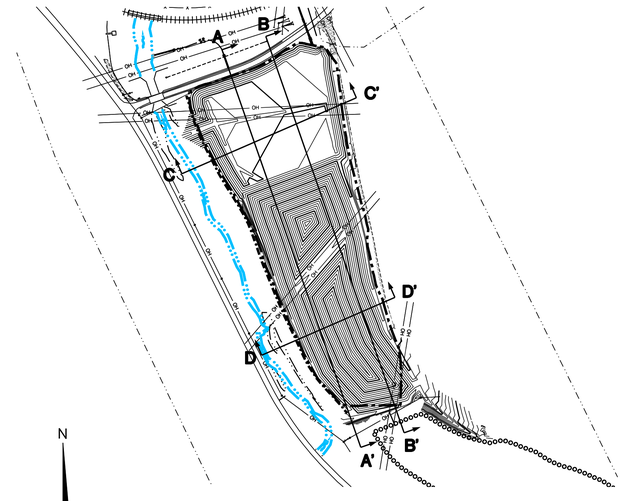
1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP NOTES.



B-B'

100 0 100

SCALE: 1" = 100'
VERTICAL EXAGGERATION: 5X



CROSS SECTION LOCATION MAP

SCALE: 1" = 300'

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

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/02/2022

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

CLIENT

ENGINEER

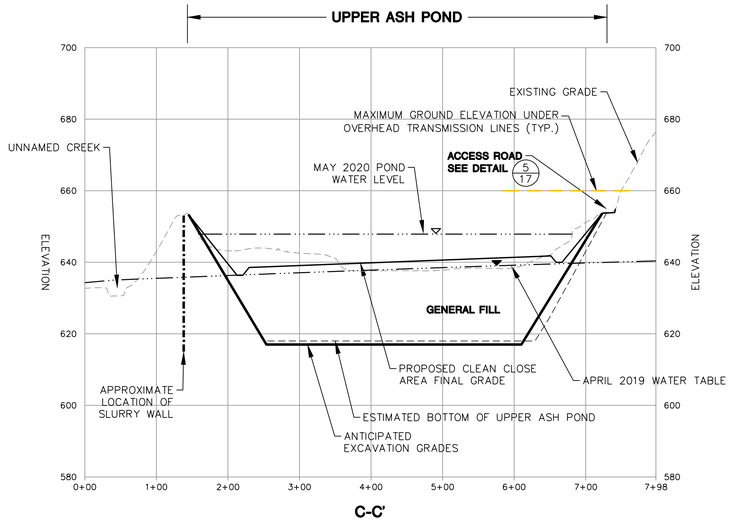
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

CROSS SECTIONS A AND B

SHEET
14 of 20

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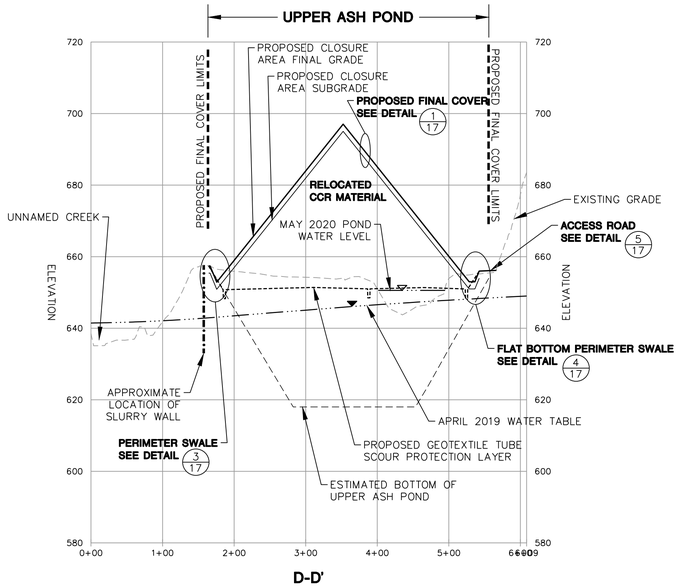
C-C'

NOTES:

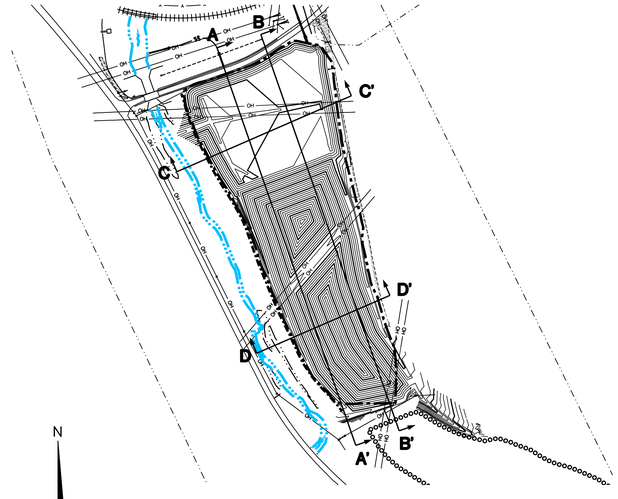
1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP NOTES.

100 0 100

SCALE: 1" = 100'
VERTICAL EXAGGERATION: 5X



D-D'



CROSS SECTION LOCATION MAP

SCALE: 1" = 300'

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

ENGINEER

UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

CROSS SECTIONS C AND D

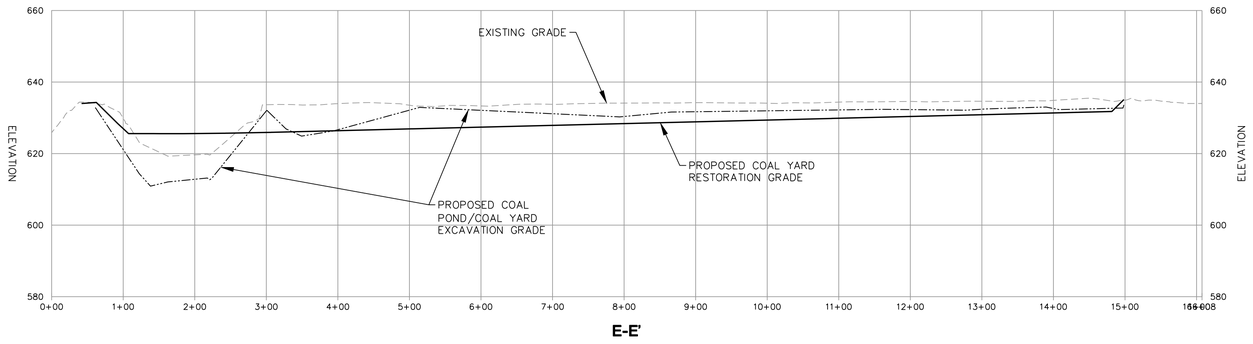
SHEET 15 of 20

CLIENT

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

PROJECT NO.	25220100.00
DRAWN:	03/25/2021
REVISED:	11/02/2022
DRAWN BY:	BSS/KP
CHECKED BY:	BSS
APPROVED BY:	MRH 12/23/2022

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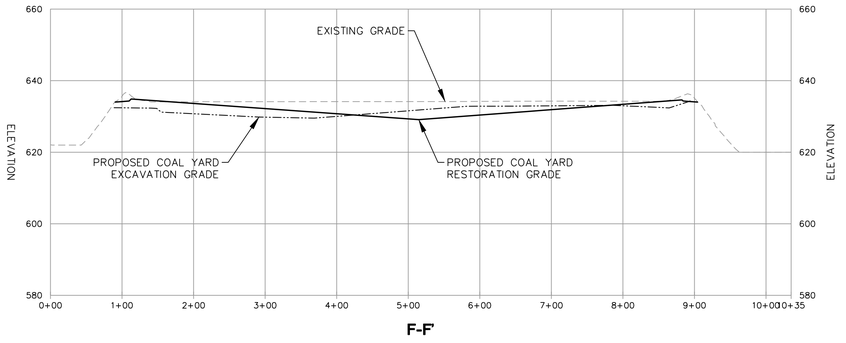
E-E'

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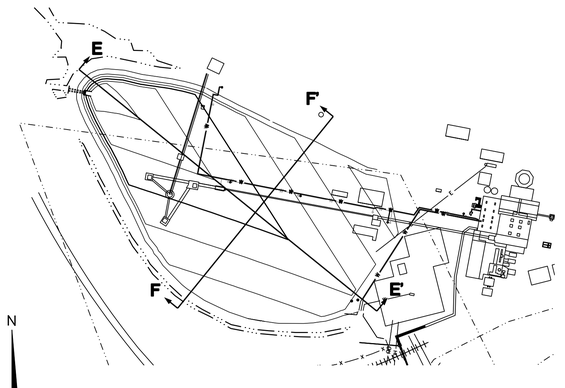
1. SEE SHEET 2 AND SHEET 3 FOR ADDITIONAL BASE MAP NOTES.

100 0 100

SCALE: 1" = 100'
VERTICAL EXAGGERATION: 5X



F-F'



CROSS SECTION LOCATION MAP

SCALE: 1" = 300'

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

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/02/2022

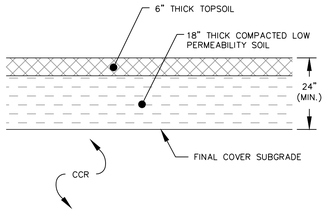
CLIENT
INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

SITE
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

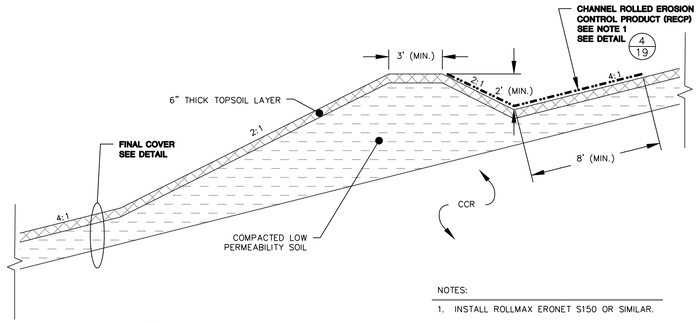
CROSS SECTIONS E AND F

SHEET
16 of 20

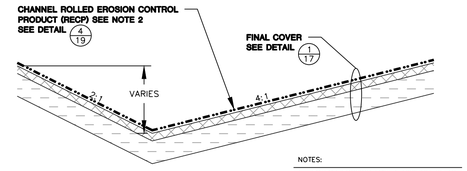
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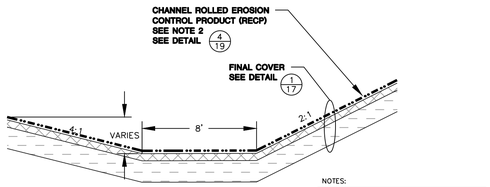
1/17 **FINAL COVER**
SCALE: 1" = 2'



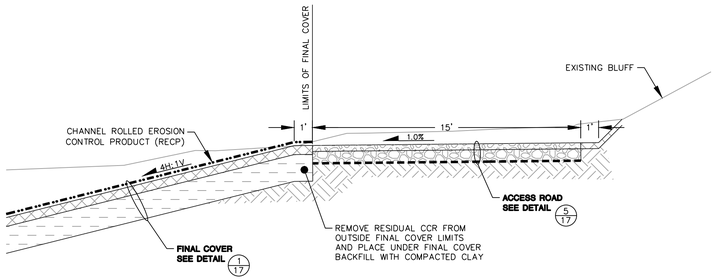
2/17 **FINAL COVER DIVERSION BERM**
SCALE: 1" = 4'



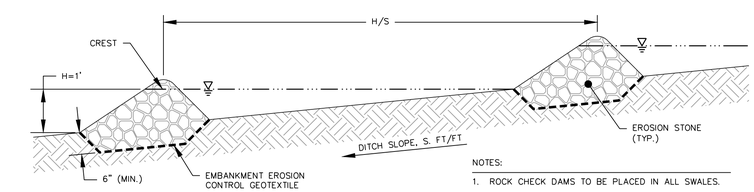
3/17 **PERIMETER SWALE**
SCALE: 1" = 5'



4/17 **FLAT BOTTOM PERIMETER SWALE**
SCALE: 1" = 5'

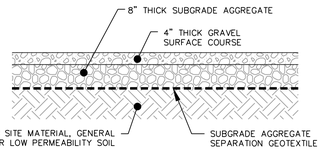


6/17 **ACCESS ROAD AT NORTH POND CLOSURE AREA**
SCALE: 1" = 4'

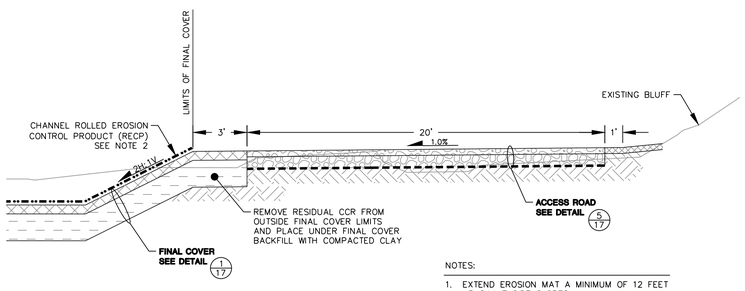


NOTES:
1. ROCK CHECK DAMS TO BE PLACED IN ALL SWALES.

8/17 **ROCK CHECK DAM**
NOT TO SCALE

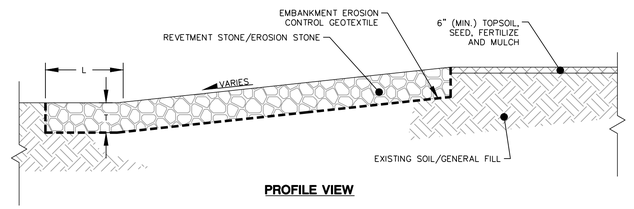


5/17 **ACCESS ROAD**
SCALE: 1" = 2'

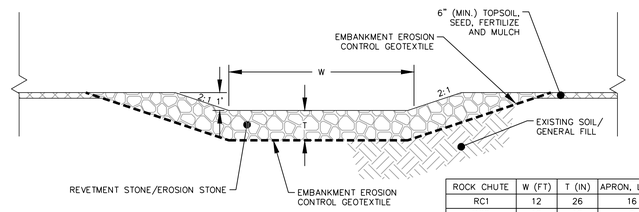


NOTES:
1. EXTEND EROSION MAT A MINIMUM OF 12 FEET UP SWALE SIDE SLOPES.
2. INSTALL ROLLMAX ERONET SC150 OR SIMILAR.

7/17 **ACCESS ROAD AT SOUTH POND CLOSURE AREA**
SCALE: 1" = 4'



PROFILE VIEW



NOTES:
1. TOP OF REVETMENT STONE/EROSION STONE TO BE FLUSH WITH SURROUNDING GRADES.

SECTION VIEW

ROCK CHUTE	W (FT)	T (IN)	APRON, L (FT)	IDOT RIPRAP CLASSIFICATION
RC1	12	26	16	REVETMENT STONE CLASS E
RC2	10	16	9	EROSION STONE
RC3	4	16	9	EROSION STONE
RC4	12	24	14	REVETMENT STONE CLASS E

9/17 **ROCK CHUTE**
NOT TO SCALE

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

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/02/2022

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

ENGINEER

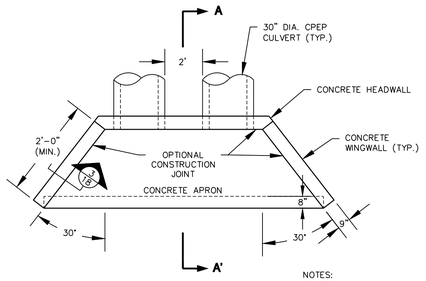
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

DETAILS

SHEET
17 or 20

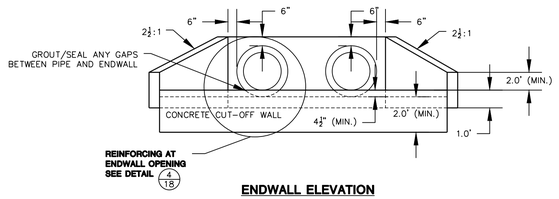
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ENDWALL PLAN VIEW

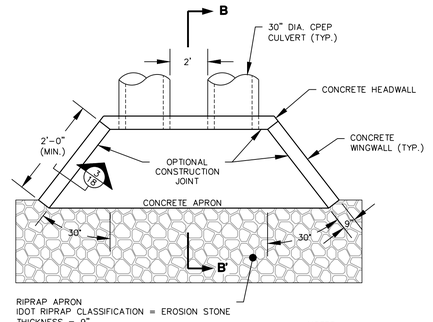
NOTES:

1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.



ENDWALL ELEVATION

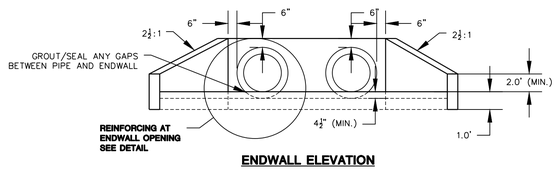
1/18 CULVERT ENDWALL INLET
NOT TO SCALE



ENDWALL PLAN VIEW

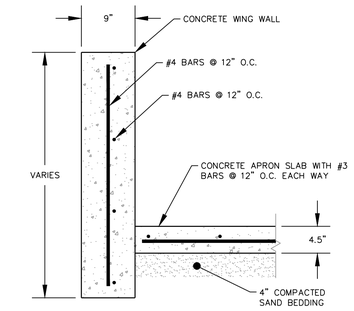
NOTES:

1. MATCH FILL SLOPES TO CONFORM TO WINGWALLS.
2. ENDWALL TO BE PRECAST CONCRETE OR CONCRETE MASONRY WITH STEEL REINFORCEMENT.

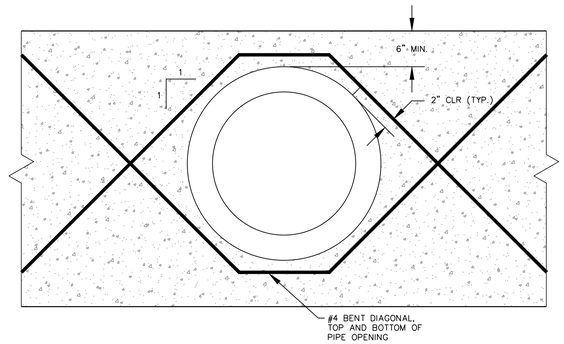


ENDWALL ELEVATION

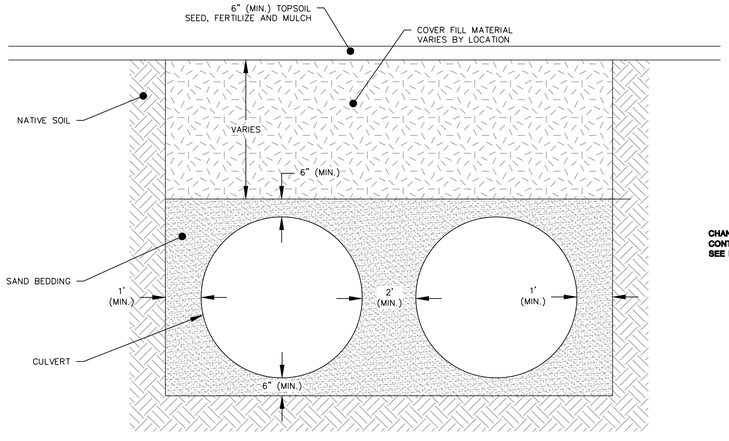
2/18 CULVERT ENDWALL OUTLET
NOT TO SCALE



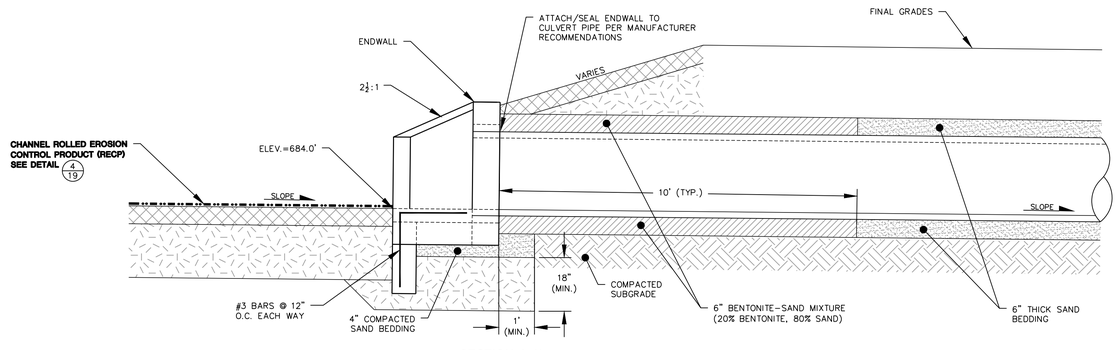
3/18 REINFORCEMENT AT APRON ENDWALL
NOT TO SCALE



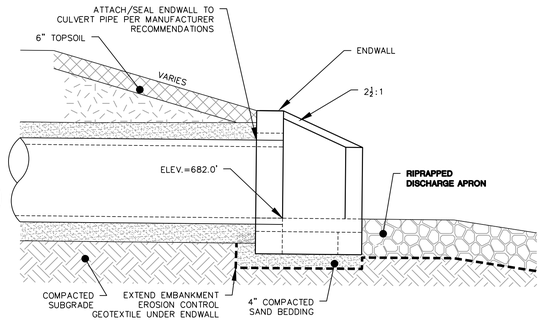
4/18 REINFORCEMENT AT ENDWALL OPENING
NOT TO SCALE



5/18 CULVERT BEDDING
NOT TO SCALE



SECTION A-A'



SECTION B-B'

6/18 CULVERT PROFILE
SCALE: 1" = 2'

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

ENGINEER

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/02/2022

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

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

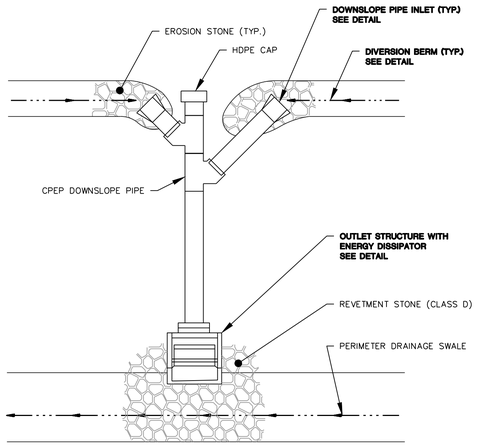
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

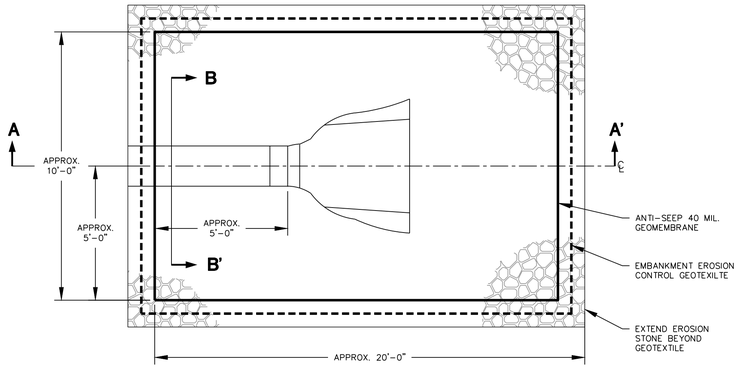
DETAILS

SHEET
18 of 20

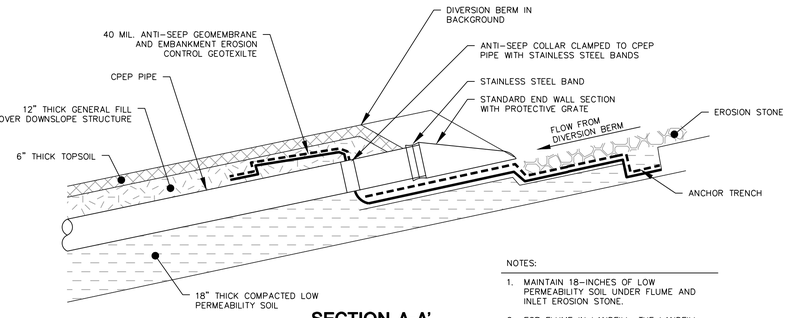
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1/19 DOWNSLOPE PIPE
NOT TO SCALE



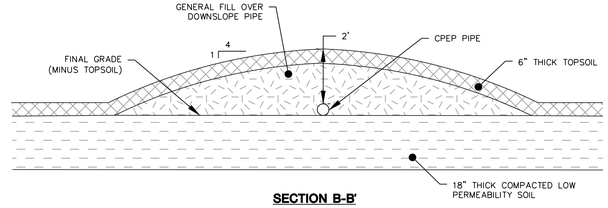
PLAN VIEW



SECTION A-A'

NOTES:

1. MAINTAIN 18-INCHES OF LOW PERMEABILITY SOIL UNDER FLUME AND INLET EROSION STONE.
2. FOR FLUME IN LANDFILL, THE LANDFILL FINAL COVER DETAIL TO BE FOLLOWED.



SECTION B-B'

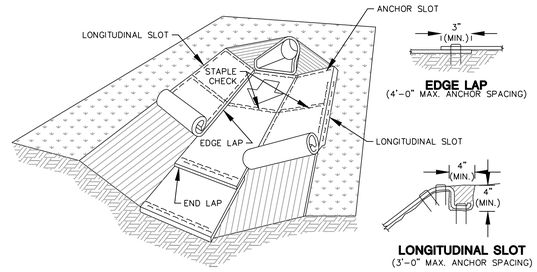
2/19 DOWNSLOPE INLET STRUCTURE
NOT TO SCALE

NOTE:

1. MAINTAIN 18-INCHES OF LOW PERMEABILITY SOIL UNDER ENERGY DISSIPATOR AND DISCHARGE APRON.

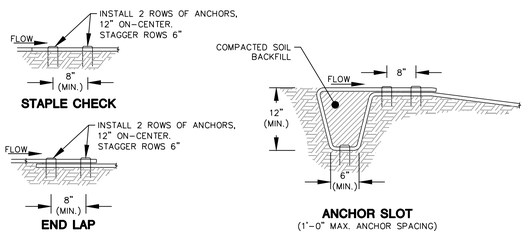
Flume	D_1 (in.)	Energy Dissipator Dimensions (feet)										Discharge Apron				
		W_b	h_1	h_3	h_4	L	L_1	L_2	W_1	W_2	t_4	Chute Width (ft.)	Apron Width (ft.)	Length (ft.)	Thickness (in.)	Stone Type
Flume 4/ Flume 5	30	8	6.17	1.33	3.33	10.67	4.58	6.17	0.58	2.17	0.5	10	10	12	20	IDOT Revetment Stone Class E
Flume 1	18	4	3.08	0.67	1.67	5.42	2.33	3.08	0.33	1.08	0.5	6	6	7	12	IDOT Erosion Stone
Flume 2																
Flume 3																

3/19 ENERGY DISSIPATOR
NOT TO SCALE



EDGE LAP
(4'-0" MAX. ANCHOR SPACING)

LONGITUDINAL SLOT
(3'-0" MAX. ANCHOR SPACING)

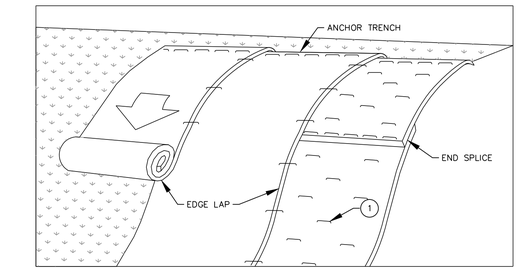


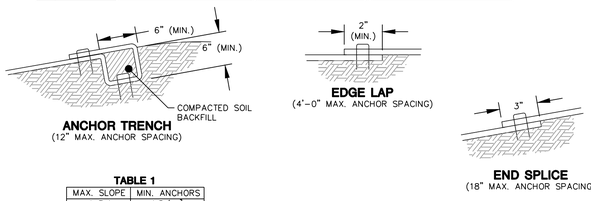
STAPLE CHECK

END LAP

ANCHOR SLOT
(1'-0" MAX. ANCHOR SPACING)

4/19 CHANNEL ROLLED EROSION CONTROL PRODUCT (RECP)
NOT TO SCALE





ANCHOR TRENCH
(12" MAX. ANCHOR SPACING)

EDGE LAP
(4'-0" MAX. ANCHOR SPACING)

END SPLICE
(18" MAX. ANCHOR SPACING)

TABLE 1

MAX. SLOPE	MIN. ANCHORS
≤ 3:1	1.5/yd²
2:1	2/yd²
1:1	2.5/yd²

(1) SECURE BLANKET TO GROUND ACCORDING TO MANUFACTURER'S RECOMMENDED ANCHORING PATTERN AND MINIMUM SHOWN IN TABLE 1.

5/19 NON-CHANNEL ROLLED EROSION CONTROL PRODUCT (RECP)
NOT TO SCALE

DRAWN BY: BSS/KP
CHECKED BY: BSS
APPROVED BY: MRH 12/23/2022

PROJECT NO. 25220100.00
DRAWN: 03/25/2021
REVISED: 11/02/2022

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

CLIENT

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

ENGINEER

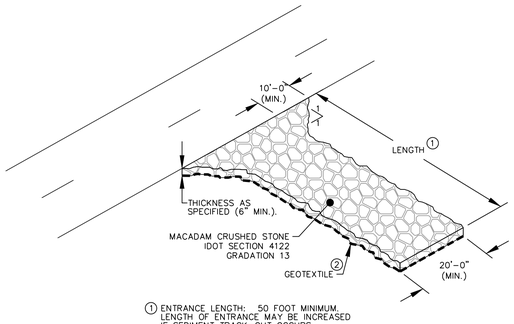
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

SITE

DETAILS

SHEET
19 or 20

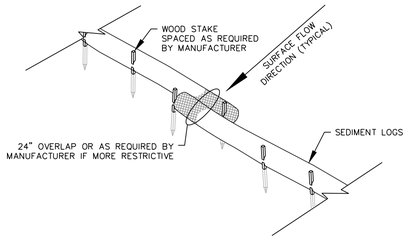
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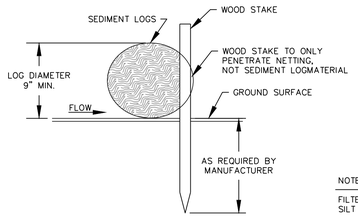


① ENTRANCE LENGTH: 50 FOOT MINIMUM. LENGTH OF ENTRANCE MAY BE INCREASED IF SEDIMENT TRACK-OUT OCCURS.

② INSTALL SUBGRADE AGGREGATE SEPARATION GEOTEXTILE BELOW STONE.

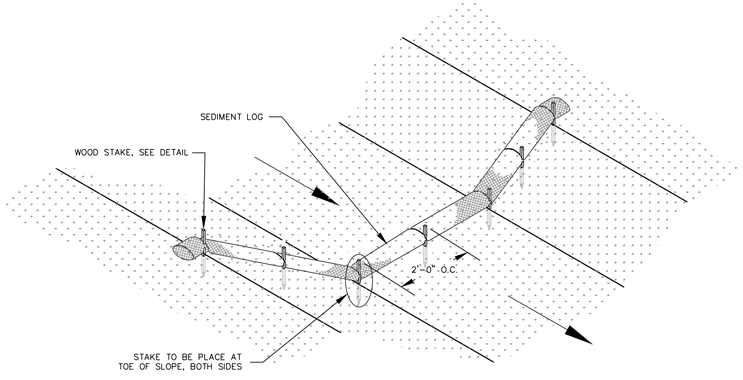
1/20 STABILIZED CONSTRUCTION ENTRANCE
NOT TO SCALE





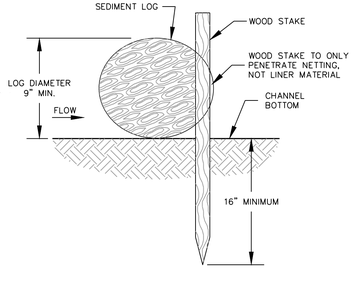
NOTE:
FILTER SOCK MAY BE USED IN PLACE OF SILT FENCE WITH ENGINEER APPROVAL.

3/20 FILTER SOCK
NOT TO SCALE

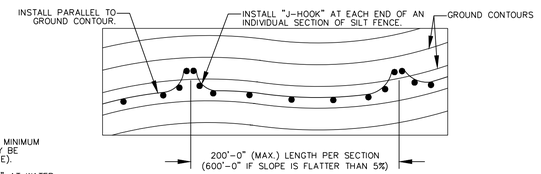


NOTES:
1. INSTALL SEDIMENT LOGS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

4/20 SEDIMENT LOG
NOT TO SCALE



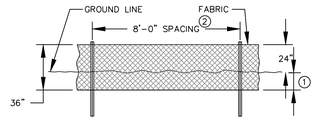
STAKE DETAIL (NO TRENCH)



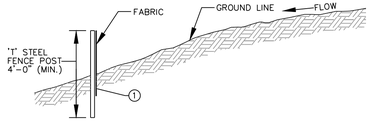
① INSERT 12 INCHES OF FABRIC A MINIMUM OF 6 INCHES DEEP (FABRIC MAY BE FOLDED BELOW THE GROUND LINE).

② REDUCE POST SPACING TO 5'-0" AT WATER CONCENTRATION AREAS, OR AS REQUIRED TO ADEQUATELY SUPPORT FENCE.

TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES (Plan View)



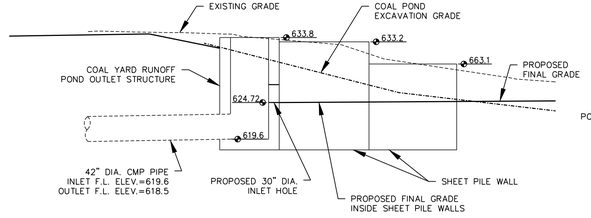
DETAILS OF SILT FENCE ON LONGITUDINAL SLOPES



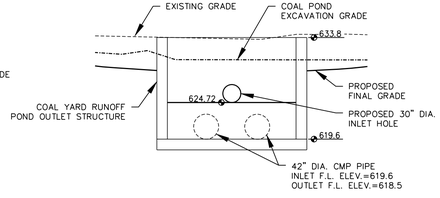
TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES (Profile View)

2/20 SILT FENCE
NOT TO SCALE

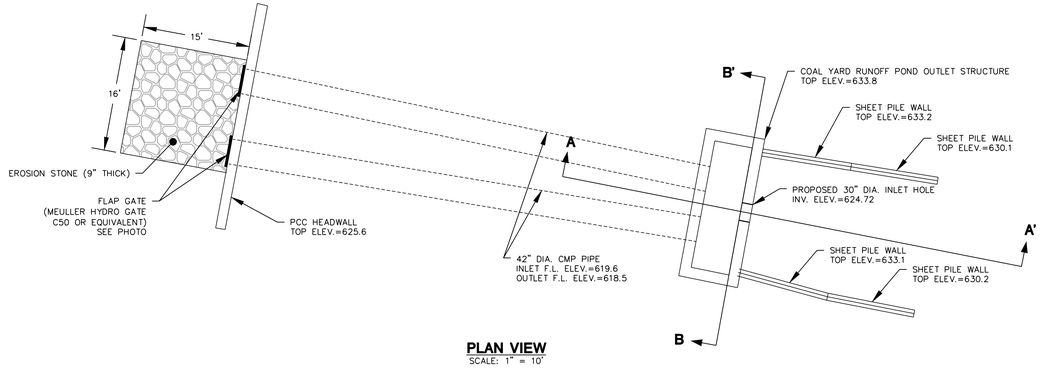




PROFILE A-A'
SCALE: 1" = 10'



PROFILE B-B'
SCALE: 1" = 10'



PLAN VIEW
SCALE: 1" = 10'

5/20 COAL YARD OUTLET STRUCTURE
SCALE: 1" = 10'

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

DRAWN BY:	BSS/KP
CHECKED BY:	BSS
APPROVED BY:	MRH 12/23/2022
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2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

ENGINEER

SITE
UPPER ASH POND CLOSURE
LANSING GENERATING STATION
LANSING, IOWA

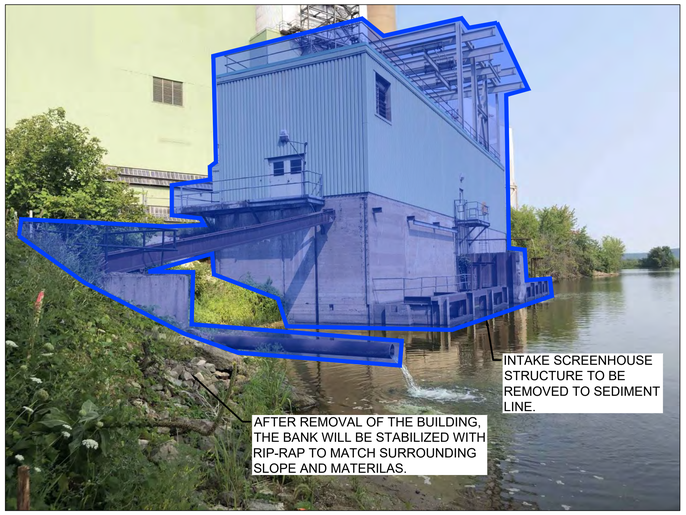
DETAILS

SHEET
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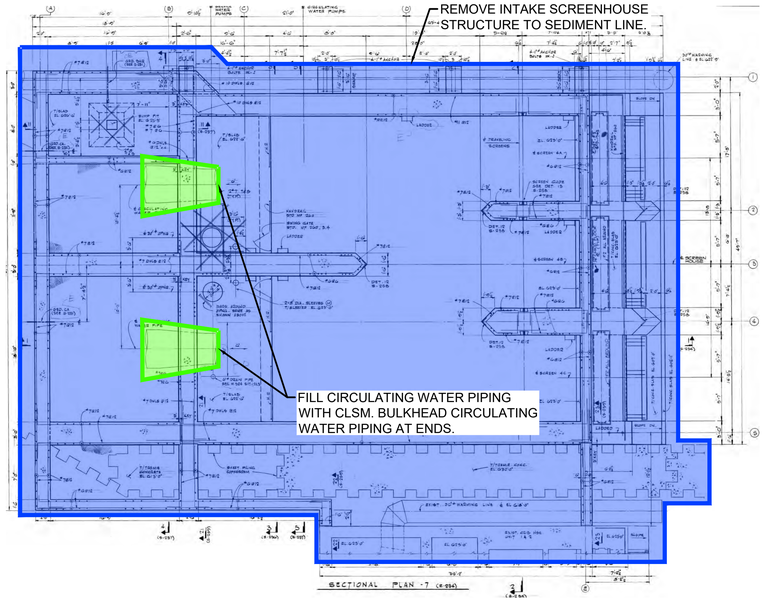
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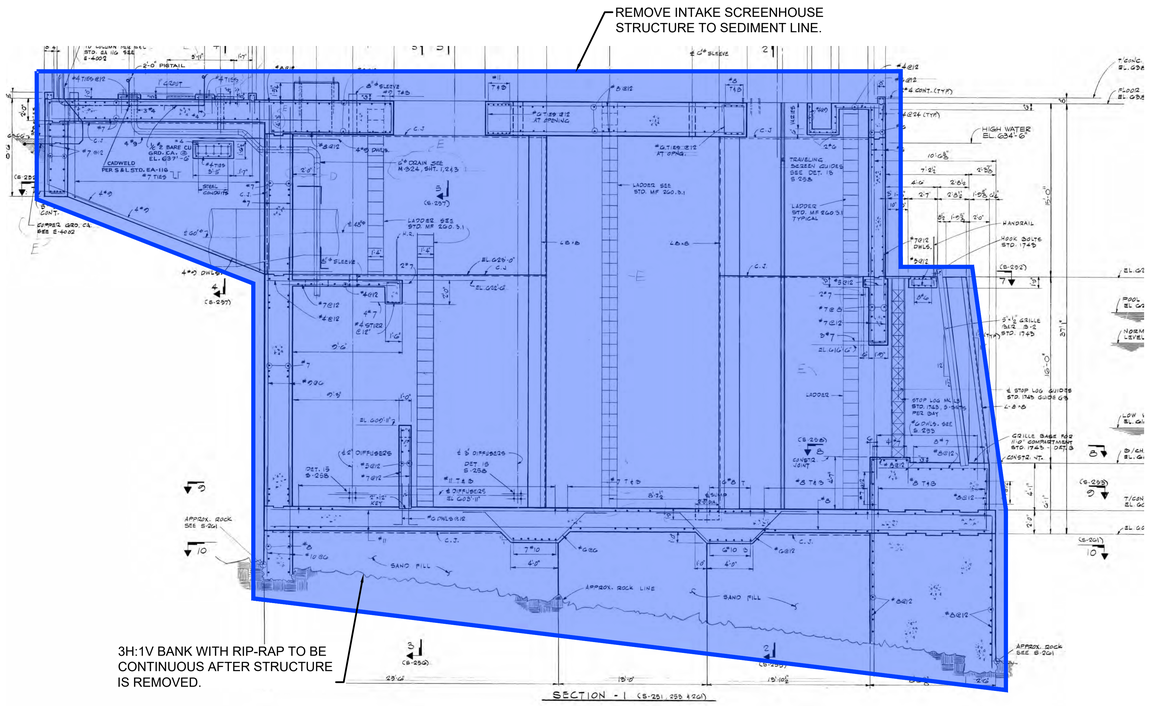
INTAKE SCREENHOUSE SECTION DETAIL
NOT TO SCALE



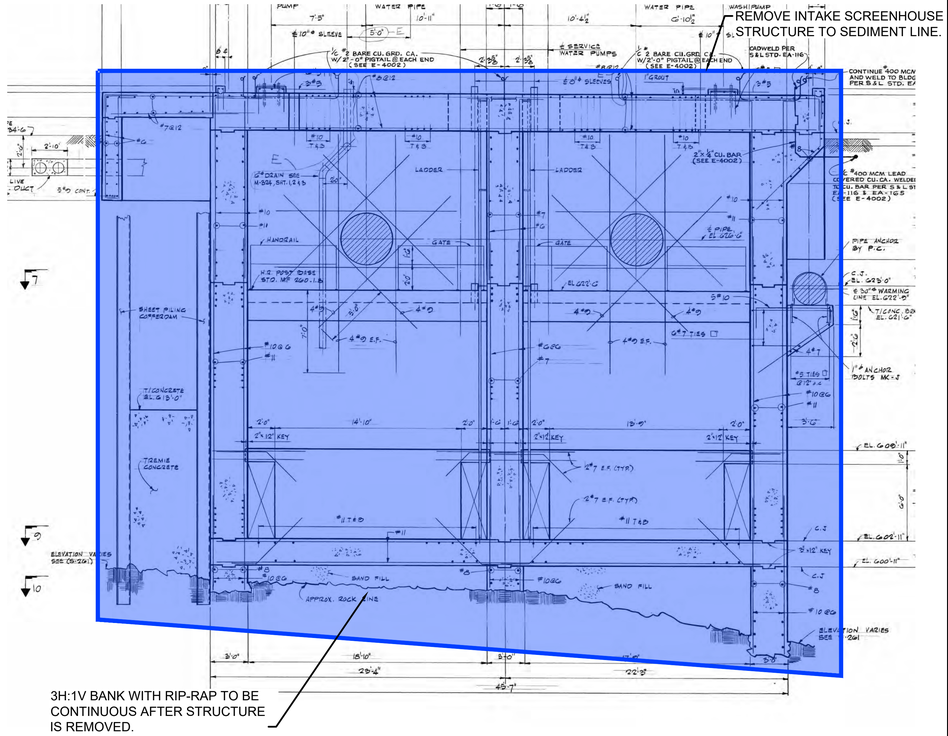
CIRCULATING WATER INTAKE SCREENHOUSE
NOT TO SCALE



INTAKE SCREENHOUSE SECTION DETAIL
NOT TO SCALE



INTAKE SCREENHOUSE SECTION DETAIL
NOT TO SCALE



INTAKE SCREENHOUSE SECTION DETAIL
NOT TO SCALE

LEGEND

TO BE REMOVED

TO BE FILLED WITH CLSM

no.	date	by	ckd	description
0	3/15/23	AM	CD	ISSUED FOR BID

BURNS McDONNELL
1431 OPUS PLACE, SUITE 400
DOWNERS GROVE, ILLINOIS 60515
630-724-3200

date	detailed
MARCH 15, 2023	A.MENDHE
designed	checked
C. DUMOULIN	J. POPE

ALLIANT ENERGY.

LANSING POWER STATION UNIT 4
INTERSTATE POWER CO.
LANSING, IOWA

LANSING CONTRACT DRAWINGS

DEMOLITION DETAILS - SCREENHOUSE

project	contract
135056	

drawing **D008** – rev. **0**

sheet of sheets

file 135056_D008.DWG

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CERTIFICATION PAGE



I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

April 21, 2023

Eric J. Nelson, PE (date)

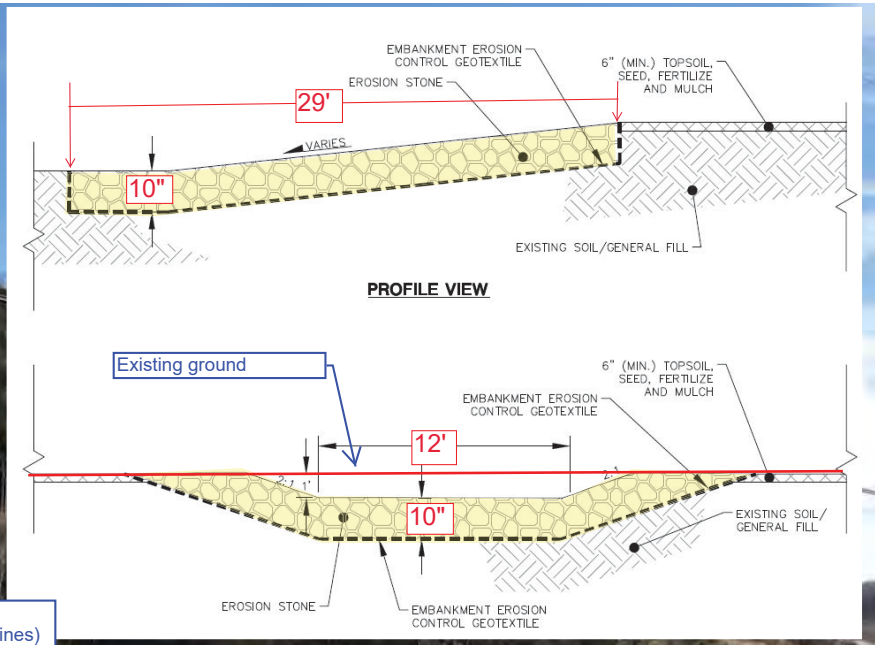
Iowa License No. 23136

My license renewal date is: 12/31/2024

Pages or sheets covered by this seal: Joint Permit Application Figures 1 through 5 attached.

FIGURE 1

Looking East/Southeast



Proposed swale and flow path

Approximate proposed berm cut (WHITE = Slope Break Lines Break Lines)

Proposed riprap leading into Unnamed Creek

Approximate 500-year floodplain Elev.
= ~635 ft (at Mississippi)
= ~634.5 ft (estimated at location based on mapping)

Approximate 100-year floodplain Elev.
= 632.1 ft (at Mississippi)
= ~632.1 ft (estimated at location based on mapping)

Proposed Elev. = 633.5 ft

Proposed Elev. = 632.0 ft

FIGURE 2

Looking South



FIGURE 3

Looking South

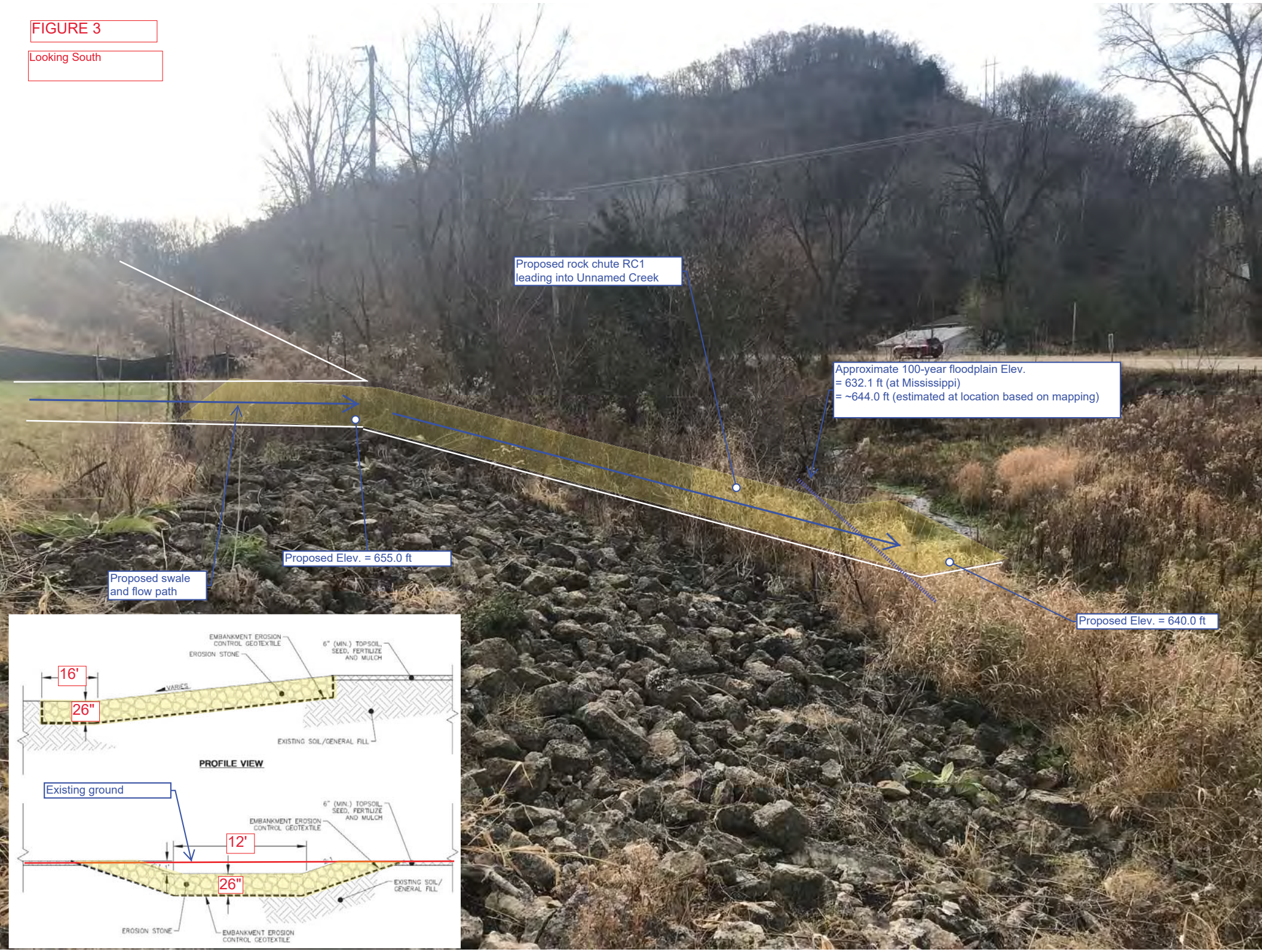
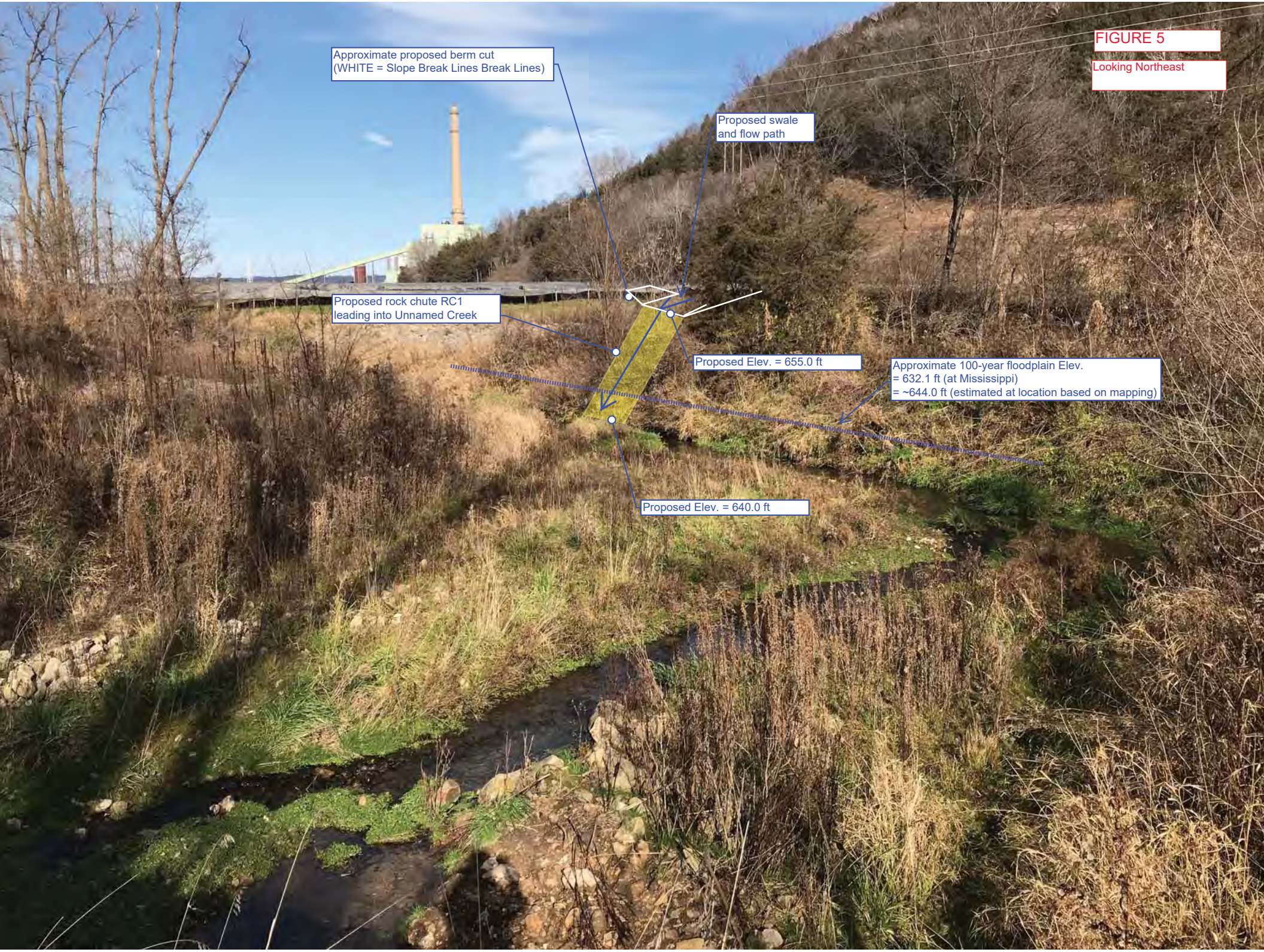


FIGURE 4

Looking East




FIGURE 5
Looking Northeast
Approximate proposed berm cut
(WHITE = Slope Break Lines Break Lines)
Proposed swale
and flow path
Proposed rock chute RC1
leading into Unnamed Creek
Proposed Elev. = 655.0 ft
Approximate 100-year floodplain Elev.
= 632.1 ft (at Mississippi)
= ~644.0 ft (estimated at location based on mapping)
Proposed Elev. = 640.0 ft

5/1/2023

JOHN WATTS
ROBIN NELSON
INTERSTATE POWER AND LIGHT COMPANY
4282 SULLIVAN SLOUGH ROAD
LANSING, IA 52151

Subject: Sovereign Lands Construction Permit 2022-0482SL-01
Project Description: Power Plant Decomission
Project Location: Power Plant Access- Mississippi River
Project County: Allamakee
Project Latitude / Longitude Location(s): 43.3331/-91.1678
Project Legal Description: Sec. 2/T98N/R03W

Dear Robin Nelson,

As provided under Chapter 461A of the Code of Iowa, the Department of Natural Resources (DNR) hereby grants permission to John Watts (the Permittee) to do the following work subject to stipulations stated herein and in the documents submitted in application for this permit which are now on file in the central office of the DNR. Any special conditions and stipulations contained in this permit shall take precedence over plans or specifications provided by the applicant.

Work shall not begin in advance of contact with the Fisheries Biologist in charge of the area. That person is Karen Osterkamp at 563-252-1156.

The Permittee is required to complete a "Report of Completion" upon conclusion of the project in accordance with 571 IAC—13.18.Report may be provided through the Department PERMT website https://programs.iowadnr.gov/permt/, or by mail.

The Permittee is hereby authorized to complete the proposed project at the Mississippi River, consistent with this permit and the plans and specifications the Permittee, or its authorized agent, submitted for consideration of this permit (collectively, the Project).

The Permittee shall follow, or cause to be followed, these conditions for the construction of the project:

1. A silt curtain shall be used when working in the area to minimize material going downstream and affecting nearby mussel beds;
2. The seawall shall be maintained and kept in good condition with the use of natural stone at the base.

The Permittee shall have, or shall cause there to be, a copy of this permit on-site during construction.

Although this permit authorizes the Permittee to construct this Project on state lands and/or waters, the Permittee must acquire other applicable federal, state and local permits before initiating the permitted activity. This Project may also require a permit from the U.S. Army Corps of Engineers. If the Permittee has not already done so, it should

contact Mr. Ward Lenz of the U.S. Army Corps of Engineers in writing or by telephone at 309-794-5057 to determine if a Corps permit is required for this project.

Any construction activity that bares the soil of an area greater than or equal to one acre including clearing, grading or excavation may require a storm water discharge permit from the Department. Construction activities may include the temporary or permanent storage of dredge material. For more information regarding this matter, please call (515)204-9234.

This permit is also a record of review for protected species, rare natural communities, state lands and waters in the Project area, including review by personnel representing state parks, preserves, recreation areas, fisheries and wildlife. The Department has searched Natural Areas Inventory records for the project area and found no site-specific records of rare species or significant natural communities that would be impacted by this project. Department data are not the result of thorough field surveys. If additional endangered or threatened listed species or rare communities are found during the planning or construction phases, additional studies and/or mitigation may be required.

The Permittee is presumed to be familiar with all laws, ordinances, and regulations that may affect employees, materials, or equipment used in or upon the project. By accepting this permit and conducting activities pursuant thereto, the Permittee hereby indemnifies and saves harmless the State of Iowa, the Department of Natural Resources, and all its officers and agents from claims or liability of any character arising out of any acts or damages that might result from the installation or construction of the project described in this permit.

This permit expires Wednesday, December 31, 2025.

Please direct questions to me by telephone at 515-330-6432 or email at Casey.Laskowski@dnr.iowa.gov.

Sincerely,

Casey Laskowski
Environmental Specialist
Conservation and Recreation Division

CC: John Watts; 2320 Power Plant Drive; Lansing, IA, 52151, JohnWatts@alliantenergy.com
Karen Osterkamp, Iowa DNR Fisheries Bureau (email)

Nationwide Permit 43
Storm Water Management Facilities

Effective Date: March 15, 2021 / Expiration Date: March 14, 2026
Authorities: Sections 10 and 404

Discharges of dredged or fill material into non-tidal waters of the United States for the construction of stormwater management facilities, including stormwater detention basins and retention basins and other stormwater management facilities; the construction of water control structures, outfall structures and emergency spillways; the construction of low impact development integrated management features such as bioretention facilities (e.g., rain gardens), vegetated filter strips, grassed swales, and infiltration trenches; and the construction of pollutant reduction green infrastructure features designed to reduce inputs of sediments, nutrients, and other pollutants into waters, such as features needed to meet reduction targets established under Total Maximum Daily Loads set under the Clean Water Act.

This NWP authorizes, to the extent that a section 404 permit is required, discharges of dredged or fill material into non-tidal waters of the United States for the maintenance of stormwater management facilities, low impact development integrated management features, and pollutant reduction green infrastructure features. The maintenance of stormwater management facilities, low impact development integrated management features, and pollutant reduction green infrastructure features that are not waters of the United States does not require a section 404 permit.

The discharge must not cause the loss of greater than 1/2-acre of non-tidal waters of the United States. This NWP does not authorize discharges of dredged or fill material into non-tidal wetlands adjacent to tidal waters. This NWP does not authorize discharges of dredged or fill material for the construction of new stormwater management facilities in perennial streams.

Notification: For discharges of dredged or fill material into non-tidal waters of the United States for the construction of new stormwater management facilities or pollutant reduction green infrastructure features, or the expansion of existing stormwater management facilities or pollutant reduction green infrastructure features, the permittee must submit a pre-construction notification to the district engineer prior to commencing the activity. (See general condition 32.) Maintenance activities do not require pre-construction notification if they are limited to restoring the original design capacities of the stormwater management facility or pollutant reduction green infrastructure feature. (Authority: Section 404)

GENERAL CONDITIONS

Note: To qualify for NWP authorization, the prospective permittee must comply with the following general conditions, as applicable, in addition to any regional or case-specific conditions imposed by the division engineer or district engineer. Prospective permittees should contact the appropriate Corps district office to determine if regional conditions

have been imposed on an NWP. Prospective permittees should also contact the appropriate Corps district office to determine the status of Clean Water Act Section 401 water quality certification and/or Coastal Zone Management Act consistency for an NWP. Every person who may wish to obtain permit authorization under one or more NWPs, or who is currently relying on an existing or prior permit authorization under one or more NWPs, has been and is on notice that all of the provisions of 33 CFR 330.1 through 330.6 apply to every NWP authorization. Note especially 33 CFR 330.5 relating to the modification, suspension, or revocation of any NWP authorization.

1. **Navigation.** (a) No activity may cause more than a minimal adverse effect on navigation.

(b) Any safety lights and signals prescribed by the U.S. Coast Guard, through regulations or otherwise, must be installed and maintained at the permittee's expense on authorized facilities in navigable waters of the United States.

(c) The permittee understands and agrees that, if future operations by the United States require the removal, relocation, or other alteration, of the structure or work herein authorized, or if, in the opinion of the Secretary of the Army or his or her authorized representative, said structure or work shall cause unreasonable obstruction to the free navigation of the navigable waters, the permittee will be required, upon due notice from the Corps of Engineers, to remove, relocate, or alter the structural work or obstructions caused thereby, without expense to the United States. No claim shall be made against the United States on account of any such removal or alteration.

2. **Aquatic Life Movements.** No activity may substantially disrupt the necessary life cycle movements of those species of aquatic life indigenous to the waterbody, including those species that normally migrate through the area, unless the activity's primary purpose is to impound water. All permanent and temporary crossings of waterbodies shall be suitably culverted, bridged, or otherwise designed and constructed to maintain low flows to sustain the movement of those aquatic species. If a bottomless culvert cannot be used, then the crossing should be designed and constructed to minimize adverse effects to aquatic life movements.

3. **Spawning Areas.** Activities in spawning areas during spawning seasons must be avoided to the maximum extent practicable. Activities that result in the physical destruction (e.g., through excavation, fill, or downstream smothering by substantial turbidity) of an important spawning area are not authorized.

4. **Migratory Bird Breeding Areas.** Activities in waters of the United States that serve as breeding areas for migratory birds must be avoided to the maximum extent practicable.

5. **Shellfish Beds.** No activity may occur in areas of concentrated shellfish populations, unless the activity is directly related to a shellfish harvesting activity authorized by

NWPs 4 and 48, or is a shellfish seeding or habitat restoration activity authorized by NWP 27.

6. **Suitable Material.** No activity may use unsuitable material (e.g., trash, debris, car bodies, asphalt, etc.). Material used for construction or discharged must be free from toxic pollutants in toxic amounts (see section 307 of the Clean Water Act).

7. **Water Supply Intakes.** No activity may occur in the proximity of a public water supply intake, except where the activity is for the repair or improvement of public water supply intake structures or adjacent bank stabilization.

8. **Adverse Effects From Impoundments.** If the activity creates an impoundment of water, adverse effects to the aquatic system due to accelerating the passage of water, and/or restricting its flow must be minimized to the maximum extent practicable.

9. **Management of Water Flows.** To the maximum extent practicable, the pre-construction course, condition, capacity, and location of open waters must be maintained for each activity, including stream channelization, storm water management activities, and temporary and permanent road crossings, except as provided below. The activity must be constructed to withstand expected high flows. The activity must not restrict or impede the passage of normal or high flows, unless the primary purpose of the activity is to impound water or manage high flows. The activity may alter the pre-construction course, condition, capacity, and location of open waters if it benefits the aquatic environment (e.g., stream restoration or relocation activities).

10. **Fills Within 100-Year Floodplains.** The activity must comply with applicable FEMA-approved state or local floodplain management requirements.

11. **Equipment.** Heavy equipment working in wetlands or mudflats must be placed on mats, or other measures must be taken to minimize soil disturbance.

12. **Soil Erosion and Sediment Controls.** Appropriate soil erosion and sediment controls must be used and maintained in effective operating condition during construction, and all exposed soil and other fills, as well as any work below the ordinary high water mark or high tide line, must be permanently stabilized at the earliest practicable date. Permittees are encouraged to perform work within waters of the United States during periods of low-flow or no-flow, or during low tides.

13. **Removal of Temporary Structures and Fills.** Temporary structures must be removed, to the maximum extent practicable, after their use has been discontinued. Temporary fills must be removed in their entirety and the affected areas returned to pre-construction elevations. The affected areas must be revegetated, as appropriate.

14. **Proper Maintenance.** Any authorized structure or fill shall be properly maintained, including maintenance to ensure public safety and compliance with applicable NWP

general conditions, as well as any activity-specific conditions added by the district engineer to an NWP authorization.

15. **Single and Complete Project.** The activity must be a single and complete project. The same NWP cannot be used more than once for the same single and complete project.

16. **Wild and Scenic Rivers.** (a) No NWP activity may occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, unless the appropriate Federal agency with direct management responsibility for such river, has determined in writing that the proposed activity will not adversely affect the Wild and Scenic River designation or study status.

(b) If a proposed NWP activity will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a "study river" for possible inclusion in the system while the river is in an official study status, the permittee must submit a pre-construction notification (see general condition 32). The district engineer will coordinate the PCN with the Federal agency with direct management responsibility for that river. Permittees shall not begin the NWP activity until notified by the district engineer that the Federal agency with direct management responsibility for that river has determined in writing that the proposed NWP activity will not adversely affect the Wild and Scenic River designation or study status.

(c) Information on Wild and Scenic Rivers may be obtained from the appropriate Federal land management agency responsible for the designated Wild and Scenic River or study river (e.g., National Park Service, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service). Information on these rivers is also available at: http://www.rivers.gov/.

17. **Tribal Rights.** No activity or its operation may impair reserved tribal rights, including, but not limited to, reserved water rights and treaty fishing and hunting rights.

18. **Endangered Species.** (a) No activity is authorized under any NWP which is likely to directly or indirectly jeopardize the continued existence of a threatened or endangered species or a species proposed for such designation, as identified under the Federal Endangered Species Act (ESA), or which will directly or indirectly destroy or adversely modify designated critical habitat or critical habitat proposed for such designation. No activity is authorized under any NWP which "may affect" a listed species or critical habitat, unless ESA section 7 consultation addressing the consequences of the proposed activity on listed species or critical habitat has been completed. See 50 CFR 402.02 for the definition of "effects of the action" for the purposes of ESA section 7 consultation, as well as 50 CFR 402.17, which provides further explanation under ESA section 7 regarding "activities that are reasonably certain to occur" and "consequences caused by the proposed action."

(b) Federal agencies should follow their own procedures for complying with the requirements of the ESA (see 33 CFR 330.4(f)(1)). If pre-construction notification is required for the proposed activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation has not been submitted, additional ESA section 7 consultation may be necessary for the activity and the respective federal agency would be responsible for fulfilling its obligation under section 7 of the ESA.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat or critical habitat proposed for such designation, and shall not begin work on the activity until notified by the district engineer that the requirements of the ESA have been satisfied and that the activity is authorized. For activities that might affect Federally-listed endangered or threatened species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation), the pre-construction notification must include the name(s) of the endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or that utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. The district engineer will determine whether the proposed activity “may affect” or will have “no effect” to listed species and designated critical habitat and will notify the non-Federal applicant of the Corps’ determination within 45 days of receipt of a complete pre-construction notification. For activities where the non-Federal applicant has identified listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) that might be affected or is in the vicinity of the activity, and has so notified the Corps, the applicant shall not begin work until the Corps has provided notification that the proposed activity will have “no effect” on listed species (or species proposed for listing or designated critical habitat (or critical habitat proposed for such designation), or until ESA section 7 consultation or conference has been completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(d) As a result of formal or informal consultation or conference with the FWS or NMFS the district engineer may add species-specific permit conditions to the NWPs.

(e) Authorization of an activity by an NWP does not authorize the “take” of a threatened or endangered species as defined under the ESA. In the absence of separate authorization (e.g., an ESA Section 10 Permit, a Biological Opinion with “incidental take” provisions, etc.) from the FWS or the NMFS, the Endangered Species Act prohibits any person subject to the jurisdiction of the United States to take a listed species, where "take" means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. The word “harm” in the definition of “take" means an act which actually kills or injures wildlife. Such an act may include significant

habitat modification or degradation where it actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, feeding or sheltering.

(f) If the non-federal permittee has a valid ESA section 10(a)(1)(B) incidental take permit with an approved Habitat Conservation Plan for a project or a group of projects that includes the proposed NWP activity, the non-federal applicant should provide a copy of that ESA section 10(a)(1)(B) permit with the PCN required by paragraph (c) of this general condition. The district engineer will coordinate with the agency that issued the ESA section 10(a)(1)(B) permit to determine whether the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation conducted for the ESA section 10(a)(1)(B) permit. If that coordination results in concurrence from the agency that the proposed NWP activity and the associated incidental take were considered in the internal ESA section 7 consultation for the ESA section 10(a)(1)(B) permit, the district engineer does not need to conduct a separate ESA section 7 consultation for the proposed NWP activity. The district engineer will notify the non-federal applicant within 45 days of receipt of a complete pre-construction notification whether the ESA section 10(a)(1)(B) permit covers the proposed NWP activity or whether additional ESA section 7 consultation is required.

(g) Information on the location of threatened and endangered species and their critical habitat can be obtained directly from the offices of the FWS and NMFS or their world wide web pages at http://www.fws.gov/ or http://www.fws.gov/ipac and http://www.nmfs.noaa.gov/pr/species/esa/ respectively.

19. **Migratory Birds and Bald and Golden Eagles.** The permittee is responsible for ensuring that an action authorized by an NWP complies with the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act. The permittee is responsible for contacting the appropriate local office of the U.S. Fish and Wildlife Service to determine what measures, if any, are necessary or appropriate to reduce adverse effects to migratory birds or eagles, including whether "incidental take" permits are necessary and available under the Migratory Bird Treaty Act or Bald and Golden Eagle Protection Act for a particular activity.

20. **Historic Properties.** (a) No activity is authorized under any NWP which may have the potential to cause effects to properties listed, or eligible for listing, in the National Register of Historic Places until the requirements of Section 106 of the National Historic Preservation Act (NHPA) have been satisfied.

(b) Federal permittees should follow their own procedures for complying with the requirements of section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)(1)). If pre-construction notification is required for the proposed NWP activity, the Federal permittee must provide the district engineer with the appropriate documentation to demonstrate compliance with those requirements. The district engineer will verify that the appropriate documentation has been submitted. If the appropriate documentation is not submitted, then additional consultation under section

106 may be necessary. The respective federal agency is responsible for fulfilling its obligation to comply with section 106.

(c) Non-federal permittees must submit a pre-construction notification to the district engineer if the NWP activity might have the potential to cause effects to any historic properties listed on, determined to be eligible for listing on, or potentially eligible for listing on the National Register of Historic Places, including previously unidentified properties. For such activities, the pre-construction notification must state which historic properties might have the potential to be affected by the proposed NWP activity or include a vicinity map indicating the location of the historic properties or the potential for the presence of historic properties. Assistance regarding information on the location of, or potential for, the presence of historic properties can be sought from the State Historic Preservation Officer, Tribal Historic Preservation Officer, or designated tribal representative, as appropriate, and the National Register of Historic Places (see 33 CFR 330.4(g)). When reviewing pre-construction notifications, district engineers will comply with the current procedures for addressing the requirements of section 106 of the National Historic Preservation Act. The district engineer shall make a reasonable and good faith effort to carry out appropriate identification efforts commensurate with potential impacts, which may include background research, consultation, oral history interviews, sample field investigation, and/or field survey. Based on the information submitted in the PCN and these identification efforts, the district engineer shall determine whether the proposed NWP activity has the potential to cause effects on the historic properties. Section 106 consultation is not required when the district engineer determines that the activity does not have the potential to cause effects on historic properties (see 36 CFR 800.3(a)). Section 106 consultation is required when the district engineer determines that the activity has the potential to cause effects on historic properties. The district engineer will conduct consultation with consulting parties identified under 36 CFR 800.2(c) when he or she makes any of the following effect determinations for the purposes of section 106 of the NHPA: no historic properties affected, no adverse effect, or adverse effect.

(d) Where the non-Federal applicant has identified historic properties on which the proposed NWP activity might have the potential to cause effects and has so notified the Corps, the non-Federal applicant shall not begin the activity until notified by the district engineer either that the activity has no potential to cause effects to historic properties or that NHPA section 106 consultation has been completed. For non-federal permittees, the district engineer will notify the prospective permittee within 45 days of receipt of a complete pre-construction notification whether NHPA section 106 consultation is required. If NHPA section 106 consultation is required, the district engineer will notify the non-Federal applicant that he or she cannot begin the activity until section 106 consultation is completed. If the non-Federal applicant has not heard back from the Corps within 45 days, the applicant must still wait for notification from the Corps.

(e) Prospective permittees should be aware that section 110k of the NHPA (54 U.S.C. 306113) prevents the Corps from granting a permit or other assistance to an applicant who, with intent to avoid the requirements of section 106 of the NHPA, has intentionally

significantly adversely affected a historic property to which the permit would relate, or having legal power to prevent it, allowed such significant adverse effect to occur, unless the Corps, after consultation with the Advisory Council on Historic Preservation (ACHP), determines that circumstances justify granting such assistance despite the adverse effect created or permitted by the applicant. If circumstances justify granting the assistance, the Corps is required to notify the ACHP and provide documentation specifying the circumstances, the degree of damage to the integrity of any historic properties affected, and proposed mitigation. This documentation must include any views obtained from the applicant, SHPO/THPO, appropriate Indian tribes if the undertaking occurs on or affects historic properties on tribal lands or affects properties of interest to those tribes, and other parties known to have a legitimate interest in the impacts to the permitted activity on historic properties.

21. **Discovery of Previously Unknown Remains and Artifacts.** Permittees that discover any previously unknown historic, cultural or archeological remains and artifacts while accomplishing the activity authorized by an NWP, they must immediately notify the district engineer of what they have found, and to the maximum extent practicable, avoid construction activities that may affect the remains and artifacts until the required coordination has been completed. The district engineer will initiate the Federal, Tribal, and state coordination required to determine if the items or remains warrant a recovery effort or if the site is eligible for listing in the National Register of Historic Places.

22. **Designated Critical Resource Waters.** Critical resource waters include, NOAA-managed marine sanctuaries and marine monuments, and National Estuarine Research Reserves. The district engineer may designate, after notice and opportunity for public comment, additional waters officially designated by a state as having particular environmental or ecological significance, such as outstanding national resource waters or state natural heritage sites. The district engineer may also designate additional critical resource waters after notice and opportunity for public comment.

(a) Discharges of dredged or fill material into waters of the United States are not authorized by NWPs 7, 12, 14, 16, 17, 21, 29, 31, 35, 39, 40, 42, 43, 44, 49, 50, 51, 52, 57 and 58 for any activity within, or directly affecting, critical resource waters, including wetlands adjacent to such waters.

(b) For NWPs 3, 8, 10, 13, 15, 18, 19, 22, 23, 25, 27, 28, 30, 33, 34, 36, 37, 38, and 54, notification is required in accordance with general condition 32, for any activity proposed by permittees in the designated critical resource waters including wetlands adjacent to those waters. The district engineer may authorize activities under these NWPs only after she or he determines that the impacts to the critical resource waters will be no more than minimal.

23. **Mitigation.** The district engineer will consider the following factors when determining appropriate and practicable mitigation necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal:

(a) The activity must be designed and constructed to avoid and minimize adverse effects, both temporary and permanent, to waters of the United States to the maximum extent practicable at the project site (i.e., on site).

(b) Mitigation in all its forms (avoiding, minimizing, rectifying, reducing, or compensating for resource losses) will be required to the extent necessary to ensure that the individual and cumulative adverse environmental effects are no more than minimal.

(c) Compensatory mitigation at a minimum one-for-one ratio will be required for all wetland losses that exceed 1/10-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. For wetland losses of 1/10-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects.

(d) Compensatory mitigation at a minimum one-for-one ratio will be required for all losses of stream bed that exceed 3/100-acre and require pre-construction notification, unless the district engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse environmental effects of the proposed activity are no more than minimal, and provides an activity-specific waiver of this requirement. This compensatory mitigation requirement may be satisfied through the restoration or enhancement of riparian areas next to streams in accordance with paragraph (e) of this general condition. For losses of stream bed of 3/100-acre or less that require pre-construction notification, the district engineer may determine on a case-by-case basis that compensatory mitigation is required to ensure that the activity results in only minimal adverse environmental effects. Compensatory mitigation for losses of streams should be provided, if practicable, through stream rehabilitation, enhancement, or preservation, since streams are difficult-to-replace resources (see 33 CFR 332.3(e)(3)).

(e) Compensatory mitigation plans for NWP activities in or near streams or other open waters will normally include a requirement for the restoration or enhancement, maintenance, and legal protection (e.g., conservation easements) of riparian areas next to open waters. In some cases, the restoration or maintenance/protection of riparian areas may be the only compensatory mitigation required. If restoring riparian areas involves planting vegetation, only native species should be planted. The width of the required riparian area will address documented water quality or aquatic habitat loss concerns. Normally, the riparian area will be 25 to 50 feet wide on each side of the stream, but the district engineer may require slightly wider riparian areas to address documented water quality or habitat loss concerns. If it is not possible to restore or maintain/protect a riparian area on both sides of a stream, or if the waterbody is a lake or coastal waters, then restoring or maintaining/protecting a riparian area along a single bank or shoreline may be sufficient. Where both wetlands and open waters exist on the

project site, the district engineer will determine the appropriate compensatory mitigation (e.g., riparian areas and/or wetlands compensation) based on what is best for the aquatic environment on a watershed basis. In cases where riparian areas are determined to be the most appropriate form of minimization or compensatory mitigation, the district engineer may waive or reduce the requirement to provide wetland compensatory mitigation for wetland losses.

(f) Compensatory mitigation projects provided to offset losses of aquatic resources must comply with the applicable provisions of 33 CFR part 332.

(1) The prospective permittee is responsible for proposing an appropriate compensatory mitigation option if compensatory mitigation is necessary to ensure that the activity results in no more than minimal adverse environmental effects. For the NWPs, the preferred mechanism for providing compensatory mitigation is mitigation bank credits or in-lieu fee program credits (see 33 CFR 332.3(b)(2) and (3)). However, if an appropriate number and type of mitigation bank or in-lieu credits are not available at the time the PCN is submitted to the district engineer, the district engineer may approve the use of permittee-responsible mitigation.

(2) The amount of compensatory mitigation required by the district engineer must be sufficient to ensure that the authorized activity results in no more than minimal individual and cumulative adverse environmental effects (see 33 CFR 330.1(e)(3)). (See also 33 CFR 332.3(f).)

(3) Since the likelihood of success is greater and the impacts to potentially valuable uplands are reduced, aquatic resource restoration should be the first compensatory mitigation option considered for permittee-responsible mitigation.

(4) If permittee-responsible mitigation is the proposed option, the prospective permittee is responsible for submitting a mitigation plan. A conceptual or detailed mitigation plan may be used by the district engineer to make the decision on the NWP verification request, but a final mitigation plan that addresses the applicable requirements of 33 CFR 332.4(c)(2) through (14) must be approved by the district engineer before the permittee begins work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation (see 33 CFR 332.3(k)(3)). If permittee-responsible mitigation is the proposed option, and the proposed compensatory mitigation site is located on land in which another federal agency holds an easement, the district engineer will coordinate with that federal agency to determine if proposed compensatory mitigation project is compatible with the terms of the easement.

(5) If mitigation bank or in-lieu fee program credits are the proposed option, the mitigation plan needs to address only the baseline conditions at the impact site and the number of credits to be provided (see 33 CFR 332.4(c)(1)(ii)).

(6) Compensatory mitigation requirements (e.g., resource type and amount to be provided as compensatory mitigation, site protection, ecological performance standards, monitoring requirements) may be addressed through conditions added to the NWP authorization, instead of components of a compensatory mitigation plan (see 33 CFR 332.4(c)(1)(ii)).

(g) Compensatory mitigation will not be used to increase the acreage losses allowed by the acreage limits of the NWPs. For example, if an NWP has an acreage limit of 1/2-acre, it cannot be used to authorize any NWP activity resulting in the loss of greater than 1/2-acre of waters of the United States, even if compensatory mitigation is provided that replaces or restores some of the lost waters. However, compensatory mitigation can and should be used, as necessary, to ensure that an NWP activity already meeting the established acreage limits also satisfies the no more than minimal impact requirement for the NWPs.

(h) Permittees may propose the use of mitigation banks, in-lieu fee programs, or permittee-responsible mitigation. When developing a compensatory mitigation proposal, the permittee must consider appropriate and practicable options consistent with the framework at 33 CFR 332.3(b). For activities resulting in the loss of marine or estuarine resources, permittee-responsible mitigation may be environmentally preferable if there are no mitigation banks or in-lieu fee programs in the area that have marine or estuarine credits available for sale or transfer to the permittee. For permittee-responsible mitigation, the special conditions of the NWP verification must clearly indicate the party or parties responsible for the implementation and performance of the compensatory mitigation project, and, if required, its long-term management.

(i) Where certain functions and services of waters of the United States are permanently adversely affected by a regulated activity, such as discharges of dredged or fill material into waters of the United States that will convert a forested or scrub-shrub wetland to a herbaceous wetland in a permanently maintained utility line right-of-way, mitigation may be required to reduce the adverse environmental effects of the activity to the no more than minimal level.

24. **Safety of Impoundment Structures.** To ensure that all impoundment structures are safely designed, the district engineer may require non-Federal applicants to demonstrate that the structures comply with established state or federal, dam safety criteria or have been designed by qualified persons. The district engineer may also require documentation that the design has been independently reviewed by similarly qualified persons, and appropriate modifications made to ensure safety.

25. **Water Quality.** (a) Where the certifying authority (state, authorized tribe, or EPA, as appropriate) has not previously certified compliance of an NWP with CWA section 401, a CWA section 401 water quality certification for the proposed discharge must be obtained or waived (see 33 CFR 330.4(c)). If the permittee cannot comply with all of the conditions of a water quality certification previously issued by certifying authority for the

issuance of the NWP, then the permittee must obtain a water quality certification or waiver for the proposed discharge in order for the activity to be authorized by an NWP.

(b) If the NWP activity requires pre-construction notification and the certifying authority has not previously certified compliance of an NWP with CWA section 401, the proposed discharge is not authorized by an NWP until water quality certification is obtained or waived. If the certifying authority issues a water quality certification for the proposed discharge, the permittee must submit a copy of the certification to the district engineer. The discharge is not authorized by an NWP until the district engineer has notified the permittee that the water quality certification requirement has been satisfied by the issuance of a water quality certification or a waiver.

(c) The district engineer or certifying authority may require additional water quality management measures to ensure that the authorized activity does not result in more than minimal degradation of water quality.

26. **Coastal Zone Management.** In coastal states where an NWP has not previously received a state coastal zone management consistency concurrence, an individual state coastal zone management consistency concurrence must be obtained, or a presumption of concurrence must occur (see 33 CFR 330.4(d)). If the permittee cannot comply with all of the conditions of a coastal zone management consistency concurrence previously issued by the state, then the permittee must obtain an individual coastal zone management consistency concurrence or presumption of concurrence in order for the activity to be authorized by an NWP. The district engineer or a state may require additional measures to ensure that the authorized activity is consistent with state coastal zone management requirements.

27. **Regional and Case-By-Case Conditions.** The activity must comply with any regional conditions that may have been added by the Division Engineer (see 33 CFR 330.4(e)) and with any case specific conditions added by the Corps or by the state, Indian Tribe, or U.S. EPA in its CWA section 401 Water Quality Certification, or by the state in its Coastal Zone Management Act consistency determination.

28. **Use of Multiple Nationwide Permits.** The use of more than one NWP for a single and complete project is authorized, subject to the following restrictions:

(a) If only one of the NWPs used to authorize the single and complete project has a specified acreage limit, the acreage loss of waters of the United States cannot exceed the acreage limit of the NWP with the highest specified acreage limit. For example, if a road crossing over tidal waters is constructed under NWP 14, with associated bank stabilization authorized by NWP 13, the maximum acreage loss of waters of the United States for the total project cannot exceed 1⁄3-acre.

(b) If one or more of the NWPs used to authorize the single and complete project has specified acreage limits, the acreage loss of waters of the United States authorized by those NWPs cannot exceed their respective specified acreage limits. For example, if a

commercial development is constructed under NWP 39, and the single and complete project includes the filling of an upland ditch authorized by NWP 46, the maximum acreage loss of waters of the United States for the commercial development under NWP 39 cannot exceed 1/2-acre, and the total acreage loss of waters of United States due to the NWP 39 and 46 activities cannot exceed 1 acre.

29. **Transfer of Nationwide Permit Verifications.** If the permittee sells the property associated with a nationwide permit verification, the permittee may transfer the nationwide permit verification to the new owner by submitting a letter to the appropriate Corps district office to validate the transfer. A copy of the nationwide permit verification must be attached to the letter, and the letter must contain the following statement and signature:

"When the structures or work authorized by this nationwide permit are still in existence at the time the property is transferred, the terms and conditions of this nationwide permit, including any special conditions, will continue to be binding on the new owner(s) of the property. To validate the transfer of this nationwide permit and the associated liabilities associated with compliance with its terms and conditions, have the transferee sign and date below."

_____
(Transferee)

_____
(Date)

30. **Compliance Certification.** Each permittee who receives an NWP verification letter from the Corps must provide a signed certification documenting completion of the authorized activity and implementation of any required compensatory mitigation. The success of any required permittee-responsible mitigation, including the achievement of ecological performance standards, will be addressed separately by the district engineer. The Corps will provide the permittee the certification document with the NWP verification letter. The certification document will include:

(a) A statement that the authorized activity was done in accordance with the NWP authorization, including any general, regional, or activity-specific conditions;

(b) A statement that the implementation of any required compensatory mitigation was completed in accordance with the permit conditions. If credits from a mitigation bank or in-lieu fee program are used to satisfy the compensatory mitigation requirements, the certification must include the documentation required by 33 CFR 332.3(l)(3) to confirm that the permittee secured the appropriate number and resource type of credits; and

(c) The signature of the permittee certifying the completion of the activity and mitigation.

The completed certification document must be submitted to the district engineer within 30 days of completion of the authorized activity or the implementation of any required compensatory mitigation, whichever occurs later.

31. **Activities Affecting Structures or Works Built by the United States.** If an NWP activity also requires review by, or permission from, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers (USACE) federally authorized Civil Works project (a "USACE project"), the prospective permittee must submit a pre-construction notification. See paragraph (b)(10) of general condition 32. An activity that requires section 408 permission and/or review is not authorized by an NWP until the appropriate Corps office issues the section 408 permission or completes its review to alter, occupy, or use the USACE project, and the district engineer issues a written NWP verification.

32. **Pre-Construction Notification.** (a) *Timing*. Where required by the terms of the NWP, the prospective permittee must notify the district engineer by submitting a pre-construction notification (PCN) as early as possible. The district engineer must determine if the PCN is complete within 30 calendar days of the date of receipt and, if the PCN is determined to be incomplete, notify the prospective permittee within that 30 day period to request the additional information necessary to make the PCN complete. The request must specify the information needed to make the PCN complete. As a general rule, district engineers will request additional information necessary to make the PCN complete only once. However, if the prospective permittee does not provide all of the requested information, then the district engineer will notify the prospective permittee that the PCN is still incomplete and the PCN review process will not commence until all of the requested information has been received by the district engineer. The prospective permittee shall not begin the activity until either:

(1) He or she is notified in writing by the district engineer that the activity may proceed under the NWP with any special conditions imposed by the district or division engineer; or

(2) 45 calendar days have passed from the district engineer's receipt of the complete PCN and the prospective permittee has not received written notice from the district or division engineer. However, if the permittee was required to notify the Corps pursuant to general condition 18 that listed species or critical habitat might be affected or are in the vicinity of the activity, or to notify the Corps pursuant to general condition 20 that the activity might have the potential to cause effects to historic properties, the permittee cannot begin the activity until receiving written notification from the Corps that there is "no effect" on listed species or "no potential to cause effects" on historic properties, or that any consultation required under Section 7 of the Endangered Species Act (see 33 CFR 330.4(f)) and/or section 106 of the National Historic Preservation Act (see 33 CFR 330.4(g)) has been completed. If the proposed activity requires a written waiver to exceed specified limits of an NWP, the permittee may not begin the activity until the district engineer issues the waiver. If the district or division engineer notifies the

permittee in writing that an individual permit is required within 45 calendar days of receipt of a complete PCN, the permittee cannot begin the activity until an individual permit has been obtained. Subsequently, the permittee's right to proceed under the NWP may be modified, suspended, or revoked only in accordance with the procedure set forth in 33 CFR 330.5(d)(2).

(b) *Contents of Pre-Construction Notification*: The PCN must be in writing and include the following information:

(1) Name, address and telephone numbers of the prospective permittee;

(2) Location of the proposed activity;

(3) Identify the specific NWP or NWP(s) the prospective permittee wants to use to authorize the proposed activity;

(4) (i) A description of the proposed activity; the activity's purpose; direct and indirect adverse environmental effects the activity would cause, including the anticipated amount of loss of wetlands, other special aquatic sites, and other waters expected to result from the NWP activity, in acres, linear feet, or other appropriate unit of measure; a description of any proposed mitigation measures intended to reduce the adverse environmental effects caused by the proposed activity; and any other NWP(s), regional general permit(s), or individual permit(s) used or intended to be used to authorize any part of the proposed project or any related activity, including other separate and distant crossings for linear projects that require Department of the Army authorization but do not require pre-construction notification. The description of the proposed activity and any proposed mitigation measures should be sufficiently detailed to allow the district engineer to determine that the adverse environmental effects of the activity will be no more than minimal and to determine the need for compensatory mitigation or other mitigation measures.

(ii) For linear projects where one or more single and complete crossings require pre-construction notification, the PCN must include the quantity of anticipated losses of wetlands, other special aquatic sites, and other waters for each single and complete crossing of those wetlands, other special aquatic sites, and other waters (including those single and complete crossings authorized by an NWP but do not require PCNs). This information will be used by the district engineer to evaluate the cumulative adverse environmental effects of the proposed linear project, and does not change those non-PCN NWP activities into NWP PCNs.

(iii) Sketches should be provided when necessary to show that the activity complies with the terms of the NWP. (Sketches usually clarify the activity and when provided results in a quicker decision. Sketches should contain sufficient detail to provide an illustrative description of the proposed activity (e.g., a conceptual plan), but do not need to be detailed engineering plans);

(5) The PCN must include a delineation of wetlands, other special aquatic sites, and other waters, such as lakes and ponds, and perennial and intermittent streams, on the project site. Wetland delineations must be prepared in accordance with the current method required by the Corps. The permittee may ask the Corps to delineate the special aquatic sites and other waters on the project site, but there may be a delay if the Corps does the delineation, especially if the project site is large or contains many wetlands, other special aquatic sites, and other waters. Furthermore, the 45-day period will not start until the delineation has been submitted to or completed by the Corps, as appropriate;

(6) If the proposed activity will result in the loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed and a PCN is required, the prospective permittee must submit a statement describing how the mitigation requirement will be satisfied, or explaining why the adverse environmental effects are no more than minimal and why compensatory mitigation should not be required. As an alternative, the prospective permittee may submit a conceptual or detailed mitigation plan.

(7) For non-federal permittees, if any listed species (or species proposed for listing) or designated critical habitat (or critical habitat proposed for such designation) might be affected or is in the vicinity of the activity, or if the activity is located in designated critical habitat (or critical habitat proposed for such designation), the PCN must include the name(s) of those endangered or threatened species (or species proposed for listing) that might be affected by the proposed activity or utilize the designated critical habitat (or critical habitat proposed for such designation) that might be affected by the proposed activity. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with the Endangered Species Act;

(8) For non-federal permittees, if the NWP activity might have the potential to cause effects to a historic property listed on, determined to be eligible for listing on, or potentially eligible for listing on, the National Register of Historic Places, the PCN must state which historic property might have the potential to be affected by the proposed activity or include a vicinity map indicating the location of the historic property. For NWP activities that require pre-construction notification, Federal permittees must provide documentation demonstrating compliance with section 106 of the National Historic Preservation Act;

(9) For an activity that will occur in a component of the National Wild and Scenic River System, or in a river officially designated by Congress as a “study river” for possible inclusion in the system while the river is in an official study status, the PCN must identify the Wild and Scenic River or the “study river” (see general condition 16); and

(10) For an NWP activity that requires permission from, or review by, the Corps pursuant to 33 U.S.C. 408 because it will alter or temporarily or permanently occupy or use a U.S. Army Corps of Engineers federally authorized civil works project, the pre-construction notification must include a statement confirming that the project proponent

has submitted a written request for section 408 permission from, or review by, the Corps office having jurisdiction over that USACE project.

(c) *Form of Pre-Construction Notification*: The nationwide permit pre-construction notification form (Form ENG 6082) should be used for NWP PCNs. A letter containing the required information may also be used. Applicants may provide electronic files of PCNs and supporting materials if the district engineer has established tools and procedures for electronic submittals.

(d) *Agency Coordination*: (1) The district engineer will consider any comments from Federal and state agencies concerning the proposed activity's compliance with the terms and conditions of the NWPs and the need for mitigation to reduce the activity's adverse environmental effects so that they are no more than minimal.

(2) Agency coordination is required for: (i) all NWP activities that require pre-construction notification and result in the loss of greater than 1/2-acre of waters of the United States; (ii) NWP 13 activities in excess of 500 linear feet, fills greater than one cubic yard per running foot, or involve discharges of dredged or fill material into special aquatic sites; and (iii) NWP 54 activities in excess of 500 linear feet, or that extend into the waterbody more than 30 feet from the mean low water line in tidal waters or the ordinary high water mark in the Great Lakes.

(3) When agency coordination is required, the district engineer will immediately provide (e.g., via e-mail, facsimile transmission, overnight mail, or other expeditious manner) a copy of the complete PCN to the appropriate Federal or state offices (FWS, state natural resource or water quality agency, EPA, and, if appropriate, the NMFS). With the exception of NWP 37, these agencies will have 10 calendar days from the date the material is transmitted to notify the district engineer via telephone, facsimile transmission, or e-mail that they intend to provide substantive, site-specific comments. The comments must explain why the agency believes the adverse environmental effects will be more than minimal. If so contacted by an agency, the district engineer will wait an additional 15 calendar days before making a decision on the pre-construction notification. The district engineer will fully consider agency comments received within the specified time frame concerning the proposed activity's compliance with the terms and conditions of the NWPs, including the need for mitigation to ensure that the net adverse environmental effects of the proposed activity are no more than minimal. The district engineer will provide no response to the resource agency, except as provided below. The district engineer will indicate in the administrative record associated with each pre-construction notification that the resource agencies' concerns were considered. For NWP 37, the emergency watershed protection and rehabilitation activity may proceed immediately in cases where there is an unacceptable hazard to life or a significant loss of property or economic hardship will occur. The district engineer will consider any comments received to decide whether the NWP 37 authorization should be modified, suspended, or revoked in accordance with the procedures at 33 CFR 330.5.

(4) In cases of where the prospective permittee is not a Federal agency, the district engineer will provide a response to NMFS within 30 calendar days of receipt of any Essential Fish Habitat conservation recommendations, as required by section 305(b)(4)(B) of the Magnuson-Stevens Fishery Conservation and Management Act.

(5) Applicants are encouraged to provide the Corps with either electronic files or multiple copies of pre-construction notifications to expedite agency coordination.

District Engineer's Decision

1. In reviewing the PCN for the proposed activity, the district engineer will determine whether the activity authorized by the NWP will result in more than minimal individual or cumulative adverse environmental effects or may be contrary to the public interest. If a project proponent requests authorization by a specific NWP, the district engineer should issue the NWP verification for that activity if it meets the terms and conditions of that NWP, unless he or she determines, after considering mitigation, that the proposed activity will result in more than minimal individual and cumulative adverse effects on the aquatic environment and other aspects of the public interest and exercises discretionary authority to require an individual permit for the proposed activity. For a linear project, this determination will include an evaluation of the single and complete crossings of waters of the United States that require PCNs to determine whether they individually satisfy the terms and conditions of the NWP(s), as well as the cumulative effects caused by all of the crossings of waters of the United States authorized by an NWP. If an applicant requests a waiver of an applicable limit, as provided for in NWPs 13, 36, or 54, the district engineer will only grant the waiver upon a written determination that the NWP activity will result in only minimal individual and cumulative adverse environmental effects.

2. When making minimal adverse environmental effects determinations the district engineer will consider the direct and indirect effects caused by the NWP activity. He or she will also consider the cumulative adverse environmental effects caused by activities authorized by an NWP and whether those cumulative adverse environmental effects are no more than minimal. The district engineer will also consider site specific factors, such as the environmental setting in the vicinity of the NWP activity, the type of resource that will be affected by the NWP activity, the functions provided by the aquatic resources that will be affected by the NWP activity, the degree or magnitude to which the aquatic resources perform those functions, the extent that aquatic resource functions will be lost as a result of the NWP activity (e.g., partial or complete loss), the duration of the adverse effects (temporary or permanent), the importance of the aquatic resource functions to the region (e.g., watershed or ecoregion), and mitigation required by the district engineer. If an appropriate functional or condition assessment method is available and practicable to use, that assessment method may be used by the district engineer to assist in the minimal adverse environmental effects determination. The district engineer may add case-specific special conditions to the NWP authorization to address site-specific environmental concerns.

3. If the proposed activity requires a PCN and will result in a loss of greater than 1/10-acre of wetlands or 3/100-acre of stream bed, the prospective permittee should submit a mitigation proposal with the PCN. Applicants may also propose compensatory mitigation for NWP activities with smaller impacts, or for impacts to other types of waters. The district engineer will consider any proposed compensatory mitigation or other mitigation measures the applicant has included in the proposal in determining whether the net adverse environmental effects of the proposed activity are no more than minimal. The compensatory mitigation proposal may be either conceptual or detailed. If the district engineer determines that the activity complies with the terms and conditions of the NWP and that the adverse environmental effects are no more than minimal, after considering mitigation, the district engineer will notify the permittee and include any activity-specific conditions in the NWP verification the district engineer deems necessary. Conditions for compensatory mitigation requirements must comply with the appropriate provisions at 33 CFR 332.3(k). The district engineer must approve the final mitigation plan before the permittee commences work in waters of the United States, unless the district engineer determines that prior approval of the final mitigation plan is not practicable or not necessary to ensure timely completion of the required compensatory mitigation. If the prospective permittee elects to submit a compensatory mitigation plan with the PCN, the district engineer will expeditiously review the proposed compensatory mitigation plan. The district engineer must review the proposed compensatory mitigation plan within 45 calendar days of receiving a complete PCN and determine whether the proposed mitigation would ensure that the NWP activity results in no more than minimal adverse environmental effects. If the net adverse environmental effects of the NWP activity (after consideration of the mitigation proposal) are determined by the district engineer to be no more than minimal, the district engineer will provide a timely written response to the applicant. The response will state that the NWP activity can proceed under the terms and conditions of the NWP, including any activity-specific conditions added to the NWP authorization by the district engineer.

4. If the district engineer determines that the adverse environmental effects of the proposed activity are more than minimal, then the district engineer will notify the applicant either: (a) that the activity does not qualify for authorization under the NWP and instruct the applicant on the procedures to seek authorization under an individual permit; (b) that the activity is authorized under the NWP subject to the applicant's submission of a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal; or (c) that the activity is authorized under the NWP with specific modifications or conditions. Where the district engineer determines that mitigation is required to ensure no more than minimal adverse environmental effects, the activity will be authorized within the 45-day PCN period (unless additional time is required to comply with general conditions 18, 20, and/or 31), with activity-specific conditions that state the mitigation requirements. The authorization will include the necessary conceptual or detailed mitigation plan or a requirement that the applicant submit a mitigation plan that would reduce the adverse environmental effects so that they are no more than minimal. When compensatory mitigation is required, no work in waters of the United States may occur until the district engineer has approved a specific mitigation plan or has determined that prior approval of a final mitigation plan is not

practicable or not necessary to ensure timely completion of the required compensatory mitigation.

Further Information

1. District engineers have authority to determine if an activity complies with the terms and conditions of an NWP.

2. NWPs do not obviate the need to obtain other federal, state, or local permits, approvals, or authorizations required by law.

3. NWPs do not grant any property rights or exclusive privileges.

4. NWPs do not authorize any injury to the property or rights of others.

5. NWPs do not authorize interference with any existing or proposed Federal project (see general condition 31).

Definitions

Best management practices (BMPs): Policies, practices, procedures, or structures implemented to mitigate the adverse environmental effects on surface water quality resulting from development. BMPs are categorized as structural or non-structural.

Compensatory mitigation: The restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

Currently serviceable: Useable as is or with some maintenance, but not so degraded as to essentially require reconstruction.

Direct effects: Effects that are caused by the activity and occur at the same time and place.

Discharge: The term “discharge” means any discharge of dredged or fill material into waters of the United States.

Ecological reference: A model used to plan and design an aquatic habitat and riparian area restoration, enhancement, or establishment activity under NWP 27. An ecological reference may be based on the structure, functions, and dynamics of an aquatic habitat type or a riparian area type that currently exists in the region where the proposed NWP 27 activity is located. Alternatively, an ecological reference may be based on a conceptual model for the aquatic habitat type or riparian area type to be restored, enhanced, or established as a result of the proposed NWP 27 activity. An ecological

reference takes into account the range of variation of the aquatic habitat type or riparian area type in the region.

Enhancement: The manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource function(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area.

Establishment (creation): The manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at an upland site. Establishment results in a gain in aquatic resource area.

High Tide Line: The line of intersection of the land with the water's surface at the maximum height reached by a rising tide. The high tide line may be determined, in the absence of actual data, by a line of oil or scum along shore objects, a more or less continuous deposit of fine shell or debris on the foreshore or berm, other physical markings or characteristics, vegetation lines, tidal gages, or other suitable means that delineate the general height reached by a rising tide. The line encompasses spring high tides and other high tides that occur with periodic frequency but does not include storm surges in which there is a departure from the normal or predicted reach of the tide due to the piling up of water against a coast by strong winds such as those accompanying a hurricane or other intense storm.

Historic Property: Any prehistoric or historic district, site (including archaeological site), building, structure, or other object included in, or eligible for inclusion in, the National Register of Historic Places maintained by the Secretary of the Interior. This term includes artifacts, records, and remains that are related to and located within such properties. The term includes properties of traditional religious and cultural importance to an Indian tribe or Native Hawaiian organization and that meet the National Register criteria (36 CFR part 60).

Independent utility: A test to determine what constitutes a single and complete non-linear project in the Corps Regulatory Program. A project is considered to have independent utility if it would be constructed absent the construction of other projects in the project area. Portions of a multi-phase project that depend upon other phases of the project do not have independent utility. Phases of a project that would be constructed even if the other phases were not built can be considered as separate single and complete projects with independent utility.

Indirect effects: Effects that are caused by the activity and are later in time or farther removed in distance, but are still reasonably foreseeable.

Loss of waters of the United States: Waters of the United States that are permanently adversely affected by filling, flooding, excavation, or drainage because of the regulated activity. The loss of stream bed includes the acres of stream bed that are permanently

adversely affected by filling or excavation because of the regulated activity. Permanent adverse effects include permanent discharges of dredged or fill material that change an aquatic area to dry land, increase the bottom elevation of a waterbody, or change the use of a waterbody. The acreage of loss of waters of the United States is a threshold measurement of the impact to jurisdictional waters or wetlands for determining whether a project may qualify for an NWP; it is not a net threshold that is calculated after considering compensatory mitigation that may be used to offset losses of aquatic functions and services. Waters of the United States temporarily filled, flooded, excavated, or drained, but restored to pre-construction contours and elevations after construction, are not included in the measurement of loss of waters of the United States. Impacts resulting from activities that do not require Department of the Army authorization, such as activities eligible for exemptions under section 404(f) of the Clean Water Act, are not considered when calculating the loss of waters of the United States.

Navigable waters: Waters subject to section 10 of the Rivers and Harbors Act of 1899. These waters are defined at 33 CFR part 329.

Non-tidal wetland: A non-tidal wetland is a wetland that is not subject to the ebb and flow of tidal waters. Non-tidal wetlands contiguous to tidal waters are located landward of the high tide line (i.e., spring high tide line).

Open water: For purposes of the NWPs, an open water is any area that in a year with normal patterns of precipitation has water flowing or standing above ground to the extent that an ordinary high water mark can be determined. Aquatic vegetation within the area of flowing or standing water is either non-emergent, sparse, or absent. Vegetated shallows are considered to be open waters. Examples of “open waters” include rivers, streams, lakes, and ponds.

Ordinary High Water Mark: The term ordinary high water mark means that line on the shore established by the fluctuations of water and indicated by physical characteristics such as a clear, natural line impressed on the bank, shelving, changes in the character of soil, destruction of terrestrial vegetation, the presence of litter and debris, or other appropriate means that consider the characteristics of the surrounding areas.

Perennial stream: A perennial stream has surface water flowing continuously year-round during a typical year.

Practicable: Available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes.

Pre-construction notification: A request submitted by the project proponent to the Corps for confirmation that a particular activity is authorized by nationwide permit. The request may be a permit application, letter, or similar document that includes information about the proposed work and its anticipated environmental effects. Pre-construction notification may be required by the terms and conditions of a nationwide permit, or by regional conditions. A pre-construction notification may be voluntarily submitted in cases

where pre-construction notification is not required and the project proponent wants confirmation that the activity is authorized by nationwide permit.

Preservation: The removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in a gain of aquatic resource area or functions.

Re-establishment: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions.

Rehabilitation: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area.

Restoration: The manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former or degraded aquatic resource. For the purpose of tracking net gains in aquatic resource area, restoration is divided into two categories: re-establishment and rehabilitation.

Riffle and pool complex: Riffle and pool complexes are special aquatic sites under the 404(b)(1) Guidelines. Riffle and pool complexes sometimes characterize steep gradient sections of streams. Such stream sections are recognizable by their hydraulic characteristics. The rapid movement of water over a course substrate in riffles results in a rough flow, a turbulent surface, and high dissolved oxygen levels in the water. Pools are deeper areas associated with riffles. A slower stream velocity, a streaming flow, a smooth surface, and a finer substrate characterize pools.

Riparian areas: Riparian areas are lands next to streams, lakes, and estuarine-marine shorelines. Riparian areas are transitional between terrestrial and aquatic ecosystems, through which surface and subsurface hydrology connects riverine, lacustrine, estuarine, and marine waters with their adjacent wetlands, non-wetland waters, or uplands. Riparian areas provide a variety of ecological functions and services and help improve or maintain local water quality. (See general condition 23.)

Shellfish seeding: The placement of shellfish seed and/or suitable substrate to increase shellfish production. Shellfish seed consists of immature individual shellfish or individual shellfish attached to shells or shell fragments (i.e., spat on shell). Suitable substrate may consist of shellfish shells, shell fragments, or other appropriate materials placed into waters for shellfish habitat.

Single and complete linear project: A linear project is a project constructed for the purpose of getting people, goods, or services from a point of origin to a terminal point, which often involves multiple crossings of one or more waterbodies at separate and distant locations. The term "single and complete project" is defined as that portion of the total linear project proposed or accomplished by one owner/developer or partnership or other association of owners/developers that includes all crossings of a single water of the United States (i.e., a single waterbody) at a specific location. For linear projects crossing a single or multiple waterbodies several times at separate and distant locations, each crossing is considered a single and complete project for purposes of NWP authorization. However, individual channels in a braided stream or river, or individual arms of a large, irregularly shaped wetland or lake, etc., are not separate waterbodies, and crossings of such features cannot be considered separately.

Single and complete non-linear project: For non-linear projects, the term "single and complete project" is defined at 33 CFR 330.2(i) as the total project proposed or accomplished by one owner/developer or partnership or other association of owners/developers. A single and complete non-linear project must have independent utility (see definition of "independent utility"). Single and complete non-linear projects may not be "piecemealed" to avoid the limits in an NWP authorization.

Stormwater management: Stormwater management is the mechanism for controlling stormwater runoff for the purposes of reducing downstream erosion, water quality degradation, and flooding and mitigating the adverse effects of changes in land use on the aquatic environment.

Stormwater management facilities: Stormwater management facilities are those facilities, including but not limited to, stormwater retention and detention ponds and best management practices, which retain water for a period of time to control runoff and/or improve the quality (i.e., by reducing the concentration of nutrients, sediments, hazardous substances and other pollutants) of stormwater runoff.

Stream bed: The substrate of the stream channel between the ordinary high water marks. The substrate may be bedrock or inorganic particles that range in size from clay to boulders. Wetlands contiguous to the stream bed, but outside of the ordinary high water marks, are not considered part of the stream bed.

Stream channelization: The manipulation of a stream's course, condition, capacity, or location that causes more than minimal interruption of normal stream processes. A channelized jurisdictional stream remains a water of the United States.

Structure: An object that is arranged in a definite pattern of organization. Examples of structures include, without limitation, any pier, boat dock, boat ramp, wharf, dolphin, weir, boom, breakwater, bulkhead, revetment, riprap, jetty, artificial island, artificial reef, permanent mooring structure, power transmission line, permanently moored floating vessel, piling, aid to navigation, or any other manmade obstacle or obstruction.

Tidal wetland: A tidal wetland is a jurisdictional wetland that is inundated by tidal waters. Tidal waters rise and fall in a predictable and measurable rhythm or cycle due to the gravitational pulls of the moon and sun. Tidal waters end where the rise and fall of the water surface can no longer be practically measured in a predictable rhythm due to masking by other waters, wind, or other effects. Tidal wetlands are located channelward of the high tide line.

Tribal lands: Any lands title to which is either: 1) held in trust by the United States for the benefit of any Indian tribe or individual; or 2) held by any Indian tribe or individual subject to restrictions by the United States against alienation.

Tribal rights: Those rights legally accruing to a tribe or tribes by virtue of inherent sovereign authority, unextinguished aboriginal title, treaty, statute, judicial decisions, executive order or agreement, and that give rise to legally enforceable remedies.

Vegetated shallows: Vegetated shallows are special aquatic sites under the 404(b)(1) Guidelines. They are areas that are permanently inundated and under normal circumstances have rooted aquatic vegetation, such as seagrasses in marine and estuarine systems and a variety of vascular rooted plants in freshwater systems.

Waterbody: For purposes of the NWPs, a waterbody is a "water of the United States." If a wetland is adjacent to a waterbody determined to be a water of the United States, that waterbody and any adjacent wetlands are considered together as a single aquatic unit (see 33 CFR 328.4(c)(2)).

REGIONAL CONDITIONS:

The following Regional Conditions have been approved by the Wilmington District for the Nationwide Permits (NWPs) published in the January 13, 2021, *Federal Register* (86 FR 2744) announcing the reissuance of 12 existing (NWPs) and four new NWPs, as well as the reissuance of NWP general conditions and definitions with some modifications.

A. EXCLUDED WATERS AND/OR AREAS

The Corps has identified waters that will be excluded from the use of all NWP's during certain timeframes. These waters are:

1. **Anadromous Fish Spawning Areas.** Work in waters of the U.S. designated by either the North Carolina Division of Marine Fisheries (NCDMF) or the North Carolina Wildlife Resources Commission (NCWRC) as anadromous fish spawning areas are prohibited from February 15th through June 30th, without prior written approval from the Corps and the appropriate wildlife agencies (NCDMF, NCWRC and/or the National Marine Fisheries Service (NMFS)). Work in waters of the U.S. designated by NCWRC as primary nursery areas in inland waters are prohibited from February 15th through September 30th, without prior written approval from the Corps and the appropriate

wildlife agencies. Work in waters of the U.S. designated by NCDMF as primary nursery areas shall be coordinated with NCDMF prior to being authorized by this NWP. Coordination with NCDMF may result in a required construction moratorium during periods of significant biological productivity or critical life stages.

2. **Trout Waters Moratorium.** Work in waters of the U.S. in the designated trout watersheds of North Carolina are prohibited from October 15th through April 15th without prior written approval from the NCWRC, or from the Eastern Band of Cherokee Indians (EBCI) Fisheries and Wildlife Management (FWM) office if the project is located on EBCI trust land. (See Section C.3. above for information on the designated trout watersheds).

3. **Sturgeon Spawning Areas.** No in-water work shall be conducted in waters of the U.S. designated by the National Marine Fisheries Service as Atlantic sturgeon critical habitat from February 1st through June 30th. No in-water work shall be conducted in waters of the U.S. in the Roanoke River designated as Atlantic sturgeon critical habitat from February 1st through June 30th, and August 1st through October 31st, without prior written approval from NMFS.

4. **Submerged Aquatic Vegetation.** Impacts to Submerged Aquatic Vegetation (SAV) are not authorized by any NWP, except NWP 48, NWP 55 and NWP 56, unless Essential Fish Habitat (EFH) consultation has been completed pursuant to the Magnuson-Stevens Fisheries Conservation and Management Act (Magnuson-Stevens Act). Permittees shall submit a PCN (See NWP General Condition 32) to the District Engineer prior to commencing the activity if the project would affect SAV. The permittee may not begin work until notified by the Corps that the requirements of the Magnuson-Stevens Act have been satisfied and that the activity is verified.

B. REGIONAL CONDITIONS APPLICABLE TO ALL NWP's

1. **Critical Habitat in Western NC.** For proposed activities within waters of the U.S. that require a Pre-Construction Notification (PCN) and are located in the thirteen counties listed below, permittees must provide a copy of the PCN to the U.S. Fish and Wildlife Service (USFWS), 160 Zillicoa Street, Asheville, North Carolina 28801 and the Corps Asheville Regulatory Field Office. Please see General Condition 18 for specific PCN requirements related to the Endangered Species Act and the below website for information on the location of designated critical habitat.

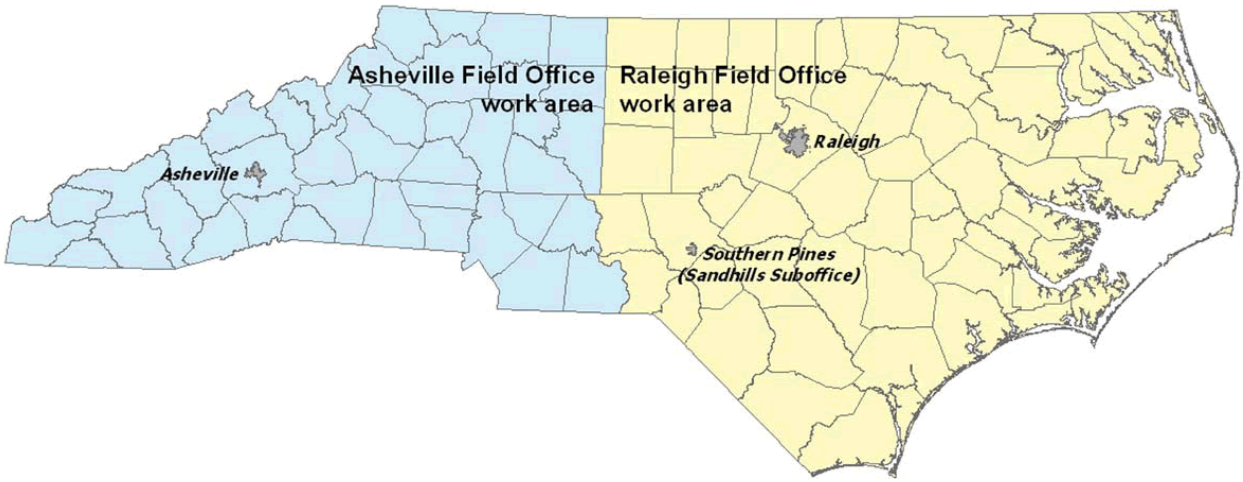
Counties with tributaries that drain to designated critical habitat that require notification to the Asheville U.S. Fish and Wildlife Service: Avery, Cherokee, Graham, Haywood, Henderson, Jackson, Macon, Mecklenburg, Mitchell, Swain, Transylvania, Union and Yancey.

Website and office addresses for Endangered Species Act Information:

The Wilmington District has developed the following website for permittees which provides guidelines on how to review linked websites and maps in order to fulfill NWP General Condition 18 (Endangered Species) requirements: http://www.saw.usace.army.mil/Missions/RegulatoryPermitProgram/AgencyCoordination/ESA.aspx.

Permittees who do not have internet access may contact the appropriate U.S. Fish and Wildlife Service offices listed below or Corps at (910) 251-4850.

Below is a map of the USFWS Field Office Boundaries:



Asheville U.S. Fish and Wildlife Service Office counties: All counties west of and including Anson, Stanly, Davidson, Forsythe and Stokes Counties.

U.S. Fish and Wildlife Service
Asheville Field Office
160 Zillicoa Street
Asheville, NC 28801
Telephone: (828) 258-3939

Raleigh U.S. Fish and Wildlife Service Office counties: All counties east of and including Richmond, Montgomery, Randolph, Guilford, and Rockingham Counties.

U.S. Fish and Wildlife Service
Raleigh Field Office
Post Office Box 33726
Raleigh, NC 27636-3726
Telephone: (919) 856-4520

2. **Special Designation Waters.** Prior to the use of any NWP that involves a discharge of dredged or fill material in any of the following identified waters and/or adjacent wetlands in North Carolina, permittees shall submit a PCN to the District Engineer prior

to commencing the activity (see General Condition 32). The North Carolina waters and wetlands that require additional PCN requirements are:

"Primary Nursery Areas" (PNA), including inland PNA, as designated by the North Carolina Marine Fisheries Commission and/or the North Carolina Wildlife Resources Commission. The definition of and designated PNA waters can be found in the North Carolina State Administrative Code at Title 15A, Subchapters 3R and 10C (15A NCAC 03R .0103; 15A NCAC 10C .0502; and 15A NCAC 10C .0503) and at the following web pages:

- http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2003%20-%20marine%20fisheries/subchapter%20r/15a%20ncac%2003r%20.0103.pdf

- http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2010%20-%20wildlife%20resources%20and%20water%20safety/subchapter%20c/15a%20ncac%2010c%20.0502.pdf

- http://reports.oah.state.nc.us/ncac/title%2015a%20-%20environmental%20quality/chapter%2010%20-%20wildlife%20resources%20and%20water%20safety/subchapter%20c/15a%20ncac%2010c%20.0503.pdf

3. **Trout Waters.** Prior to any discharge of dredge or fill material into streams, waterbodies or wetlands within the 294 designated trout watersheds of North Carolina, the permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity. The permittee shall also provide a copy of the PCN to the appropriate NCWRC office, or to the EBCI FWM Office (if the project is located on EBCI trust land), to facilitate the determination of any potential impacts to designated Trout Waters.

NCWRC and NC Trout Watersheds:

NCWRC Contact**	**Counties that are entirely within Trout Watersheds***		**Counties that are partially within Trout Watersheds***	
Mountain Coordinator 645 Fish Hatchery Rd., Building B Marion, NC 28752	Alleghany Ashe Avery Graham Haywood	Jackson Macon Swain Transylvania Watauga	Burke Buncombe Caldwell Cherokee Clay Henderson Madison	McDowell Mitchell Polk Rutherford Surry Wilkes Yancey

828-803-6054 For NCDOT Projects: NCDOT Coordinator 12275 Swift Rd. Oakboro, NC 28129 704-984-1070		
EBCI Contact**	**Counties that are within Trout Watersheds***	
Office of Natural Resources P.O. Box 1747, Cherokee, NC 28719 (828) 359-6113	Qualla Boundary and non-contiguous tracts of trust land located in portions of Swain, Jackson, Haywood, Graham and Cherokee Counties.	

*NOTE: To determine PCN requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps showing trout watersheds in each County at the following webpage: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Trout/.

**If a project is located on EBCI trust land, submit the PCN in accordance with Regional Condition C.16. Contact the Corps Asheville Regulatory Field Office at (828) 271-7980 with questions.

4. **Western NC Waters and Corridors.** The permittee shall submit a PCN (see General Condition 32) to the District Engineer prior to commencing the activity in waters of the U.S. if the activity will occur within any of the following identified waters in western North Carolina, within 0.5 mile on either side of these waters, or within 0.75 mile of the Little Tennessee River, as measured from the top of the bank of the respective water (i.e., river, stream, or creek):

Brasstown Creek
Burningtown Creek

Cane River
Caney Fork
Cartoogechaye Creek
Chattooga River
Cheoah River
Cowee Creek
Cullasaja River
Deep Creek
Ellijay Creek
French Broad River
Garden Creek
Hiwassee River
Hominy Creek
Iotla Creek
Little Tennessee River (within the river or within 0.75 mile on either side of this river)
Nantahala River
Nolichucky River
North Fork French Broad River
North Toe River
Nottley River
Oconaluftee River (portion not located on trust/EBCI land)
Peachtree Creek
Shooting Creek
Snowbird Creek
South Toe River
Stecoah Creek
Swannanoa River
Sweetwater Creek
Tuckasegee River (also spelled Tuckaseegee or Tuckaseigee)
Valley River
Watauga Creek
Watauga River
Wayah Creek
West Fork French Broad River

To determine PCN requirements, contact the Corps Asheville Regulatory Field Office at (828) 271-7980 or view maps for all corridors at the following webpage: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/Designated-Special-Waters.aspx .

5. **Limitation of Loss of Stream Bed.** NWPs may not be used for activities that may result in the loss of more than 0.05 acres of stream bed, except for NWP 32.

6. **Pre-Construction Notification for Loss of Stream Bed Exceeding 0.02 acres.** The permittee shall submit a PCN to the District Engineer prior to commencing the activity (see General Condition 32) prior to the use of any NWP for any activity that

results in the loss of more than 0.02 acres of stream bed. This applies to NWPs that do not have PCN requirements as well as those NWPs that require a PCN.

7. **Mitigation for Loss of Stream Bed.** For any NWP that results in a loss of more than 0.02 acres of stream bed, the permittee shall provide a mitigation proposal to compensate for more than minimal individual and cumulative adverse impacts to the aquatic environment, unless the District Engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal. For stream bed losses of 0.02 acres or less that require a PCN, the District Engineer may determine, on a case-by-case basis, that compensatory mitigation is required to ensure that the activity results in minimal adverse effect on the aquatic environment.

8**. Riprap.** For all NWPs that allow for the use of riprap material for bank stabilization, the following conditions shall be applied:

a. Filter cloth must be placed underneath the riprap as an additional requirement of its use in North Carolina waters. The placement of filter fabric is not required if the riprap will be pushed or “keyed” into the bank of the waterbody. A waiver from the specifications in this Regional Condition must be requested in writing.

b. Riprap shall be placed only on the stream banks, or, if it is necessary to be placed in the stream bed, the finished top elevation of the riprap should not exceed that of the original stream bed.

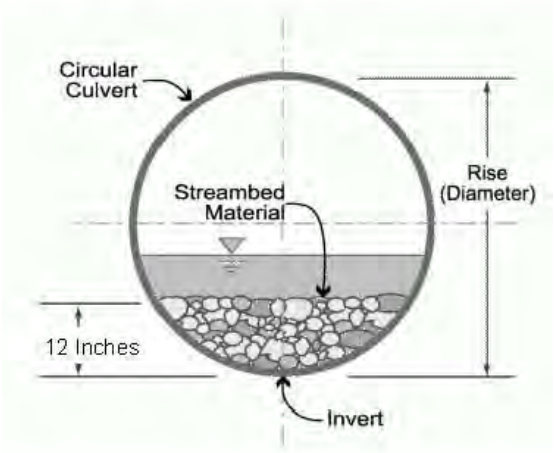
9**. Culvert Placement.** For all NWPs that allow for culvert placement, the following conditions shall be applied:

a. For all NWPs that involve the construction/installation of culverts, measures shall be included in the construction/installation that will promote the safe passage of fish and other aquatic organisms

Placement of culverts and other structures in streams shall be below the elevation of the streambed by one foot for all culverts with a diameter greater than 48 inches, and 20% of the culvert diameter for culverts having a diameter less than or equal to 48 inches. If the culvert outlet is submerged within a pool or scour hole and designed to provide for aquatic passage, then culvert burial into the streambed is not required.
Culvert burial is not required for structures less than 72 inch diameter/width, where the slope of the culvert will be greater than 2.5%, provided that all alternative options for flattening the slope have been investigated and aquatic life movement/connectivity has been provided when possible (e.g., rock ladders, cross vanes, sills, baffles etc.). Culvert burial is not required when bedrock is present in culvert locations.

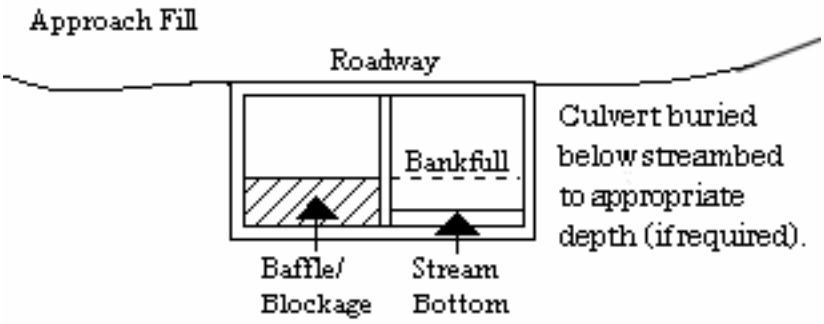
Installation of culverts in wetlands shall ensure continuity of water movement and be designed to adequately accommodate high water or flood conditions. When roadways, causeways, or other fill projects are constructed across FEMA-designated floodways or

wetlands, openings such as culverts or bridges shall be provided to maintain the natural hydrology of the system as well as prevent constriction of the floodway that may result in destabilization of streams or wetlands.



A waiver from the depth specifications in this condition may be requested, in writing, by the permittee and issued by the Corp. This waiver request must be specific as to the reasons(s) for the request. The waiver will be issued if it can be demonstrated that the proposed design would result in less impacts to the aquatic environment. Culverts placed across wetland fills purely for the purposes of equalizing surface water do not have to be buried, but the culverts must be of adequate size and/or number to ensure unrestricted transmission of water.

b**.** Bank-full flows (or less) shall be accommodated through maintenance of the existing bank-full channel cross sectional area. Additional culverts or culvert barrels at such crossings shall be allowed only to receive bank-full flows.



c. Culverts shall be designed and installed in such a manner that the original stream profiles are not altered and allow for aquatic life movement during low flows. The dimension, pattern, and profile of the stream above and below a pipe or culvert shall not be modified by widening the stream channel or by reducing the depth of the stream in connection with the construction activity. The width, height, and gradient of a proposed culvert shall be such as to pass the average historical low flow and spring flow without adversely altering flow velocity. If the width of the culvert is wider than the stream channel, the culvert shall include multiple boxes/pipes, baffles, benches and/or sills to

maintain the natural width of the stream channel. If multiple culverts/pipes/barrels are used, low flows shall be accommodated in one culvert/pipe and additional culverts/pipes shall be installed such that they receive only flows above bankfull.

10. **Utility Lines.** For all NWPs that allow for the construction and installation of utility lines, the following conditions shall be applied:

a. Utility lines consisting of aerial electric power transmission lines crossing navigable waters of the U.S. (which are defined at 33 CFR part 329) must comply with the applicable minimum clearances specified in 33 CFR 322.5(i).

b. The work area authorized by this permit, including temporary and/or permanent fills, will be minimized to the greatest extent practicable. Justification for work corridors exceeding forty (40) feet in width is required and will be based on pipeline diameter and length, size of equipment required to construct the utility line, and other construction information deemed necessary to support the request. The permittee is required to provide this information to the Corps with the initial PCN package.

c. A plan to restore and re-vegetate wetland areas cleared for construction must be submitted with the required PCN. Cleared wetland areas shall be re-vegetated, as appropriate, with species of canopy, shrub, and herbaceous species. The permittee shall not use fescue grass or any other species identified as invasive or exotic species by the NC Native Plant Society (NCNPS): https://ncwildflower.org/invasive-exotic-species-list/.

d. Any permanently maintained corridor along the utility right of way within forested wetlands shall be considered a loss of aquatic function. A compensatory mitigation plan will be required for all such impacts associated with the requested activity if the activity requires a PCN and the cumulative total of permanent conversion of forested wetlands exceeds 0.1 acres, unless the District Engineer determines in writing that either some other form of mitigation would be more environmentally appropriate or the adverse effects of the proposed activity are minimal.

Where permanently maintained corridor within forested wetlands is 0.1 acres or less, the District Engineer may determine, on a case-by-case basis, that compensatory mitigation is required to ensure that the activity results in minimal adverse effects on the aquatic environment.

e. When directional boring or horizontal directional drilling (HDD) under waters of the U.S., including wetlands, permittees shall closely monitor the project for hydraulic fracturing or “fracking.” Any discharge from hydraulic fracturing or “fracking” into waters of the U.S., including wetlands, shall be reported to the appropriate Corps Regulatory Field Office within 48 hours. Restoration and/or compensatory mitigation may be required as a result of any unintended discharges.

11. **Temporary Access Fills.** The permittee shall submit a PCN to the District Engineer prior to commencing the activity if the activity will involve the discharge of dredged or fill material into more than 0.1 acres of wetlands or 0.02 acres of stream channel for the construction of temporary access fills and/or temporary road crossings. The PCN must include a restoration plan that thoroughly describes how all temporary fills will be removed, how pre-project conditions will be restored, and include a timetable for all restoration activities.

12. **Federal Navigation Channel Setbacks.** Authorized structures and fills located in or adjacent to Federally authorized waterways must be constructed in accordance with the latest setback criteria established by the Wilmington District Engineer. You may review the setback policy at http://www.saw.usace.army.mil/Missions/Navigation/Setbacks.aspx. This general permit does not authorize the construction of hardened or permanently fixed structures within the Federally Authorized Channel Setback, unless the activity is approved by the Corps. The permittee shall submit a PCN (see General Condition 32) to the District Engineer to obtain a written verification prior to the construction of any structures or fills within the Federally Authorized Channel Setback.

13. **Northern Long-eared Bat – Endangered Species Act Compliance**

The Wilmington District, U.S. Army Corps of Engineers has consulted with the United States Fish and Wildlife Service (USFWS) in regard to the threatened Northern long-eared bat (NLEB) (*Myotis septentrionalis*) and Standard Local Operating Procedures for Endangered Species (SLOPES) have been approved by the Corps and the USFWS. This condition concerns effects to the NLEB only and does not address effects to other federally listed species and/or federally designated critical habitat.

A. Procedures when the Corps is the lead federal* agency for a project:

The permittee must comply with (1) and (2) below when:

• the project is located in the western 41 counties of North Carolina, to include non-federal aid North Carolina Department of Transportation (NCDOT) projects, OR;
• the project is located in the 59 eastern counties of North Carolina and is a non-NCDOT project.

*Generally, if a project is located on private property or on non-federal land, and the project is not being funded by a federal entity, the Corps will be the lead federal agency due to the requirement to obtain Department of the Army authorization to impact waters of the U.S. If the project is located on federal land, contact the Corps to determine the lead federal agency.

(1) A permittee using an NWP must check to see if their project is located in the range of the NLEB by using the following website:

http://www.fws.gov/midwest/endangered/mammals/nleb/pdf/WNSZone.pdf. If the project is within the range of the NLEB, or if the project includes percussive activities (e.g., blasting, pile driving, etc.), the permittee is then required to check the appropriate website in the paragraph below to discover if their project:

• is located in a 12-digit Hydrologic Unit Code area ("red HUC" - shown as red areas on the map), AND/OR;
• involves percussive activities within 0.25 mile of a red HUC.

Red HUC maps - for the western 41 counties in NC (covered by the Asheville Ecological Services Field Office), check the project location against the electronic maps found at: http://www.fws.gov/asheville/htmls/project_review/NLEB_in_WNC.html. For the eastern 59 counties in NC (covered by the Raleigh Ecological Services Field Office), check the project location against the electronic maps found at: https://www.fws.gov/raleigh/NLEB_RFO.html.

(2) A permittee must submit a PCN to the District Engineer, and receive written verification from the District Engineer, prior to commencing the activity, if the activity will involve any of the following:

• tree clearing/removal and/or, construction/installation of wind turbines in a red HUC, AND/OR;
• bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, (applies anywhere in the range of the NLEB), AND/OR:
• percussive activities in a red HUC, or within 0.25 mile of a red HUC.

The permittee may proceed with the activity without submitting a PCN to either the Corps or the USFWS, provided the activity complies with all applicable NWP terms and general and regional conditions, if the permittee's review under A.(1) and A.(2) above shows that the project is:

• located outside of a red HUC (and there are no percussive activities), and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;
• located outside of a red HUC and there are percussive activities, but the percussive activities will not occur within 0.25-mile of a red HUC boundary, and the activity will NOT include bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, OR;
• located in a red HUC, but the activity will NOT include tree clearing/removal; construction/installation of wind turbines; bridge removal or maintenance, unless the bridge has been inspected and there is no evidence of bat use, and/or; any percussive activities.

B. Procedures when the USACE is not the lead federal agency:

For projects where another federal agency is the lead federal agency - if that other federal agency has completed project-specific ESA Section 7(a)(2) consultation for the NLEB, and has (1) determined that the project would not cause prohibited incidental take of the NLEB, and (2) completed coordination/consultation that is required by the USFWS (per the directions on the respective USFWS office's website), that project may proceed without PCN to either the USACE or the USFWS, provided all General and Regional Permit Conditions are met.

The NLEB SLOPES can be viewed on the USACE website at: http://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/ESA/. Permittees who do not have internet access may contact the USACE at (910) 251- 4633.

14. **West Indian Manatee Protection.** In order to protect the endangered West Indian manatee (*Trichechus manatus*) the Permittee shall implement the USFWS' Manatee Guidelines, and strictly adhere to all requirements therein. The guidelines can be found at https://www.fws.gov/raleigh/pdfs/ManateeGuidelines2017.pdf.

15. **ESA Programmatic Biological Opinions.** The Wilmington District, USFWS, NCDOT, and the FHWA have conducted programmatic Section 7(a)(2) consultation for a number of federally listed species and designated critical habitat (DCH), and programmatic consultation concerning other federally listed species and/or DCH may occur in the future. The result of completed programmatic consultation is a Programmatic Biological Opinion (PBO) issued by the USFWS. These PBOs contain mandatory terms and conditions to implement the reasonable and prudent measures that are associated with "incidental take" of whichever species or critical habitat is covered by a specific PBO. Authorization under NWPs is conditional upon the permittee's compliance with all the mandatory terms and conditions associated with incidental take of the applicable PBO (or PBOs), which are incorporated by reference in the NWPs. Failure to comply with the terms and conditions associated with incidental take of an applicable PBO, where a take of the federally listed species occurs, would constitute an unauthorized take by the permittee, and would also constitute permittee non-compliance with the authorization under the NWPs. If the terms and conditions of a specific PBO (or PBOs) apply to a project, the Corps will include this/these requirements in any NWP verification that may be issued for a project. For an activity/project that does not require a PCN, the terms and conditions of the applicable PBO(s) also apply to that non-notifying activity/project. The USFWS is the appropriate authority to determine compliance with the terms and conditions of its PBO and the ESA. All PBOs can be found on our website at: https://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Agency-Coordination/ESA/.

16. **Work on Eastern Band of Cherokee Land.**

Notifying NWPs - All PCNs submitted for activities in waters of the U.S. on Eastern Band of Cherokee Indians (EBCI) trust land (i.e., Qualla Boundary and non-contiguous tracts of trust land located in portions of Swain, Jackson, Haywood, Graham and Cherokee Counties), must comply with the requirements of the latest MOU between the Wilmington District and the EBCI.

Non-notifying NWPs - Prior to the use of any non-notifying NWP for activities in waters of the U.S. on EBCI trust land (i.e., Qualla Boundary and non-contiguous tracts of trust land located in portions of Swain, Jackson, Haywood, Graham and Cherokee Counties), all prospective permittees must comply with the requirements of the latest MOU between the Wilmington District and the EBCI; this includes coordinating the proposed project with the EBCI Natural Resources Program and obtaining a Tribal Approval Letter from the Tribe.

The EBCI MOU can be found at the following URL: http://saw-reg.usace.army.mil/FO/Final-MOU-EBCI-USACE.pdf

17. **Sedimentation and Erosion Control Structures and Measures**
All PCNs will identify and describe sedimentation and erosion control structures and measures proposed for placement in waters of the U.S. The structures and measures should be depicted on maps, surveys or drawings showing location and impacts to jurisdictional wetlands and streams.

C. REGIONAL CONDITIONS APPLICABLE TO NWP 43

a. Discharges in streams and wetlands for stormwater management facilities are prohibited under this NWP.

b. Discharges of dredged or fill material into waters of the U.S., including wetlands, within the floodway* or mapped FEMA 100-year floodplain resulting in permanent above-grade fills are not authorized by this NWP.

* NOTE: Floodway means the area designated and/or regulated by Federal, State, or local requirements to provide for the discharge of the base flood so the cumulative increase in water surface elevation is no more than a designated height identified by the regulating entity within the 100-year floodplain.

D. SECTION 401 WATER QUALITY CERTIFICATION (WQC) AND/OR COASTAL ZONE MANAGEMENT ACT (CZMA) CONSISTENCY DETERMINATION SUMMARY AND APPLICABLE CONDITIONS

The CZMA Consistency Determination and all Water Quality Certifications for the NWPs can be found at: https://www.saw.usace.army.mil/Missions/Regulatory-Permit-Program/Permits/2017-Nationwide-Permits/

From: Vollman, Brant J CIV USARMY CEMVR (USA) <Brant.J.Vollman@usace.army.mil>
Sent: Tuesday, August 8, 2023 7:21 AM
To: Maxted, Jeffrey <JeffreyMaxted@alliantenergy.com>; Groves, Jackie M CIV USARMY CEMVR (USA) <Jackie.M.Groves@usace.army.mil>
Cc: Watts, John <JohnWatts@alliantenergy.com>; Coughlin, Jenny <JennyCoughlin@alliantenergy.com>; Nelson, Robin <RobinNelson@alliantenergy.com>; Stevens, Jill <JillStevens@alliantenergy.com>; Zehr, Matthew A CIV USARMY CEMVR (USA) <Matthew.A.Zehr@usace.army.mil>
Subject: [EXTERNAL] RE: 2023-0039 - Lansing Generating Station

Good morning,

Thanks for taking my call last week regarding the project.

Also appreciate you following up with the email to let us know that you intend to proceed with the construction on the rock chutes independent of the project to remove the outfall structure on the power plant.

In there is anything we can do to assist in getting the information pulled together to assess the National Register of Historic Places eligibility for the power plant please do not hesitate to contact me directly.

If you have any questions or concerns on this project please contact me at your convenience.

Thanks,

Brant Vollman
Archaeologist
US Army Corps of Engineers
Regulatory Division
Rock Island District
P.O. Box 2004
Clock Tower Bldg.
Rock Island, Illinois 61204-2004

(309) 794-5380 (Office)

From: Maxted, Jeffrey <JeffreyMaxted@alliantenergy.com>
Sent: Thursday, August 3, 2023 5:02 PM
To: Groves, Jackie M CIV USARMY CEMVR (USA) <Jackie.M.Groves@usace.army.mil>
Cc: Vollman, Brant J CIV USARMY CEMVR (USA) <Brant.J.Vollman@usace.army.mil>; Watts, John <JohnWatts@alliantenergy.com>; Coughlin, Jenny <JennyCoughlin@alliantenergy.com>; Nelson, Robin <RobinNelson@alliantenergy.com>; Stevens, Jill <JillStevens@alliantenergy.com>; Zehr, Matthew A CIV USARMY CEMVR

(USA) <Matthew.A.Zehr@usace.army.mil>
Subject: [URL Verdict: Neutral][Non-DoD Source] 2023-0039 - Lansing Generating Station

Hi Jackie,

I spoke with Brant Vollman today regarding our pending application for work at the IPL Lansing Generating Station. I appreciated the opportunity to clarify various activities at the site.

As a follow-up to that conversation, I'd like to provide notification of our intent to proceed with construction of the two rock chutes that will be used to convey storm water in the vicinity of the Ash Pond closure project. This work will be completed under Nationwide Permit 43. Please note that the permitted activity, including placement of rock in areas below the ordinary high water mark to prevent stormwater erosion, is limited to the two new storm water management features. It is independent from and not connected to the intake structure used for the former facility or the future demolition of the Lansing Generating Station. Given the independent utility of these projects, we request that the Army Corps proceed with its review of the aspects of the application pertaining to the intake structure and demolition of the plant building as we commence installation of the rock chutes.

We would appreciate confirmation of this communication, and we welcome any additional guidance or questions you have on the remainder of the application.

Regards,
Jeff

Jeff Maxted | Manager – Environmental Services, Generation Operations Support
Pronouns: He/him/his

Alliant Energy
4902 N Biltmore Lane | Madison, WI 53718
Office: (608) 458-3853
alliantenergy.com I jeffreymaxted@alliantenergy.com

This e-mail message is intended only for the personal use of the recipient(s) named above. This message may be an attorney-client communication and as such privileged and confidential. If you are not an intended recipient, you may not review, copy or distribute this message. If you have received this communication in error, please notify us immediately by e-mail and delete the original message.

A3 County Floodplain

FLOOD PLAIN DEVELOPMENT APPLICATION/PERMIT

Application # 20230508A Date May 8-2023

TO THE ADMINISTRATOR: The undersigned hereby makes application for a Permit to develop in a flood plain. The work to be performed, including flood protection works, is as described below and in attachments hereto. The undersigned agrees that all such work shall be done in accordance with the requirements of the Allamakee County Flood Plain Management Ordinance and with all other applicable county/city ordinances and the laws and regulations of the State of Iowa.

John Watts 5/3/23
(Owner or Agent) *(Date)*

2320 Power Plant Drive, Lansing, Iowa 52151
(Address)

Telephone # 319-786-8440

Email/Website JohnWatts@alliantenergy.com

Interstate Power and Light Co. 5/3/23
(Builder) *(Date)*

2320 Power Plant Drive, Lansing, Iowa 52151
(Address)

Telephone # _____

Email/Website _____

1. Location: ____ ¼ ____ ¼ , Section 2, Township 98, Range 3W
   Street Address: 2320 Power Plant Drive, Lansing, Iowa 52151

2. Type of Development
   Filling X Grading X Excavation X Routine Maintenance _____
   Minor Improvement _____ Substantial Improvement _____ New Construction _____

3. Description of Development: Decommissioning the Upper Ash Pond, the coal yard, and the plant. See additional supplement information in cover letter.

4. Premises: Size of site: ____ ft. x ____ ft. Area of Site: _____ sq. ft. Estimated cost: $ _____
   Principal Use: Former generation plant/coal yard (north of Power Plant Drive), closed landfill/impoundment (south of Power Plant Drive)
   Accessory Uses (Storage, parking, etc.) parking

5. Addition or modification to non-conforming use? Yes ___ No X Assessed value of structure: $ _____

6. Elevation of the 100 year (Base) flood (identify source): 632.1 FEMA Floodmaps

7. Elevation of the proposed development site (natural ground): _____ MSL/NGVD

8. Required elevation/floodproofing elevation for lowest floor: NA MSL/NGVD

9. Proposed elevation/flood proofing level for lowest floor (including basement): NA MSL/NGVD

10. Other flood plain information (identify and describe source): _____

THIS PERMIT IS ISSUED WITH THE CONDITION THAT THE LOWEST FLOOR (INCLUDING BASEMENT) OF ANY NEW OR SUBSTANTIALLY IMPROVED RESIDENTIAL BUILDING WILL BE ELEVATED AT LEAST 1.0 FOOT. ABOVE THE 100 YR. (BASE) FLOOD ELEVATION. IF THE PROPOSED DEVELOPMENT IS A NON-RESIDENTIAL BUILDING, THIS PERMIT IS ISSUED WITH THE CONDITION THAT THE LOWEST FLOOR (INCLUDING BASEMENT) OF A NEW OR SUBSTANTIALLY IMPROVED NON-RESIDENTIAL BUILDING WILL BE ELEVATED OR FLOOD PROOFED TO AT LEAST 1.0 FOOT ABOVE THE 100 YR. (BASE) FLOOD ELEVATION.

11. Other permits required? (attach a copy of the DNR pre-application form or copies of other permits acquired.)

Iowa Department of Natural Resources: Yes_X No___ If yes, permit # see cover letter

Date Received: _____

Corps of Engineers: Yes_X No___ If yes, permit # _____

Date Received: _____

Other: See letter for description of permits

All provisions of the Allamakee County Flood Plain Management Ordinance shall be complied with.

THIS PERMIT IS ISSUED WITH THE CONDITION THAT THE DEVELOPER/OWNER WILL PROVIDE CERTIFICATION BY A REGISTERED ENGINEER, ARCHITECT, OR LAND SURVEYOR OF THE "AS-BUILT" LOWEST FLOOR (INCLUDING BASEMENT) ELEVATION OF ANY NEW OR SUBSTANTIALLY IMPROVED BUILDING COVERED BY THIS PERMIT.

Plans and Specifications Approved this 8 Day of May, 20 23.

John Watts
(Signature of Developer/Owner)

Stephen Rud
(Authorizing Official)

cc: Water Resources Section
Iowa Department of Natural Resources
Wallace State Office Building
East 9th and Grand
Des Moines, IA 50319

A4 General Permit No. 2

DEPARTMENT OF NATURAL RESOURCES
NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES)
NOTICE OF GENERAL PERMIT COVERAGE UNDER
GENERAL PERMIT NO. 2

STORM WATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY

This notice of general permit coverage for a storm water discharge associated with construction activity is issued pursuant to the authority of section 402 (b) of the Clean Water Act (U.S.C. 1342(b)), Iowa Code 455B.174, and subrule 567--64.4(2), Iowa Administrative Code. A Notice of Intent has been filed with the Iowa Department of Natural Resources that this storm water discharge complies with the terms and conditions of NPDES General Permit No. 2. Authorization is hereby issued to discharge storm water associated with industrial activity as defined in Part VIII of the Iowa Department of Natural Resources NPDES General Permit No. 2 in accordance with the terms and conditions set forth in the permit.

Owner:

INTERSTATE POWER AND LIGHT COMPANY
200 1ST ST. SE
CEDAR RAPIDS IA 52401
(319)758-5301

Contact:

ROBIN NELSON
INTERSTATE POWER AND LIGHT COMPANY
4282 SULLIVAN SLOUGH RD.
BURLINGTON AL 52601
(319)758-5311

Permit Coverage Issued To:

INTERSTATE POWER AND LIGHT COMPANY LANSING GENERATING STATION - CONSTRUCTION
2320 POWER PLANT DR.
in LANSING, ALLAMAKEE COUNTY
located at

1/4 Section	Section	Township	Range
NW	2	98	3W
	For additional location data, please refer to	the storm water database.	

Coverage Provided Through: **5/2/2025**
NPDES Permit Discharge Authorization Number: **40957 - 40586**
Discharge Authorization Date: **5/2/2022**

Project Description: THE CLOSURE OF THE ASH POND, DRY ASH LANDFILL AND COAL YARD 52 ACRES

April 12, 2022

ROBIN NELSON
INTERSTATE POWER AND LIGHT COMPANY
4282 SULLIVAN SLOUGH RD.
BURLINGTON, AL 52601

Re: Authorization of a Storm Water Discharge Associated With Construction Activity
Iowa Department of Natural Resources, NPDES General Permit No. 2
DNR Authorization Number: IA - 40957 - 40586
Facility Name and Location: INTERSTATE POWER AND LIGHT COMPANY LANSING GENERATING STATION - CONSTRUCTION, LANSING, IA

This letter is to acknowledge that a complete Notice of Intent to be covered under Iowa's NPDES Storm Water General Permit No. 2 has been received. Please use the DNR Authorization Number provided above for any future correspondence on this project. By making this Notice of Intent with the DNR, you are committing to meet the terms and conditions in General Permit No. 2. If you do not have a copy of General Permit No. 2 please call (515)204-9234 and request that a copy be sent to you or go to http://www.iowadnr.gov/Environmental-Protection/Water-Quality/NPDES-Storm-Water/Permits-Guidance-Forms

In accordance with the terms and conditions in General Permit No. 2, a pollution prevention plan was to have been developed before the Notice of Intent was submitted to the department. The plan is to be implemented at the start of construction and updated accordingly. The pollution prevention plan and other records are to be kept on-site where the storm water discharge occurs. Unless otherwise requested, you do not need to provide a copy to the DNR.

When the construction project has reached final stabilization as defined in the permit, you must submit a Notice of Discontinuation to the DNR (refer to the summary guidance document). Final stabilization is not achieved for residential and commercial developments until all houses and buildings have been constructed and ground surrounding them has been finally stabilized.

If you have questions, please call me at 515-725-8417 or email at Joe.Griffin@dnr.iowa.gov.

Sincerely,

Joe Griffin
NPDES Section

Enclosure: Permit Authorization Sheet

File No. CON 11 - 34 -- 40957
IDNR Field Office # 1

A5 USACE Dredge Stockpile

February 7, 2022

JEFFREY MAXTED
ENVIRONMENTAL SERVICES MANAGER
ALLIANT ENERGY
4902 NORTH BILTMORE LANE
PO BOX 77007
MADISON WI 53707-1007

Re: Interstate Power and Light Company (IPL) - Lansing Generating Station
U.S. Army Corps of Engineers (USACE) - Dredge Sand Stockpile
Uncontaminated Rubble Designation

Dear Mr. Maxted:

This correspondence is in response to your February 7, 2022 (Doc #102292) request for regulatory confirmation that the U.S. Army Corps of Engineers' (USACE) dredge sand stockpile ("Lansing Hwy Bridge Site"), comprised of spoils from various USACE Mississippi River maintenance dredging projects, be classified as "uncontaminated" rubble pursuant to 567 IAC 108.4(12). Per your submittal, and upon DNR concurrence, IPL intends to utilize the dredged sand as beneficial fill during upcoming surface impoundment closure projects at the Lansing Generating Station.

Given "uncontaminated" has been left undefined in Iowa Law, and while the DNR has no reason to believe that the USACE dredged sand stockpile has been impacted, the DNR must rely upon material testing to substantiate such claims. Per prior DNR direction, IPL collected a composite sample of the dredged sand and conducted material testing utilizing the following methods: Toxicity Characteristic Leaching Procedure (TCLP), Synthetic Precipitation Leaching Procedure (SPLP) and Total Metal analyses. Based upon the results of this analysis, the DNR acknowledges that the dredged sand stockpile composite sample passed all regulatory analytical testing levels for reuse in Iowa.

Therefore, the DNR concludes that the referenced material may be classified as "uncontaminated" rubble pursuant to 567 IAC 108.4(12). IPL shall conduct, and submit to the DNR, continued material testing as expressed within the above-referenced request, to maintain the material's regulatory status as uncontaminated. While the DNR concludes the dredged sand can be classified as uncontaminated, the DNR does not provide any assurance or make any claims as to its physical characteristics or performance as beneficial fill.

Thank you for your efforts to comply with Iowa's environmental regulations. Should you have any questions, please contact me at (515) 201-8272 or Chad.Stobbe@dnr.iowa.gov.

Sincerely,

Chad A. Stobbe
Environmental Specialist Senior
Land Quality Bureau

cc: Iowa DNR Field Office #1, Manchester

A6 Coal Yard Material TCLP for Disposal

Alliant Energy
4902 North Biltmore Lane
P.O. Box 77007
Madison, WI 53707-1007

1-800-ALLIANT (800-255-4268)
alliantenergy.com

March 30, 2023

Mr. Mick Leat
Land Quality Bureau
Iowa Department of Natural Resources
502 East 9th Street
Des Moines, IA 50319-0034

Subject: **Lansing Generating Station Ash Disposal Landfill Permit No. 03-SDP-05-01P Toxicity Characteristic Leaching Procedure test results**

Dear Mr. Leat:

On behalf of Interstate Power and Light Company (IPL) and in accordance with Special Provision 7 of Permit No. 03-SDP-05-01P, Alliant Energy is providing the enclosed Toxicity Characteristic Leaching Procedure (TCLP) test results on coal, coal fines, and soil from the coal yard at the Lansing Generating Station in Lansing, Iowa.

Disposal of coal, coal fines, and soil from the coal yard was incorporated into the current operating permit through approval of the updated the closure plan in December 2022. A composite sample was collected and analyzed to support disposal of this material in the onsite Ash Disposal Landfill and is required under Special Provision 7 of the current operating permit (Permit No. 03-SDP-05-01P). Disposal of the coal, coal fines, and soil from the coal yard will commence immediately following department concurrence with these results and will comply with all other requirements in the permit, including the alternative weighing procedure in Special Condition 9. Tons disposed will be reported to the department in quarterly fee exempt reports.

Please call me at (515) 558-9704 or email me at jennycoughlin@alliantenergy.com with any questions regarding the enclosed report.

Sincerely,

Jenny Coughlin
Sr. Environmental Specialist
Alliant Energy Corporate Services, Inc.

Enclosures

Cc: IDNR Field Office #1, Manchester
Robin Nelson, Alliant Energy
Chad Wall, Alliant Energy
SCS Engineers

eurofins | Environment Testing

ANALYTICAL REPORT

PREPARED FOR

Attn: Glen Thomas
Alliant Energy Corporation
2320 Power Plant Drive
Lansing, Iowa 52151

Generated 3/14/2023 4:02:31 PM

JOB DESCRIPTION

Lansing End of Coal Sample

JOB NUMBER

310-250906-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



Generated
3/14/2023 4:02:31 PM

Authorized for release by
Tayler Sanderson, Project Manager I
Tayler.Sanderson@et.eurofinsus.com
Designee for
Shirley Thompson, Client Service Manager
Shirley.Thompson@et.eurofinsus.com
(319)277-2401

Case Narrative

Client: Alliant Energy Corporation
Project/Site: Lansing End of Coal Sample

Job ID: 310-250906-1

Job ID: 310-250906-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-250906-1

Comments
No additional comments.

Receipt
The sample was received on 3/8/2023 9:25 AM. Unless otherwise noted below, the sample arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 2.3º C.

Metals
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.

Sample Summary

Client: Alliant Energy Corporation
Project/Site: Lansing End of Coal Sample

Job ID: 310-250906-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-250906-1	End of Coal Sample	Solid	03/07/23 08:00	03/08/23 09:25

Client Sample Results

Client: Alliant Energy Corporation
Job ID: 310-250906-1
Project/Site: Lansing End of Coal Sample

Client Sample ID: End of Coal Sample
Lab Sample ID: 310-250906-1

Date Collected: 03/07/23 08:00
Matrix: Solid
Date Received: 03/08/23 09:25

Method: 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Arsenic	<0.0300		0.100	0.0300	mg/L		03/10/23 16:39	1	XXW3
Barium	**1.16**		0.200	0.0400	mg/L		03/10/23 16:39	1	XXW3
Cadmium	<0.00390		0.0200	0.00390	mg/L		03/10/23 16:39	1	XXW3
Chromium	<0.00600		0.0200	0.00600	mg/L		03/10/23 16:39	1	XXW3
Lead	<0.0260		0.100	0.0260	mg/L		03/10/23 16:39	1	XXW3
Selenium	<0.0290		0.100	0.0290	mg/L		03/10/23 16:39	1	XXW3
Silver	<0.0140		0.0500	0.0140	mg/L		03/10/23 16:39	1	XXW3

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Analyzed	Dil Fac	Analyst
Mercury	<0.00150		0.00200	0.00150	mg/L		03/13/23 17:25	1	XXW3

Accreditation/Certification and Definitions Summary

Client: Alliant Energy Corporation
Job ID: 310-250906-1
Project/Site: Lansing End of Coal Sample

Laboratory: Eurofins Cedar Falls

The accreditations/certifications listed below are applicable to this report.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

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
MRL	Method Reporting 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
SDL	Sample Detection Limit
SDL	Sample Detection Limit
SDL	Sample Detection Limit
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Method Summary

Client: Alliant Energy Corporation
Job ID: 310-250906-1
Project/Site: Lansing End of Coal Sample

Method	Method Description	Protocol	Laboratory
6010D	Metals (ICP)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
1311	TCLP Extraction	SW846	EET CF
3010A	Preparation, Total Metals	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

eurofins | Environment Testing America

310-250906 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: Alliant

City/State: CITY | STATE: IA | Project:

Receipt Information

Date/Time Received: DATE: 3/9/23 | TIME: 0925 | Received By: ST

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 # _____ of _____

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: T | Correction Factor (°C): +0

Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 2.2 | Corrected Temp (°C): 2.3

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

General temperature criteria is 0 to 6°C

Chain of Custody Record

604797 eurofins | Environment Testing TestAmerica

Address _____

Regulatory Program: ☐ DW ☐ NPDES ☐ RCRA ☐ Other

TAL-8210

Client Contact	Project Manager: Brandon Suchomel	Site Contact: Glen Thomas	Date:	COC No
Company Name: Alliant Energy	Tel/Email: bsuchomel@scsengineers.com	Lab Contact: Glen Thomas	Carrier: UPS	1 of 1 COCs
Address: 2320 Power Plant Drive	Analysis Turnaround Time			Sampler:
City/State/Zip: Lansing, IA 52151	☐ CALENDAR DAYS ☐ WORKING DAYS			For Lab Use Only:
Phone: (563) 538-3143	TAT if different from Below _____			Walk-in Client:
Fax:	☐ 2 weeks			Lab Sampling
Project Name: Lansing End of Coal Sample	☐ 1 week			
Site: Lansing Generating Station	☐ 2 days			Job / SDG No
P O #: C-ENCO 0000249079	☐ 1 day			

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=Grab)	Matrix	# of Cont.	Filtered Sample (Y / N)	Perform MS / MSD (Y / N)	TCLP														Sample Specific Notes
End of coal Sample	3-7-23	08:00	C		2			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

Custody Seals Intact: ☐ Yes ☐ No | Custody Seal No | Cooler Temp (°C) Obs'd _____ Corr'd _____ Therm ID No _____

Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Glen Thomas	Alliant Energy	3-7-23 08:15			
Relinquished by	Company	Date/Time	Received by	Company	Date/Time
Relinquished by	Company	Date/Time	Received in Laboratory by	Company	Date/Time
					3/8/23 0925

Page 9 of 9

3/14/2023

7 6 5 4 3 2 1

Suchomel, Brandon

From: Leat, Mick <mick.leat@dnr.iowa.gov>
Sent: Thursday, March 30, 2023 11:53 AM
To: Coughlin, Jenny
Cc: jason.gearhart@dnr.iowa.gov; Jolly, Becky [DNR]; Nelson, Robin; Wall, Chad; Maxted, Jeffrey; Nelson, Eric; Suchomel, Brandon
Subject: Re: IPL Lansing Generating Station - TCLP Results for Coal, Coal Fines and Soil - Permit No. 03-SDP-05-01P

Categories: Filed by Newforma

This email originated from outside of SCS Engineers. Do not click links or open attachments unless you recognize the sender and know the content is safe.

We concur that coal, coal fines, and soil wastes are suitable for disposal in the landfill. Please let me know if you need anything else.

Mick

www.iowadnr.gov

MICK LEAT • Landfill Permitting
Solid Waste and Contaminated Sites Section
Iowa Department of Natural Resources
515-689-6548
502 E 9th St, Des Moines, IA 50319

On Thu, Mar 30, 2023 at 10:48 AM Coughlin, Jenny <JennyCoughlin@alliantenergy.com> wrote:

> Hi Mick,
>
> On behalf of Interstate Power and Light Company and in accordance with Special Provision 7 of landfill operating Permit No. 03-SDP-05-01P, Alliant Energy is submitting the attached TCLP information to support disposal of coal, coal fines, and soil in the onsite Ash Disposal Landfill at the Lansing Generating Station. Disposal of this material was incorporated into the current to operating permit through approval of the updated closure plan in December 2022. We are seeking your concurrence with these results, and will commence disposal of the material upon receipt of concurrence. As noted in the attached cover letter, all other provisions of the permit will be followed, including the alternative weighing procedure in Special Condition 9, and tons disposed will be reported to the department in quarterly fee exempt reports.
>
> Please call me at (515) 558-9704 or email me at jennycoughlin@alliantenergy.com with any question you may have.

Regards,

Jenny Coughlin | Sr. Environmental Specialist

Pronouns: she/her/hers

Alliant Energy

500 East Court Ave. Suite 300 | Des Moines, IA 50309

Office: (515) 558-9704

alliantenergy.com | jennycoughlin@alliantenergy.com

Appendix B

Photo Documentation

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 1: Pre-construction condition of the road going to the Ash Disposal Landfill.

Date: 05/02/2022
Direction: Looking south



Photo 2: Pre-construction condition of the bottom of the north end of the Ash Disposal Landfill.

Date: 05/02/2022
Direction: Looking southeast

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 3: Pre-construction condition of the Ash Disposal Landfill access road and active FGD placement area.

Date: 05/02/2022
Direction: Looking southeast



Photo 4: Ames grading/conditioning CCR in the Ash Disposal Landfill.

Date: 08/01/2022
Direction: Looking southeast

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 5: Ames graded and compacted the CCR in the northeast area of the Ash Disposal Landfill.

Date: 08/09/2022
Direction: Looking northeast



Photo 6: Ames grading the northeast slope of the Ash Disposal Landfill.

Date: 08/10/2022
Direction: Looking northeast

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 7: Ames managing/conditioning CCR material in the Ash Disposal Landfill.

Date: 04/25/2023
Direction: Looking northwest



Photo 8: Grading the Ash Disposal Landfill to final cover subgrade.

Date: 06/13/2023
Direction: Looking northwest

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 9: Ames began placing select clay fill in the northern part of the Ash Disposal Landfill from the east access road.

Date: 06/14/2023
Direction: Looking east



Photo 10: Construction of the select clay fill access road for east access road at the bottom of the Ash Disposal Landfill for select clay fill placement.

Date: 06/21/2023
Direction: Looking north

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 11: Select clay fill placed on north slope of the Ash Disposal Landfill.

Date: 06/26/2023
Direction: Looking northwest



Photo 12: Nuclear density gauge used to test for compaction and moisture content of the select clay fill in Ash Disposal Landfill.

Date: 06/28/2023
Direction: Looking down

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 13: Compaction with sheep foot compactor and grading the select clay fill layer on the west slope of the Ash Disposal Landfill.

Date: 07/12/2023
Direction: Looking south



Photo 14: Spreading sand for the rooting zone layer on the east slope of the Ash Disposal Landfill.

Date: 08/01/2023
Direction: Looking northwest

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 15: Placement of topsoil material along the top of the Ash Disposal Landfill.

Date: 08/21/2023
Direction: Looking south



Photo 16: Seeding and erosion control blanket installation.

Date: 08/21/2023
Direction: Looking northwest

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 17: Installing non-channel erosion mat on the east slope of the Ash Disposal Landfill.

Date: 08/23/2023
Direction: Looking southwest



Photo 18: Placement of topsoil material on the northeast slope of the Ash Disposal Landfill.

Date: 08/25/2023
Direction: Looking south

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 19: Placement of revetment stone over embankment erosion control geotextile fabric for the construction of Rock Chute No. 1.

Date: 09/06/2023
Direction: Looking southeast



Photo 20: Ash Disposal Landfill access road installation around culvert outlet with erosion stone discharge apron installation.

Date: 09/11/2023
Direction: Looking east

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 21: Installation channel erosion mat and check dams in swale downslope of culvert.

Date: 09/13/2023
Direction: Looking south



Photo 22: Perimeter swale along northeast side of Ash Disposal Landfill leading to culvert inlet.

Date: 10/18/2023
Direction: Looking south

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 23: Perimeter swale with erosion mat and ditch checks on northeast side of Ash Disposal Landfill.

Date: 10/18/2023
Direction: Looking south



Photo 24: Completed surface water drainage swale along south end of pond closure area. Energy dissipator from Ash Disposal Landfill downslope flume shown in background.

Date: 10/18/2023
Direction: Looking east

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 25: Stormwater swale discharge to the Rock Chute No. 1 leading to Unnamed Creek One.

Date: 10/18/2023
Direction: Looking west



Photo 26: Completed restoration of Ash Disposal Landfill cover and diversion berm.

Date: 10/18/2023
Direction: Looking south

Appendix B – Photo Documentation
Ash Disposal Landfill Closure
Lansing Generating Station – Lansing, Iowa
SCS Engineers Project #25222159.00



Photo 27: Inlet structure to downslope flume on north end of Ash Disposal Landfill cover.

Date: 10/18/2023
Direction: Looking north

Appendix C

Select Clay Fill Laboratory Test Results

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

133 Brown Street
Evansdale, IA 50707
Phone: 319-233-5344
Fax: 319-233-5434
www.teamservices.com
staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **4-0**

SAMPLE ID: **12**

SAMPLE SOURCE: ADL-B1-1

SAMPLE DESCRIPTION: CL

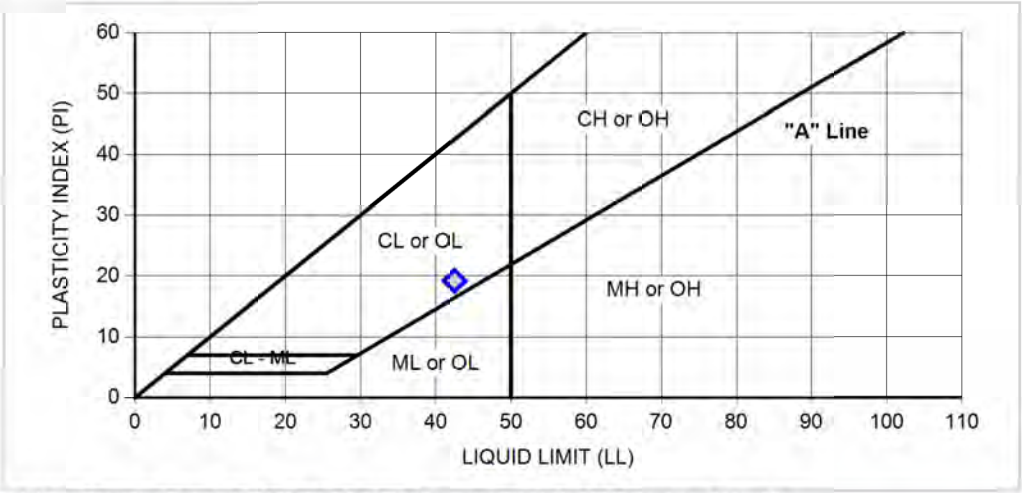
NOTES:

DATE RECEIVED: 2023-06-29

DATE TESTED: 2023-07-05

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
23	105.65	99.17	84.08	42.50
23	132.41	125.35	108.92	42.50

AVG. LIQUID LIMIT (LL)

43

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
47.22	46.04	41.01	23.50
123.18	121.18	112.54	23.10

AVG. PLASTIC LIMIT (PL)

23

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

19

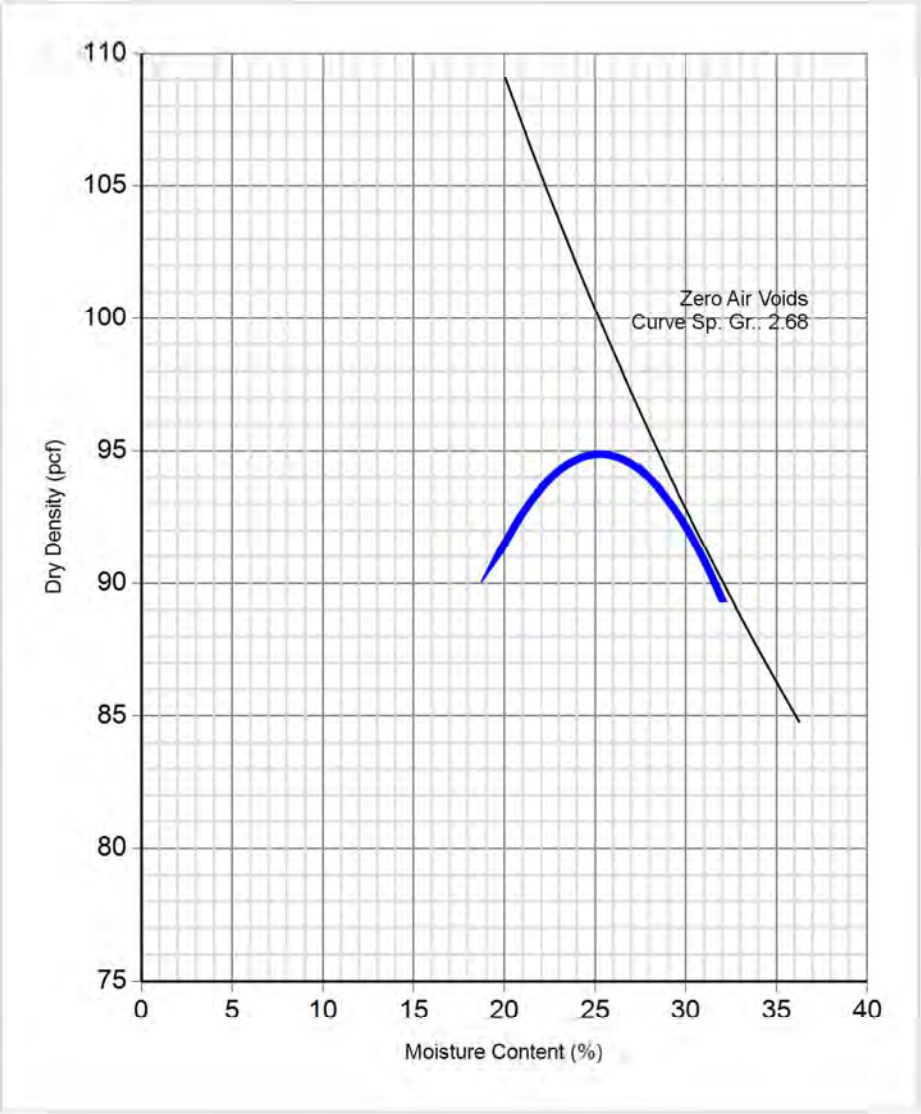
Approved: Jeff Roberts

MOISTURE - DENSITY RELATIONSHIP REPORT

(Proctor Test)

ASTM D 1557-12 Method A Modified

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA



PROJECT NO: 57-925

REPORT NO: 6-0

PROCTOR ID: **11**

DATE RECEIVED: 06/27/2023

DATE TESTED: 06/30/2023

TESTED BY: JR

TEST RESULTS

MAXIMUM DRY DENSITY (pcf)

94.9

OPTIMUM MOISTURE (%)

25.3

Prep Method:: Moist

Rammer Type: Mechanical

Proctor points available upon request.

SOURCE: ADL-B1-1

SAMPLE DESCRIPTION: Fat CLAY, with sand, trace gravel, medium-dark reddish brown

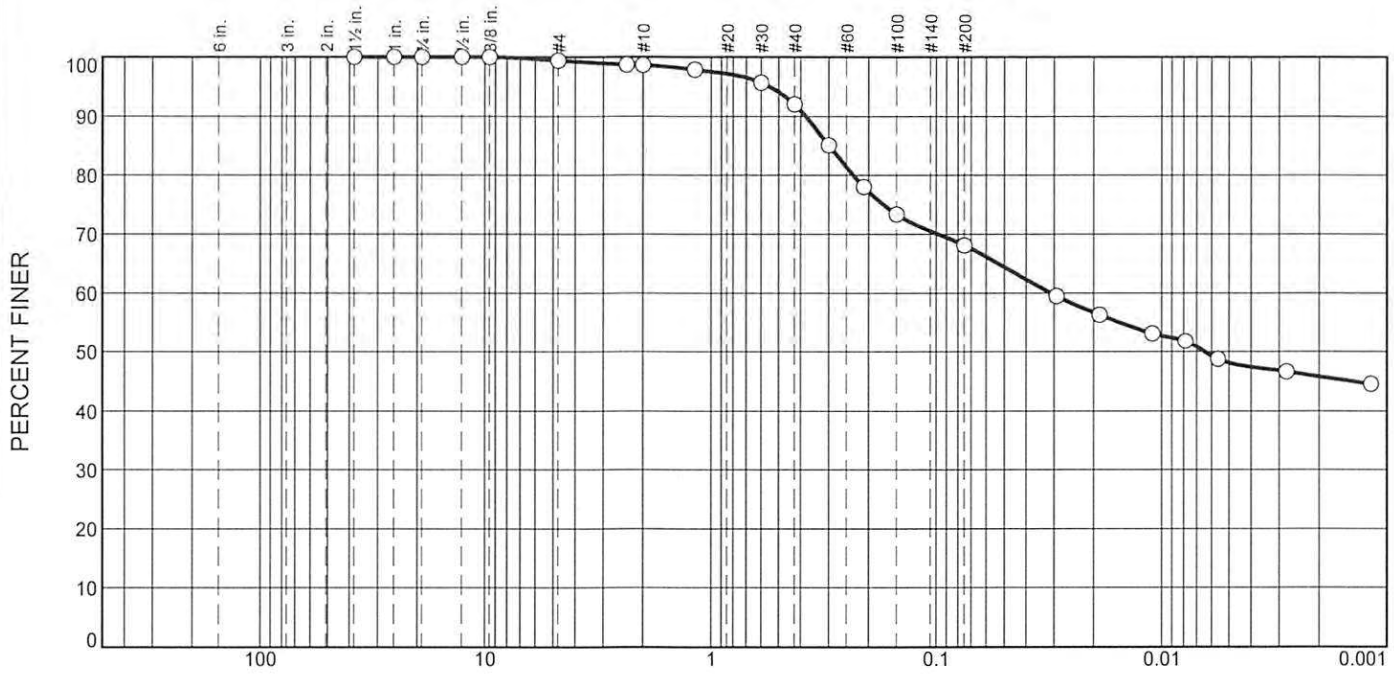
Notes/Remarks:

APPROVED: *Jeff Roberts*

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133 Brown Street
Evansdale, IA 50707
319-233-5344
319-233-5434
www.teamservices.com
staff@teamservices.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.8	6.5	24.0	22.3	45.8

Test Results (ASTM D6913 and D7928)			
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.4		
#8	98.7		
#10	98.6		
#16	97.9		
#30	95.7		
#40	92.1		
#50	85.1		
#70	78.0		
#100	73.3		
#200	68.1		
0.0293 mm.	59.5		
0.0188 mm.	56.3		
0.0110 mm.	53.2		
0.0078 mm.	51.8		
0.0056 mm.	48.7		
0.0028 mm.	46.6		
0.0012 mm.	44.5		

· (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/3/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/3/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 23 LL= 42 PI= 19

Coefficients

D_{90}= 0.3783 D_{85}= 0.2982

D_{60}= 0.0310 D_{50}= 0.0065

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/26/23

Date Received: 6/29/23

Checked By: MC

Title: LM

Location: ADL-B1-1

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

133 Brown Street
Evansdale, IA 50707
Phone: 319-233-5344
Fax: 319-233-5434
www.teamservices.com
staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **6-0**

SAMPLE ID: **24**

SAMPLE SOURCE: ADL-B1-2

SAMPLE DESCRIPTION: CL

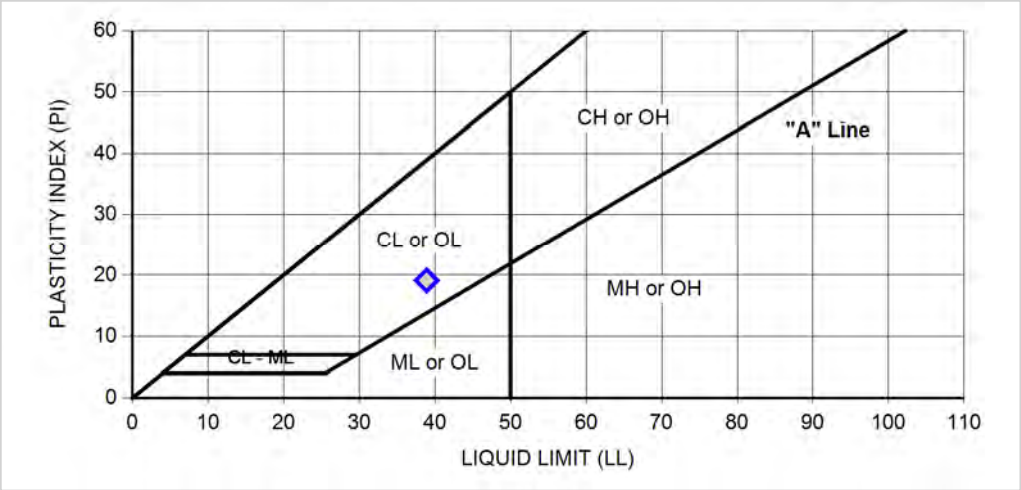
NOTES:

DATE RECEIVED: 2023-07-07

DATE TESTED: 2023-07-21

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
20	111.94	104.00	84.02	38.70
20	135.50	128.94	112.60	39.10

AVG. LIQUID LIMIT (LL)

39

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
49.47	48.07	41.03	19.90
119.04	117.32	108.65	19.80

AVG. PLASTIC LIMIT (PL)

20

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

19

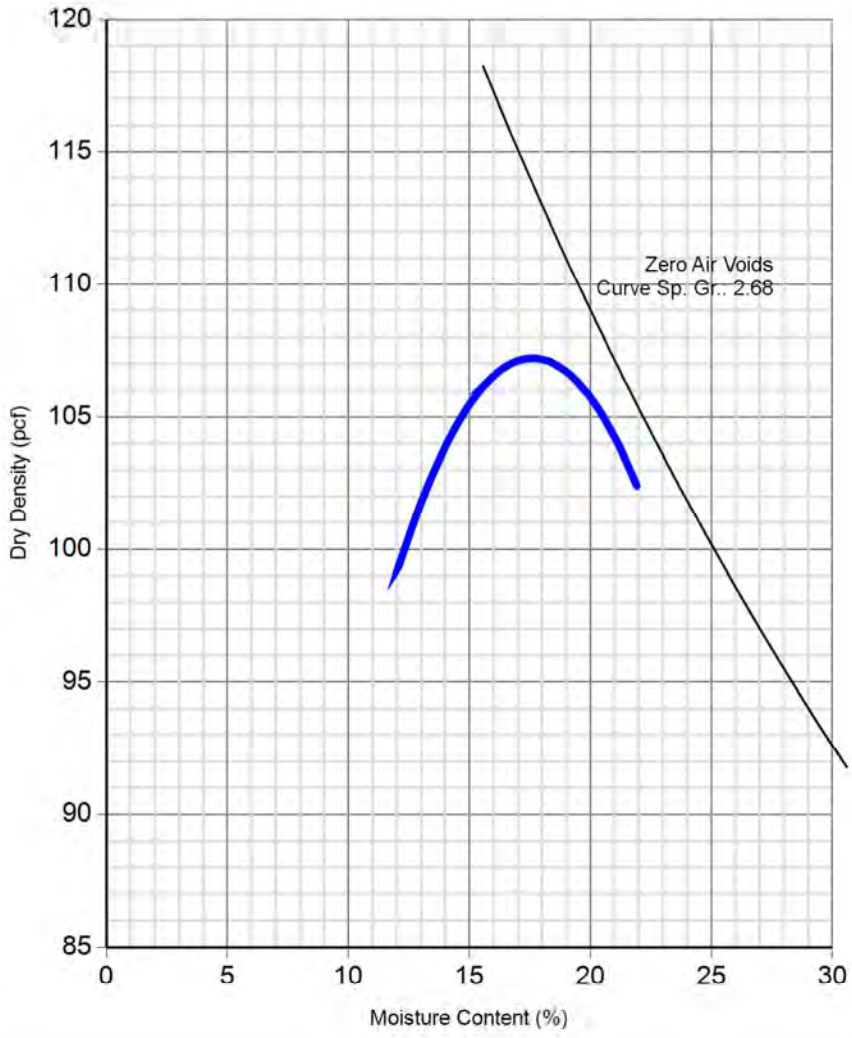
Approved: Jeff Roberts

MOISTURE - DENSITY RELATIONSHIP REPORT

(Proctor Test)

ASTM D 1557-12 Method A Modified

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA



PROJECT NO: 57-925

REPORT NO: 7-0

PROCTOR ID: **12**

DATE RECEIVED: 07/06/2023

DATE TESTED: 07/08/2023

TESTED BY: JR

TEST RESULTS

MAXIMUM DRY DENSITY (pcf)

107.2

OPTIMUM MOISTURE (%)

17.6

Prep Method:: Moist

Rammer Type: Mechanical

Proctor points available upon request.

SOURCE: ADL-B1-2

SAMPLE DESCRIPTION: Lean CLAY, with sand, medium reddish brown

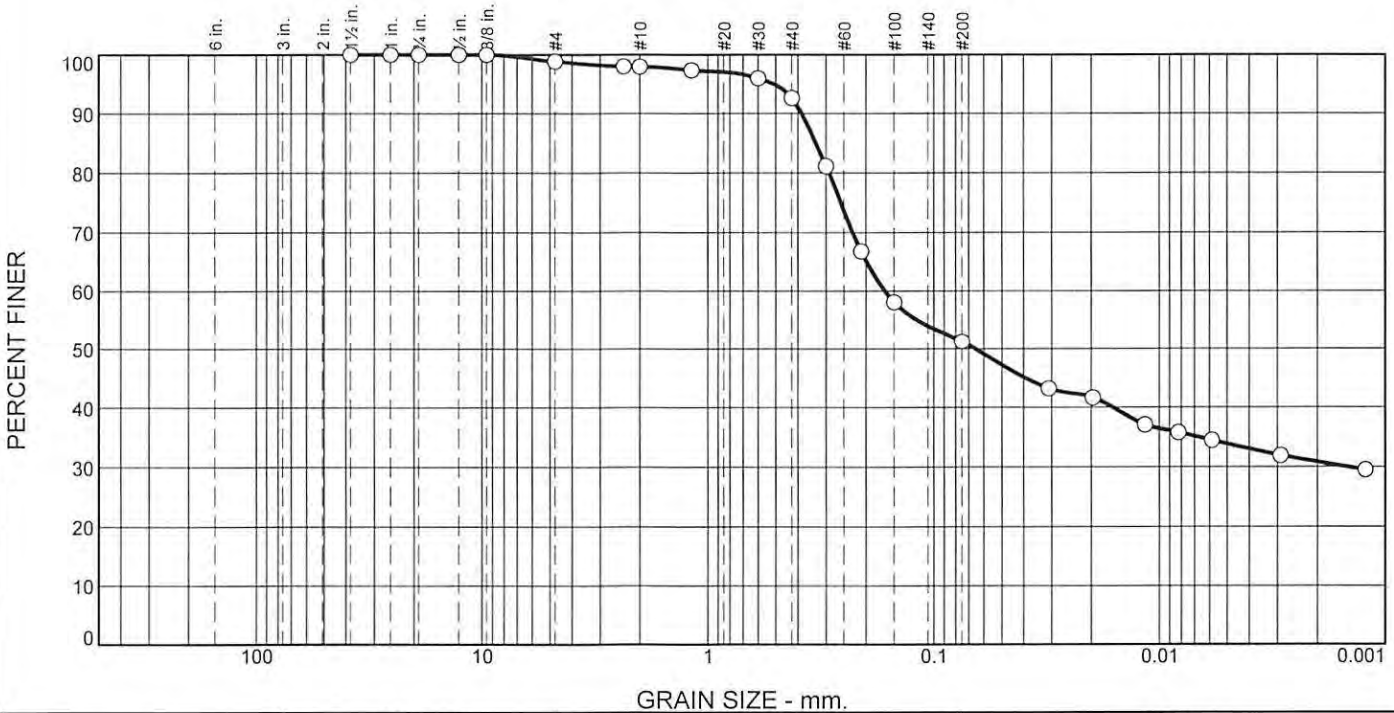
Notes/Remarks:

APPROVED: *Jeff Roberts*

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133 Brown Street
Evansdale, IA 50707
319-233-5344
319-233-5434
www.teamservices.com
staff@teamservices.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.1	0.9	5.4	41.3	20.5	30.8

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	98.9		
#8	98.0		
#10	98.0		
#16	97.4		
#30	96.0		
#40	92.6		
#50	81.2		
#70	66.8		
#100	58.1		
#200	51.3		
0.0309 mm.	43.2		
0.0197 mm.	41.7		
0.0116 mm.	37.1		
0.0082 mm.	35.8		
0.0059 mm.	34.5		
0.0029 mm.	32.0		
0.0012 mm.	29.5		

* (no specification provided)

Location: ADL-B1-2

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/20/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/20/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 20 LL= 39 PI= 19

Coefficients

D_{90}= 0.3847 D_{85}= 0.3325

D_{60}= 0.1648 D_{50}= 0.0656

D_{30}= 0.0015 D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/27/23

Date Received: 7/7/23

Checked By: [signature]

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

TEAM Services
ISO 9001 International Accredited Laboratory
Geotechnical and Construction Material Consultants

133 Brown Street
Evansdale, IA 50707
Phone: 319-233-5344
Fax: 319-233-5434
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staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **4-0**

SAMPLE ID: **9**

SAMPLE SOURCE: ADL-B1-3

SAMPLE DESCRIPTION: CL

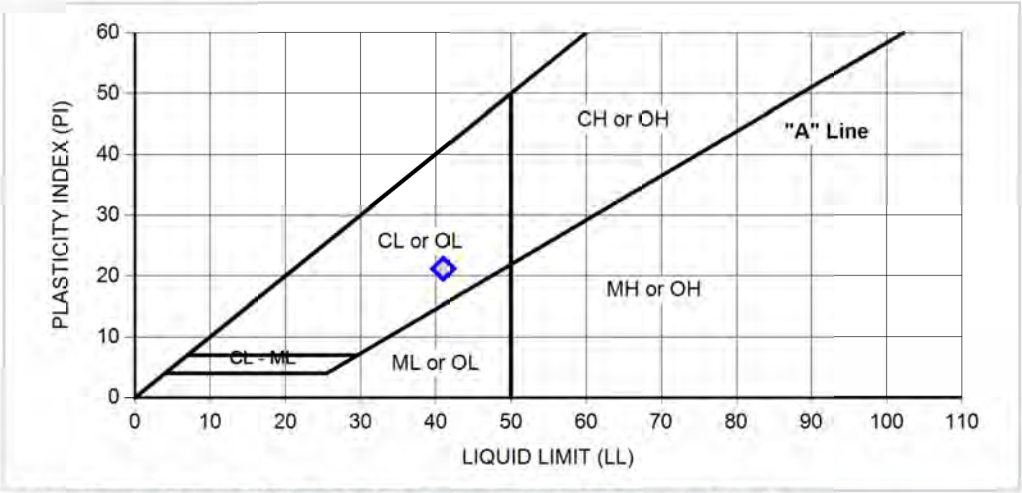
NOTES:

DATE RECEIVED: 2023-06-24

DATE TESTED: 2023-07-05

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
20	59.47	53.43	39.02	40.80
20	60.53	54.20	39.20	41.10

AVG. LIQUID LIMIT (LL)

41

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
47.19	45.78	38.62	19.70
47.75	46.32	39.08	19.80

AVG. PLASTIC LIMIT (PL)

20

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

21

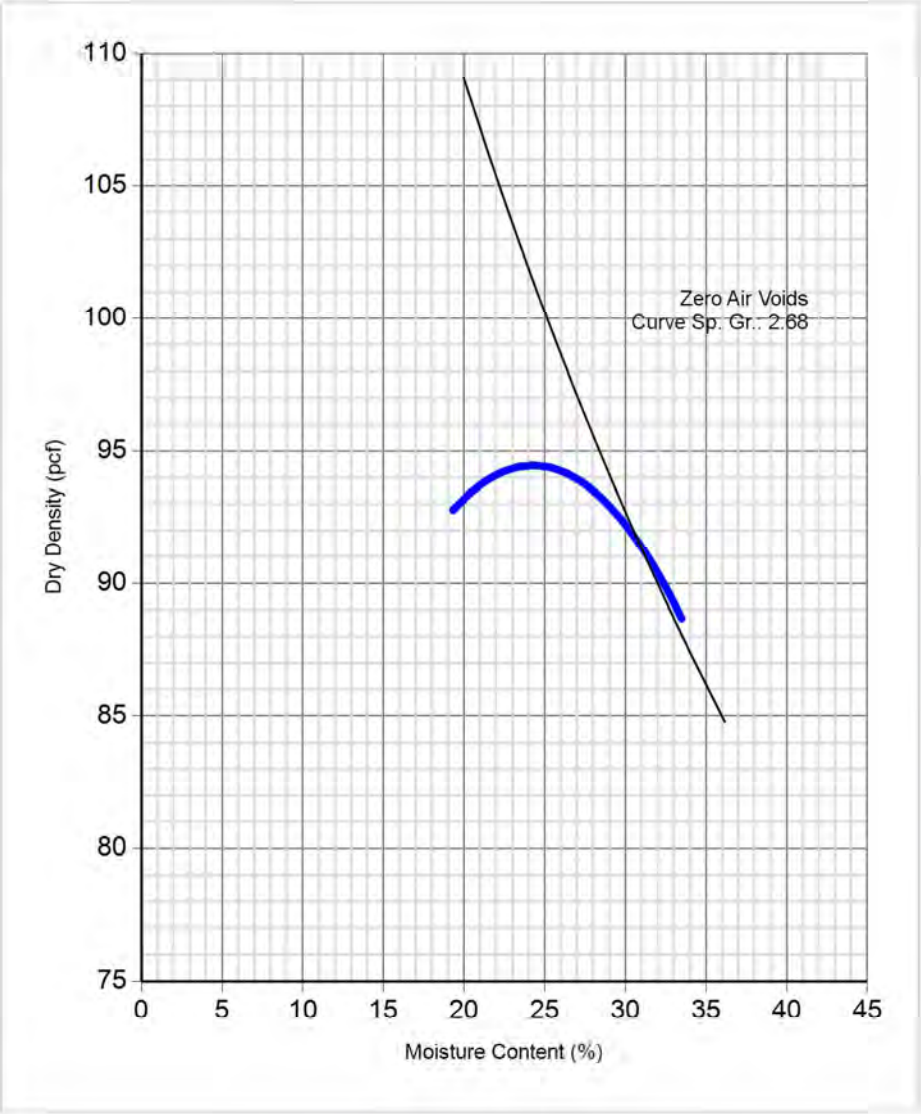
Approved: Jeff Roberts

MOISTURE - DENSITY RELATIONSHIP REPORT

(Proctor Test)

ASTM D 1557-12 Method A Modified

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA



PROJECT NO: 57-925

REPORT NO: 5-0

PROCTOR ID: **8**

DATE RECEIVED: 06/20/2023

DATE TESTED: 06/24/2023

TESTED BY: JR

TEST RESULTS

MAXIMUM DRY DENSITY (pcf)

94.5

OPTIMUM MOISTURE (%)

24.3

Prep Method:: Moist

Rammer Type: Mechanical

Proctor points available upon request.

SOURCE: ADL-B1-3

SAMPLE DESCRIPTION: Fat CLAY, with sand, trace gravel, medium-dark reddish brown

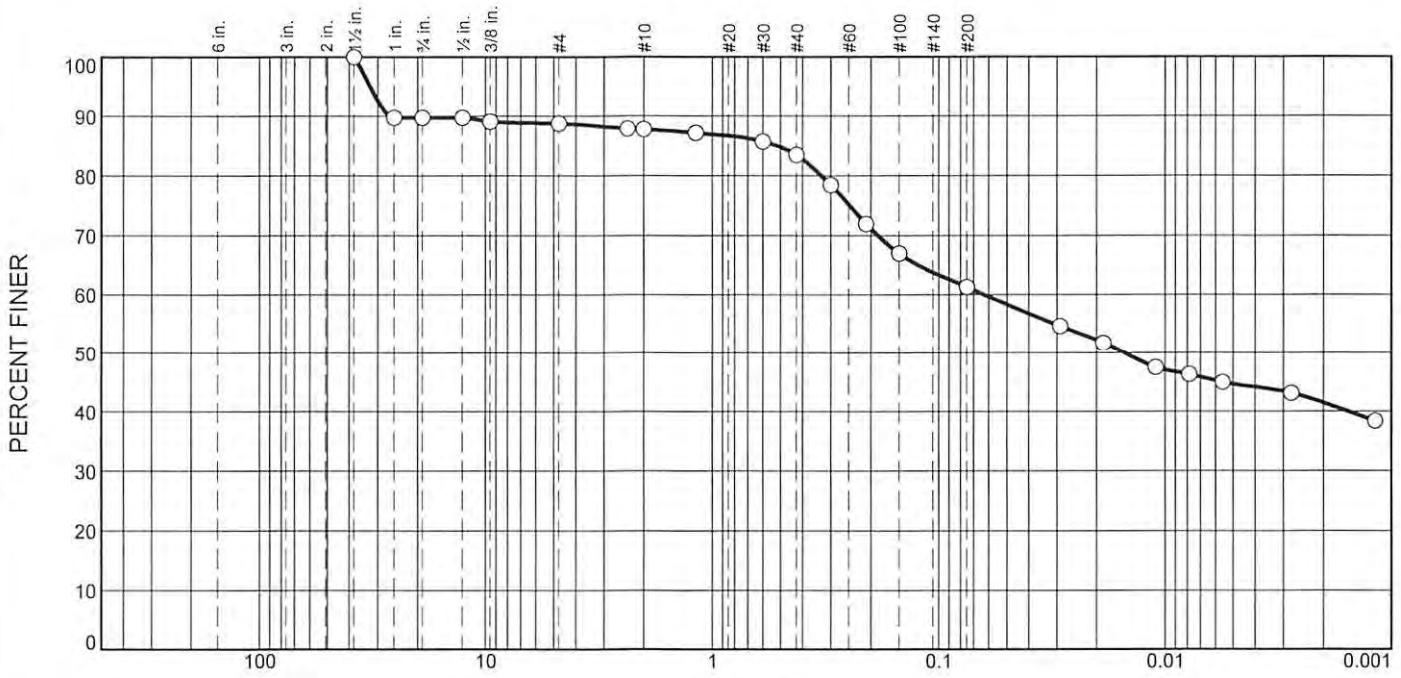
Notes/Remarks:

APPROVED: *Jeff Roberts*

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133 Brown Street
Evansdale, IA 50707
319-233-5344
319-233-5434
www.teamservices.com
staff@teamservices.com

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.2	1.0	1.0	4.3	22.2	19.8	41.5

Test Results (ASTM D6913 and D7928)			
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	89.8		
3/4"	89.8		
1/2"	89.8		
3/8"	89.1		
#4	88.8		
#8	87.9		
#10	87.8		
#16	87.2		
#30	85.7		
#40	83.5		
#50	78.5		
#70	72.0		
#100	67.0		
#200	61.3		
0.0291 mm.	54.6		
0.0187 mm.	51.8		
0.0110 mm.	47.5		
0.0078 mm.	46.3		
0.0056 mm.	45.0		
0.0028 mm.	43.1		
0.0012 mm.	38.4		

* (no specification provided)

Location: ADL-B1-3

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/3/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/3/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 20 LL= 41 PI= 21

Coefficients

D_{90}= 26.5559 D_{85}= 0.5155

D_{60}= 0.0631 D_{50}= 0.0151

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/20/23

Date Received: 6/24/23

Checked By: JR

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **4-0**

SAMPLE ID: **8**

SAMPLE SOURCE: ADL-B1-4

SAMPLE DESCRIPTION: CL

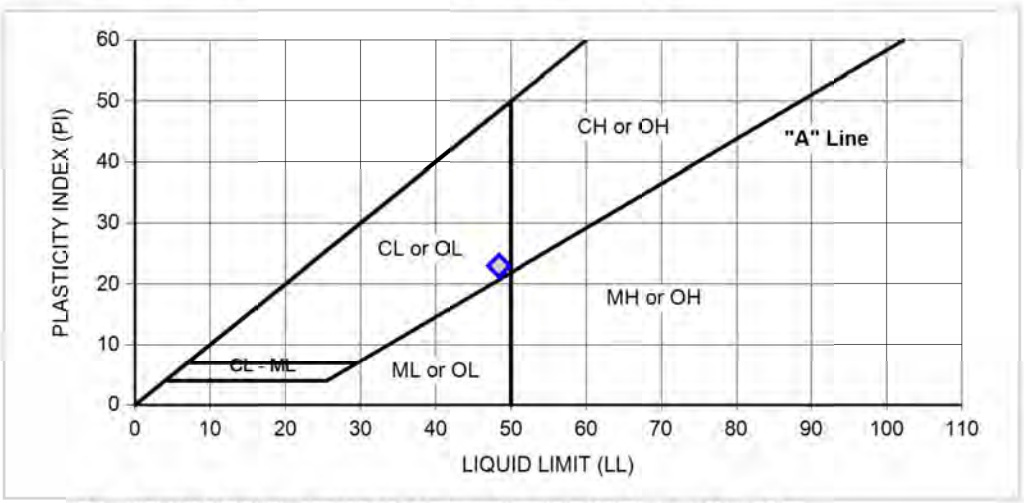
NOTES:

DATE RECEIVED: 2023-06-24

DATE TESTED: 2023-07-05

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
21	130.95	123.66	108.86	48.20
21	104.93	98.02	84.08	48.50

AVG. LIQUID LIMIT (LL)

48

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
47.54	46.22	41.01	25.30
121.62	119.74	112.38	25.50

AVG. PLASTIC LIMIT (PL)

25

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

23

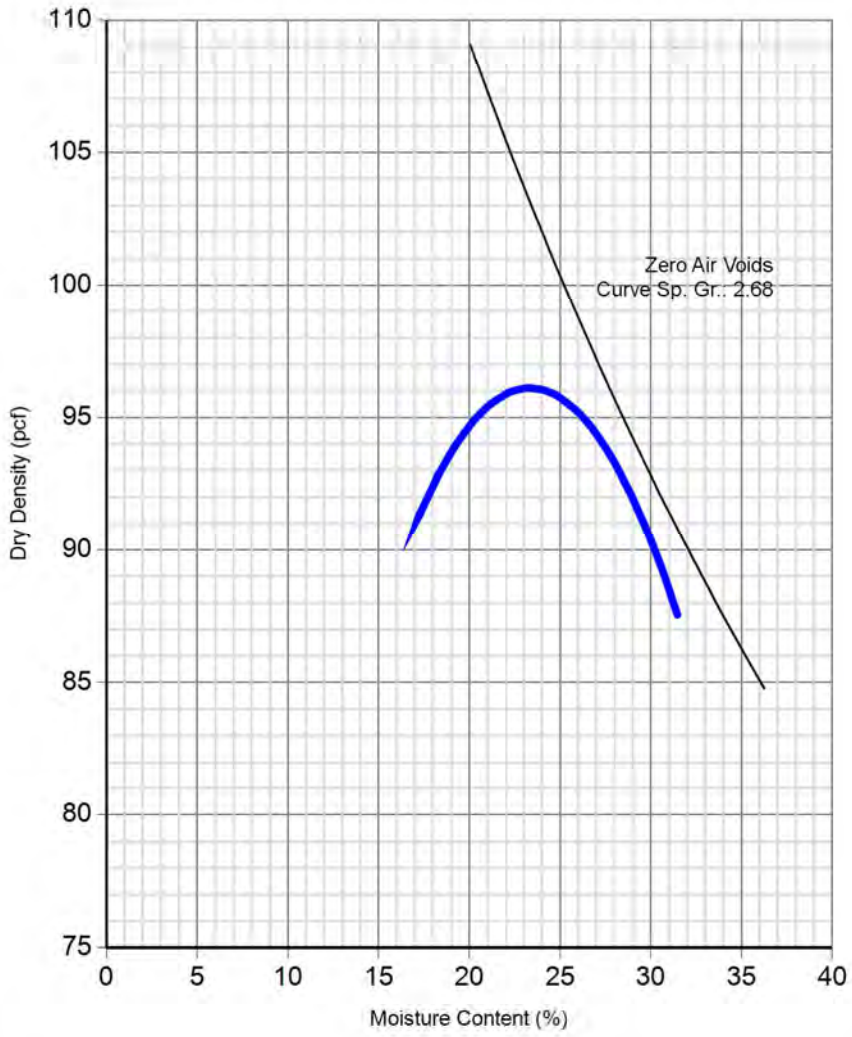
Approved: Jeff Roberts

MOISTURE - DENSITY RELATIONSHIP REPORT

(Proctor Test)

ASTM D 1557-12 Method A Modified

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA



PROJECT NO:	57-925
REPORT NO:	5-0
PROCTOR ID:	9
DATE RECEIVED:	06/20/2023
DATE TESTED:	06/24/2023
TESTED BY:	JR

TEST RESULTS

MAXIMUM DRY DENSITY (pcf)	
96.1	
OPTIMUM MOISTURE (%)	
23.3	

Prep Method::	Moist
Rammer Type:	Mechanical

Proctor points available upon request.

SOURCE: ADL-B1-4

SAMPLE DESCRIPTION: Fat CLAY, with sand, trace gravel, medium reddish brown

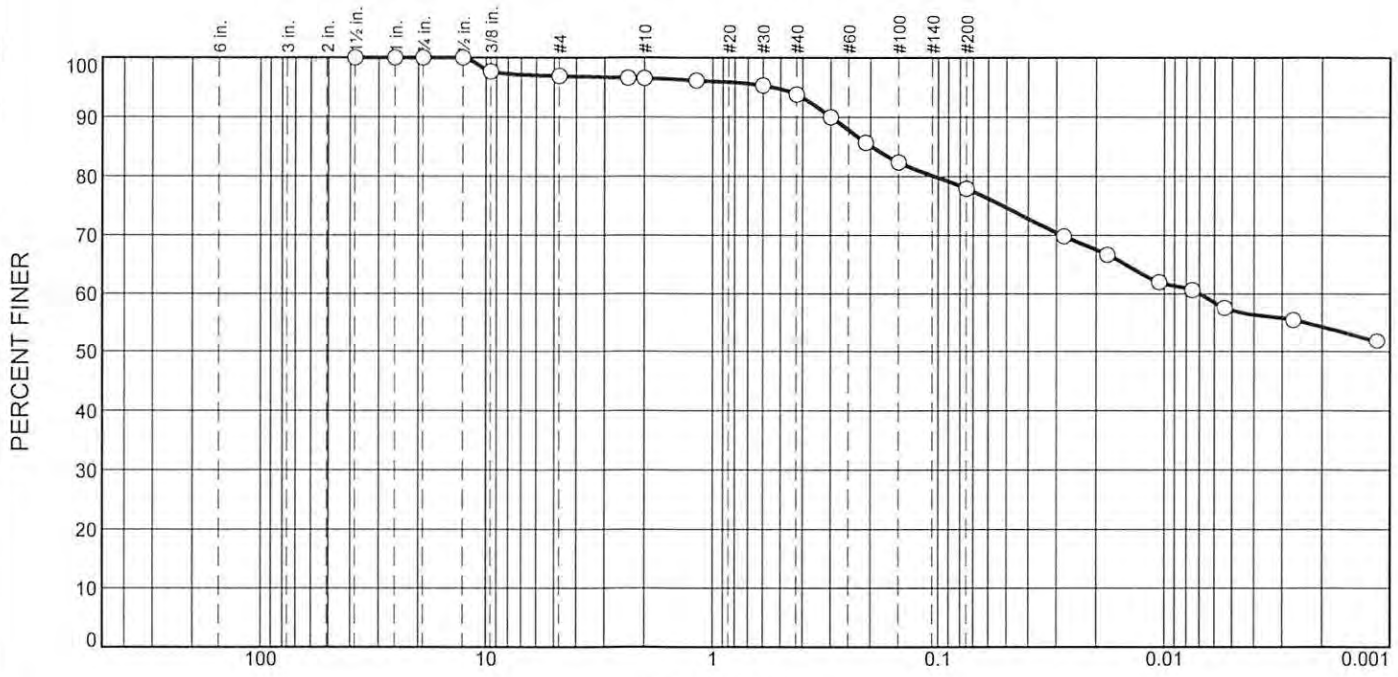
Notes/Remarks:

APPROVED: *Jeff Roberts*

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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.1	0.4	2.7	15.8	23.6	54.4

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	97.7		
#4	96.9		
#8	96.6		
#10	96.5		
#16	96.1		
#30	95.3		
#40	93.8		
#50	90.0		
#70	85.7		
#100	82.4		
#200	78.0		
0.0278 mm.	69.8		
0.0179 mm.	66.7		
0.0105 mm.	62.0		
0.0075 mm.	60.6		
0.0054 mm.	57.6		
0.0027 mm.	55.5		
0.0011 mm.	51.9		

· (no specification provided)

Location: ADL-B1-4

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/3./23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/3/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 25 LL= 48 PI= 23

Coefficients

D_{90}= 0.2990 D_{85}= 0.1965

D_{60}= 0.0069 D_{50}=

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/20/23

Date Received: 6/24/23

Checked By: [illegible]

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers
Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

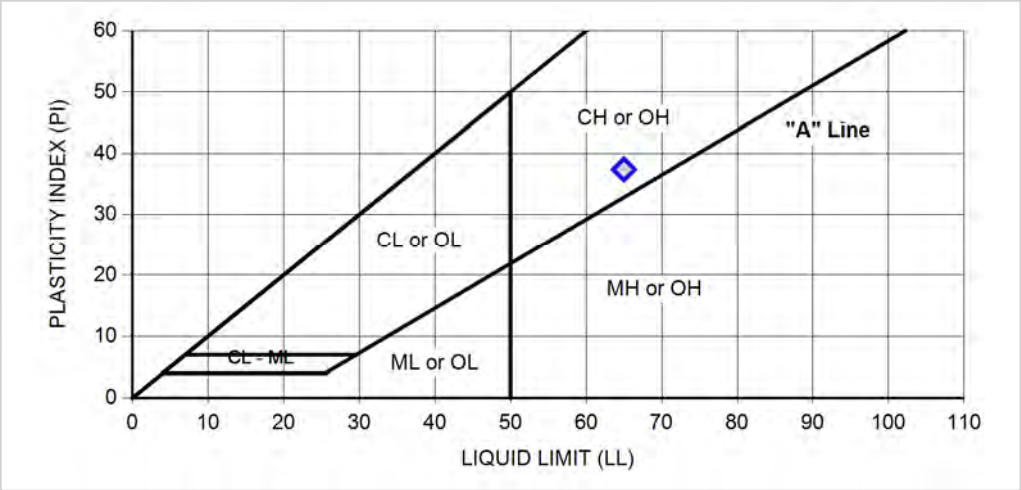
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PROJECT NO: **57-925**
PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA
REPORT NO: **2-0**

SAMPLE ID: **4**
SAMPLE SOURCE: LAN-CL-BS4
SAMPLE DESCRIPTION: CH
NOTES:

DATE RECEIVED: 2023-05-18
DATE TESTED: 2023-05-19
TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
27	65.36	55.12	39.20	64.90
27	57.55	50.27	39.00	65.20

AVG. LIQUID LIMIT (LL)

65

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
44.05	42.87	38.60	27.60
45.87	44.40	39.07	27.60

AVG. PLASTIC LIMIT (PL)

28

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

37

Approved: Jeff Roberts

HYDRAULIC CONDUCTIVITY TEST REPORT

ASTM D5084

Project Name	IPL - Lansing, IA Pond Closure	***Project No.***	57-925
Client Name	SCS Engineers	***Date Received***	05/17
Client Address	2830 Dairy Drive	***Date Tested***	05/26
	Madison, WI 53718	***Date Issued***	06/13
Boring No.			
Sample Type	Remolded		
Sample Location	LAN-CL-BS4		
Sample Description	Lean-Fat Clay red-brown		

	Before	***After*****	***Units***
Moisture Content, w	25.8	33.9	*%*
Dry Unit Weight, Dd	92.5	85.9	*pcf*
Height, L	4.09	4.01	*inches*
Diameter, d	2.86	2.86	*inches*
Degree of Saturation, Sr	89.0	99.2	*%*

Chamber Pressure:	70.0	**psi**
Applied Pressure (influent):	67.0	**psi**
Applied Pressure (effluent):	64.0	**psi**
Consolidation Pressure:	3.0	**psi**

Test Number		***Temp. Deg. C***	***Time (sec)***	***Influent Reading***	***Effluent Reading***	***Hydraulic Conductivity (cm/sec) @ Test Temp.***	***Hydraulic Conductivity (cm/sec) @ 20° C***	***Hydraulic Gradient h/L***
1	Start	20.0	0	0.00	25.00			
	Finish	20.0	344700	3.40	21.80	1.05E-08	1.0E-08	22.12
2	Start	20.0	344700	3.40	21.80			
	Finish	20.0	620100	6.50	18.90	1.23E-08	1.2E-08	21.53
3	Start	20.0	620100	6.50	18.90			
	Finish	20.0	1039500	10.20	15.00	1.05E-08	1.1E-08	20.78
4	Start	20.0	1039500	10.20	15.00			
	Finish	20.0	1468500	16.00	9.50	1.60E-08	1.6E-08	19.66

Average Hydraulic Conductivity "k" (cm/sec) @ Test Temp. 1.2E-08

Average Hydraulic Conductivity "k" (cm/sec) @ 20° C **1.2E-08**

Assumed Specific Gravity, SG 2.6

Area of Tube (cm^2), a (Pipette) 0.9900

Permeant : Deaired Tap Water

Formulas:

Permeability (Falling Head-Rising Tailwater Test)

$k = [(a*L/(2*A*t)] \ln(ho/h1)$

k = Hydraulic Conductivity (cm/sec)

a = Area of Tube (cm^2)

L = Height or Length of Sample (cm)

A = Area of Sample (cm^2)

t = Time of Test Interval (sec)

h_o = Height of Head at Start of Test Interval (cm)

h_1 = Height of Head at End of Test Interval (cm)

Degree of Saturation

Sr = w*SG/e Dd = (SG/1+e)Dw

Therefore:

Sr = (w*SG)/((SG*Dw/Dd)-1)

Sr = Degree of Saturation (%)

w = Moisture Content (%)

SG = Specific Gravity

e = Void Ratio

Dd =Dry Unit Weight (pcf)

Dw = Unit Weight of Water (62.4 pcf)

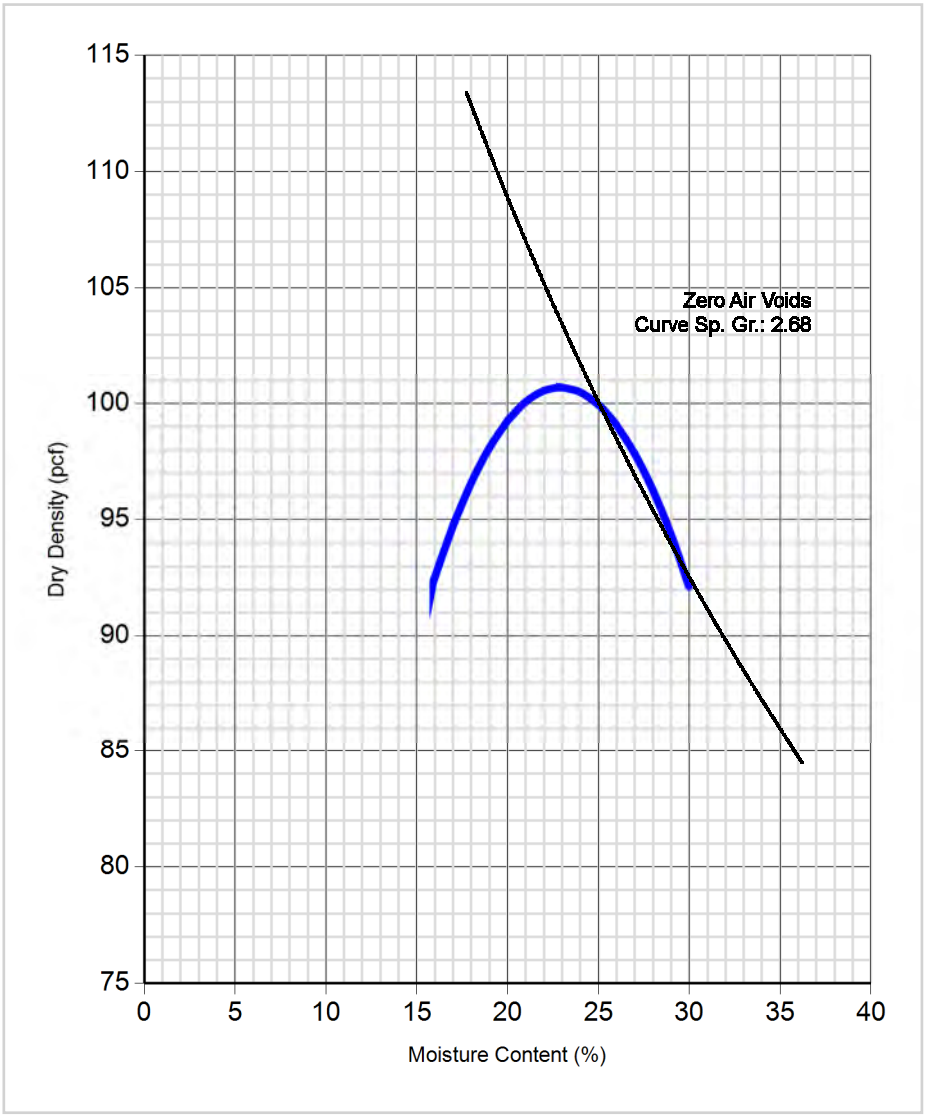
MOISTURE - DENSITY RELATIONSHIP REPORT

(Proctor Test)

ASTM D 1557-12 Method A Modified

LOW PERM/SELECT - RED CLAY

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA



PROJECT NO: 57-925

REPORT NO: 2-0

PROCTOR ID:	4

DATE RECEIVED: 05/15/2023

DATE TESTED: 05/17/2023

TESTED BY: NG

TEST RESULTS

MAXIMUM DRY DENSITY (pcf)
100.7

OPTIMUM MOISTURE (%)
22.9

Prep Method:: Moist

Rammer Type: Manual

Proctor points available upon request.

SOURCE: LAN-CL-BS4

SAMPLE DESCRIPTION:	Lean - Fat CLAY red-brown

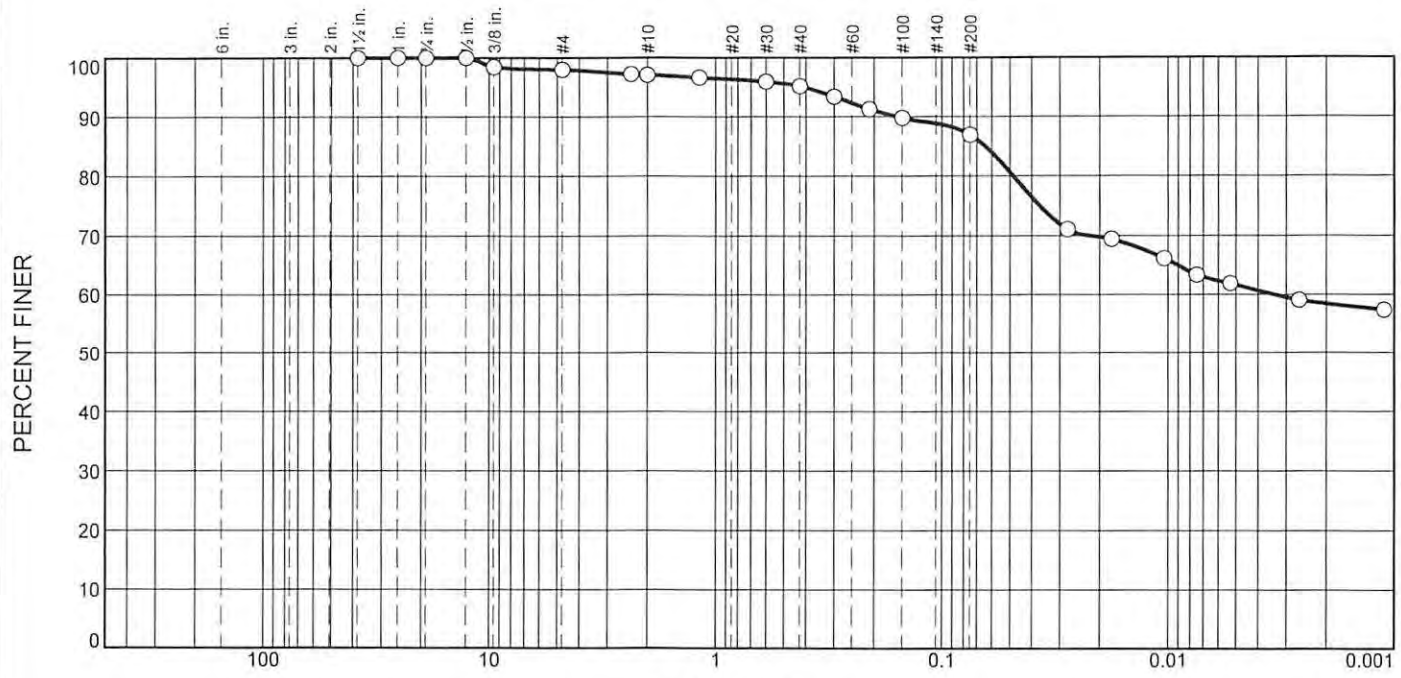
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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.0	0.9	1.9	8.3	28.5	58.4

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	98.4		
#4	98.0		
#8	97.2		
#10	97.1		
#16	96.6		
#30	95.9		
#40	95.2		
#50	93.4		
#70	91.3		
#100	89.8		
#200	86.9		
0.0278 mm.	71.1		
0.0177 mm.	69.4		
0.0104 mm.	66.2		
0.0075 mm.	63.3		
0.0053 mm.	61.9		
0.0026 mm.	59.1		
0.0011 mm.	57.4		

* (no specification provided)

Material Description

CH reddish brown

Sieve Test (ASTM D6913)

Test Date: 5/19/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 5/19/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 28 LL= 65 PI= 37

Coefficients

D_{90}= 0.1580 D_{85}= 0.0644

D_{60}= 0.0034 D_{50}=

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: _____

Date Received: _____

Checked By: _____

Title: _____

Location: LAN-CL-BS4

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers
Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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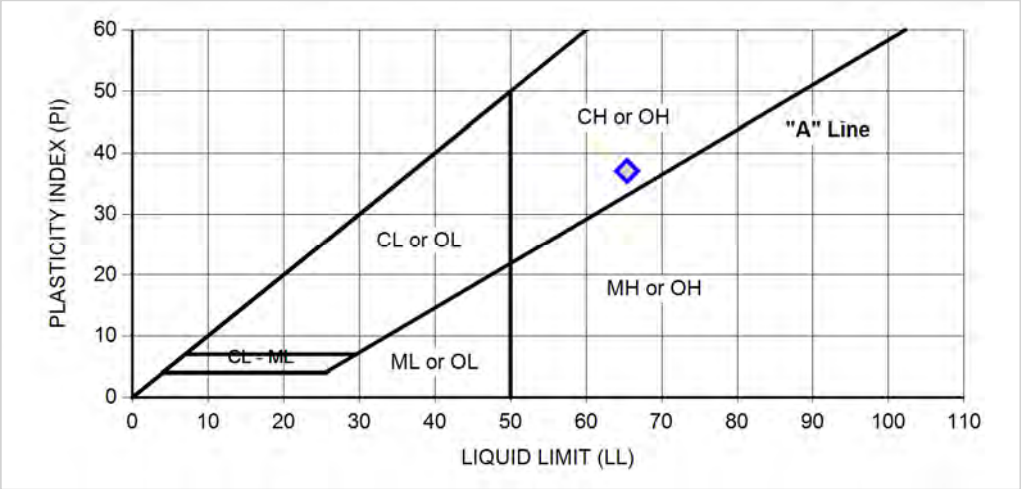
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PROJECT NO: 57-925
PROJECT: IPL - Lansing Pond Closure
Lansing, IA
REPORT NO: 2-0

SAMPLE ID: 5
SAMPLE SOURCE: LAN-CL-BS5
SAMPLE DESCRIPTION: CH
NOTES:

DATE RECEIVED: 2023-05-18
DATE TESTED: 2023-05-19
TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
30	102.82	95.40	83.81	65.40
30	104.79	96.69	84.01	65.30

AVG. LIQUID LIMIT (LL)

65

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
46.50	45.28	41.00	28.50
121.59	119.60	112.52	28.10

AVG. PLASTIC LIMIT (PL)

28

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

37

Approved: Jeff Roberts

HYDRAULIC CONDUCTIVITY TEST REPORT

ASTM D5084

Project Name	IPL - Lansing, IA Pond Closure	***Project No.***	57-925
Client Name	SCS Engineers	***Date Received***	05/17
Client Address	2830 Dairy Drive	***Date Tested***	05/26
	Madison, WI 53718	***Date Issued***	06/13
Boring No.			
Sample Type	Remolded		
Sample Location	LAN-CL-BS5		
Sample Description	Lean-Fat Clay red-brown		

	Before	*After***	*Units*
Moisture Content, w	23.3	35.6	*%*
Dry Unit Weight, Dd	92.8	84.0	*pcf*
Height, L	4.00	3.98	*inches*
Diameter, d	2.86	2.86	*inches*
Degree of Saturation, Sr	81.0	99.4	*%*

Chamber Pressure:	70.0	**psi**
Applied Pressure (influent):	67.0	**psi**
Applied Pressure (effluent):	64.0	**psi**
Consolidation Pressure:	3.0	**psi**

Test Number		*Temp. Deg. C*	*Time (sec)*	*Influent Reading*	*Effluent Reading*	*Hydraulic Conductivity (cm/sec) @ Test Temp.*	*Hydraulic Conductivity (cm/sec) @ 20° C*	*Hydraulic Gradient h/L*
1	Start	20.0	0	0.00	25.00			
	Finish	20.0	345000	3.00	22.20	8.98E-09	9.0E-09	22.70
2	Start	20.0	345000	3.00	22.20			
	Finish	20.0	620100	6.10	19.20	1.22E-08	1.2E-08	22.08
3	Start	20.0	620100	6.10	19.20			
	Finish	20.0	1039500	9.60	15.80	9.29E-09	9.3E-09	21.39
4	Start	20.0	1039500	9.60	15.80			
	Finish	20.0	1468500	11.90	13.00	6.91E-09	6.9E-09	20.87

Average Hydraulic Conductivity "k" (cm/sec) @ Test Temp. 9.3E-09

Average Hydraulic Conductivity "k" (cm/sec) @ 20° C **9.3E-09**

Assumed Specific Gravity, SG 2.6

Area of Tube (cm^2), a (Pipette) 0.9900

Permeant : Deaired Tap Water

Formulas:

Permeability (Falling Head-Rising Tailwater Test)

$k = [(a*L/(2*A*t)] \ln(ho/h1)$

k = Hydraulic Conductivity (cm/sec)

a = Area of Tube (cm^2)

L = Height or Length of Sample (cm)

A = Area of Sample (cm^2)

t = Time of Test Interval (sec)

h_o = Height of Head at Start of Test Interval (cm)

h_1 = Height of Head at End of Test Interval (cm)

Degree of Saturation

Sr = w*SG/e Dd = (SG/1+e)Dw

Therefore:

Sr = (w*SG)/((SG*Dw/Dd)-1)

Sr = Degree of Saturation (%)

w = Moisture Content (%)

SG = Specific Gravity

e = Void Ratio

Dd =Dry Unit Weight (pcf)

Dw = Unit Weight of Water (62.4 pcf)

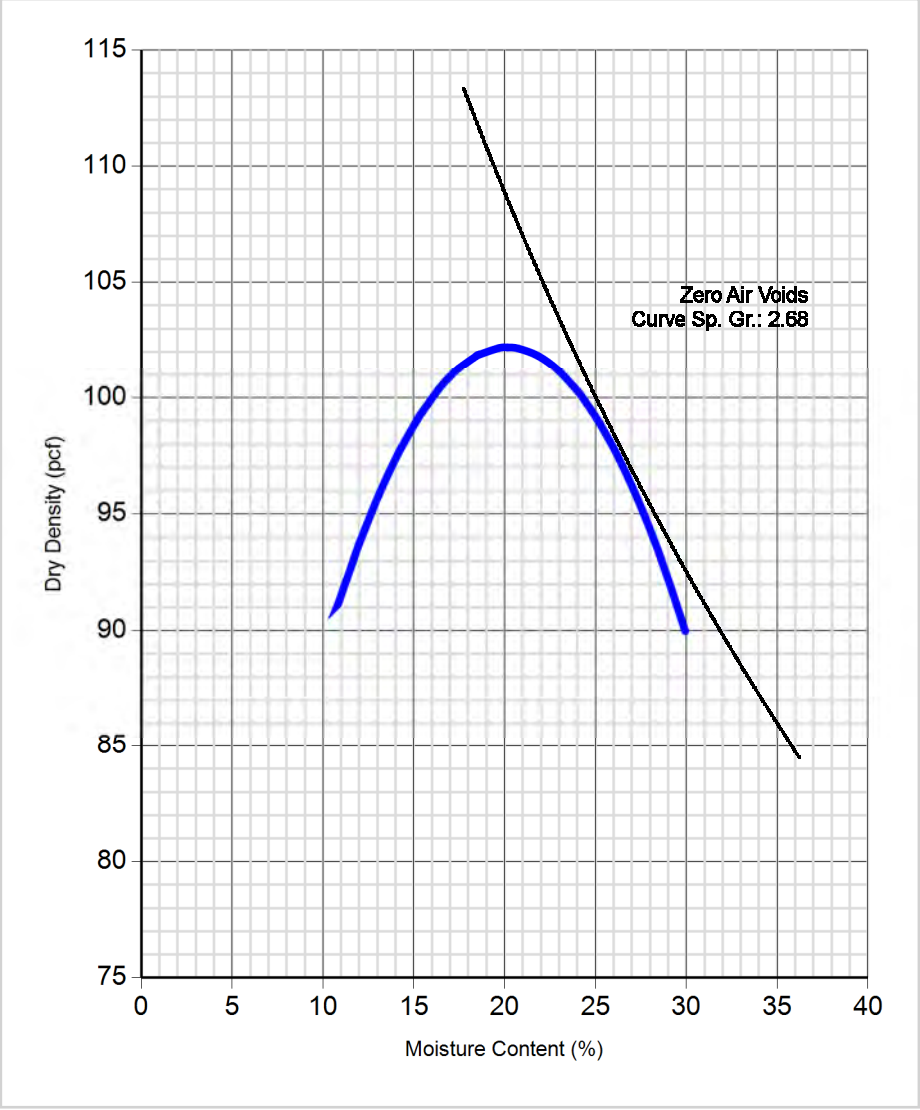
MOISTURE - DENSITY RELATIONSHIP REPORT

(Proctor Test)

ASTM D 1557-12 Method A Modified

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

LOW PERM/SELECT - RED CLAY



PROJECT NO: 57-925

REPORT NO: 2-0

PROCTOR ID:	5

DATE RECEIVED: 05/15/2023

DATE TESTED: 05/16/2023

TESTED BY: NG

TEST RESULTS

MAXIMUM DRY DENSITY (pcf)
102.2

OPTIMUM MOISTURE (%)
20.1

Prep Method:: Moist

Rammer Type: Manual

Proctor points available upon request.

SOURCE: LAN-CL-BS5

SAMPLE DESCRIPTION:	Lean - Fat CLAY red-brown

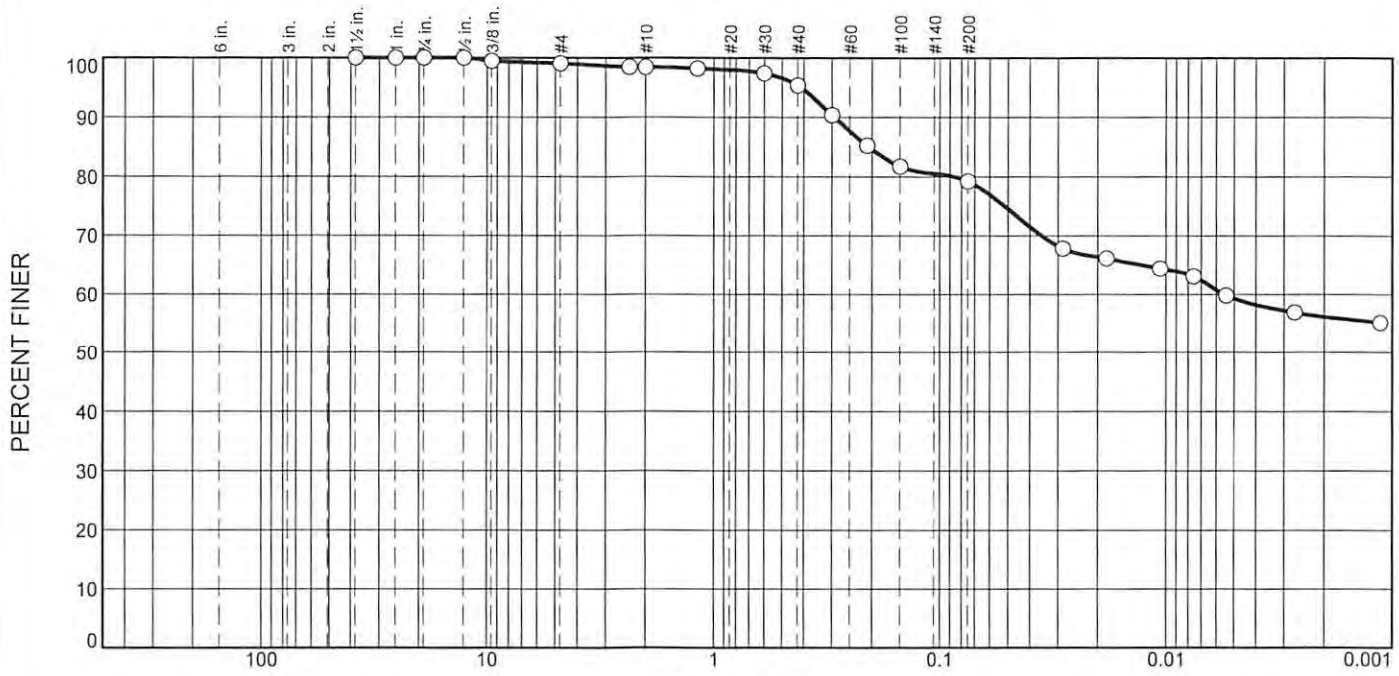
Notes/Remarks:

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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.9	0.7	3.0	16.1	23.1	56.2

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	99.5		
#4	99.1		
#8	98.5		
#10	98.4		
#16	98.2		
#30	97.4		
#40	95.4		
#50	90.4		
#70	85.3		
#100	81.8		
#200	79.3		
0.0287 mm.	67.8		
0.0183 mm.	66.1		
0.0106 mm.	64.4		
0.0076 mm.	63.1		
0.0054 mm.	59.8		
0.0027 mm.	56.9		
0.0011 mm.	55.1		

· (no specification provided)

Material Description

CH reddish brown

Sieve Test (ASTM D6913)

Test Date: 5/19/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 5/19/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 28 LL= 65 PI= 37

Coefficients

D_{90}= 0.2924 D_{85}= 0.2053

D_{60}= 0.0055 D_{50}=

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: _____

Date Received: _____

Checked By: _____

Title: _____

Location: LAN-CL-BS5

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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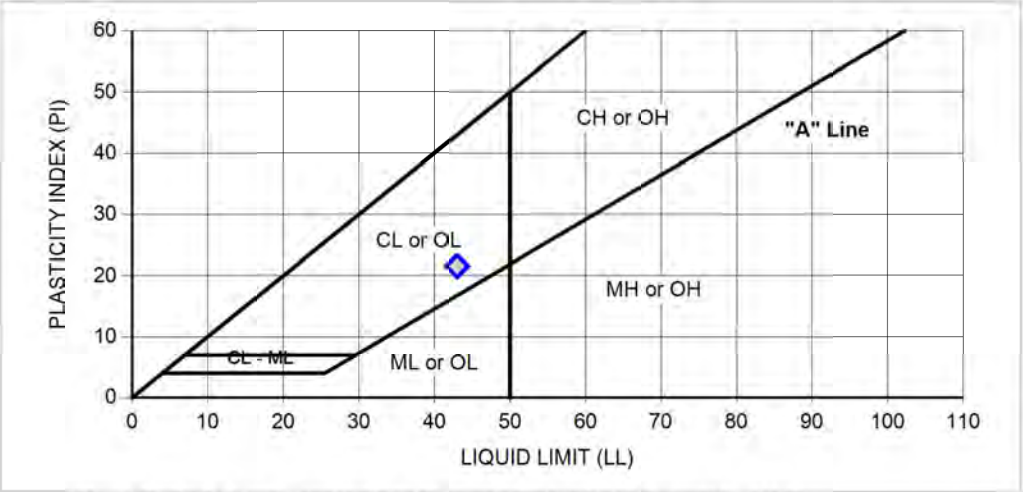
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PROJECT NO: 57-925
PROJECT: IPL - Lansing Pond Closure
Lansing, IA
REPORT NO: 3-0

SAMPLE ID: 7
SAMPLE SOURCE: LAN-CL-BS7
SAMPLE DESCRIPTION: CL
NOTES:

DATE RECEIVED: 2023-06-20
DATE TESTED: 2023-06-26
TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
23	39.01	30.75	11.78	43.10
23	38.31	31.00	14.15	42.90

AVG. LIQUID LIMIT (LL)
43

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
20.58	19.09	12.09	21.30
23.54	21.71	13.20	21.50

AVG. PLASTIC LIMIT (PL)
21

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)
22

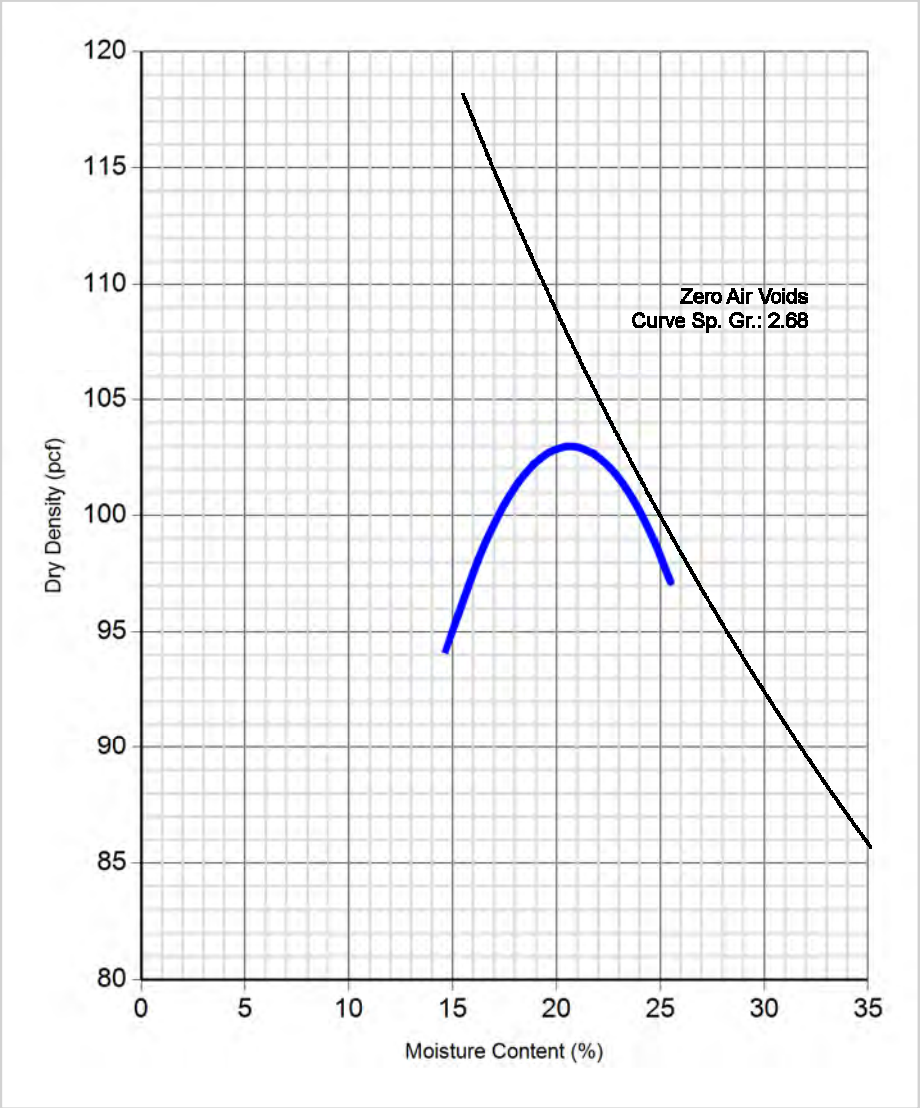
Approved: Jeff Roberts

MOISTURE - DENSITY RELATIONSHIP REPORT

(Proctor Test)

ASTM D 1557-12 Method A Modified

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA



PROJECT NO: 57-925

REPORT NO: 4-0

PROCTOR ID:	7

DATE RECEIVED: 06/19/2023

DATE TESTED: 06/20/2023

TESTED BY: JR

TEST RESULTS

MAXIMUM DRY DENSITY (pcf)
103.0

OPTIMUM MOISTURE (%)
20.7

Prep Method:: Moist

Rammer Type: Mechanical

Proctor points available upon request.

SOURCE: LAN-CL-BS7

SAMPLE DESCRIPTION:	Lean CLAY, medium orange brown

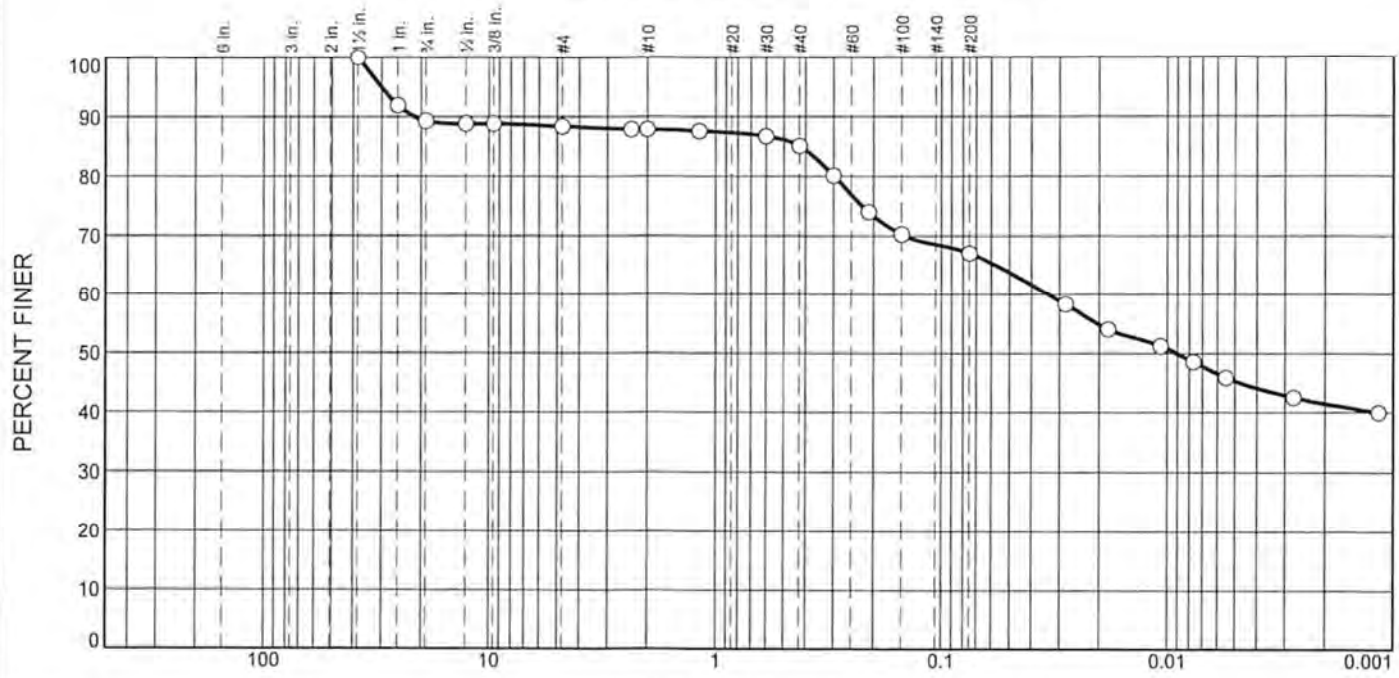
Notes/Remarks:

APPROVED: *Jeff Roberts*

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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	10.7	0.9	0.5	2.7	18.1	25.7	41.4

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	91.9		
3/4"	89.3		
1/2"	88.9		
3/8"	88.9		
#4	88.4		
#8	88.0		
#10	87.9		
#16	87.6		
#30	86.8		
#40	85.2		
#50	80.1		
#70	74.0		
#100	70.2		
#200	67.1		
0.0282 mm.	58.3		
0.0183 mm.	54.0		
0.0107 mm.	51.2		
0.0077 mm.	48.6		
0.0055 mm.	45.9		
0.0027 mm.	42.5		
0.0012 mm.	39.9		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 6/23/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 6/23/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 21 LL= 43 PI= 22

Coefficients

D_{90}= 21.4566 D_{85}= 0.4186

D_{60}= 0.0338 D_{50}= 0.0091

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/14/23

Date Received: 6/20/23

Checked By: JR

Title: LM

Location: LAN-CL-BS7

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **4-0**

SAMPLE ID: **10**

SAMPLE SOURCE: LAN-CL-BS8

SAMPLE DESCRIPTION: CL

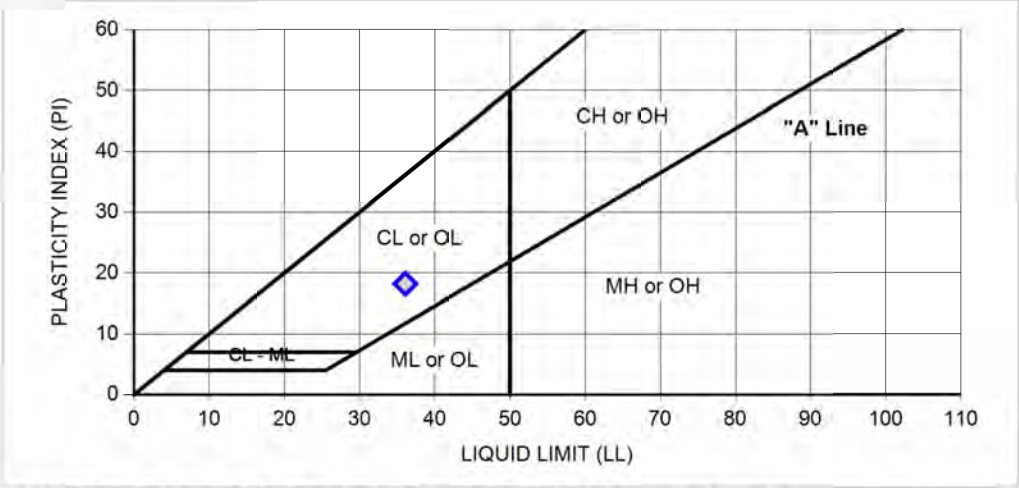
NOTES:

DATE RECEIVED: 2023-06-24

DATE TESTED: 2023-07-05

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
25	64.06	57.40	39.02	36.20
25	60.39	54.78	39.20	36.00

AVG. LIQUID LIMIT (LL)

36

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
47.63	46.26	38.62	17.90
48.24	46.85	39.07	17.90

AVG. PLASTIC LIMIT (PL)

18

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

18

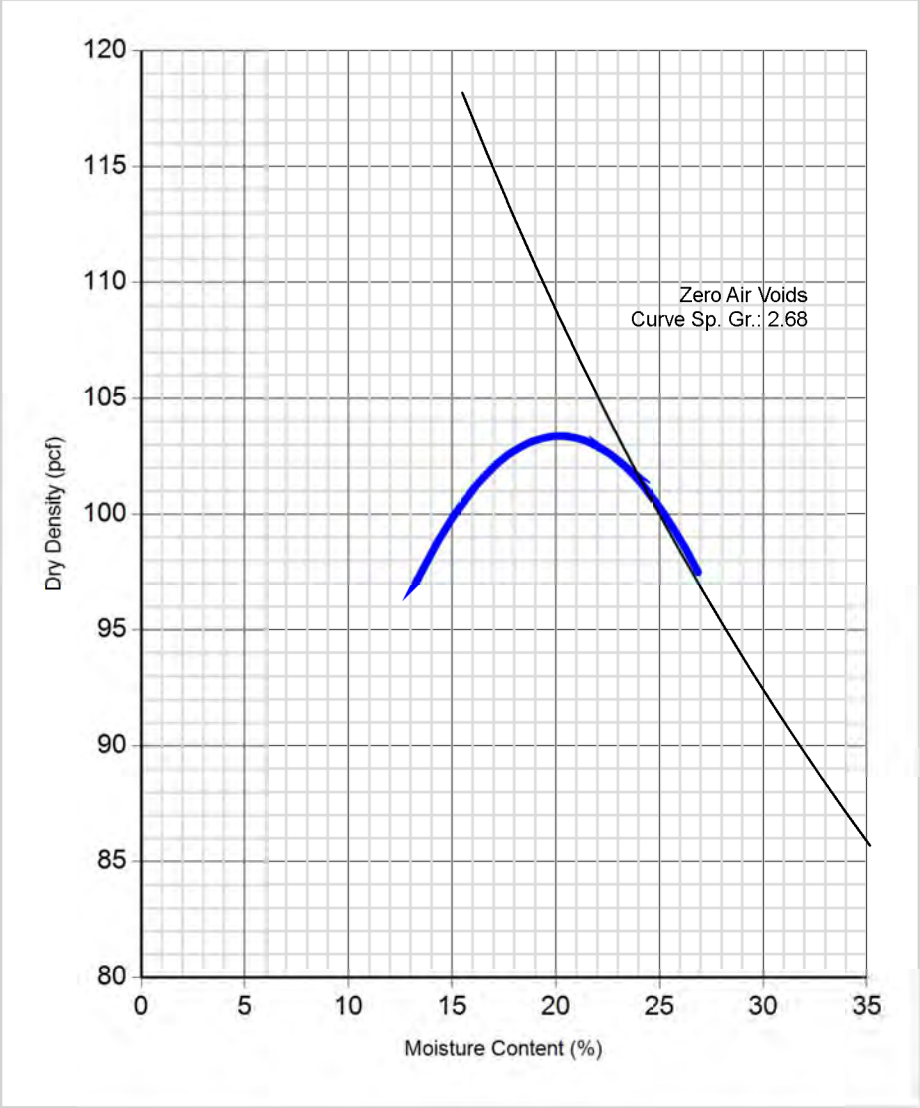
Approved: Jeff Roberts

MOISTURE - DENSITY RELATIONSHIP REPORT

(Proctor Test)

ASTM D 1557-12 Method A Modified

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA



PROJECT NO: 57-925

REPORT NO: 5-0

PROCTOR ID:	10

DATE RECEIVED: 06/21/2023

DATE TESTED: 06/24/2023

TESTED BY: JR

TEST RESULTS

MAXIMUM DRY DENSITY (pcf)
103.4

OPTIMUM MOISTURE (%)
20.2

Prep Method:: Moist

Rammer Type: Mechanical

Proctor points available upon request.

SOURCE: LAN-CL-BS8

SAMPLE DESCRIPTION: Lean - Fat CLAY, with sand, with gravel, medium reddish brown

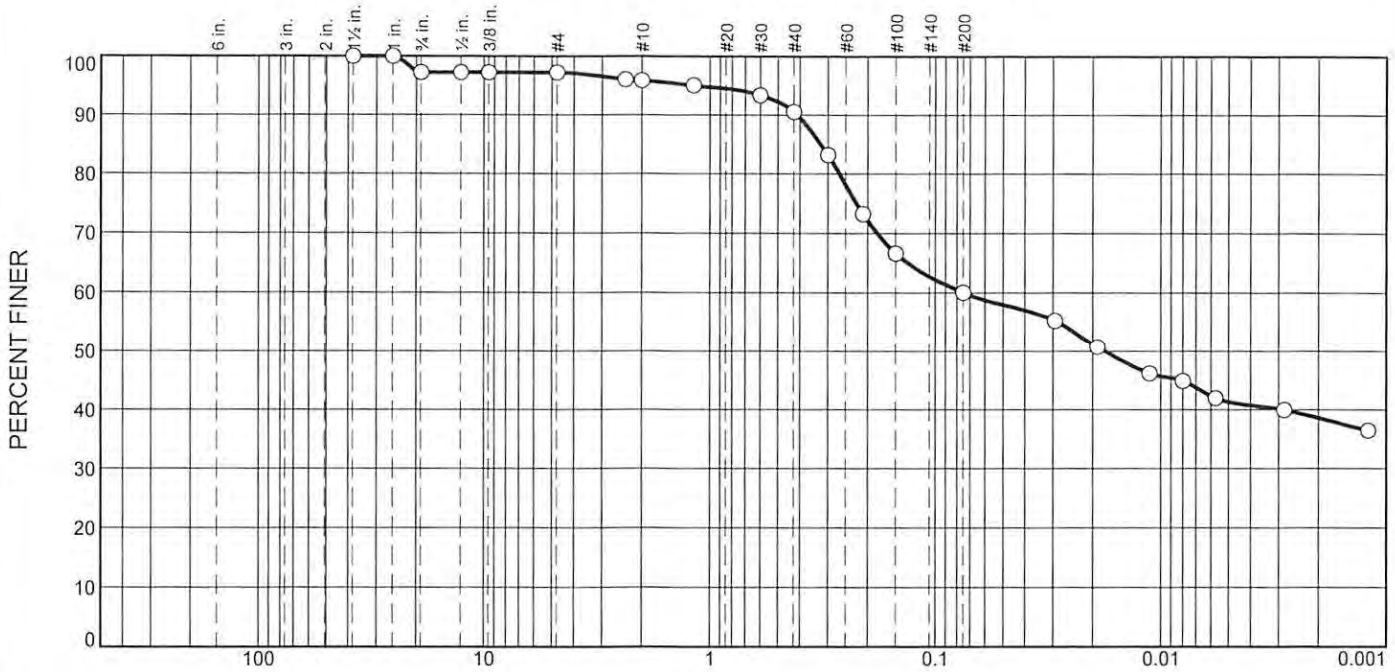
Notes/Remarks:

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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.8	0.0	1.3	5.4	30.4	21.5	38.6

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	97.2		
1/2"	97.2		
3/8"	97.2		
#4	97.2		
#8	96.1		
#10	95.9		
#16	95.0		
#30	93.4		
#40	90.5		
#50	83.2		
#70	73.3		
#100	66.6		
#200	60.1		
0.0295 mm.	55.3		
0.0190 mm.	50.8		
0.0112 mm.	46.2		
0.0080 mm.	44.9		
0.0057 mm.	42.0		
0.0028 mm.	40.0		
0.0012 mm.	36.5		

· (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/3/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/3/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 18 LL= 36 PI= 18

Coefficients

D_{90}= 0.4103 D_{85}= 0.3230

D_{60}= 0.0745 D_{50}= 0.0176

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/21/23

Date Received: 6/24/23

Checked By: MM

Title: LM

Location: LAN-CL-BS8

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **5-0**

SAMPLE ID: **18**

SAMPLE SOURCE: ADL-T1-1(K)

SAMPLE DESCRIPTION: CH

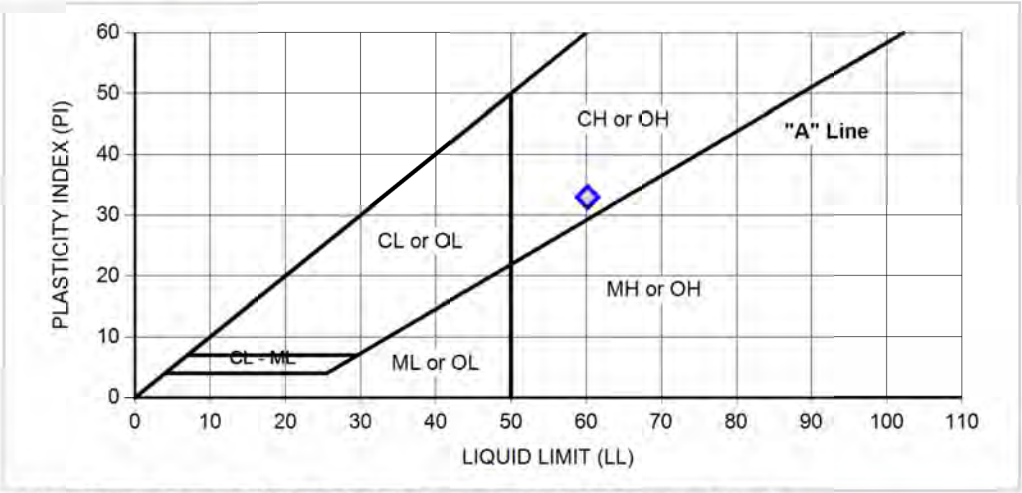
NOTES:

DATE RECEIVED: 2023-07-07

DATE TESTED: 2023-07-14

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
30	35.74	27.04	12.26	60.20
30	37.22	28.78	14.45	60.20

AVG. LIQUID LIMIT (LL)

60

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
22.10	20.34	13.88	27.20
22.65	20.82	14.07	27.10

AVG. PLASTIC LIMIT (PL)

27

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

33

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No: 57-925 **Project:** IPL - Lansing Pond Closure
Date: 6/29/2023 **Sample ID:** ADL-T1-1(K)
Tech: NG **Location:**
Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

41.1	**Weight Dish (g)**
107.9	**Weight Specimen Wet + Dish (g)**
92	**Weight Specimen Dried + Dish (g)**
31.2%	**Moisture Content (% of Dry Weight)**

Dry Density (Unit Weight)

ASTM D2263-09

2.856	2.846	2.853	2.875	**Specimen Diameter (in)**
5.668	5.669		6.04	**Specimen Height (in)**
			1175.8	**Weight Specimen Wet (g)**
			114.2	**Wet Density (pcf)**
			87.0	**Dry Density (pcf)**

Checked: JR

PERMEABILITY TEST RESULTS
Falling Head

Project Name: IPL - Lansing Pond Closure
Project No.: 57-925
Sample: ADL-T1-1(K) **Date Received:** 7/7/2023
Sample Location:
Test Started: 7/10/2023 **Test Competed:** 7/18/2023
Test Procedure: ASTM D 5084 - 03 Falling Head Test (Method B)
Sample Description: CL trace coarse sand Reddish Brown

INITIAL SAMPLE DATA

Wet Weight (g)	1175.8
Non-cut Height (in)	6.04
Diameter (in)	2.875
Moisture Content (%)	31.2
Dry Unit Weight (pcf)	87.1

FINAL SAMPLE DATA

Wet Weight (g)	1044.6
Final Cut Height (in)	5.29
Diameter (in)	2.875
Moisture Content (%)	33.2
Dry Unit Weight (pcf)	87.0

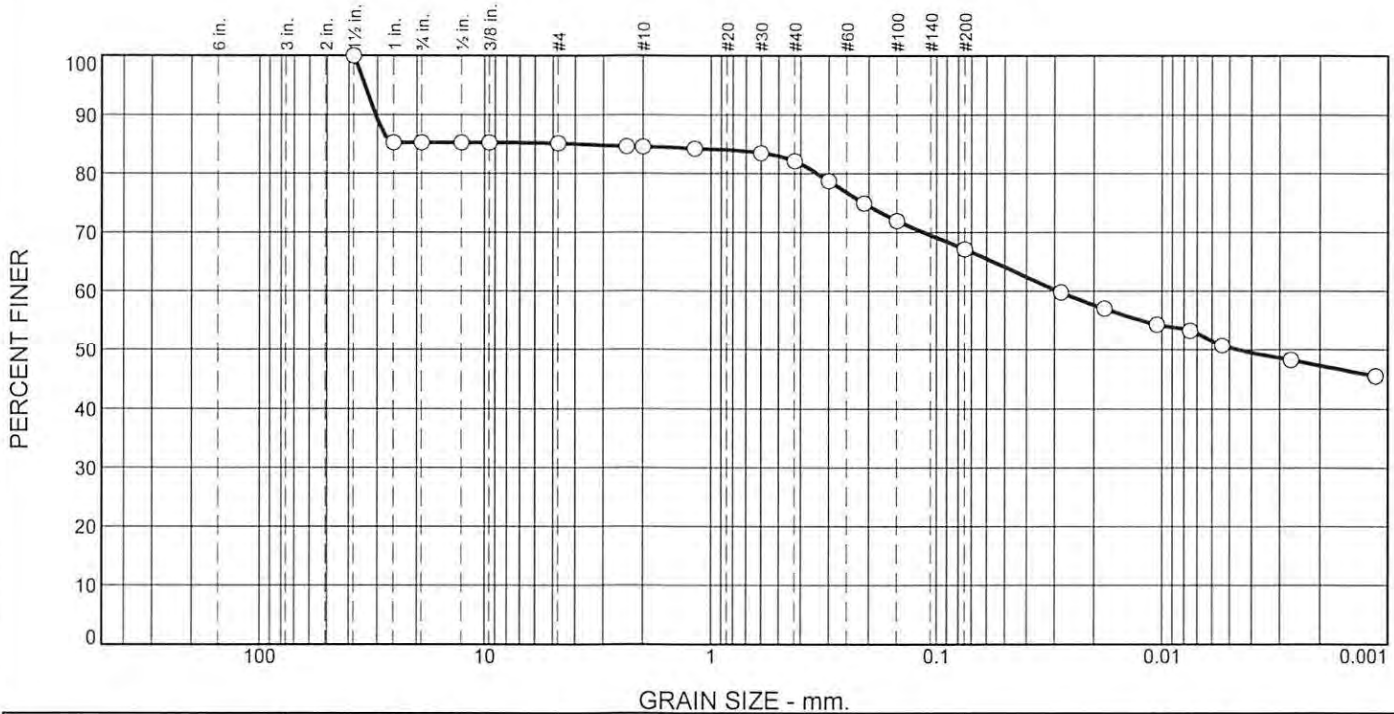
TEST DATA

Elapsed Time (hr)	Initial Head (in)	Final Head (in)	Coefficient of Permeability, k (cm/s)
20.00	133.65	131.40	3.9E-08
25.20	133.65	132.40	1.7E-08
23.63	133.65	132.77	1.3E-08
24.42	133.65	132.59	1.5E-08
71.58	133.65	130.52	1.5E-08
23.50	133.65	132.65	1.5E-08
Average of last	**3**	**readings**	**1.5E-08**

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Approved: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.7	0.1	0.6	2.5	15.0	19.8	47.3

Test Results (ASTM D6913 and D7928)			
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	85.3		
3/4"	85.3		
1/2"	85.3		
3/8"	85.3		
#4	85.2		
#8	84.6		
#10	84.6		
#16	84.3		
#30	83.5		
#40	82.1		
#50	78.7		
#70	74.9		
#100	72.0		
#200	67.1		
0.0280 mm.	59.7		
0.0180 mm.	57.0		
0.0105 mm.	54.3		
0.0075 mm.	53.3		
0.0054 mm.	50.7		
0.0027 mm.	48.2		
0.0011 mm.	45.5		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/12/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/12/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 27 LL= 60 PI= 33

Coefficients

D_{90}= 30.5481 D_{85}= 3.7704

D_{60}= 0.0290 D_{50}= 0.0046

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: 6/29/23

Date Received: 7/7/23

Checked By: MC

Title: LM

Location: ADL-T1-1(K)

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

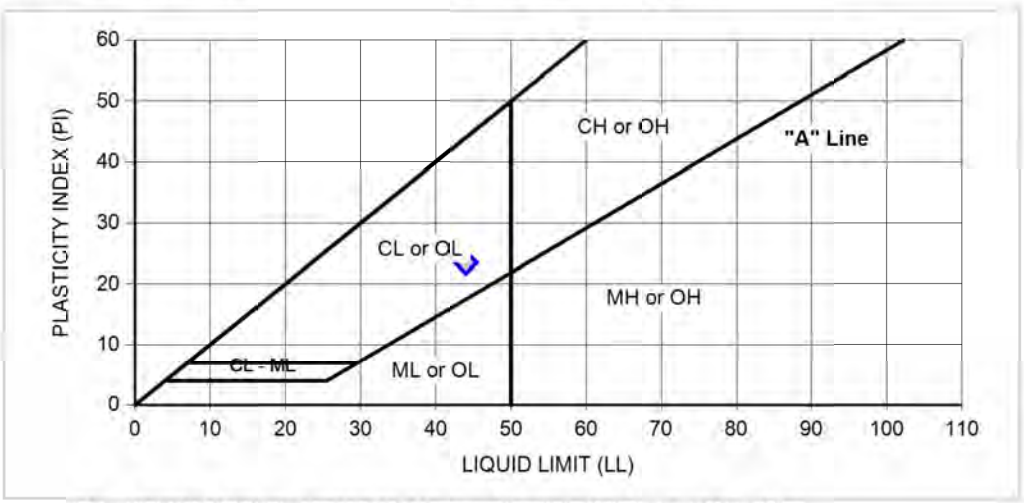
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PROJECT NO: **57-925**
PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA
REPORT NO: **5-0**

SAMPLE ID: **15**
SAMPLE SOURCE: ADL-T1-2
SAMPLE DESCRIPTION: CL
NOTES:

DATE RECEIVED: 2023-07-07
DATE TESTED: 2023-07-14
TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
27	37.69	29.92	12.19	44.20
27	37.77	30.72	14.48	43.80

AVG. LIQUID LIMIT (LL)

44

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
20.63	19.09	11.58	20.50
23.92	22.53	15.76	20.50

AVG. PLASTIC LIMIT (PL)

21

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

24

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No: 57-925 **Project:** IPL - Lansing Pond Closure
Date: 6/29/2023 **Sample ID:** ADL-T1-2
Tech: NG **Location:**
Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

26.8	**Weight Dish (g)**
168.6	**Weight Specimen Wet + Dish (g)**
145.1	**Weight Specimen Dried + Dish (g)**
19.9%	**Moisture Content (% of Dry Weight)**

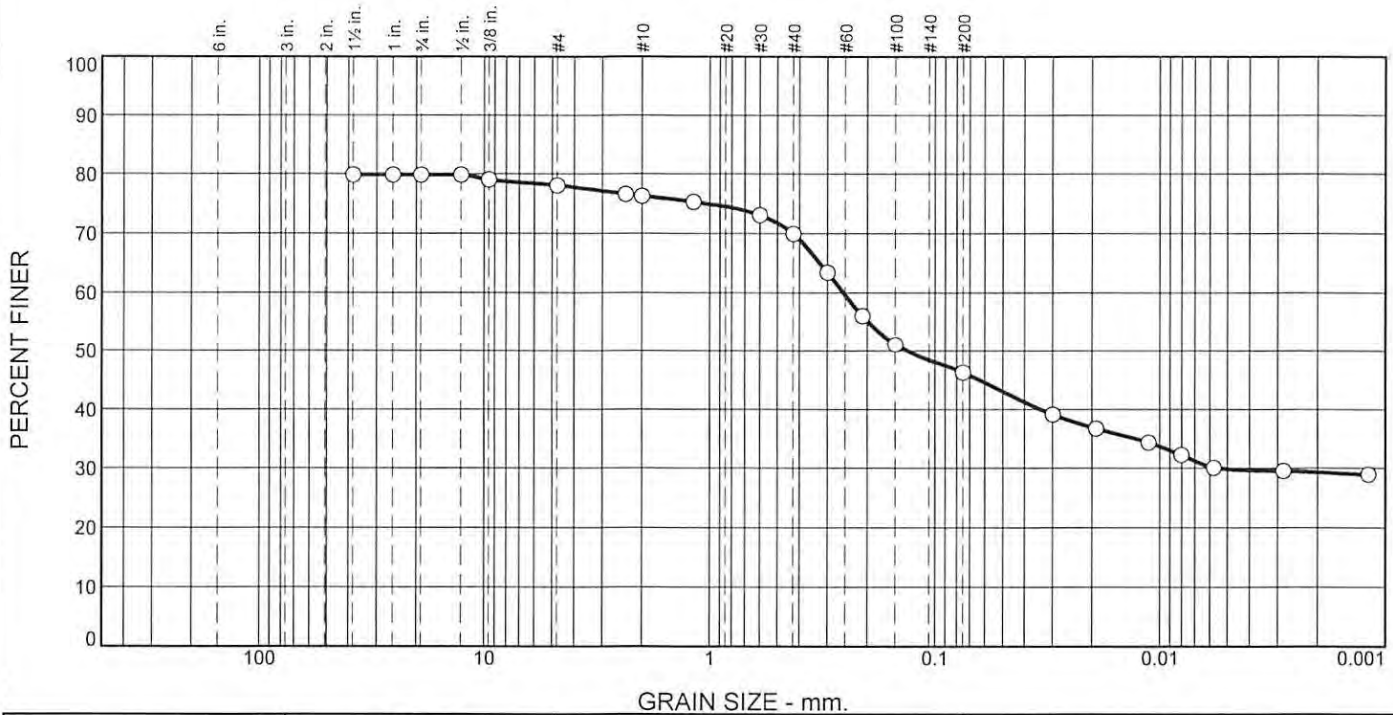
Dry Density (Unit Weight)

ASTM D2263-09

2.863	2.865	2.865	2.864	**Specimen Diameter (in)**
5.689	5.692		5.691	**Specimen Height (in)**
			1086.3	**Weight Specimen Wet (g)**
			112.9	**Wet Density (pcf)**
			94.2	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
		1.8	1.8	6.4	23.6	17.0	29.3

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	79.9		
1"	79.9		
3/4"	79.9		
1/2"	79.9		
3/8"	79.0		
#4	78.1		
#8	76.6		
#10	76.3		
#16	75.3		
#30	73.1		
#40	69.9		
#50	63.4		
#70	56.1		
#100	51.2		
#200	46.3		
0.0299 mm.	39.1		
0.0192 mm.	36.8		
0.0112 mm.	34.4		
0.0080 mm.	32.3		
0.0057 mm.	30.1		
0.0028 mm.	29.5		
0.0012 mm.	28.9		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/14/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/14/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 20 LL= 44 PI= 24

Coefficients

D_{90}= D_{85}=

D_{60}= 0.2551 D_{50}= 0.1329

D_{30}= 0.0055 D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

SC

Date Sampled: 6/29/23

Date Received: 7/7/23

Checked By: JC

Title: LM

Location: ADL-T1-2

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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Fax: 319-233-5434
www.teamservices.com
staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **7-0**

SAMPLE ID: **27**

SAMPLE SOURCE: ADL-T1-2R

SAMPLE DESCRIPTION: CL

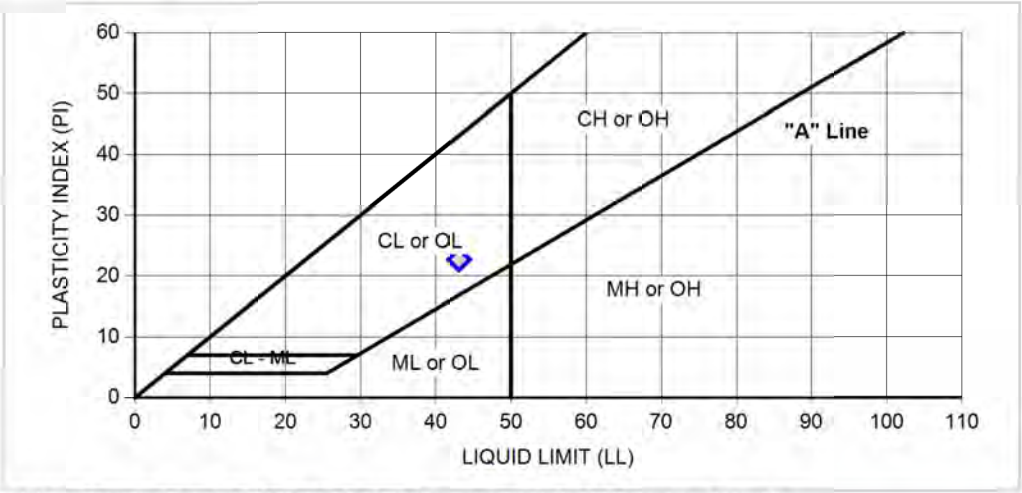
NOTES:

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool

DATE RECEIVED: 2023-07-21

DATE TESTED: 2023-07-27

TESTED BY: NG



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
27	36.69	29.16	11.48	43.00
27	35.13	29.23	15.45	43.20

AVG. LIQUID LIMIT (LL)

43

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
18.65	17.42	11.38	20.40
21.29	20.03	13.88	20.50

AVG. PLASTIC LIMIT (PL)

20

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

23

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No: 57-925 **Project:** IPL - Lansing Pond Closure
Date: 7/19/2023 **Sample ID:** ADL-T1-2R
Tech: NG **Location:**
Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

18.3	**Weight Dish (g)**
85.4	**Weight Specimen Wet + Dish (g)**
73	**Weight Specimen Dried + Dish (g)**
22.7%	**Moisture Content (% of Dry Weight)**

Dry Density (Unit Weight)

ASTM D2263-09

2.856	2.846	2.853	2.875	**Specimen Diameter (in)**
5.668	5.669		5.97	**Specimen Height (in)**
			1207.3	**Weight Specimen Wet (g)**
			118.7	**Wet Density (pcf)**
			96.7	**Dry Density (pcf)**

Checked: JR

PERMEABILITY TEST RESULTS
Falling Head

TEAM Services

Project Name: IPL-Lansing Pond Closure
Project No.: 57-925
Sample: ADL-T1-2R **Date Received:** 7/25/2023
Sample Location:
Test Started: 7/25/2023 **Test Competed:** 8/1/2023
Test Procedure: ASTM D 5084 - 03 Falling Head Test (Method B)
Sample Description: CL trace coarse sand Reddish Brown

INITIAL SAMPLE DATA

Wet Weight (g)	1207.3
Non-cut Height (in)	5.97
Diameter (in)	2.875
Moisture Content (%)	22.7
Dry Unit Weight (pcf)	96.8

FINAL SAMPLE DATA

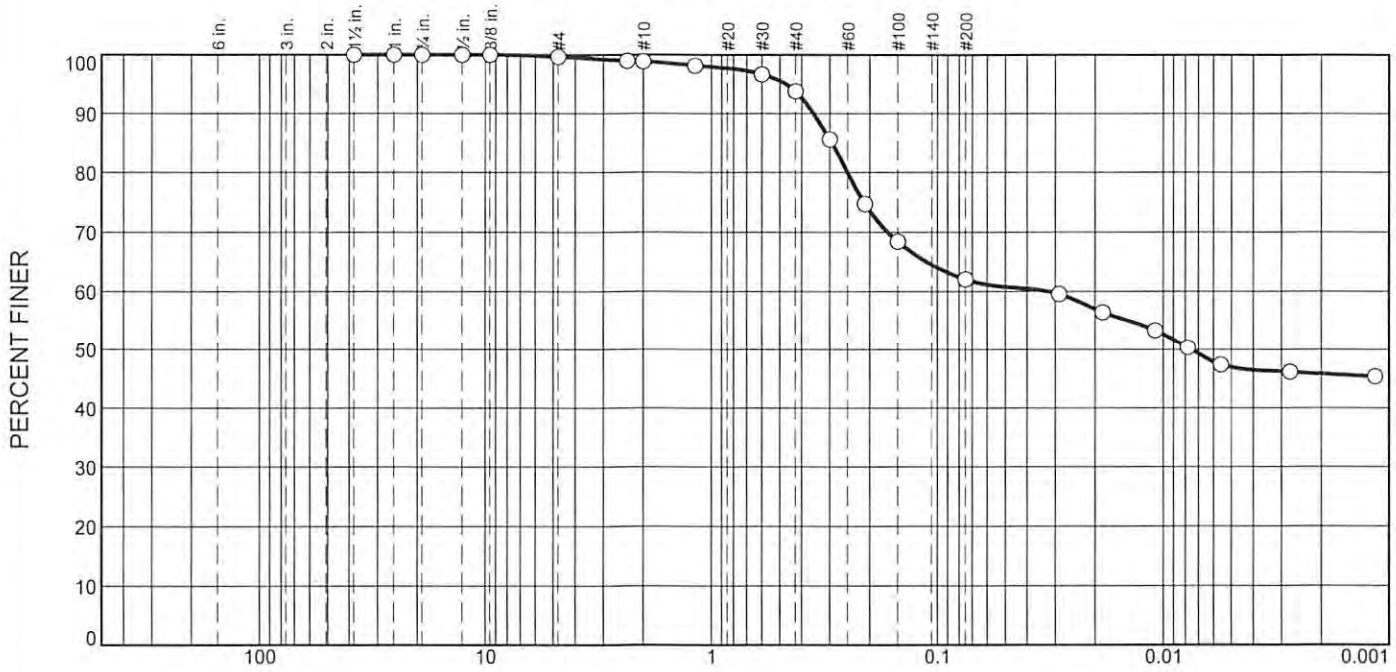
Wet Weight (g)	1087.2
Final Cut Height (in)	5.27
Diameter (in)	2.875
Moisture Content (%)	26.8
Dry Unit Weight (pcf)	95.5

TEST DATA

Elapsed Time (hr)	Initial Head (in)	Final Head (in)	Coefficient of Permeability, k (cm/s)
22.00	133.72	110.66	3.9E-07
24.67	133.72	124.72	1.3E-07
23.67	133.72	127.09	9.8E-08
23.17	133.72	128.22	8.3E-08
23.00	133.72	129.22	6.8E-08
25.42	133.72	128.72	6.8E-08
22.83	133.72	129.22	6.8E-08
Average of last	**3**	**readings**	**6.8E-08**

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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.8	5.1	31.8	16.2	45.8

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.7		
#8	99.0		
#10	98.9		
#16	98.2		
#30	96.7		
#40	93.8		
#50	85.6		
#70	74.7		
#100	68.4		
#200	62.0		
0.0289 mm.	59.6		
0.0185 mm.	56.5		
0.0108 mm.	53.4		
0.0078 mm.	50.4		
0.0056 mm.	47.4		
0.0027 mm.	46.2		
0.0012 mm.	45.4		

* (no specification provided)

Location: ADL-T1-2R

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/23/23 **Technician:** NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/23/23 **Technician:** NG

Test Notes

Atterberg (ASTM D4318)

PL= LL= PI=

Coefficients

D_{90}= 0.3540 D_{85}= 0.2933

D_{60}= 0.0321 D_{50}= 0.0075

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

Date Sampled: 7/19/23

Date Received: 7/21/23

Checked By: [illegible]

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

TEAM Services
ISO 9001 International Accredited Laboratory
Geotechnical and Construction Material Consultants

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Evansdale, IA 50707
Phone: 319-233-5344
Fax: 319-233-5434
www.teamservices.com
staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **5-0**

SAMPLE ID: **21**

SAMPLE SOURCE: ADL-T1-3(K)

SAMPLE DESCRIPTION: CH

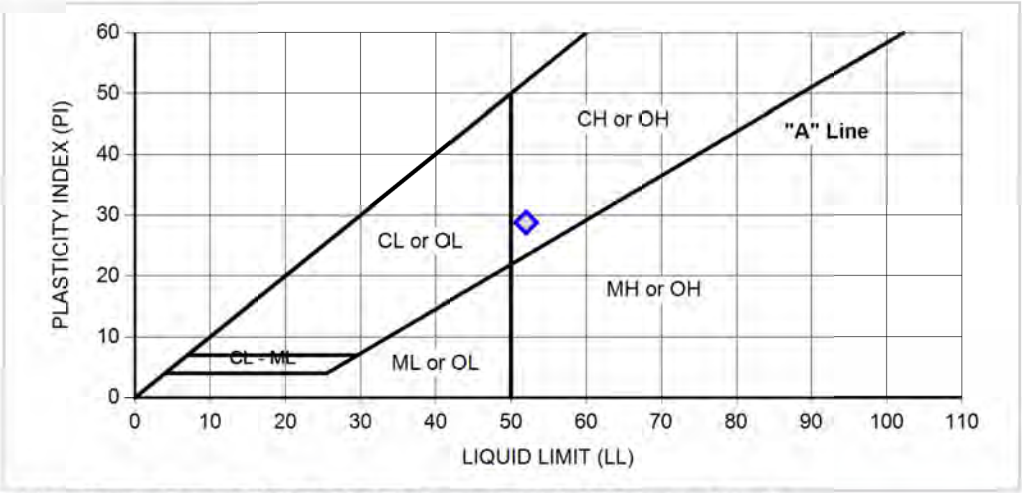
NOTES:

DATE RECEIVED: 2023-07-07

DATE TESTED: 2023-07-14

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
28	34.97	27.81	13.85	52.00
28	33.08	26.60	13.93	51.90

AVG. LIQUID LIMIT (LL)

52

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
19.08	17.65	11.49	23.20
22.63	21.17	14.88	23.20

AVG. PLASTIC LIMIT (PL)

23

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

29

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No: 57-925 **Project:** IPL - Lansing Pond Closure
Date: 6/28/2023 **Sample ID:** ADL-T1-3(K)
Tech: NG **Location:**
Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

109.0	**Weight Dish (g)**
197.6	**Weight Specimen Wet + Dish (g)**
182.5	**Weight Specimen Dried + Dish (g)**
20.5%	**Moisture Content (% of Dry Weight)**

Dry Density (Unit Weight)

ASTM D2263-09

2.856	2.846	2.853	2.875	**Specimen Diameter (in)**
5.668	5.669		6.09	**Specimen Height (in)**
			1194.7	**Weight Specimen Wet (g)**
			115.1	**Wet Density (pcf)**
			95.5	**Dry Density (pcf)**

Checked: JR

PERMEABILITY TEST RESULTS
Falling Head

Project Name: IPL - Lansing Pond Closure
Project No.: 57-925
Sample: ADL-T1-3(K) **Date Received:** 7/7/2023
Sample Location:
Test Started: 7/10/2023 **Test Competed:**
Test Procedure: ASTM D 5084 - 03 Falling Head Test (Method B)
Sample Description: CL trace coarse sand Reddish Brown

INITIAL SAMPLE DATA

Wet Weight (g)	1194.7
Non-cut Height (in)	6.09
Diameter (in)	2.875
Moisture Content (%)	20.5
Dry Unit Weight (pcf)	95.6

FINAL SAMPLE DATA

Wet Weight (g)	1122.7
Final Cut Height (in)	5.59
Diameter (in)	2.875
Moisture Content (%)	23.7
Dry Unit Weight (pcf)	95.3

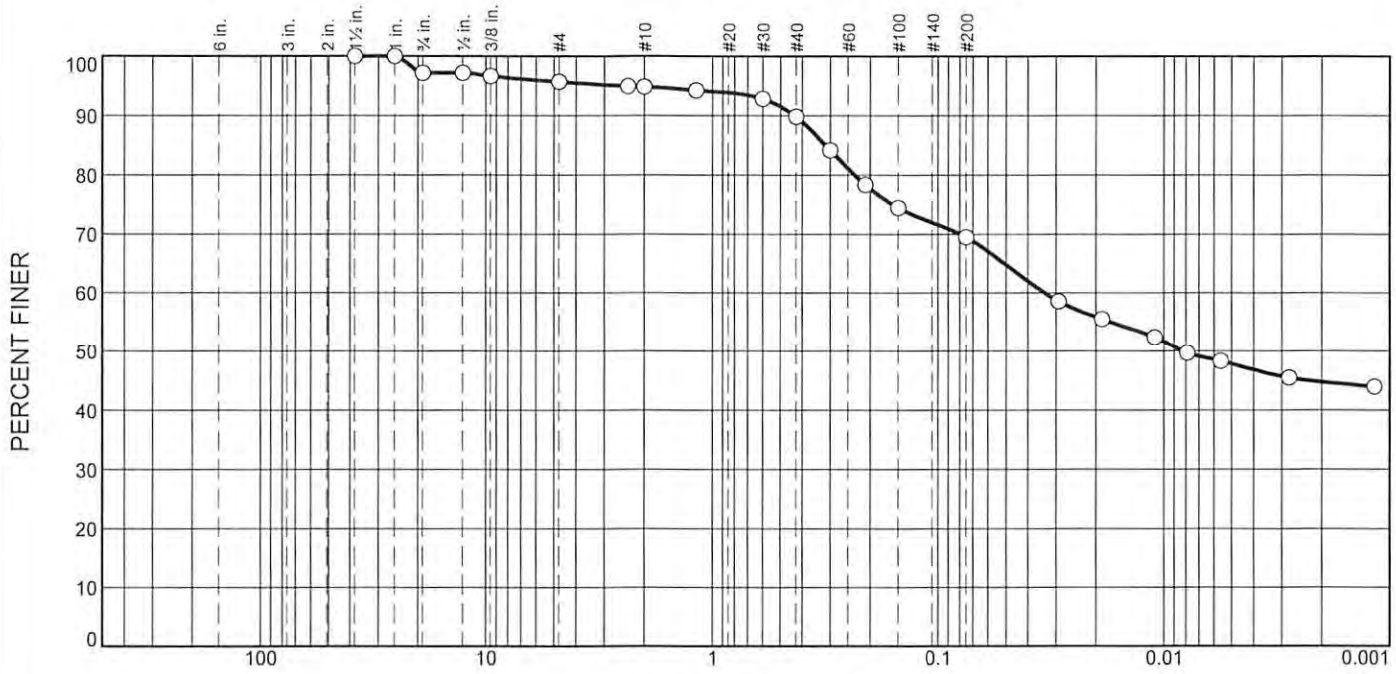
TEST DATA

Elapsed Time (hr)	Initial Head (in)	Final Head (in)	Coefficient of Permeability, k (cm/s)
20.00	133.60	125.10	1.5E-07
25.20	133.60	132.85	1.0E-08
23.63	133.60	133.23	5.5E-09
24.42	133.60	133.23	5.4E-09
71.58	133.60	128.48	2.5E-08
23.50	133.60	131.48	3.2E-08
Average of last	**6**	**readings**	**1.7E-08**

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Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	2.8	1.5	0.9	5.0	20.3	24.7	44.8

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	97.2		
1/2"	97.2		
3/8"	96.6		
#4	95.7		
#8	95.0		
#10	94.8		
#16	94.3		
#30	92.8		
#40	89.8		
#50	84.2		
#70	78.4		
#100	74.5		
#200	69.5		
0.0293 mm.	58.5		
0.0188 mm.	55.4		
0.0110 mm.	52.4		
0.0079 mm.	49.7		
0.0056 mm.	48.3		
0.0028 mm.	45.5		
0.0012 mm.	43.9		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/12/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/12/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 23 LL= 52 PI= 29

Coefficients

D_{90}= 0.4303 D_{85}= 0.3144

D_{60}= 0.0338 D_{50}= 0.0082

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: 6/28/23

Date Received: 7/7/23

Checked By: MC

Title: LM

Location: ADL-T1-3(K)

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **5-0**

SAMPLE ID: **23**

SAMPLE SOURCE: ADL-T1-4

SAMPLE DESCRIPTION: CH

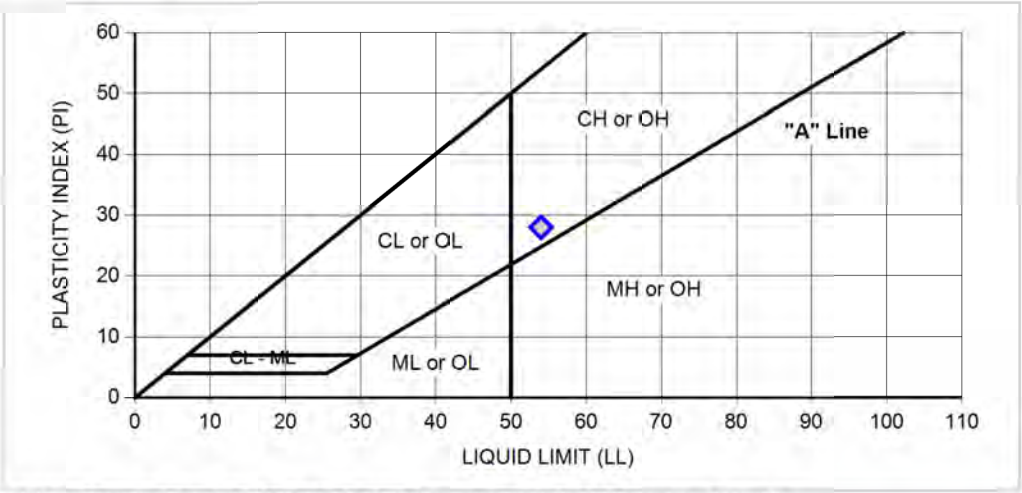
NOTES:

DATE RECEIVED: 2023-07-07

DATE TESTED: 2023-07-17

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
25	35.27	27.75	13.86	54.10
25	34.51	27.30	13.93	53.90

AVG. LIQUID LIMIT (LL)

54

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
19.28	17.65	11.37	26.00
22.84	21.00	13.91	26.00

AVG. PLASTIC LIMIT (PL)

26

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

28

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	6/28/2023	**Sample ID:**	ADL-T1-4
Tech:	NG	**Location:**	

Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

27.2	**Weight Dish (g)**
109.9	**Weight Specimen Wet + Dish (g)**
94.7	**Weight Specimen Dried + Dish (g)**
22.5%	**Moisture Content (% of Dry Weight)**

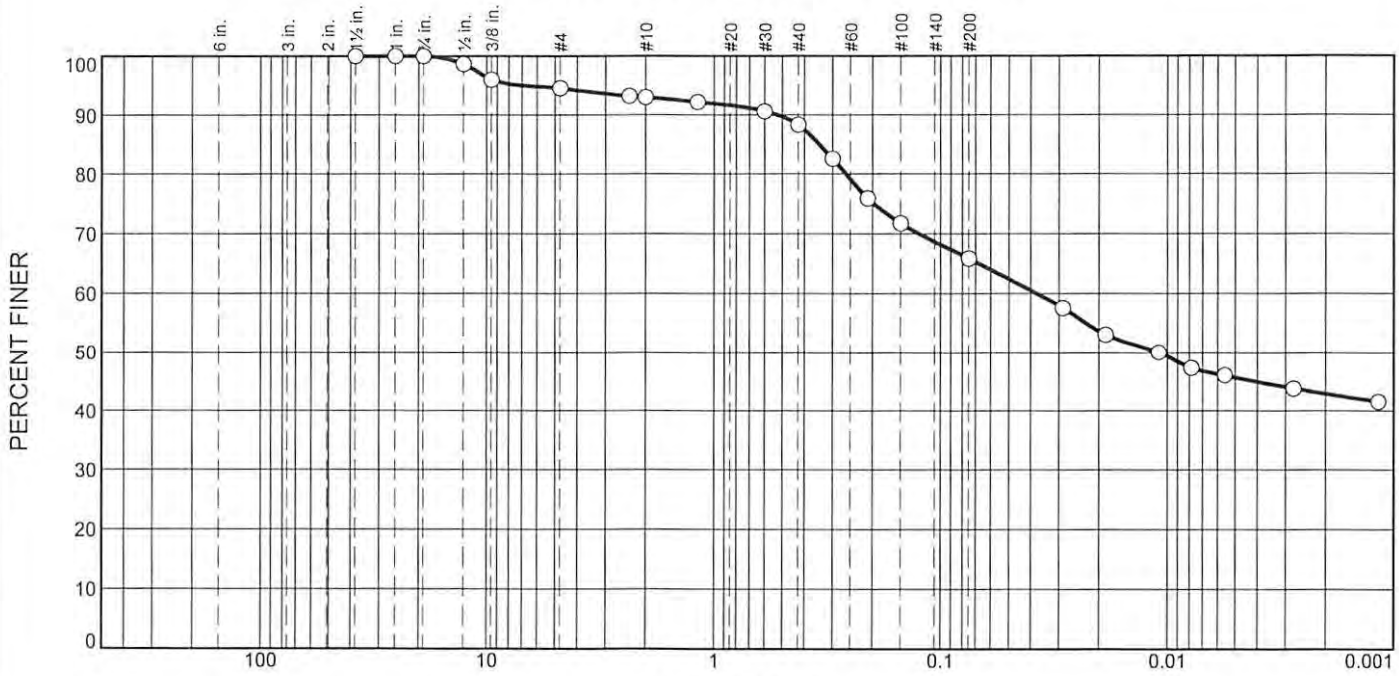
Dry Density (Unit Weight)

ASTM D2263-09

2.866	2.868	2.865	2.866	**Specimen Diameter (in)**
4.334	4.332		4.333	**Specimen Height (in)**
			888.9	**Weight Specimen Wet (g)**
			121.1	**Wet Density (pcf)**
			98.9	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.5	1.5	4.7	22.4	23.0	42.9

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	98.7		
3/8"	96.0		
#4	94.5		
#8	93.2		
#10	93.0		
#16	92.2		
#30	90.6		
#40	88.3		
#50	82.6		
#70	75.9		
#100	71.7		
#200	65.9		
0.0289 mm.	57.6		
0.0187 mm.	53.0		
0.0109 mm.	50.0		
0.0078 mm.	47.3		
0.0056 mm.	46.0		
0.0028 mm.	43.8		
0.0012 mm.	41.5		

* (no specification provided)

Location: ADL-T1-4

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/14/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/14/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 26 LL= 54 PI= 28

Coefficients

D_{90}= 0.5254 D_{85}= 0.3433

D_{60}= 0.0377 D_{50}= 0.0109

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: 6/28/23

Date Received: 7/7/23

Checked By: [signature]

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers
Project: IPL Lansing Pond Closure

Project No: 57-925 **Figure**

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **5-0**

SAMPLE ID: **17**

SAMPLE SOURCE: ADL-T1-5

SAMPLE DESCRIPTION: CL

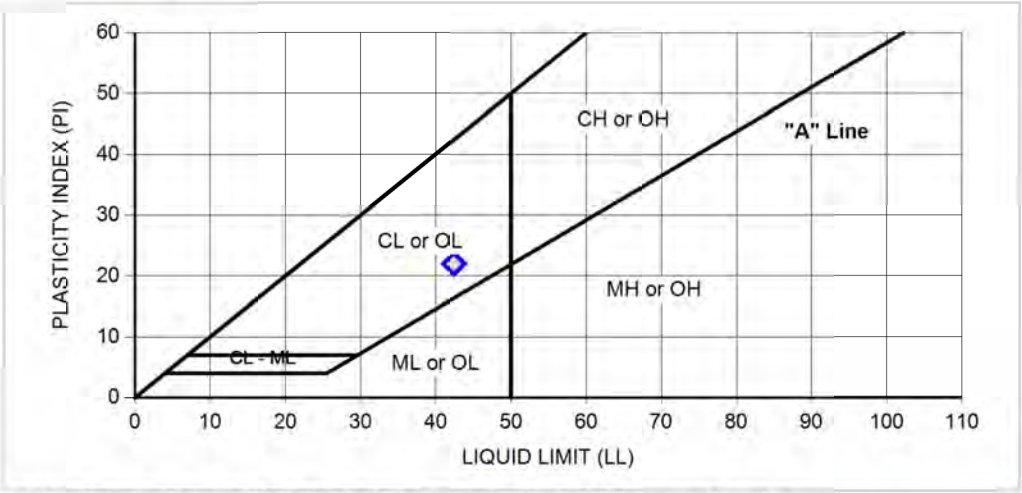
NOTES:

DATE RECEIVED: 2023-07-07

DATE TESTED: 2023-07-14

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
21	35.09	27.99	11.56	42.30
21	37.62	30.44	13.84	42.40

AVG. LIQUID LIMIT (LL)

42

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
21.38	19.81	12.08	20.30
24.19	22.78	15.86	20.40

AVG. PLASTIC LIMIT (PL)

20

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

22

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	6/28/2023	**Sample ID:**	ADL-T1-5
Tech:	NG	**Location:**	

Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

20.1	**Weight Dish (g)**
150.7	**Weight Specimen Wet + Dish (g)**
122.5	**Weight Specimen Dried + Dish (g)**
27.5%	**Moisture Content (% of Dry Weight)**

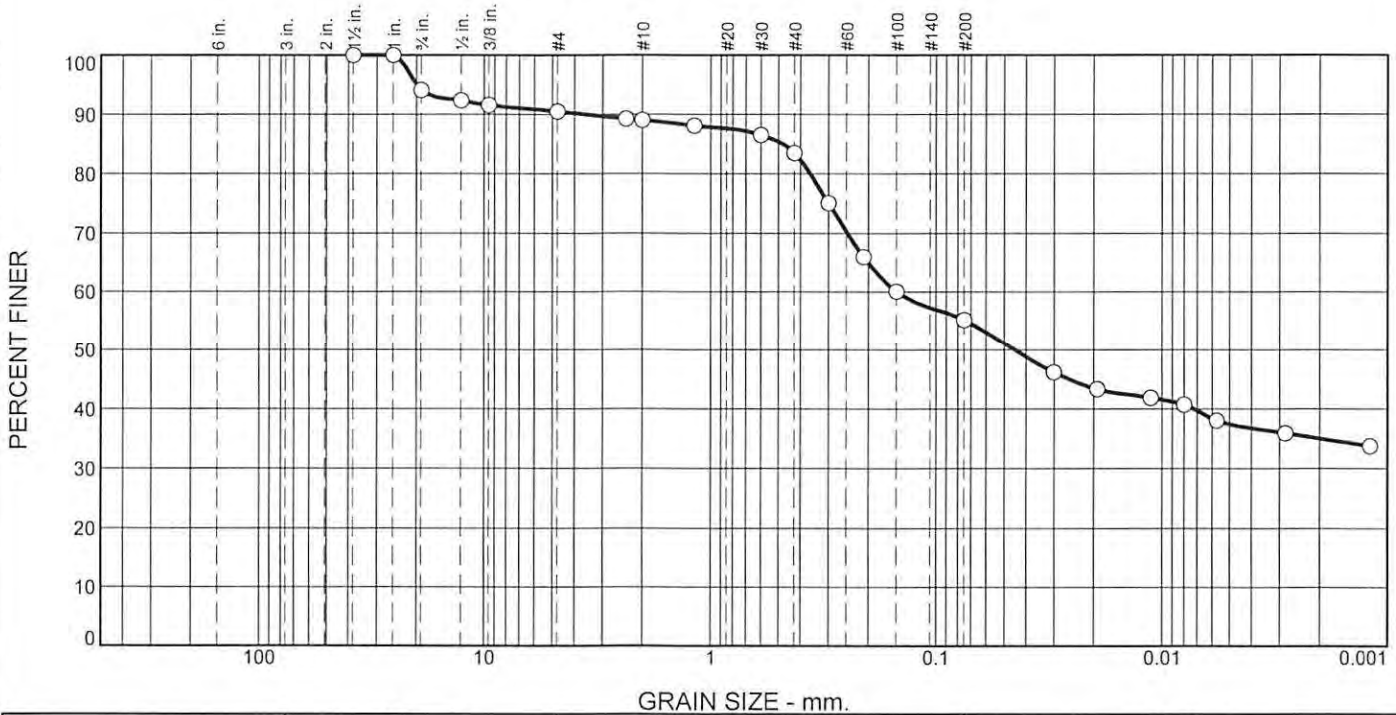
Dry Density (Unit Weight)

ASTM D2263-09

2.873	2.869	2.865	2.869	**Specimen Diameter (in)**
5.666	5.669		5.668	**Specimen Height (in)**
			1067.3	**Weight Specimen Wet (g)**
			111.0	**Wet Density (pcf)**
			87.0	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	5.9	3.6	1.5	5.5	28.4	20.1	35.0

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	94.1		
1/2"	92.4		
3/8"	91.6		
#4	90.5		
#8	89.3		
#10	89.0		
#16	88.1		
#30	86.5		
#40	83.5		
#50	75.1		
#70	66.0		
#100	60.0		
#200	55.1		
0.0301 mm.	46.2		
0.0193 mm.	43.3		
0.0112 mm.	41.8		
0.0080 mm.	40.7		
0.0057 mm.	38.1		
0.0028 mm.	35.9		
0.0012 mm.	33.8		

* (no specification provided)

Location: ADL-T1-5

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/14/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/14/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 20 LL= 42 PI= 22

Coefficients

D_{90}= 3.5817 D_{85}= 0.4765

D_{60}= 0.1494 D_{50}= 0.0448

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/28/23

Date Received: 7/7/23

Checked By: JR

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **5-0**

SAMPLE ID: **19**

SAMPLE SOURCE: ADL-T1-6(K)

SAMPLE DESCRIPTION: CL

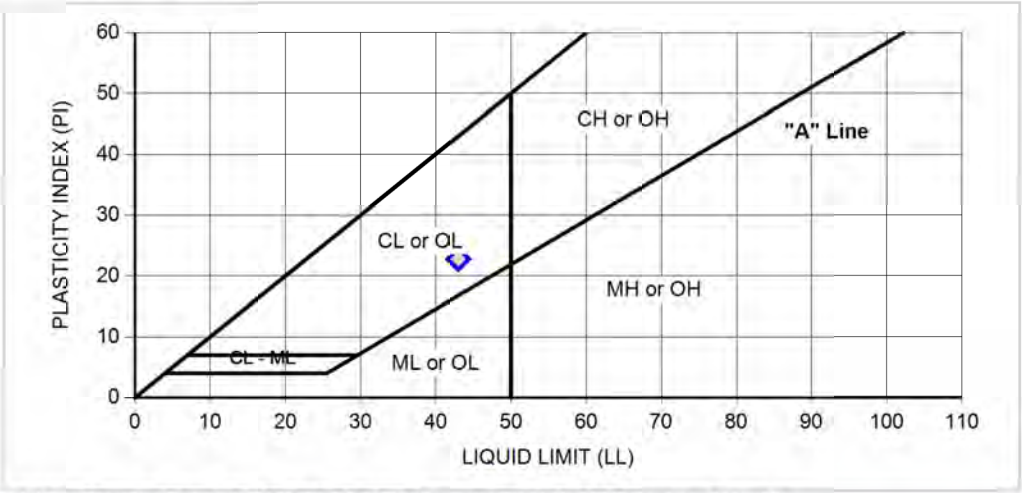
NOTES:

DATE RECEIVED: 2023-07-07

DATE TESTED: 2023-07-14

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
30	35.81	28.64	11.66	43.20
30	35.11	28.85	13.92	42.90

AVG. LIQUID LIMIT (LL)

43

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
20.66	19.15	11.66	20.20
24.02	22.42	14.44	20.10

AVG. PLASTIC LIMIT (PL)

20

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

23

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No: 57-925 **Project:** IPL - Lansing Pond Closure
Date: 6/30/2023 **Sample ID:** ADL-T1-6(K)
Tech: NG **Location:**
Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

112.5	**Weight Dish (g)**
211.4	**Weight Specimen Wet + Dish (g)**
193	**Weight Specimen Dried + Dish (g)**
22.9%	**Moisture Content (% of Dry Weight)**

Dry Density (Unit Weight)

ASTM D2263-09

2.856	2.846	2.853	2.875	**Specimen Diameter (in)**
5.668	5.669		5.88	**Specimen Height (in)**
			1185.7	**Weight Specimen Wet (g)**
			118.3	**Wet Density (pcf)**
			96.3	**Dry Density (pcf)**

Checked: JR

PERMEABILITY TEST RESULTS
Falling Head

Project Name: IPL - Lansing Pond Closure
Project No.: 57-925
Sample: ADL-T1-6(K) **Date Received:** 7/7/2023
Sample Location:
Test Started: 7/10/2023 **Test Competed:** 7/18/2023
Test Procedure: ASTM D 5084 - 03 Falling Head Test (Method B)
Sample Description: CL trace coarse sand Reddish Brown

INITIAL SAMPLE DATA

Wet Weight (g)	1185.7
Non-cut Height (in)	5.88
Diameter (in)	2.875
Moisture Content (%)	22.9
Dry Unit Weight (pcf)	96.4

FINAL SAMPLE DATA

Wet Weight (g)	1053.6
Final Cut Height (in)	5.13
Diameter (in)	2.875
Moisture Content (%)	25.2
Dry Unit Weight (pcf)	96.3

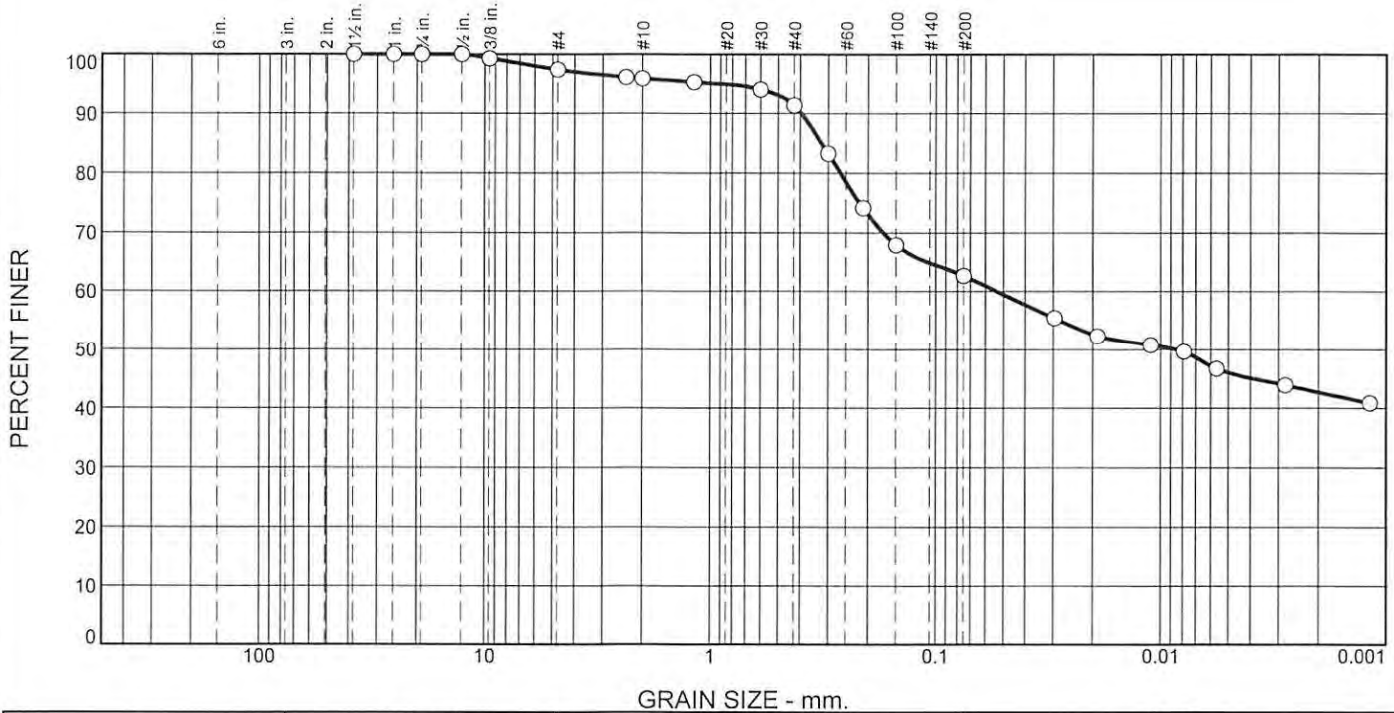
TEST DATA

Elapsed Time (hr)	Initial Head (in)	Final Head (in)	Coefficient of Permeability, k (cm/s)
20.00	133.81	125.94	1.4E-07
25.20	133.81	132.69	1.5E-08
23.63	133.81	133.00	1.2E-08
24.42	133.81	132.94	1.2E-08
71.58	133.81	131.19	1.2E-08
23.50	133.81	132.87	1.3E-08
Average of last	**4**	**readings**	**1.2E-08**

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Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.6	1.5	4.5	28.7	20.0	42.7

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	99.3		
#4	97.4		
#8	96.1		
#10	95.9		
#16	95.3		
#30	94.0		
#40	91.4		
#50	83.3		
#70	74.2		
#100	67.9		
#200	62.7		
0.0297 mm.	55.4		
0.0190 mm.	52.4		
0.0111 mm.	50.8		
0.0079 mm.	49.7		
0.0056 mm.	46.8		
0.0028 mm.	43.9		
0.0012 mm.	40.9		

· (no specification provided)

Location: ADL-T1-6(K)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/12/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/12/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 20 LL= 43 PI= 23

Coefficients

D_{90}= 0.3942 D_{85}= 0.3212

D_{60}= 0.0535 D_{50}= 0.0084

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/30/23

Date Received: 7/7/23

Checked By: JL

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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Evansdale, IA 50707
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Fax: 319-233-5434
www.teamservices.com
staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **5-0**

SAMPLE ID: **16**

SAMPLE SOURCE: ADL-T1-7

SAMPLE DESCRIPTION: CL

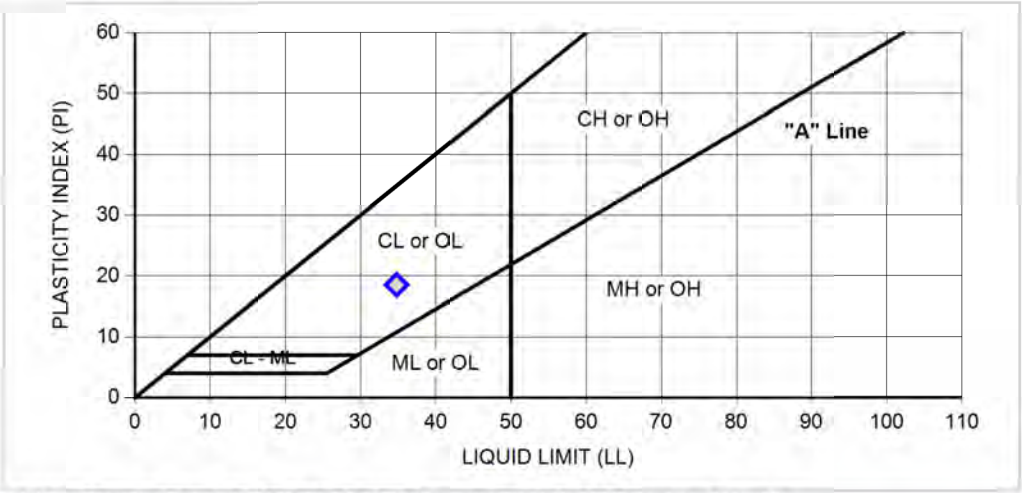
NOTES:

DATE RECEIVED: 2023-07-07

DATE TESTED: 2023-07-14

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
26	42.91	35.79	15.29	34.90
26	35.64	29.87	13.19	34.80

AVG. LIQUID LIMIT (LL)

35

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
18.78	17.71	11.11	16.20
24.49	23.18	15.21	16.40

AVG. PLASTIC LIMIT (PL)

16

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

19

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	6/28/2023	**Sample ID:**	ADL-T1-7
Tech:	NG	**Location:**	

Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

32.2	**Weight Dish (g)**
142.7	**Weight Specimen Wet + Dish (g)**
127.8	**Weight Specimen Dried + Dish (g)**
15.6%	**Moisture Content (% of Dry Weight)**

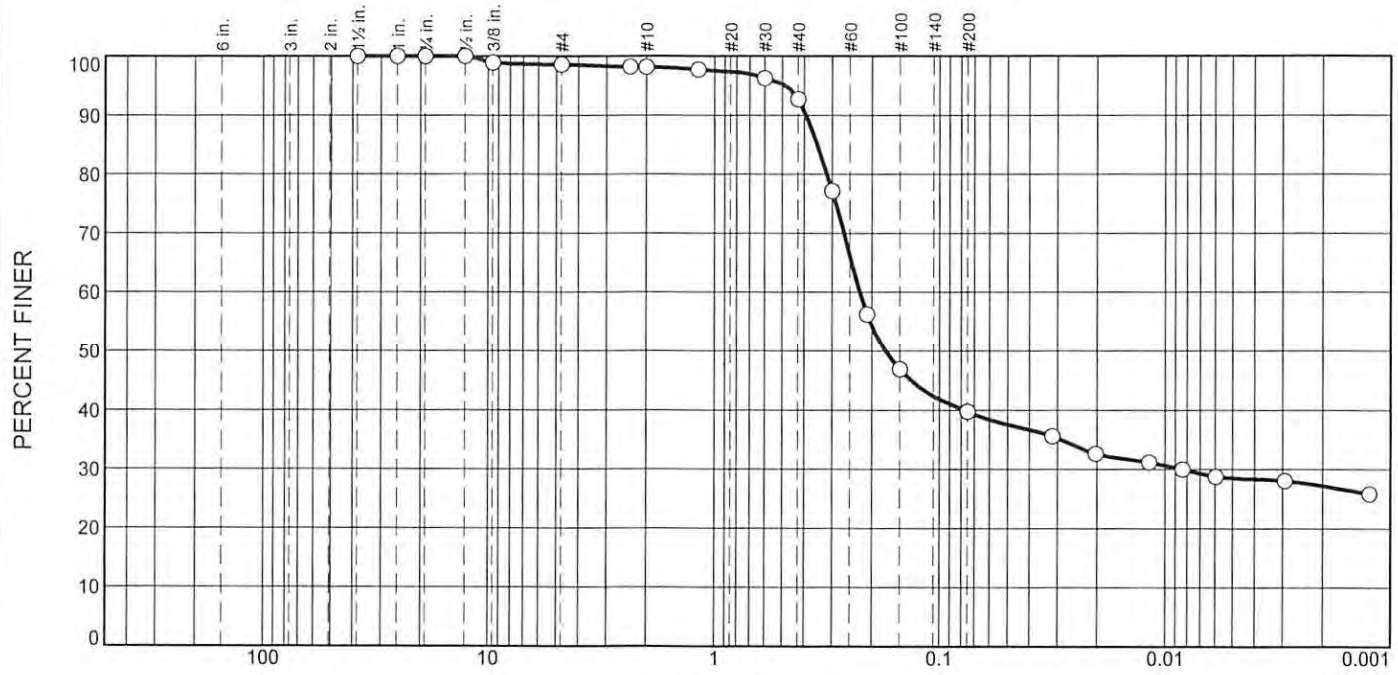
Dry Density (Unit Weight)

ASTM D2263-09

2.836	2.832	2.84	2.836	**Specimen Diameter (in)**
5.716	5.72		5.718	**Specimen Height (in)**
			1149.9	**Weight Specimen Wet (g)**
			121.3	**Wet Density (pcf)**
			104.9	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	1.4	0.4	5.5	52.9	12.6	27.2

Test Results (ASTM D6913 and D7928)			
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	98.9		
#4	98.6		
#8	98.2		
#10	98.2		
#16	97.7		
#30	96.2		
#40	92.7		
#50	77.2		
#70	56.3		
#100	46.9		
#200	39.8		
0.0317 mm.	35.7		
0.0203 mm.	32.7		
0.0118 mm.	31.2		
0.0084 mm.	30.0		
0.0060 mm.	28.8		
0.0029 mm.	28.1		
0.0012 mm.	25.9		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/14/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/14/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 16 LL= 35 PI= 19

Coefficients

D_{90}= 0.3919 D_{85}= 0.3498

D_{60}= 0.2263 D_{50}= 0.1735

D_{30}= 0.0083 D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

SC

Date Sampled: 6/28/23

Date Received: 7/7/23

Checked By: JK

Title: LM

Location: ADL-T1-7

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **7-0**

SAMPLE ID: **28**

SAMPLE SOURCE: ADL-T1-7R

SAMPLE DESCRIPTION: CL

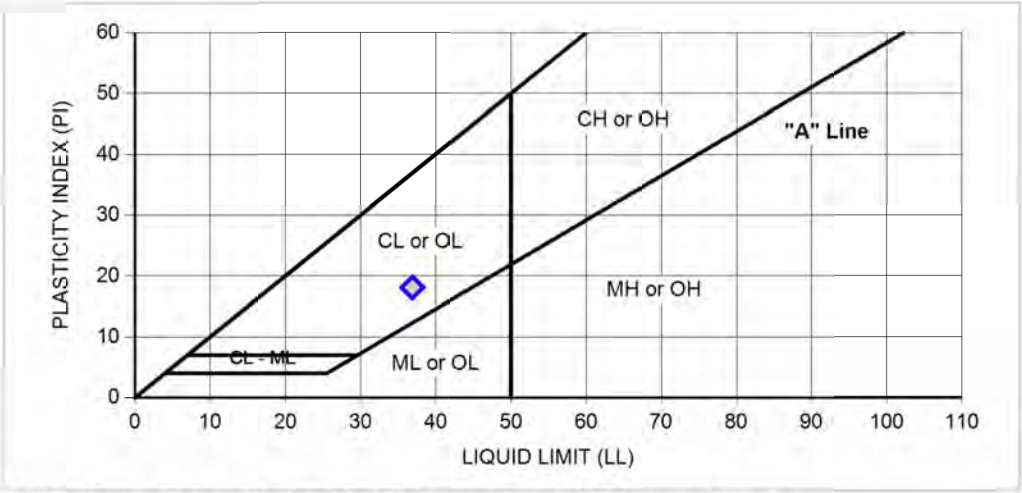
NOTES:

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool

DATE RECEIVED: 2023-07-21

DATE TESTED: 2023-07-27

TESTED BY: NG



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
21	36.64	30.44	13.94	36.80
21	41.73	34.25	14.44	37.00

AVG. LIQUID LIMIT (LL)

37

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
24.70	22.64	11.66	18.80
25.60	23.50	12.35	18.80

AVG. PLASTIC LIMIT (PL)

19

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

18

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No: 57-925 **Project:** IPL - Lansing Pond Closure
Date: 7/19/2023 **Sample ID:** ADL-T1-7R
Tech: NG **Location:**
Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

26.6	**Weight Dish (g)**
121.9	**Weight Specimen Wet + Dish (g)**
101.1	**Weight Specimen Dried + Dish (g)**
27.9%	**Moisture Content (% of Dry Weight)**

Dry Density (Unit Weight)

ASTM D2263-09

2.856	2.846	2.853	2.875	**Specimen Diameter (in)**
5.668	5.669		6.01	**Specimen Height (in)**
			1218.7	**Weight Specimen Wet (g)**
			119.0	**Wet Density (pcf)**
			93.0	**Dry Density (pcf)**

Checked: JR

PERMEABILITY TEST RESULTS
Falling Head

TEAM Services

Project Name: IPL-Lansing Pond Closure
Project No.: 57-925
Sample: ADL-T1-7R **Date Received:**
Sample Location:
Test Started: 7/25/2023 **Test Competed:** 7/31/2023
Test Procedure: ASTM D 5084 - 03 Falling Head Test (Method B)
Sample Description: CL trace coarse sand Reddish Brown

INITIAL SAMPLE DATA

Wet Weight (g)	1218.7
Non-cut Height (in)	6.01
Diameter (in)	2.875
Moisture Content (%)	27.9
Dry Unit Weight (pcf)	93.1

FINAL SAMPLE DATA

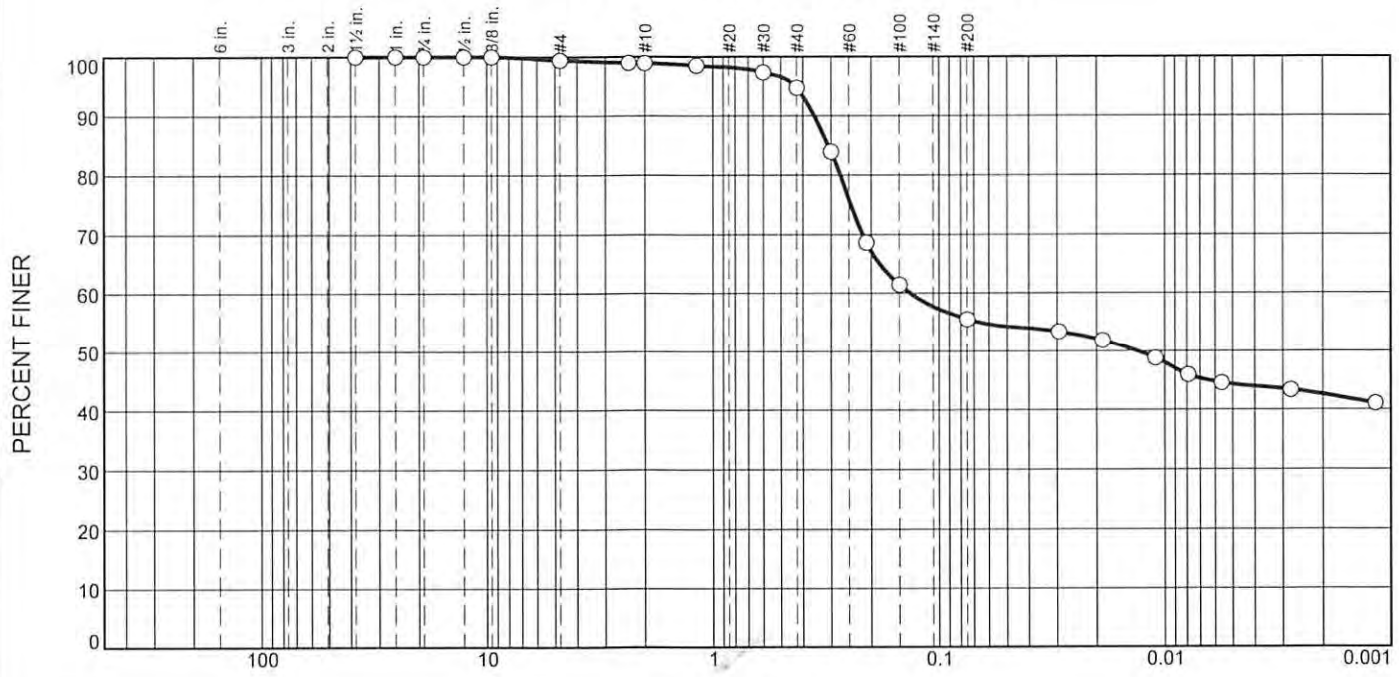
Wet Weight (g)	1072.8
Final Cut Height (in)	5.31
Diameter (in)	2.875
Moisture Content (%)	31.8
Dry Unit Weight (pcf)	90.0

TEST DATA

Elapsed Time (hr)	Initial Head (in)	Final Head (in)	Coefficient of Permeability, k (cm/s)
22.00	133.68	125.24	1.4E-07
24.67	133.68	132.68	1.4E-08
23.67	133.68	132.68	1.5E-08
23.18	133.68	132.68	1.5E-08
22.98	133.68	132.68	1.5E-08
25.42	133.68	132.68	1.4E-08
Average of last	**5**	**readings**	**1.4E-08**

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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.6	0.5	4.2	39.2	13.0	42.5

Test Results (ASTM D6913 and D7928)			
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.4		
#8	99.0		
#10	98.9		
#16	98.5		
#30	97.3		
#40	94.7		
#50	84.0		
#70	68.6		
#100	61.4		
#200	55.5		
0.0295 mm.	53.3		
0.0188 mm.	51.8		
0.0110 mm.	48.8		
0.0079 mm.	45.9		
0.0056 mm.	44.5		
0.0028 mm.	43.3		
0.0012 mm.	41.0		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/23/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/23/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= LL= PI=

Coefficients

D_{90}= 0.3556 D_{85}= 0.3083

D_{60}= 0.1348 D_{50}= 0.0132

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

Date Sampled: 7/19/23

Date Received: 7/21/23

Checked By: MC

Title: LMS

Location: ADL-T1-7R

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **5-0**

SAMPLE ID: **20**

SAMPLE SOURCE: ADL-T1-8(K)

SAMPLE DESCRIPTION: CL

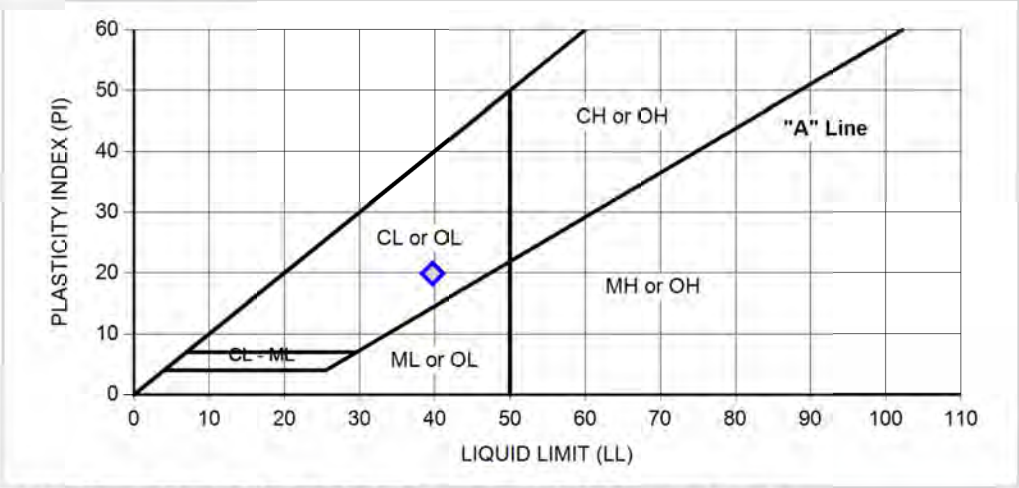
NOTES:

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool

DATE RECEIVED: 2023-07-07

DATE TESTED: 2023-07-14

TESTED BY: NG



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
28	31.35	26.00	12.34	39.70
28	34.97	29.11	14.15	39.70

AVG. LIQUID LIMIT (LL)

40

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
21.50	19.82	11.38	19.90
24.11	22.44	13.94	19.60

AVG. PLASTIC LIMIT (PL)

20

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

20

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No: 57-925 **Project:** IPL - Lansing Pond Closure
Date: 6/30/2023 **Sample ID:** ADL-T1-8(K)
Tech: NG **Location:**
Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

84.3	**Weight Dish (g)**
169.8	**Weight Specimen Wet + Dish (g)**
152.7	**Weight Specimen Dried + Dish (g)**
25.0%	**Moisture Content (% of Dry Weight)**

Dry Density (Unit Weight)

ASTM D2263-09

2.856	2.846	2.853	2.875	**Specimen Diameter (in)**
5.668	5.669		5.93	**Specimen Height (in)**
			1130.6	**Weight Specimen Wet (g)**
			111.9	**Wet Density (pcf)**
			89.5	**Dry Density (pcf)**

Checked: JR

PERMEABILITY TEST RESULTS
Falling Head

Project Name: IPL - Lansing Pond Closure
Project No.: 57-925
Sample: ADL-T1-8(K) **Date Received:** 7/7/2023
Sample Location:
Test Started: 7/10/2023 **Test Competed:** 7/18/2023
Test Procedure: ASTM D 5084 - 03 Falling Head Test (Method B)
Sample Description: CL trace coarse sand Reddish Brown

INITIAL SAMPLE DATA

Wet Weight (g)	1130.6
Non-cut Height (in)	5.93
Diameter (in)	2.875
Moisture Content (%)	25.0
Dry Unit Weight (pcf)	89.5

FINAL SAMPLE DATA

Wet Weight (g)	1026.5
Final Cut Height (in)	5.37
Diameter (in)	2.875
Moisture Content (%)	25.4
Dry Unit Weight (pcf)	89.5

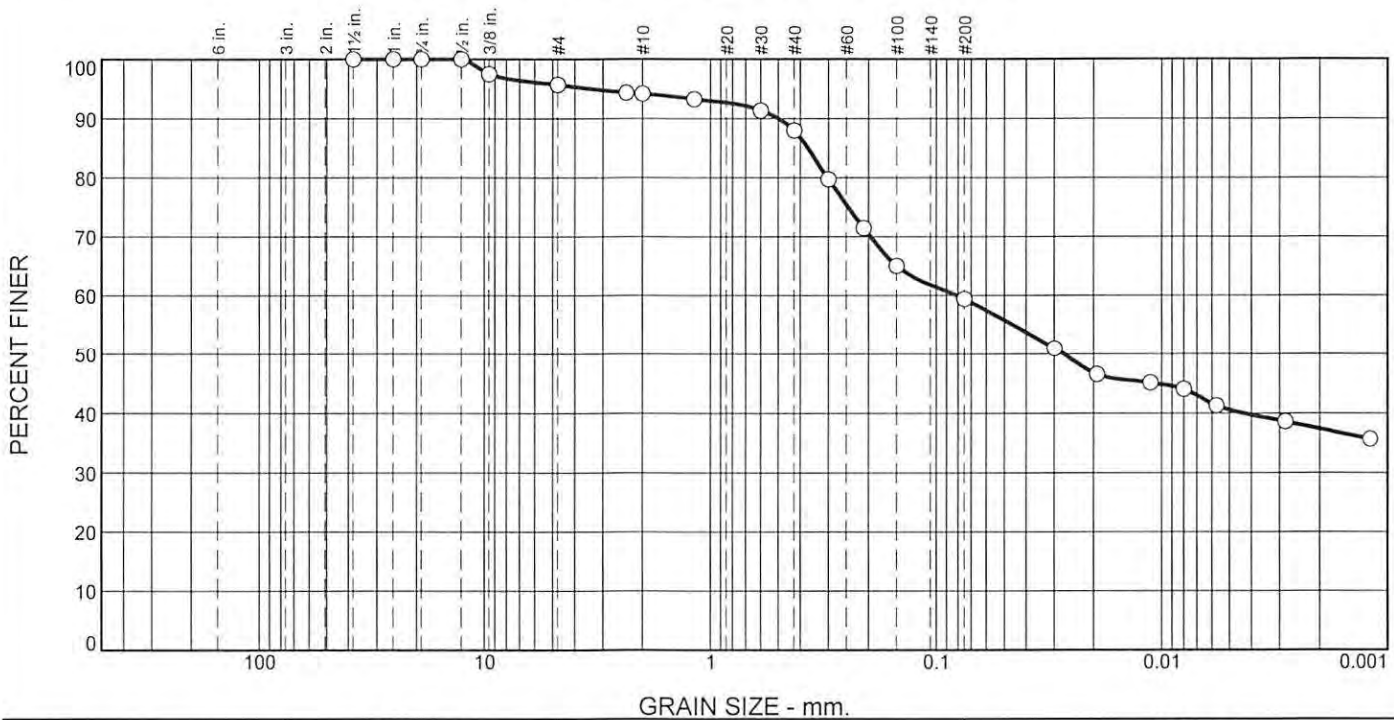
TEST DATA

Elapsed Time (hr)	Initial Head (in)	Final Head (in)	Coefficient of Permeability, k (cm/s)
20.00	133.76	121.57	2.2E-07
25.20	133.76	129.26	6.1E-08
23.63	133.76	129.88	5.6E-08
24.42	133.76	129.63	5.8E-08
71.58	133.76	121.88	5.9E-08
23.50	133.76	129.76	5.8E-08
Average of last	**3**	**readings**	**5.8E-08**

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Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	4.3	1.5	6.2	28.6	22.0	37.4

Test Results (ASTM D6913 and D7928)			
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	97.5		
#4	95.7		
#8	94.4		
#10	94.2		
#16	93.3		
#30	91.4		
#40	88.0		
#50	79.8		
#70	71.5		
#100	65.0		
#200	59.4		
0.0299 mm.	51.0		
0.0193 mm.	46.6		
0.0112 mm.	45.2		
0.0080 mm.	44.1		
0.0057 mm.	41.3		
0.0028 mm.	38.6		
0.0012 mm.	35.7		

· (no specification provided)

Location: ADL-T1-8(K)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/12/23 **Technician:** NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/12/23 **Technician:** NG

Test Notes

Atterberg (ASTM D4318)

PL= 20 LL= 40 PI= 20

Coefficients

D_{90}= 0.4976 D_{85}= 0.3689

D_{60}= 0.0809 D_{50}= 0.0273

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/30/23

Date Received: 7/7/23

Checked By: JL

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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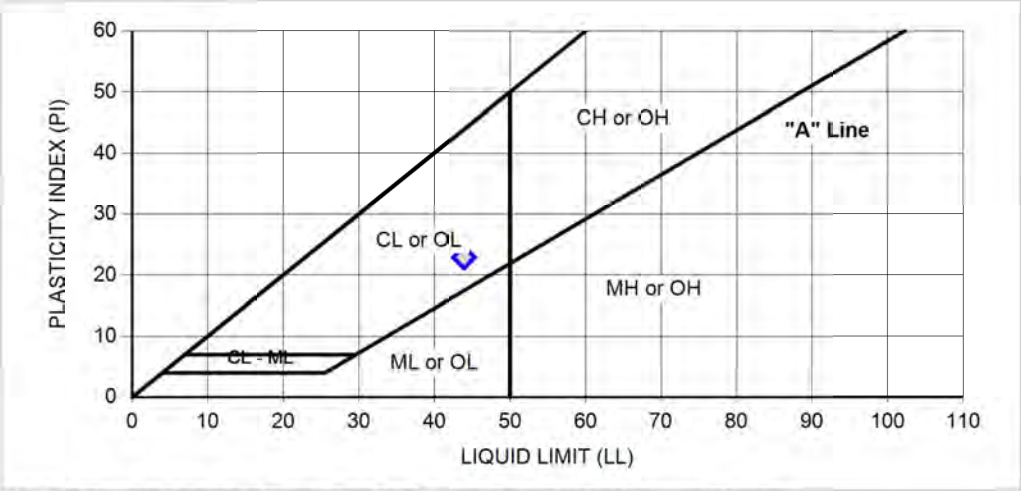
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PROJECT NO: 57-925
PROJECT: IPL - Lansing Pond Closure
Lansing, IA
REPORT NO: 5-0

SAMPLE ID: **22**
SAMPLE SOURCE: ADL-T1-9
SAMPLE DESCRIPTION: CL
NOTES:

DATE RECEIVED: 2023-07-07
DATE TESTED: 2023-07-14
TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
28	34.33	27.58	12.01	44.00
28	36.37	30.06	15.45	43.80

AVG. LIQUID LIMIT (LL)
44

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
17.96	16.87	11.67	21.00
22.65	21.23	14.47	21.00

AVG. PLASTIC LIMIT (PL)
21

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)
23

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	6/30/2023	**Sample ID:**	ADL-T1-9
Tech:	NG	**Location:**	

Soil Description : CL trace coarse sand Reddish Brown

Moisture Content

ASTM D2216-10

28.3	**Weight Dish (g)**
146.4	**Weight Specimen Wet + Dish (g)**
123.8	**Weight Specimen Dried + Dish (g)**
23.7%	**Moisture Content (% of Dry Weight)**

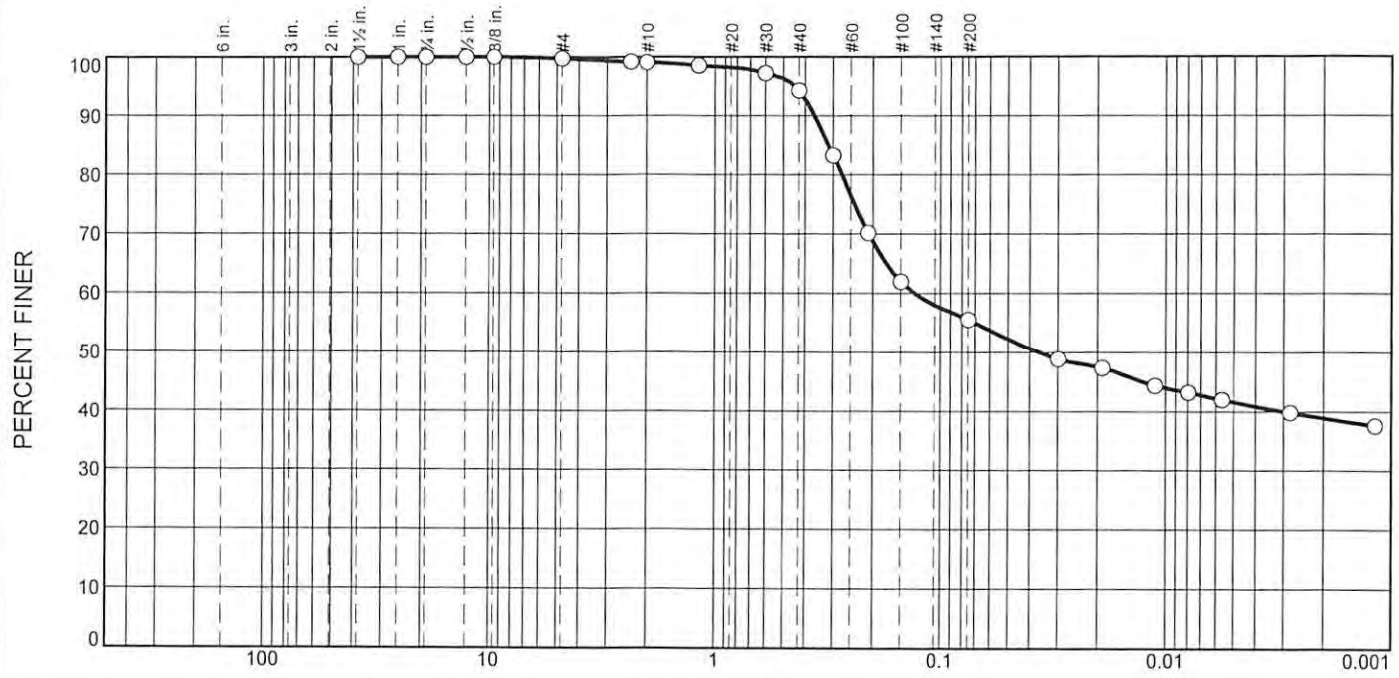
Dry Density (Unit Weight)

ASTM D2263-09

2.871	2.869	2.867	2.869	**Specimen Diameter (in)**
5.669	5.668		5.669	**Specimen Height (in)**
			1096.1	**Weight Specimen Wet (g)**
			113.9	**Wet Density (pcf)**
			92.1	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.3	0.6	4.8	38.8	16.6	38.9

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.7		
#8	99.2		
#10	99.1		
#16	98.5		
#30	97.2		
#40	94.3		
#50	83.3		
#70	70.2		
#100	62.0		
#200	55.5		
0.0299 mm.	48.9		
0.0190 mm.	47.4		
0.0111 mm.	44.4		
0.0079 mm.	43.2		
0.0056 mm.	42.0		
0.0028 mm.	39.8		
0.0012 mm.	37.6		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/14/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/14/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 21 LL= 44 PI= 23

Coefficients

D_{90}= 0.3633 D_{85}= 0.3149

D_{60}= 0.1308 D_{50}= 0.0364

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 6/30/23

Date Received: 7/7/23

Checked By:

Title: LM

Location: ADL-T1-9

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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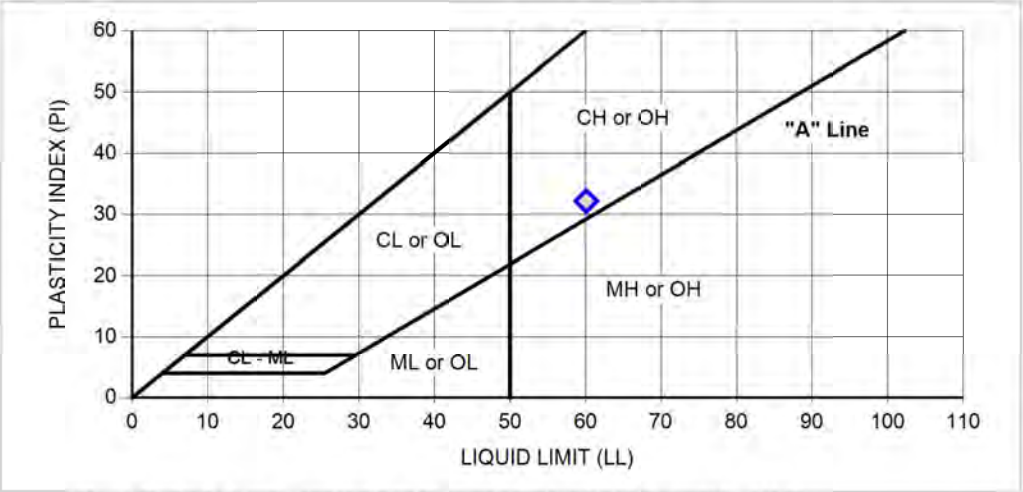
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PROJECT NO: 57-925
PROJECT: IPL - Lansing Pond Closure
Lansing, IA
REPORT NO: 8-0

SAMPLE ID: 35
SAMPLE SOURCE: ADL-T2-1
SAMPLE DESCRIPTION: CH
NOTES:

DATE RECEIVED: 2023-07-21
DATE TESTED: 2023-08-01
TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
30	35.22	26.27	11.10	60.30
30	34.23	26.90	14.40	59.90

AVG. LIQUID LIMIT (LL)
60

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
24.53	22.05	13.19	28.00
24.00	22.09	15.22	27.80

AVG. PLASTIC LIMIT (PL)
28

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)
32

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/18/2023	**Sample ID:**	ADL-T2-1
Tech:	NG	**Location:**	
Soil Description :	CH Fat Clay		

Moisture Content

ASTM D2216-10

19.0	**Weight Dish (g)**
94.2	**Weight Specimen Wet + Dish (g)**
77.2	**Weight Specimen Dried + Dish (g)**
29.2%	**Moisture Content (% of Dry Weight)**

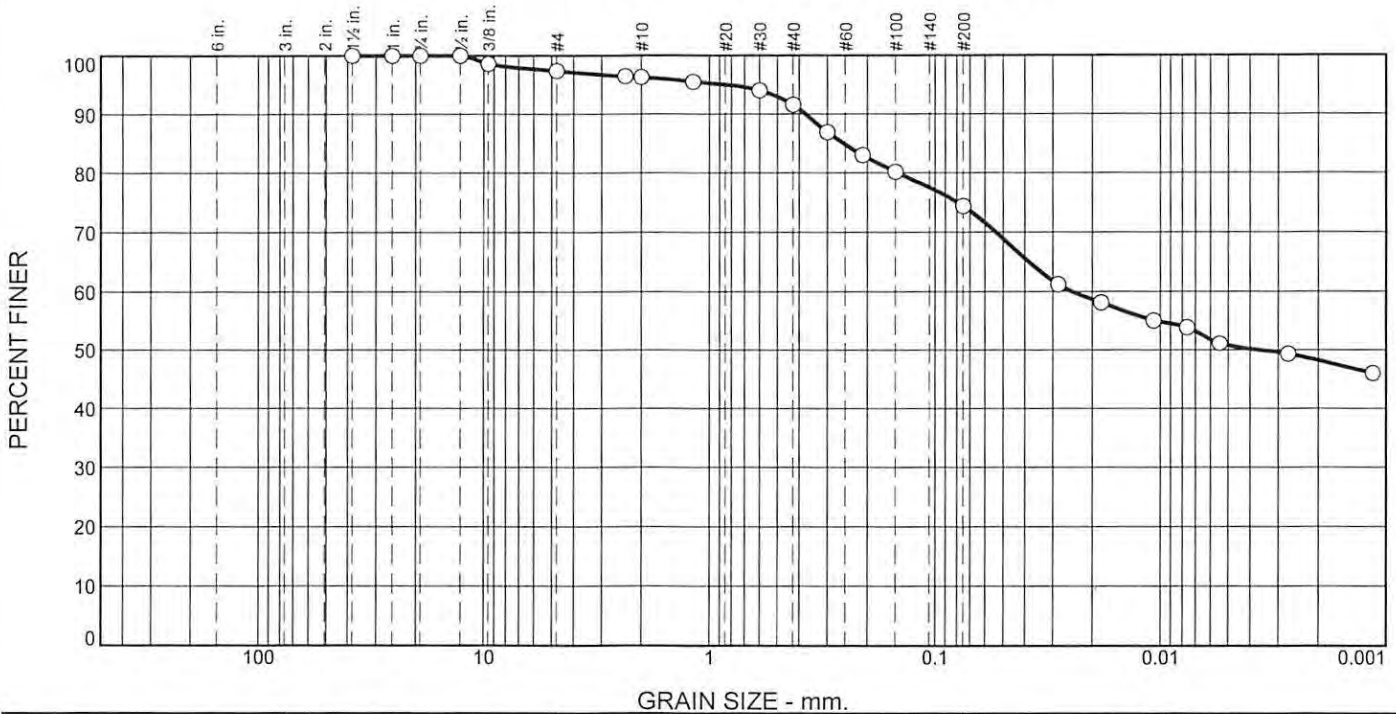
Dry Density (Unit Weight)

ASTM D2263-09

2.868	2.872	2.869	2.870	**Specimen Diameter (in)**
5.429	5.431		5.430	**Specimen Height (in)**
			1059.8	**Weight Specimen Wet (g)**
			115.0	**Wet Density (pcf)**
			89.0	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.6	1.1	4.7	17.2	26.2	48.2

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	98.6		
#4	97.4		
#8	96.4		
#10	96.3		
#16	95.5		
#30	94.0		
#40	91.6		
#50	86.9		
#70	83.0		
#100	80.2		
#200	74.4		
0.0285 mm.	61.2		
0.0183 mm.	58.2		
0.0107 mm.	55.1		
0.0076 mm.	54.0		
0.0055 mm.	51.2		
0.0027 mm.	49.3		
0.0011 mm.	46.0		

· (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/31/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/31/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 28 LL= 60 PI= 32

Coefficients

D_{90}= 0.3745 D_{85}= 0.2545

D_{60}= 0.0248 D_{50}= 0.0037

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: 7/18/23

Date Received: 7/21/23

Checked By: MM

Title: LN

Location: ADL-T2-1

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

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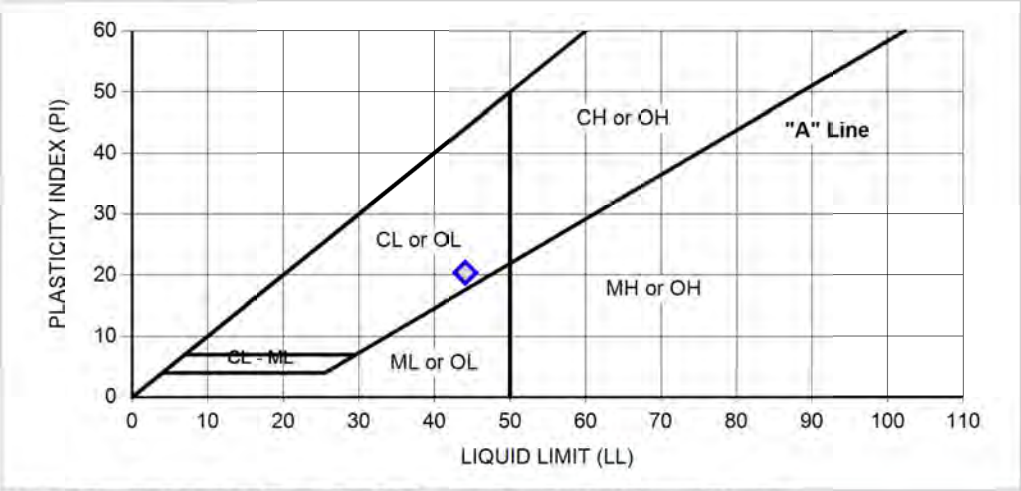
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PROJECT NO: 57-925
PROJECT: IPL - Lansing Pond Closure
Lansing, IA
REPORT NO: 7-0

SAMPLE ID: **34**
SAMPLE SOURCE: ADL-T2-2(K)
SAMPLE DESCRIPTION: CL
NOTES:

DATE RECEIVED: 2023-07-21
DATE TESTED: 2023-07-31
TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
21	29.95	24.33	11.80	43.90
21	30.15	25.38	14.83	44.30

AVG. LIQUID LIMIT (LL)

44

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
18.39	17.07	11.48	23.60
21.83	20.43	14.55	23.80

AVG. PLASTIC LIMIT (PL)

24

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

20

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/18/2023	**Sample ID:**	ADL-T2-2(K)
Tech:	NG	**Location:**	

Soil Description : CL Lean Clay

Moisture Content

ASTM D2216-10

19.1	**Weight Dish (g)**
110.5	**Weight Specimen Wet + Dish (g)**
89.8	**Weight Specimen Dried + Dish (g)**
29.3%	**Moisture Content (% of Dry Weight)**

Dry Density (Unit Weight)

ASTM D2263-09

2.856	2.846	2.853	2.875	**Specimen Diameter (in)**
5.668	5.669		6.01	**Specimen Height (in)**
			1191.6	**Weight Specimen Wet (g)**
			116.4	**Wet Density (pcf)**
			90.0	**Dry Density (pcf)**

Checked: JR

PERMEABILITY TEST RESULTS
Falling Head

TEAM Services

Project Name: IPL- Lansing Pond Closure
Project No.: 16-1979
Sample: ADL-T2-2(K) **Date Received:** 7/27/2023
Sample Location:
Test Started: 7/27/2023 **Test Competed:** 8/1/2023
Test Procedure: ASTM D 5084 - 03 Falling Head Test (Method B)
Sample Description: CL trace coarse sand reddish brown

INITIAL SAMPLE DATA

Wet Weight (g)	1191.6
Non-cut Height (in)	6.01
Diameter (in)	2.875
Moisture Content (%)	29.3
Dry Unit Weight (pcf)	90.0

FINAL SAMPLE DATA

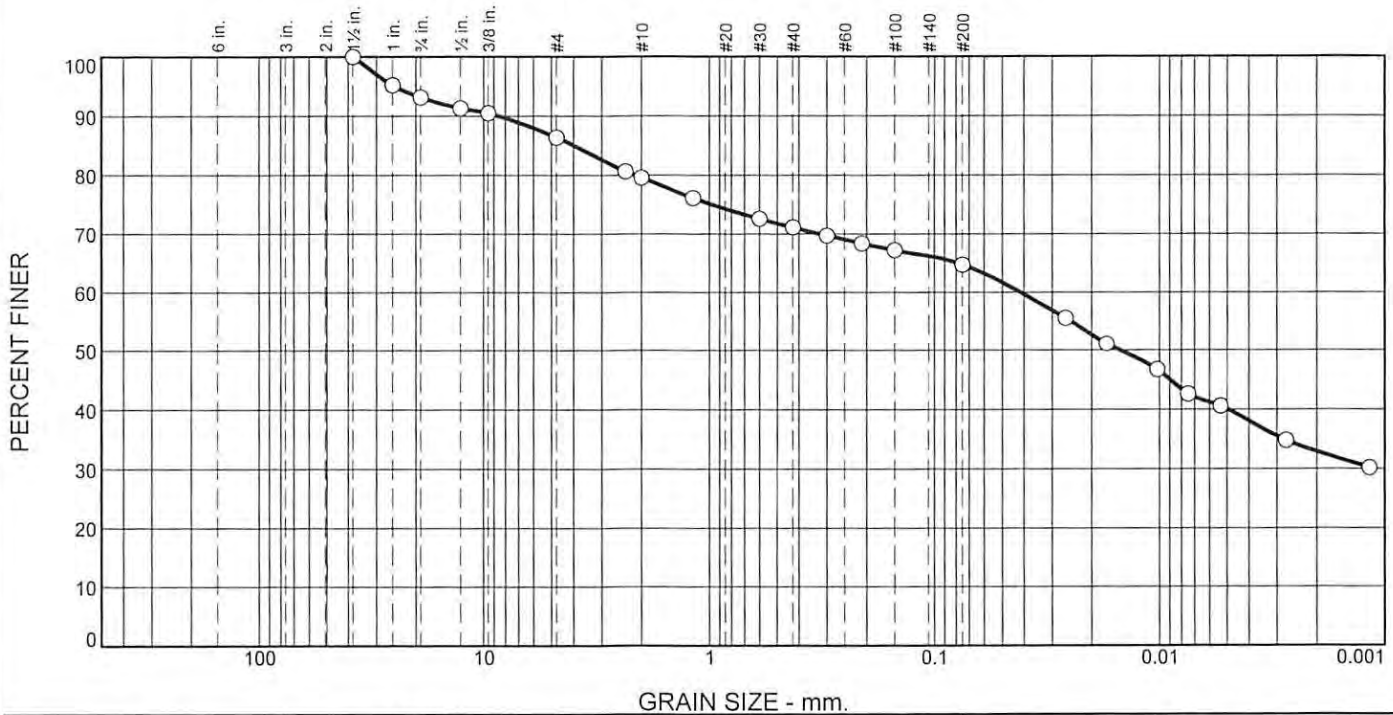
Wet Weight (g)	1038.6
Final Cut Height (in)	5.51
Diameter (in)	2.875
Moisture Content (%)	29.9
Dry Unit Weight (pcf)	85.1

TEST DATA

Elapsed Time (hr)	Initial Head (in)	Final Head (in)	Coefficient of Permeability, k (cm/s)
17.83	133.68	120.55	2.7E-07
23.18	133.68	130.93	4.1E-08
22.98	133.68	132.80	1.3E-08
25.42	133.68	132.74	1.3E-08
22.83	133.68	132.80	1.3E-08
Average of last	**3**	**readings**	**1.3E-08**

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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.8	6.8	6.8	8.5	6.4	31.8	32.9

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	95.2		
3/4"	93.2		
1/2"	91.3		
3/8"	90.5		
#4	86.4		
#8	80.7		
#10	79.6		
#16	76.1		
#30	72.6		
#40	71.1		
#50	69.7		
#70	68.3		
#100	67.2		
#200	64.7		
0.0262 mm.	55.6		
0.0172 mm.	51.2		
0.0102 mm.	46.7		
0.0075 mm.	42.6		
0.0053 mm.	40.6		
0.0027 mm.	34.8		
0.0012 mm.	30.2		

· (no specification provided)

Location: ADL-T2-2(K)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/31/23 **Technician:** NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/31/23 **Technician:** NG

Test Notes

Atterberg (ASTM D4318)

PL= 24 LL= 44 PI= 20

Coefficients

D_{90}= 8.5395 D_{85}= 3.9532

D_{60}= 0.0415 D_{50}= 0.0150

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 7/18/23

Date Received: 7/21/23

Checked By: JR

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

TEAM Services
ISO 9001 International Accredited Laboratory
Geotechnical and Construction Material Consultants

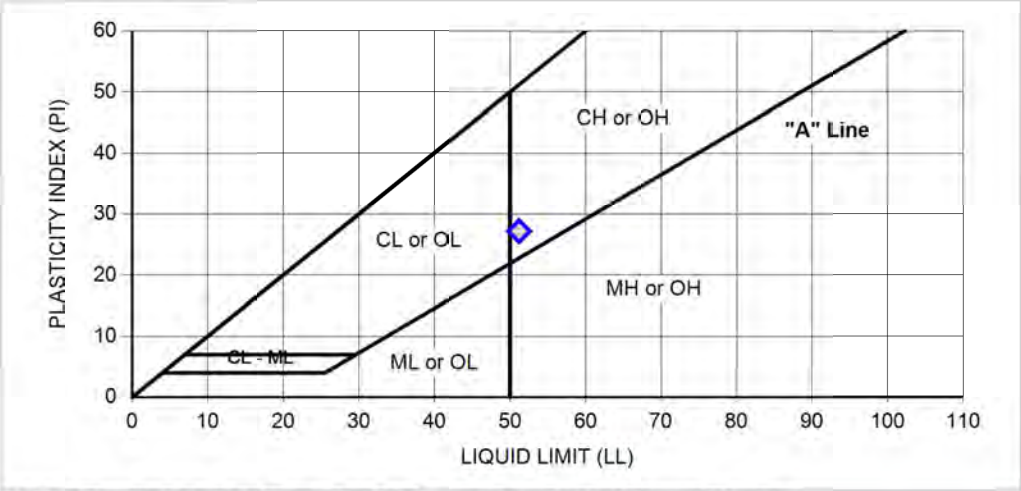
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PROJECT NO: 57-925
PROJECT: IPL - Lansing Pond Closure
Lansing, IA
REPORT NO: 7-0

SAMPLE ID: **32**
SAMPLE SOURCE: ADL-T2-3
SAMPLE DESCRIPTION: CH
NOTES:

DATE RECEIVED: 2023-07-21
DATE TESTED: 2023-07-31
TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
25	38.52	29.65	12.34	51.20
25	36.25	28.74	14.06	51.20

AVG. LIQUID LIMIT (LL)

51

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
20.37	18.84	12.49	24.10
22.08	20.50	13.93	24.00

AVG. PLASTIC LIMIT (PL)

24

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

27

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/18/2023	**Sample ID:**	ADL-T2-3
Tech:	NG	**Location:**	
Soil Description :	CH Fat Clay		

Moisture Content

ASTM D2216-10

27.8	**Weight Dish (g)**
150.2	**Weight Specimen Wet + Dish (g)**
122.2	**Weight Specimen Dried + Dish (g)**
29.7%	**Moisture Content (% of Dry Weight)**

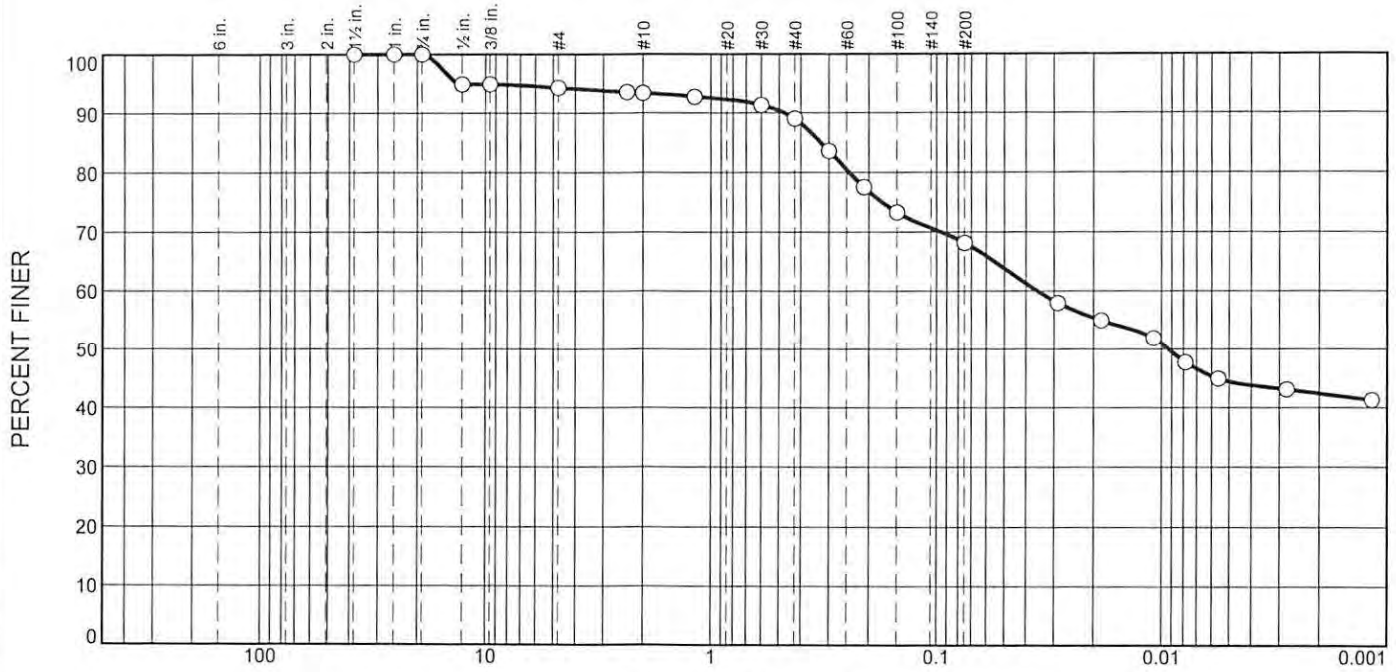
Dry Density (Unit Weight)

ASTM D2263-09

2.823	2.839	2.815	2.826	**Specimen Diameter (in)**
5.673	5.675		5.674	**Specimen Height (in)**
			1094.7	**Weight Specimen Wet (g)**
			117.2	**Wet Density (pcf)**
			90.4	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	5.7	0.9	4.4	20.8	25.8	42.4

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	94.9		
3/8"	94.9		
#4	94.3		
#8	93.6		
#10	93.4		
#16	92.7		
#30	91.3		
#40	89.0		
#50	83.6		
#70	77.5		
#100	73.3		
#200	68.2		
0.0289 mm.	57.9		
0.0185 mm.	54.9		
0.0108 mm.	51.9		
0.0078 mm.	47.7		
0.0056 mm.	45.0		
0.0028 mm.	43.1		
0.0012 mm.	41.3		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/31/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/31/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 24 LL= 51 PI= 27

Coefficients

D_{90}= 0.4722 D_{85}= 0.3258

D_{60}= 0.0356 D_{50}= 0.0093

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: 7/18/23

Date Received: 7/21/23

Checked By: MC

Title: LM

Location: ADL-T2-3

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

TEAM Services
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PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **8-0**

SAMPLE ID: **36**

SAMPLE SOURCE: ADL-T2-4

SAMPLE DESCRIPTION: CH

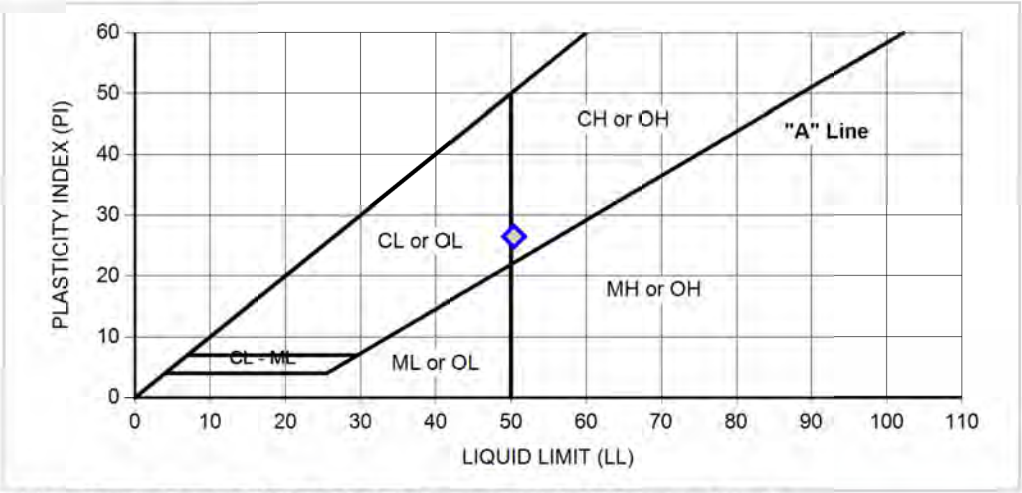
NOTES:

DATE RECEIVED: 2023-07-21

DATE TESTED: 2023-08-02

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
28	60.17	53.15	39.01	50.30
28	59.98	53.09	39.22	50.40

AVG. LIQUID LIMIT (LL)

50

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
46.26	44.78	38.63	24.10
47.59	45.96	39.08	23.70

AVG. PLASTIC LIMIT (PL)

24

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

27

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/11/2023	**Sample ID:**	ADL-T2-4
Tech:	NG	**Location:**	
Soil Description :	CH Fat Clay		

Moisture Content

ASTM D2216-10

27.4	**Weight Dish (g)**
141.1	**Weight Specimen Wet + Dish (g)**
114.7	**Weight Specimen Dried + Dish (g)**
30.2%	**Moisture Content (% of Dry Weight)**

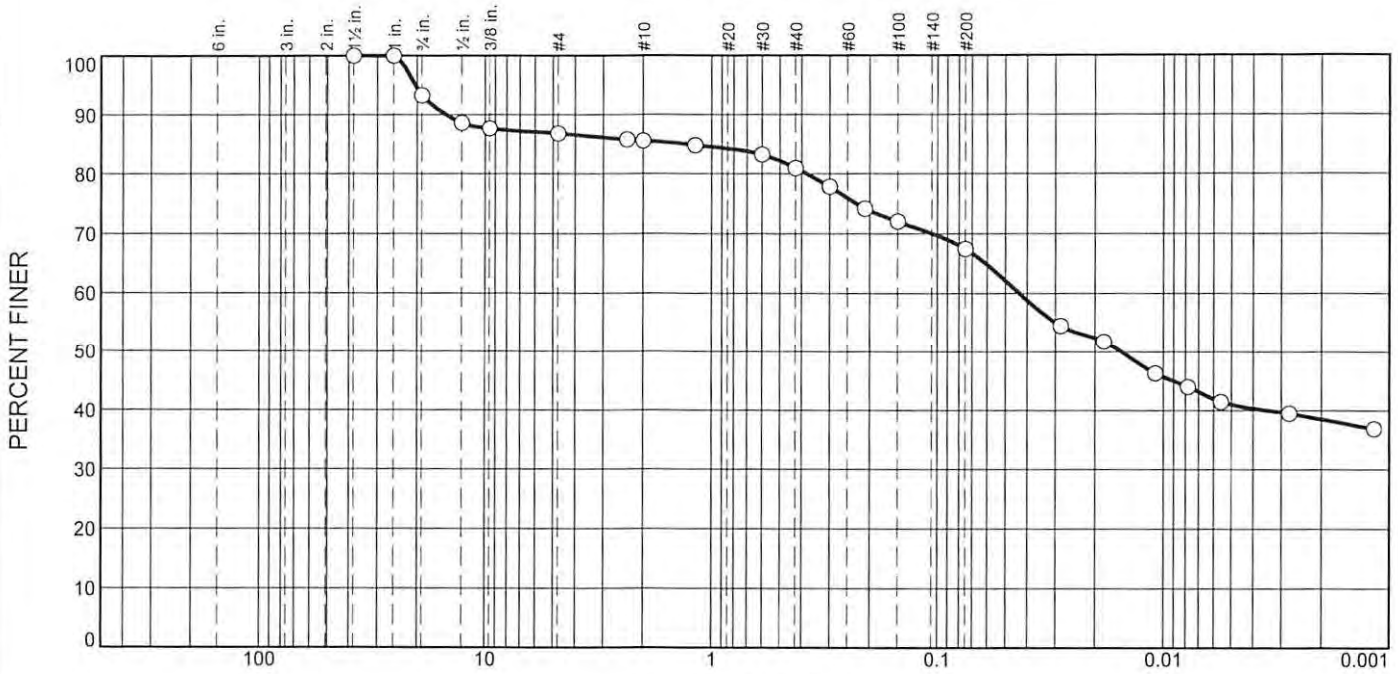
Dry Density (Unit Weight)

ASTM D2263-09

2.859	2.859	2.86	2.859	**Specimen Diameter (in)**
5.669	5.67		5.670	**Specimen Height (in)**
			1116.6	**Weight Specimen Wet (g)**
			116.8	**Wet Density (pcf)**
			89.7	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	6.7	6.5	1.2	4.7	13.5	28.9	38.5

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	93.3		
1/2"	88.6		
3/8"	87.7		
#4	86.8		
#8	85.8		
#10	85.6		
#16	84.8		
#30	83.2		
#40	80.9		
#50	77.8		
#70	74.2		
#100	72.0		
#200	67.4		
0.0285 mm.	54.5		
0.0183 mm.	51.8		
0.0108 mm.	46.4		
0.0078 mm.	44.1		
0.0056 mm.	41.5		
0.0028 mm.	39.5		
0.0012 mm.	36.9		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/29/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/29/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 24 LL= 50 PI= 26

Coefficients

D_{90}= 14.9279 D_{85}= 1.3035

D_{60}= 0.0434 D_{50}= 0.0152

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: 7/11/23

Date Received: 7/21/23

Checked By: MK

Title: LM

Location: ADL-T2-4

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

TEAM Services
ISO 9001 International Accredited Laboratory
Geotechnical and Construction Material Consultants

133 Brown Street
Evansdale, IA 50707
Phone: 319-233-5344
Fax: 319-233-5434
www.teamservices.com
staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **7-0**

SAMPLE ID: **33**

SAMPLE SOURCE: ADL-T2-5(K)

SAMPLE DESCRIPTION: CH

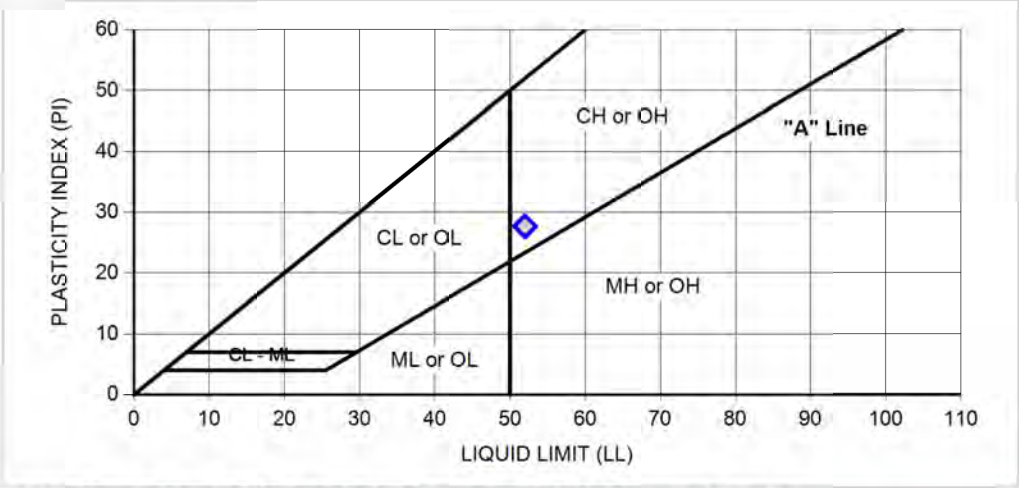
NOTES:

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool

DATE RECEIVED: 2023-07-21

DATE TESTED: 2023-07-31

TESTED BY: NG



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
24	32.93	25.55	11.49	52.20
24	32.00	25.55	13.19	51.90

AVG. LIQUID LIMIT (LL)

52

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
19.84	18.32	12.08	24.40
22.82	21.34	15.22	24.20

AVG. PLASTIC LIMIT (PL)

24

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

28

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/11/2023	**Sample ID:**	ADL-T2-5(K)
Tech:	NG	**Location:**	
Soil Description :	CH Fat Clay		

Moisture Content

ASTM D2216-10

26.7	**Weight Dish (g)**
114.1	**Weight Specimen Wet + Dish (g)**
97.2	**Weight Specimen Dried + Dish (g)**
24.0%	**Moisture Content (% of Dry Weight)**

Dry Density (Unit Weight)

ASTM D2263-09

2.856	2.846	2.853	2.875	**Specimen Diameter (in)**
5.668	5.669		5.63	**Specimen Height (in)**
			1083.9	**Weight Specimen Wet (g)**
			113.0	**Wet Density (pcf)**
			91.1	**Dry Density (pcf)**

Checked: JR

PERMEABILITY TEST RESULTS
Falling Head

TEAM Services

Project Name: IPL- Lansing Pond Closure
Project No.: 57-925
Sample: ADL-T2-5(K) **Date Received:** 7/11/2023
Sample Location:
Test Started: 7/21/2023 **Test Competed:** 7/28/2023
Test Procedure: ASTM D 5084 - 03 Falling Head Test (Method B)
Sample Description: CL trace coarse sand reddish brown

INITIAL SAMPLE DATA

Wet Weight (g)	1083.9
Non-cut Height (in)	5.63
Diameter (in)	2.875
Moisture Content (%)	24.0
Dry Unit Weight (pcf)	91.2

FINAL SAMPLE DATA

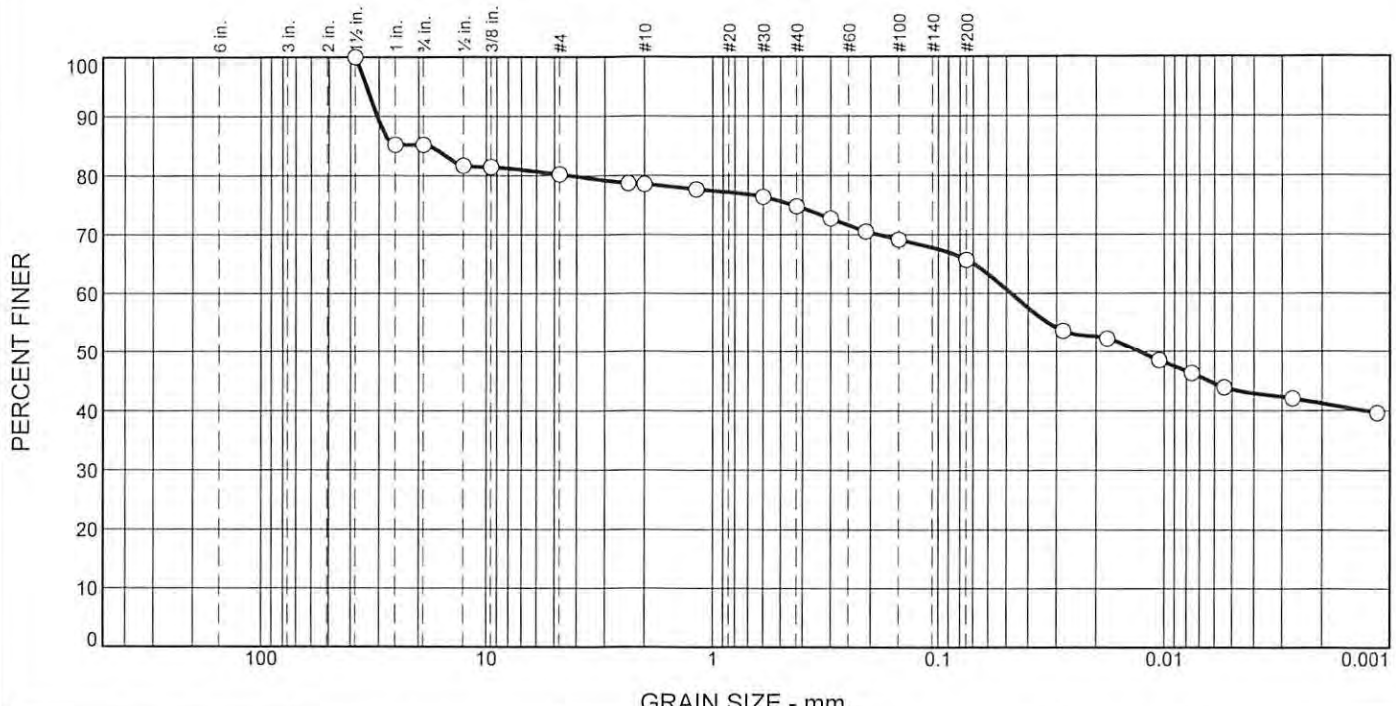
Wet Weight (g)	966.7
Final Cut Height (in)	4.83
Diameter (in)	2.875
Moisture Content (%)	31.9
Dry Unit Weight (pcf)	89.1

TEST DATA

Elapsed Time (hr)	Initial Head (in)	Final Head (in)	Coefficient of Permeability, k (cm/s)
18.33	134.06	125.19	1.6E-07
29.17	134.06	132.31	1.9E-08
19.50	134.06	133.44	1.0E-08
24.00	134.06	133.12	1.2E-08
24.42	134.06	133.12	1.2E-08
24.67	134.06	133.19	1.1E-08
23.67	134.06	133.25	1.1E-08
Average of last	**5**	**readings**	**1.1E-08**

717 S.E. 6th St, Des Moines, IA 50309 (515) 282-8818 fax: (515) 282-8741 www.teamservices.com staff@teamservices.com
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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	14.8	5.0	1.6	3.8	9.1	24.5	41.2

Test Results (ASTM D6913 and D7928)			
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	85.2		
3/4"	85.2		
1/2"	81.7		
3/8"	81.5		
#4	80.2		
#8	78.7		
#10	78.6		
#16	77.7		
#30	76.4		
#40	74.8		
#50	72.7		
#70	70.5		
#100	69.1		
#200	65.7		
0.0280 mm.	53.6		
0.0179 mm.	52.3		
0.0105 mm.	48.5		
0.0076 mm.	46.3		
0.0054 mm.	44.0		
0.0027 mm.	42.1		
0.0011 mm.	39.7		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/29/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/29/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 24 LL= 52 PI= 28

Coefficients

D_{90}= 30.5830 D_{85}= 17.8445

D_{60}= 0.0476 D_{50}= 0.0128

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: 7/11/23

Date Received: 7/21/23

Checked By: [signature]

Title: LM

Location: ADL-T2-5(K)

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

TEAM Services
ISO 9001 International Accredited Laboratory
Geotechnical and Construction Material Consultants
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Evansdale, IA 50707
Phone: 319-233-5344
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staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **7-0**

SAMPLE ID: **25**

SAMPLE SOURCE: ADL-T2-6

SAMPLE DESCRIPTION: CL

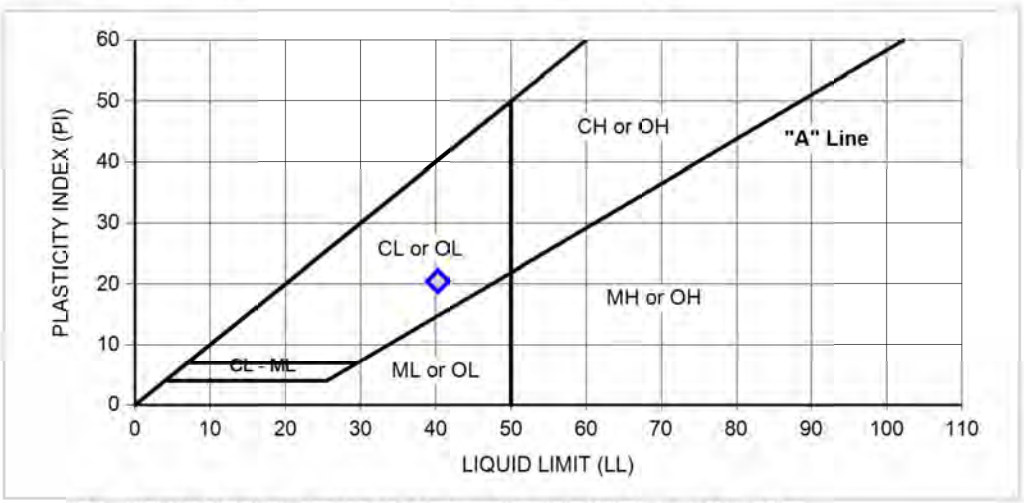
NOTES:

DATE RECEIVED: 2023-07-21

DATE TESTED: 2023-07-27

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
22	35.32	29.15	14.06	40.30
22	38.05	31.20	14.47	40.30

AVG. LIQUID LIMIT (LL)

40

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
21.08	19.57	11.98	19.90
20.53	19.32	13.19	19.70

AVG. PLASTIC LIMIT (PL)

20

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

21

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/10/2023	**Sample ID:**	ADL-T2-6
Tech:	NG	**Location:**	

Soil Description : CL Lean Clay

Moisture Content

ASTM D2216-10

27.8	**Weight Dish (g)**
129.5	**Weight Specimen Wet + Dish (g)**
106.2	**Weight Specimen Dried + Dish (g)**
29.7%	**Moisture Content (% of Dry Weight)**

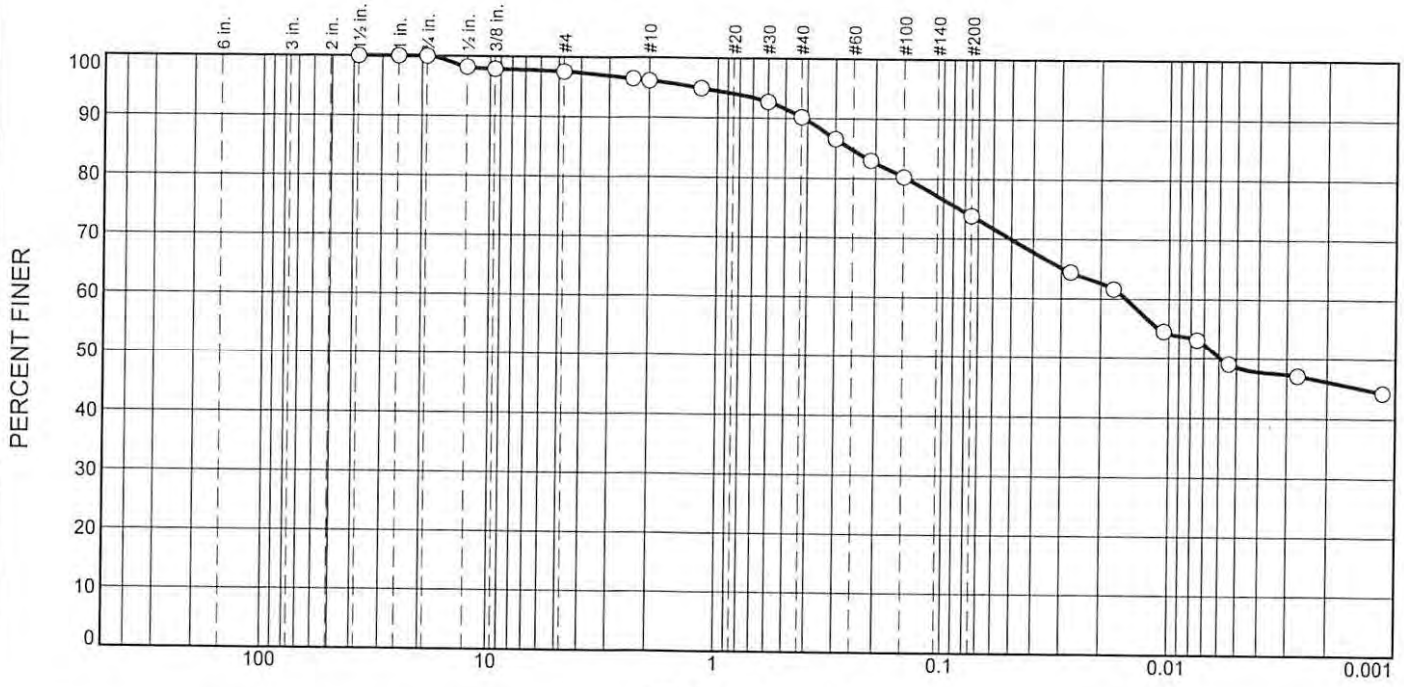
Dry Density (Unit Weight)

ASTM D2263-09

2.868	2.861	2.873	2.867 **Specimen Diameter (in)**
5.692	5.695		5.694 **Specimen Height (in)**
			1123.5 **Weight Specimen Wet (g)**
			116.4 **Wet Density (pcf)**
			89.7 **Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	2.4	1.4	5.9	16.5	27.6	46.2

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	98.2		
3/8"	97.9		
#4	97.6		
#8	96.5		
#10	96.2		
#16	95.0		
#30	92.7		
#40	90.3		
#50	86.6		
#70	83.1		
#100	80.3		
#200	73.8		
0.0274 mm.	64.4		
0.0176 mm.	61.6		
0.0105 mm.	54.6		
0.0075 mm.	53.1		
0.0054 mm.	49.1		
0.0027 mm.	47.2		
0.0011 mm.	44.3		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/28/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/28/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 20 LL= 40 PI= 20

Coefficients

D_{90}= 0.4132 D_{85}= 0.2560

D_{60}= 0.0155 D_{50}= 0.0059

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 7/10/23

Date Received: 7/21/23

Checked By: AK

Title: LM

Location: ADL-T2-6

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

TEAM Services
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Geotechnical and Construction Material Consultants

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Fax: 319-233-5434
www.teamservices.com
staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **7-0**

SAMPLE ID: **29**

SAMPLE SOURCE: ADL-T2-7

SAMPLE DESCRIPTION: CH

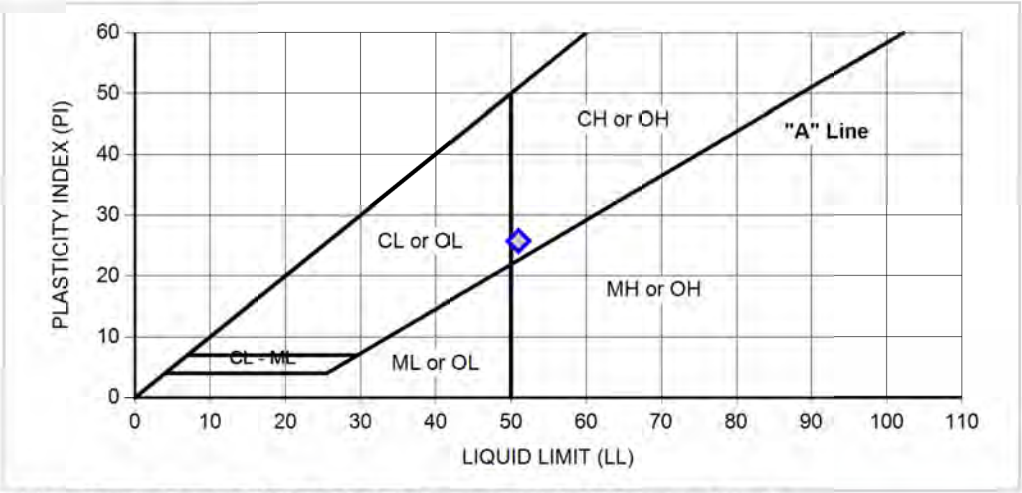
NOTES:

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool

DATE RECEIVED: 2023-07-21

DATE TESTED: 2023-07-31

TESTED BY: NG



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
29	39.98	31.45	14.45	51.10
29	33.74	27.13	13.88	50.80

AVG. LIQUID LIMIT (LL)

51

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
18.33	16.99	11.66	25.10
21.16	19.70	13.94	25.30

AVG. PLASTIC LIMIT (PL)

25

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

26

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/10/2023	**Sample ID:**	ADL-T2-7
Tech:	NG	**Location:**	
Soil Description :	CH Fat Clay		

Moisture Content

ASTM D2216-10

27.5	**Weight Dish (g)**
139.1	**Weight Specimen Wet + Dish (g)**
115.4	**Weight Specimen Dried + Dish (g)**
27.0%	**Moisture Content (% of Dry Weight)**

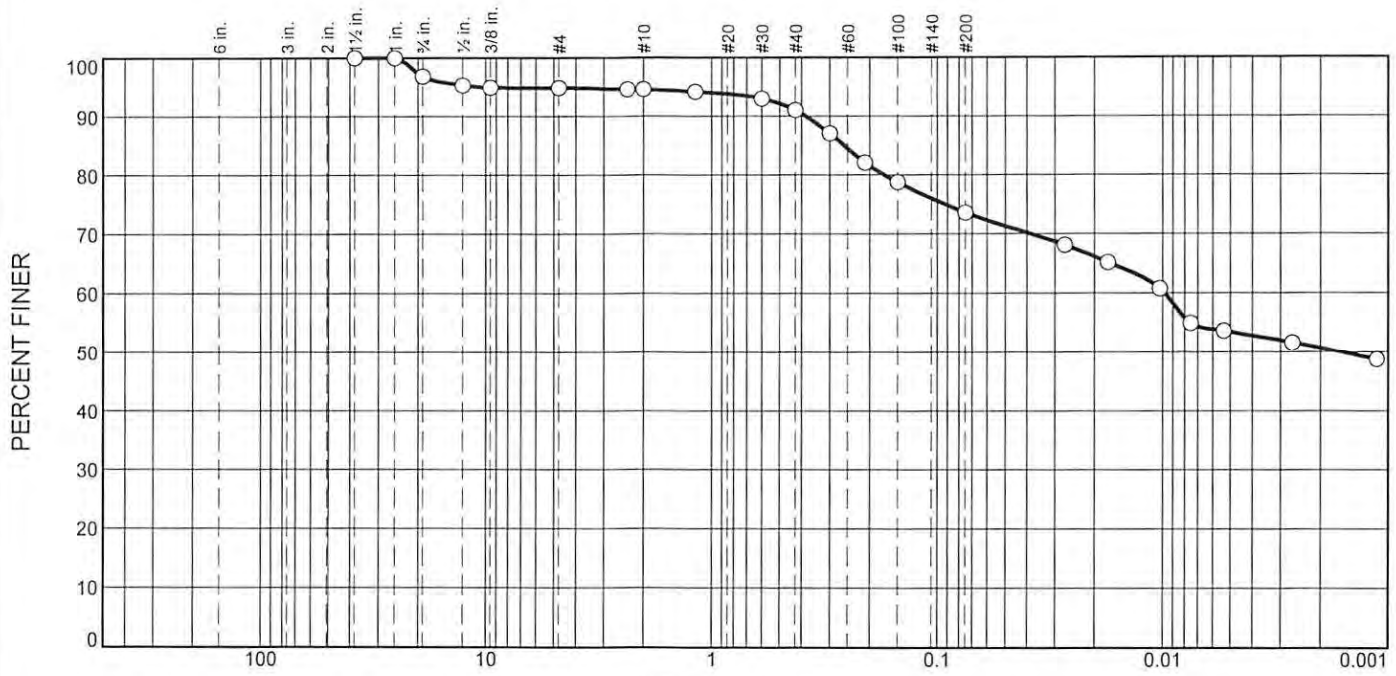
Dry Density (Unit Weight)

ASTM D2263-09

2.877	2.869	2.872	2.873	**Specimen Diameter (in)**
5.688	5.687		5.688	**Specimen Height (in)**
			1149.6	**Weight Specimen Wet (g)**
			118.8	**Wet Density (pcf)**
			93.6	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.2	1.9	0.3	3.6	17.4	22.9	50.7

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	96.8		
1/2"	95.3		
3/8"	94.9		
#4	94.9		
#8	94.6		
#10	94.6		
#16	94.2		
#30	93.0		
#40	91.0		
#50	87.1		
#70	82.1		
#100	78.8		
#200	73.6		
0.0271 mm.	68.0		
0.0174 mm.	65.1		
0.0103 mm.	60.8		
0.0075 mm.	54.9		
0.0053 mm.	53.6		
0.0027 mm.	51.7		
0.0011 mm.	48.7		

* (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/28/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/28/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 25 LL= 51 PI= 26

Coefficients

D_{90}= 0.3824 D_{85}= 0.2589

D_{60}= 0.0098 D_{50}= 0.0016

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

Date Sampled: 7/10/23

Date Received: 7/21/23

Checked By: JM

Title: LM

Location: ADL-T2-7

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

TEAM Services
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staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **7-0**

SAMPLE ID: **26**

SAMPLE SOURCE: ADL-T2-8(K)

SAMPLE DESCRIPTION: CL

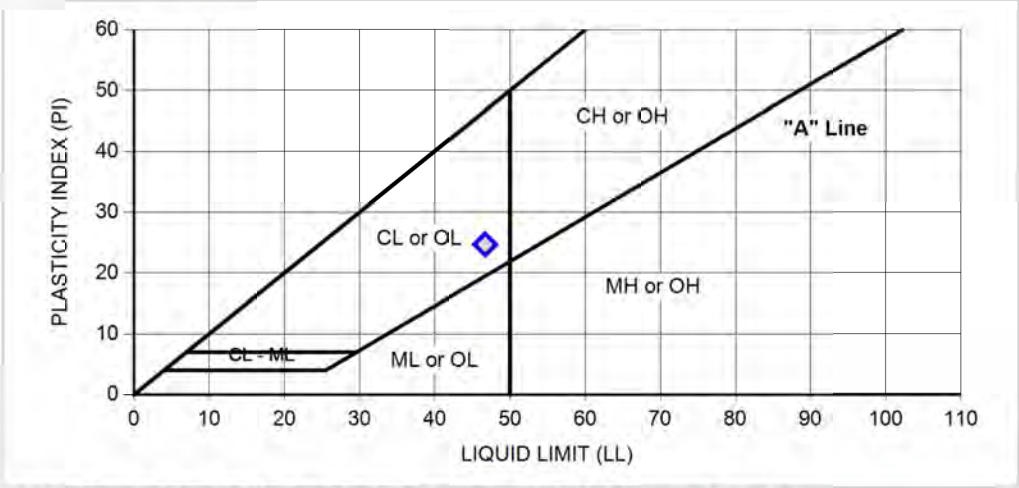
NOTES:

DATE RECEIVED: 2023-07-21

DATE TESTED: 2023-07-27

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
22	36.38	28.42	11.68	46.80
22	36.86	29.80	14.88	46.60

AVG. LIQUID LIMIT (LL)

47

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
19.77	18.43	12.35	22.00
22.41	20.87	13.85	21.90

AVG. PLASTIC LIMIT (PL)

22

MATERIAL CLASSIFICATION: **CL - Lean Clay**

PLASTICITY INDEX (PI)

25

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/11/2023	**Sample ID:**	ADL-T2-8(K)
Tech:	NG	**Location:**	

Soil Description : CL Lean Clay

Moisture Content

ASTM D2216-10

19.2	**Weight Dish (g)**
104.9	**Weight Specimen Wet + Dish (g)**
89.1	**Weight Specimen Dried + Dish (g)**
22.6%	**Moisture Content (% of Dry Weight)**

Dry Density (Unit Weight)

ASTM D2263-09

2.856	2.846	2.853	2.875	**Specimen Diameter (in)**
5.668	5.669		6.04	**Specimen Height (in)**
			1217.5	**Weight Specimen Wet (g)**
			118.3	**Wet Density (pcf)**
			96.5	**Dry Density (pcf)**

Checked: JR

PERMEABILITY TEST RESULTS
Falling Head

TEAM Services

Project Name: IPL- Lansing Pond Closure
Project No.: 57-925
Sample: ADL-T2-8(K) **Date Received:** 7/11/2023
Sample Location:
Test Started: 7/21/2023 **Test Competed:** 7/28/2023
Test Procedure: ASTM D 5084 - 03 Falling Head Test (Method B)
Sample Description: CL trace coarse sand reddish brown

INITIAL SAMPLE DATA

Wet Weight (g)	1217.5
Non-cut Height (in)	6.04
Diameter (in)	2.875
Moisture Content (%)	22.6
Dry Unit Weight (pcf)	96.6

FINAL SAMPLE DATA

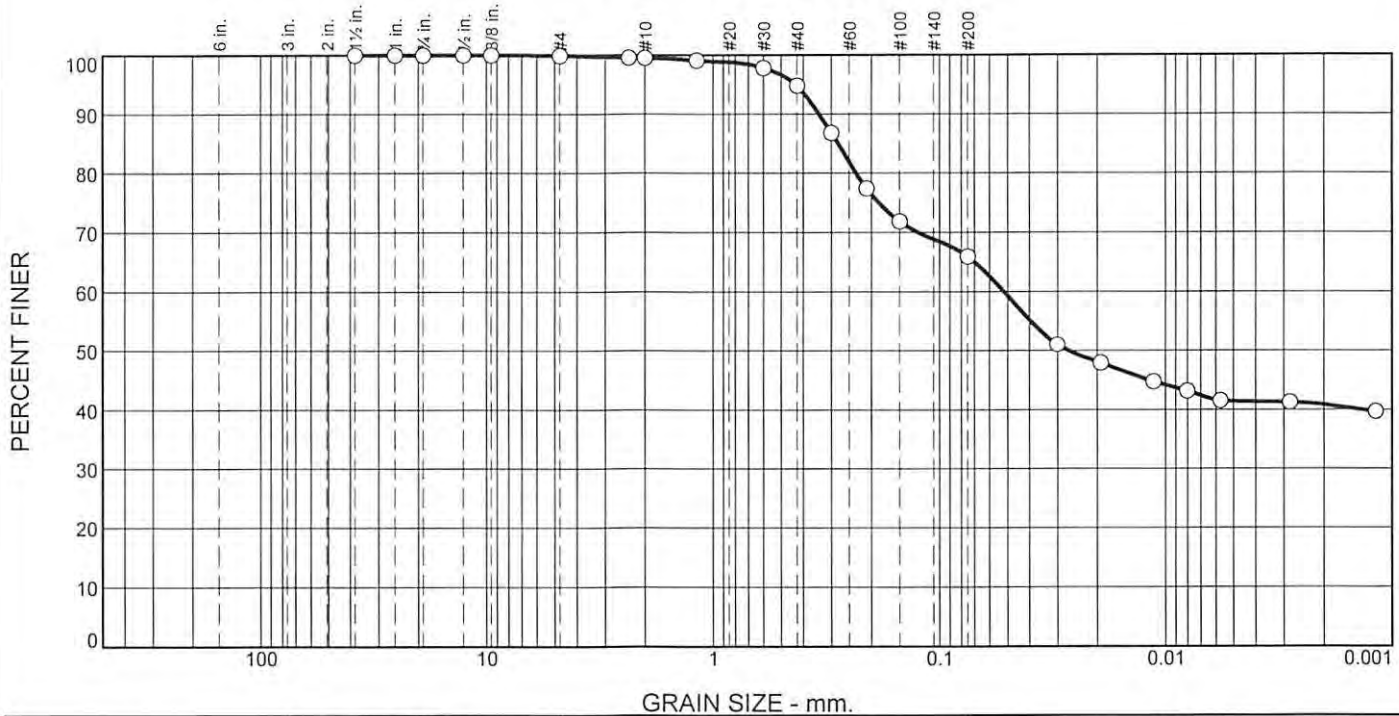
Wet Weight (g)	1103.8
Final Cut Height (in)	5.44
Diameter (in)	2.875
Moisture Content (%)	24.4
Dry Unit Weight (pcf)	95.7

TEST DATA

Elapsed Time (hr)	Initial Head (in)	Final Head (in)	Coefficient of Permeability, k (cm/s)
18.33	133.65	118.03	3.1E-07
29.17	133.65	129.40	5.1E-08
19.50	133.65	131.53	3.8E-08
24.00	133.65	131.15	3.6E-08
24.42	133.65	131.15	3.6E-08
24.67	133.65	131.03	3.7E-08
23.67	133.65	131.21	3.6E-08
Average of last	**4**	**readings**	**3.6E-08**

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Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.1	0.4	4.7	28.9	25.0	40.9

Test Results (ASTM D6913 and D7928)			
Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	100.0		
3/8"	100.0		
#4	99.9		
#8	99.6		
#10	99.5		
#16	99.1		
#30	97.8		
#40	94.8		
#50	86.8		
#70	77.4		
#100	71.8		
#200	65.9		
0.0301 mm.	51.0		
0.0193 mm.	47.9		
0.0113 mm.	44.8		
0.0080 mm.	43.2		
0.0057 mm.	41.5		
0.0028 mm.	41.3		
0.0012 mm.	39.7		

· (no specification provided)

Location: ADL-T2-8(K)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/28/23 **Technician:** NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/28/23 **Technician:** NG

Test Notes

Atterberg (ASTM D4318)

PL= 22 LL= 47 PI= 25

Coefficients

D_{90}= 0.3404 D_{85}= 0.2801

D_{60}= 0.0519 D_{50}= 0.0270

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CL

Date Sampled: 7/11/23

Date Received: 7/21/23

Checked By: JM

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers
Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

TEAM Services
ISO 9001 International Accredited Laboratory
Geotechnical and Construction Material Consultants

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Evansdale, IA 50707
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staff@teamservices.com

PROJECT NO: **57-925**

PROJECT: **IPL - Lansing Pond Closure**
Lansing, IA

REPORT NO: **7-0**

SAMPLE ID: **30**

SAMPLE SOURCE: ADL-T2-9

SAMPLE DESCRIPTION: CH

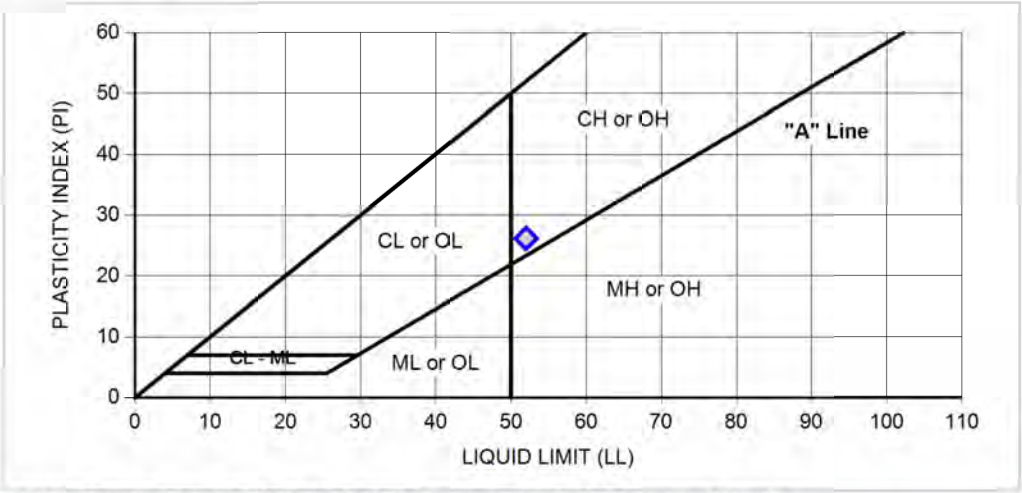
NOTES:

DATE RECEIVED: 2023-07-21

DATE TESTED: 2023-07-31

TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
30	38.07	30.55	15.85	52.30
30	32.46	25.30	11.16	51.80

AVG. LIQUID LIMIT (LL)

52

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
19.39	17.87	11.97	25.80
21.82	20.18	13.83	25.80

AVG. PLASTIC LIMIT (PL)

26

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

26

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/7/2023	**Sample ID:**	ADL-T2-9
Tech:	NG	**Location:**	
Soil Description :	CH Fat Clay		

Moisture Content

ASTM D2216-10

18.3	**Weight Dish (g)**
106.8	**Weight Specimen Wet + Dish (g)**
87.3	**Weight Specimen Dried + Dish (g)**
28.3%	**Moisture Content (% of Dry Weight)**

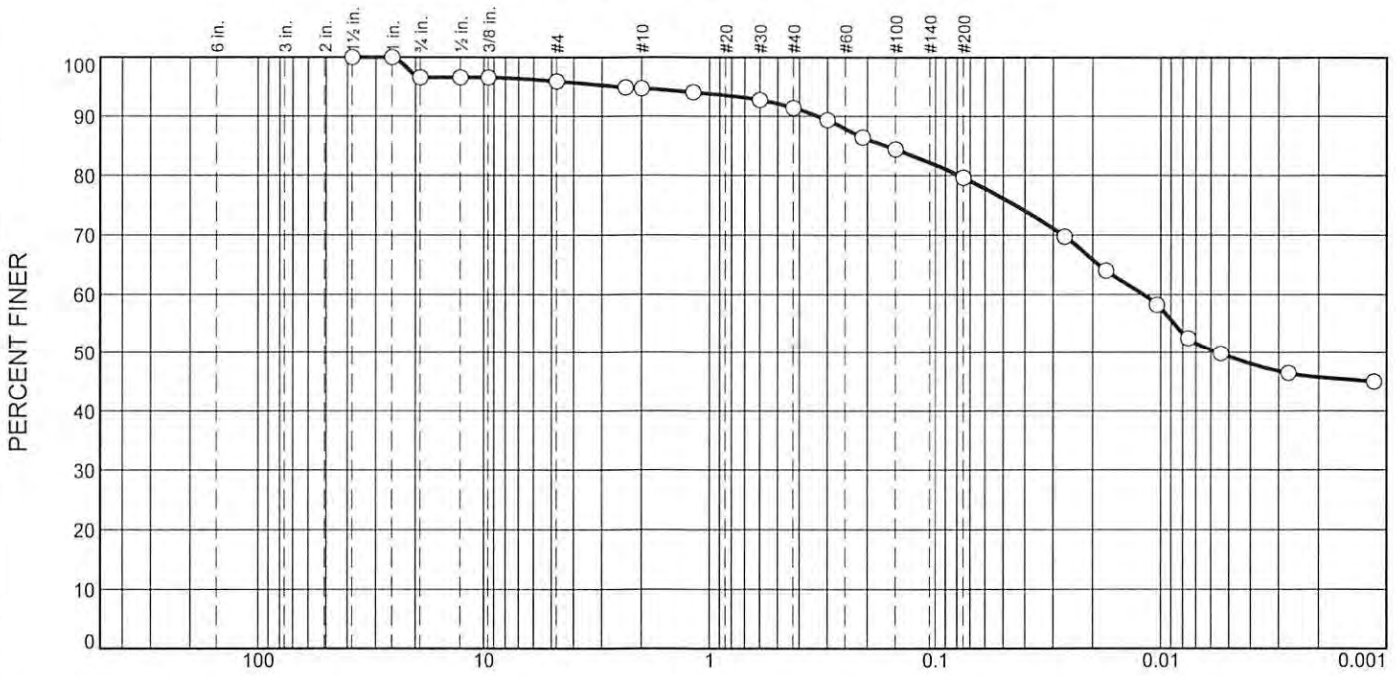
Dry Density (Unit Weight)

ASTM D2263-09

2.849	2.856	2.852	2.852	**Specimen Diameter (in)**
5.679	5.683		5.681	**Specimen Height (in)**
			1117.4	**Weight Specimen Wet (g)**
			117.3	**Wet Density (pcf)**
			91.4	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	3.4	0.7	1.2	3.3	11.8	33.9	45.7

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	96.6		
1/2"	96.6		
3/8"	96.6		
#4	95.9		
#8	94.9		
#10	94.7		
#16	94.1		
#30	92.8		
#40	91.4		
#50	89.4		
#70	86.4		
#100	84.4		
#200	79.6		
0.0267 mm.	69.7		
0.0174 mm.	64.0		
0.0104 mm.	58.2		
0.0076 mm.	52.5		
0.0054 mm.	49.8		
0.0027 mm.	46.4		
0.0011 mm.	45.0		

· (no specification provided)

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/28/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/28/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 26 LL= 52 PI= 26

Coefficients

D_{90}= 0.3301 D_{85}= 0.1656

D_{60}= 0.0119 D_{50}= 0.0056

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: 7/7/23

Date Received: 7/21/23

Checked By: JK

Title: LM

Location: ADL-T2-9

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers
Project: IPL Lansing Pond Closure

Project No: 57-925

Figure

Liquid Limit, Plastic Limit & Plasticity Index of Soils

ASTM D-4318 "Atterberg Limits"

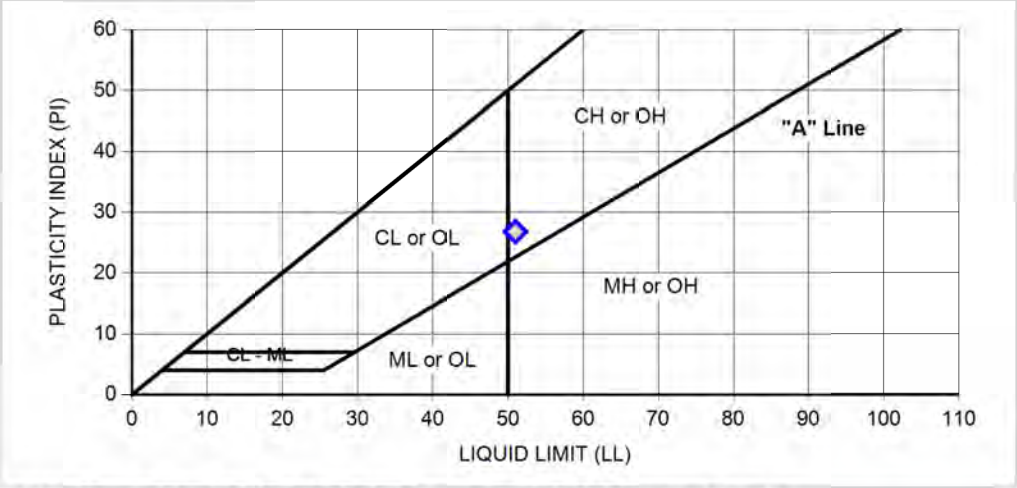
133 Brown Street
Evansdale, IA 50707
Phone: 319-233-5344
Fax: 319-233-5434
www.teamservices.com
staff@teamservices.com

PROJECT NO: 57-925
PROJECT: IPL - Lansing Pond Closure
Lansing, IA
REPORT NO: 7-0

SAMPLE ID: 31
SAMPLE SOURCE: ADL-T2-10
SAMPLE DESCRIPTION: CH
NOTES:

DATE RECEIVED: 2023-07-21
DATE TESTED: 2023-07-31
TESTED BY: NG

Wet (air-dried) Preparation. PL 2 Trials. Manual LL Device. Hand PL Rolling. Metal Grooving Tool



[CL] Lean Clay [CH] Fat Clay [ML] Silt [MH] Elastic Silt [OL] Organic Clay/Silt [OH] Organic Clay/Silt

LIQUID LIMIT TEST DATA Method B

NUMBER OF DROPS	WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	LIQUID LIMIT
28	41.34	32.48	14.88	51.00
28	36.05	28.81	14.46	51.10

AVG. LIQUID LIMIT (LL)

51

PLASTIC LIMIT TEST DATA

WT. WET SOIL + TARE (g)	WT. DRY SOIL + TARE (g)	WT. TARE (g)	PLASTIC LIMIT
20.12	18.41	11.37	24.30
23.88	22.24	15.46	24.20

AVG. PLASTIC LIMIT (PL)

24

MATERIAL CLASSIFICATION: **CH - Fat Clay**

PLASTICITY INDEX (PI)

27

Approved: Jeff Roberts

Dry Density & Moisture of Soil

TEAM Services
717 SE 6th Street
Des Moines, IA 50309

Project No:	57-925	**Project:**	IPL - Lansing Pond Closure
Date:	7/7/2023	**Sample ID:**	ADL-T2-10
Tech:	NG	**Location:**	
Soil Description :	CH Fat Clay		

Moisture Content

ASTM D2216-10

19.0	**Weight Dish (g)**
112.3	**Weight Specimen Wet + Dish (g)**
92.9	**Weight Specimen Dried + Dish (g)**
26.3%	**Moisture Content (% of Dry Weight)**

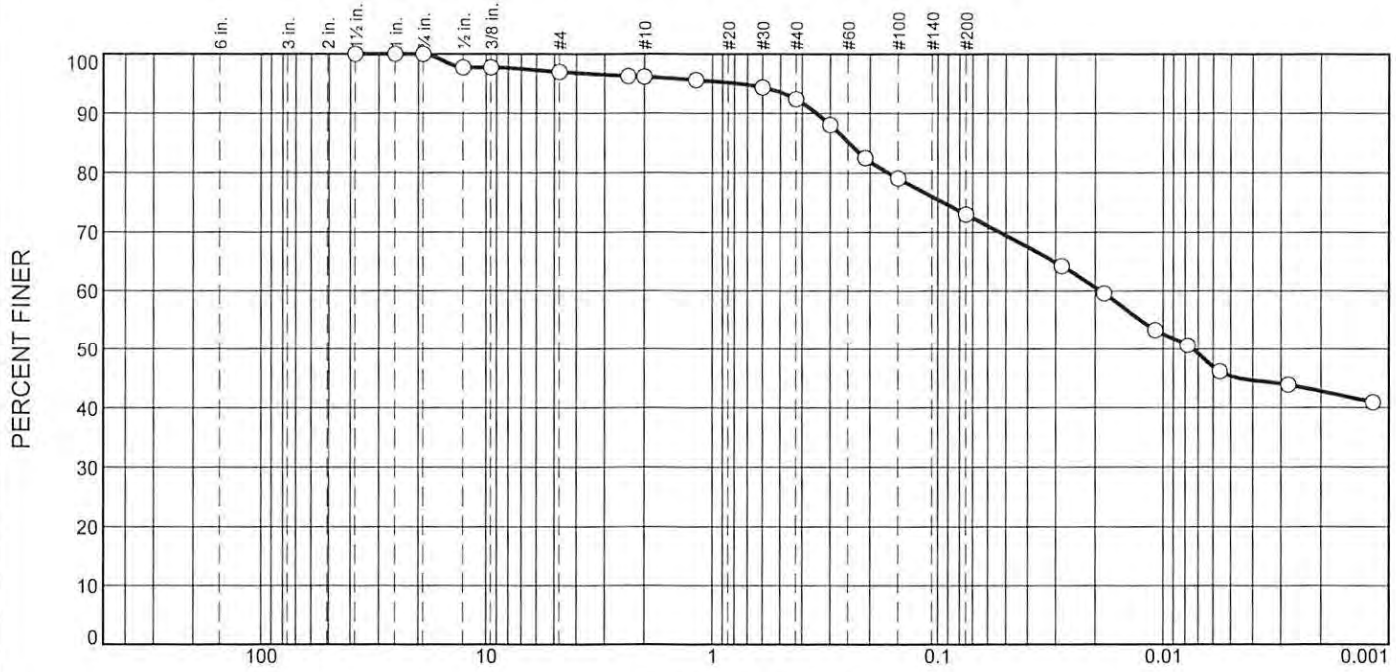
Dry Density (Unit Weight)

ASTM D2263-09

2.849	2.86	2.855	2.855	**Specimen Diameter (in)**
5.675	5.677		5.676	**Specimen Height (in)**
			1123.5	**Weight Specimen Wet (g)**
			117.8	**Wet Density (pcf)**
			93.3	**Dry Density (pcf)**

Checked: JR

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	3.0	0.9	3.7	19.4	30.3	42.7

Test Results (ASTM D6913 and D7928)

Sieve Size or Diam. (mm.)	Finer (%)	Spec.* (%)	Out of Spec. (%)
1-1/2"	100.0		
1"	100.0		
3/4"	100.0		
1/2"	97.7		
3/8"	97.7		
#4	97.0		
#8	96.3		
#10	96.1		
#16	95.6		
#30	94.4		
#40	92.4		
#50	88.1		
#70	82.5		
#100	79.1		
#200	73.0		
0.0282 mm.	64.2		
0.0183 mm.	59.5		
0.0108 mm.	53.3		
0.0078 mm.	50.6		
0.0056 mm.	46.1		
0.0028 mm.	43.9		
0.0012 mm.	40.9		

* (no specification provided)

Location: ADL-T2-10

Material Description

Sieve Test (ASTM D6913)

Test Date: 7/29/23 Technician: NG

Test Notes

Hydrometer Test (ASTM D7928)

Test Date: 7/29/23 Technician: NG

Test Notes

Atterberg (ASTM D4318)

PL= 24 LL= 51 PI= 27

Coefficients

D_{90}= 0.3451 D_{85}= 0.2474

D_{60}= 0.0190 D_{50}= 0.0074

D_{30}= D_{15}=

D_{10}=

C_u= C_c=

USCS (ASTM D2487)

CH

Date Sampled: 7/7/23

Date Received: 7/21/23

Checked By: JM

Title: LM

TEAM Services
Geotechnical and Construction Material Consultants

Client: SCS Enginneers

Project: IPL Lansing Pond Closure

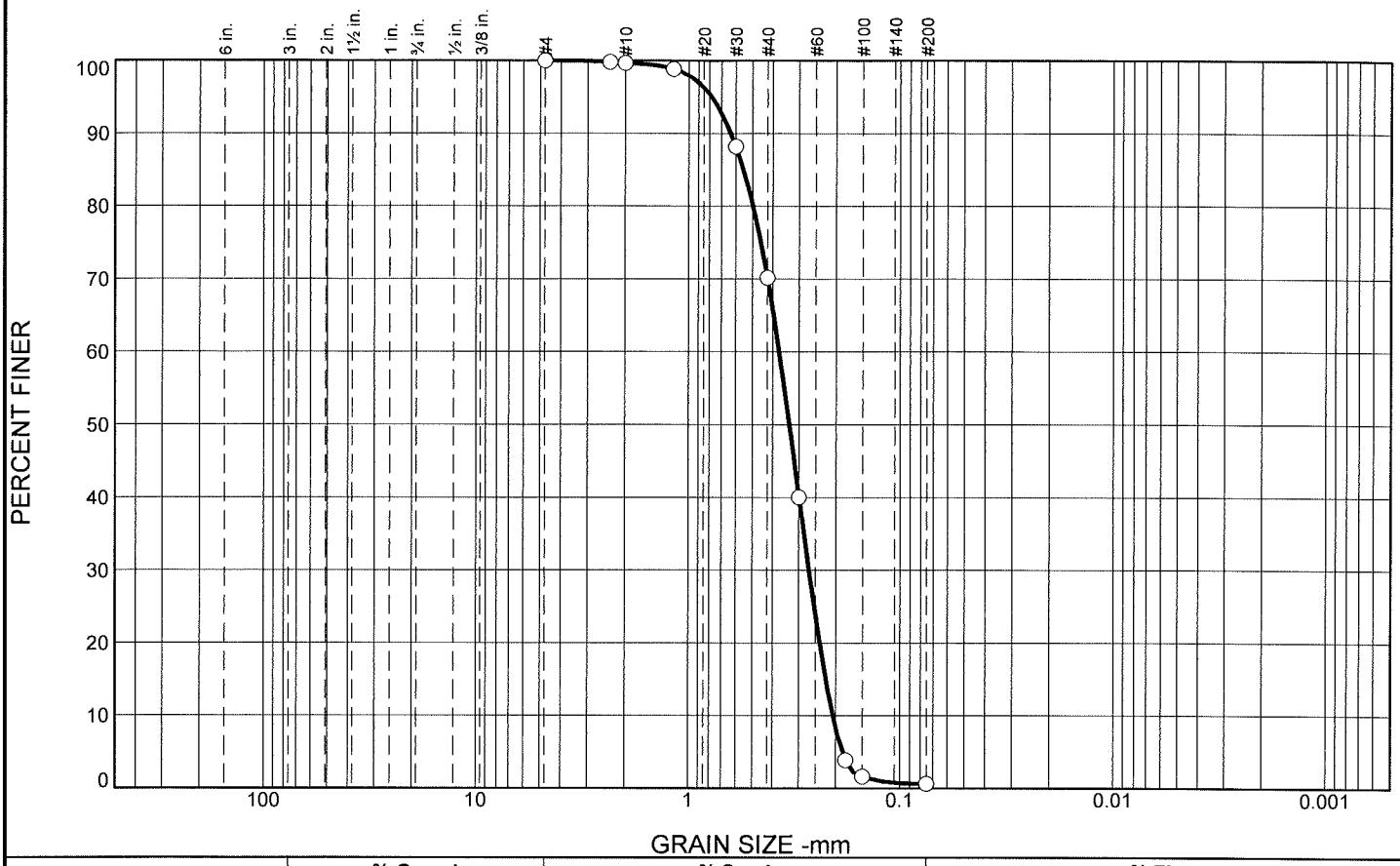
Project No: 57-925

Figure

Appendix D

Rooting Zone Laboratory Test Results
(USACE Dredge Sand Stockpile)

Particle Size Distribution Report



% +3"	% Gravel		% Sand			% Fines	
	Coarse	Fine	Coarse	Medium	Fine	Silt	Clay
0.0	0.0	0.0	0.3	29.5	69.6	0.6	

SIEVE SIZE	PERCENT FINER	SPEC.* PERCENT	PASS? (X=NO)
#4	100.0		
#8	99.8		
#10	99.7		
#16	98.8		
#30	88.2		
#40	70.2		
#50	40.0		
#80	3.8		
#100	1.6		
#200	0.6		

* (no specification provided)

Material Description

Brown Fine to Medium Sand, Trace Silt

Atterberg Limits

PL= LL= PI=

Coefficients

D_{90}= 0.6337 D_{85}= 0.5529 D_{60}= 0.3738
D_{50}= 0.3340 D_{30}= 0.2690 D_{15}= 0.2238
D_{10}= 0.2072 C_u= 1.80 C_c= 0.93

Classification

USCS= SP AASHTO=

Remarks

Sample Number: USACE Bridge S. Pile

Date: 2/11/22

CGC, Inc.

Client: SCS Engineers

Project: LAN Pond Closure (SCS # 25220100.00)

Project No: C22011-1 **Figure**

Tested By: KJS **Checked By:** FHC

Table 1. U.S. Army Corps of Engineers Lansing Iowa Dredge Stockpile Analytical Results Summary
Lansing Generating Station / SCS Engineers Project #25222159.00

Method / Parameter Name				S01-S04 Lab Composite		Composite LAN USACE sand 220303		LAN USACE SAND 220311		LAN USACE Sand 230221		LAN USACE Sand 230808	
				11/24/2021		3/8/2022		3/15/2022		2/21/2023		8/8/2023	
Synthetic Precipitation Leaching Procedure (SPLP) (mg/L)	**MCL (mg/L)**	**10 X MCL (mg/L)**	**Regulatory Limit (mg/kg)**										
Antimony	0.006	0.06	--	<0.00550		<0.00550		**0.0115**		<0.00550		<0.00500	^3+F1
Arsenic	0.010	0.10	--	<0.00380		<0.00380		0.00396	J	0.00389	J	0.00464	J F1
Barium	2.0	20.0	--	0.0325	J	0.0395	J	0.0327	J	0.0253	J	0.0688	F1
Beryllium	0.004	0.04	--	<0.00140		<0.00140		<0.00140		<0.00140		<0.00170	F1
Boron	--	--	--	<0.290		<0.290		<0.290		<0.290		<0.380	F1
Cadmium	0.005	0.05	--	<0.000260		<0.000280		<0.000280		0.000695	J B	<0.000500	
Chromium	0.1	1.0	--	<0.00650		<0.00720		0.00774	J	0.00747	J	0.0145	J F1
Cobalt	--	--	--	0.000830	J	0.00156	J	0.00133	J	0.00174	J B	0.00191	J
Copper	1.3	13.0	--	<0.0160		<0.0160		<0.0160		<0.0160		0.0104	J B
Calcium*	--	--	--	4.86		5.39		6.60		3.50		5.22	
Chloride*	--	--	--	<1.00		<0.500		<0.500		<0.500		<0.500	
Fluoride	4.0	40.0	--	<0.0750		<0.0750		<0.0750		<0.0750		<0.0750	
Lead	0.015	0.15	--	0.00204	J	0.00222	J	0.00208	J	0.00263	J	<0.00573	F1
Lithium	--	--	--	<0.0160		<0.0160		<0.0160		<0.0160		<0.0160	F1
Manganese	--	--	--	NA		NA		NA		NA		NA	
Mercury	0.002	0.02	--	<0.00150		<0.00120		<0.00120		<0.00150		<0.00150	
Molybdenum	--	--	--	<0.00650		<0.00920		0.00957	J	<0.00920		<0.00920	
Nickel	--	--	--	NA		NA		NA		NA		NA	
Selenium	0.05	0.5	--	<0.00790		<0.00830		<0.00830		<0.00830		<0.00830	
Silver	--	--	--	NA		NA		NA		NA		NA	
Sulfate	--	--	--	<1.00		0.964	J	<0.610		<0.610	*+	<0.500	
Thallium	0.002	0.02	--	<0.00240		**0.00358**	J	<0.00240		**0.00402**	J	0.00153	J
Vanadium	--	--	--	NA		NA		NA		NA		NA	
Zinc	--	--	--	NA		NA		NA		NA		NA	
Method: 9315 - Radium-226 (GFPC) - SPLP West (pCi/L)													
Radium-226*				<0.193	U	<0.140	U	<0.131	U	<0.335	U	<0.165	U
Method: 9320 - Radium-228 (GFPC) - SPLP West (pCi/L)													
Radium-228*				1.10		<0.567	U	<0.622	U	<1.89	U G	<0.968	U
Total Metals (mg/kg)	**MCL**	**10 X MCL**	**Regulatory Limit (mg/kg)**										
Antimony	--	--	31	<0.249	F2	<0.350		<0.407		<0.347		<0.354	
Arsenic	--	--	17	1.06	F2	1.18		1.26		1.36	F1	1.48	
Barium	--	--	15,000	26.3	F2	30.1		31.8		32.9	F1	43.7	
Beryllium	--	--	110	<0.144	F2	<0.146		<0.171		0.192	J F1	0.184	J
Boron	--	--	16,000	<21.7		<12.2		<14.2		<14.3	F1	<20.6	
Cadmium	--	--	70	<0.112		<0.122		<0.142		<0.143	F1	<0.157	
Chromium	--	--	**(Total)	2.85	F2	3.48		3.62		3.43	B	5.22	
(Hexavalent - IV)	--	--	210	<0.402		0.482	J	<0.425		0.576	J	<0.409	
(Trivalent - III)	--	--	97,000	2.85		<0.104		3.62		2.85		5.22	
Cobalt	--	--	23	2.31	F2	2.58		2.61		2.91	F1	3.63	
Copper	--	--	15,000	1.50	F2	1.47		1.30	J	1.66	F1 B	2.86	
Calcium*	--	--	--	2,880	F2, F1	2,140		10,400		2,230	F1	2,420	F1
Chloride*	--	--	--	<60.9		<47.5		<54.7		<47.3		<45.2	
Fluoride	--	--	4,700	<6.69		<4.27		<4.91		<4.25		<7.53	
Lead	--	--	400	1.72	J	1.48	J	1.79	J	1.71	J F1	1.79	J
Lithium	--	--	160	1.44	J, F2	1.89	J	1.47	J	1.94	J F1	2.33	
Manganese	--	--	10,000	276	F2, F1	293	F1 F2	271		317	F2 F1	401	

Table 1. U.S. Army Corps of Engineers Lansing Iowa Dredge Stockpile Analytical Results Summary
Lansing Generating Station / SCS Engineers Project #25222159.00

Method / Parameter Name				S01-S04 Lab Composite		Composite LAN USACE sand 220303		LAN USACE SAND 220311		LAN USACE Sand 230221		LAN USACE Sand 230808	
				11/24/2021		3/8/2022		3/15/2022		2/21/2023		8/8/2023	
Mercury	--	--	23	<0.00815		<0.00707		<0.00804		<0.00758		<0.00716	H
Molybdenum	--	--	390	<0.265	F2	<0.268		<0.313		0.345	J F1	<0.404	
Nickel	--	--	1,500	3.32	F2	3.03		3.61		3.65		5.51	
Selenium	--	--	390	0.328	J, F2	<0.504		<0.588		0.670	J F1	0.666	J
Silver	--	--	370	<0.0883	F2	<0.122		<0.142		<0.143	F1	<0.239	
Sulfate*	--	--	--	<66.9		<38.8		<44.6		<38.6		<42.2	
Thallium	--	--	0.78	0.253	F2	<0.163		<0.190		0.299		0.536	
Vanadium	--	--	350	6.14	F2	6.30		5.66		6.42		8.37	
Zinc	--	--	23,000	8.69	F2	9.49		9.66		9.77		13.1	
Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (pCi/g)													
Radium-226*				0.323		0.363		0.285		0.307		0.282	
Radium-228*				0.497		0.237		0.436		0.333		<0.275	U
Toxicity Characteristic Leaching Procedure (TCLP)													
Metals (mg/L)	**MCL**	**10 X MCL**	**Regulatory Limit (mg/L)**										
Arsenic	--	--	5.0	<0.0500		<0.0500		<0.100		<0.100		<0.0300	
Barium	--	--	100.0	0.345	J	0.432	J	0.275	J	0.211	J	0.331	
Cadmium	--	--	1.0	<0.00440		<0.00530		<0.00780		<0.00780		<0.00390	
Chromium	--	--	5.0	<0.00870		<0.00870		<0.00870		<0.00870		<0.00600	
Lead	--	--	5.0	<0.0320		<0.0320		<0.0500		<0.0500		<0.0260	
Mercury	--	--	0.2	<0.00150		<0.00120		<0.00120		<0.00150		<0.00150	
Selenium	--	--	1.0	<0.0630		<0.0630		<0.0670		<0.0670		<0.0290	
Silver	--	--	5.0	<0.00870	*+	0.00987	J B	<0.00940		<0.00940		<0.0140	
Pesticides (µg/L)	**MCL**	**10 X MCL**	**Regulatory Limit (µg/L)**										
Chlordane	--	--	30	<1.10		<1.10		<1.10		<1.10		<1.10	
Endrin	--	--	20	<0.0500		<0.0500		<0.0500		<0.0500		<0.0500	
Heptachlor (and its epoxide)	--	--	8	<0.106		<0.106		<0.106		<0.106		<0.106	
Lindane	--	--	400	<0.0700		<0.0700		<0.0700		<0.0700		<0.0700	
Methoxychlor	--	--	10,000	<0.0700		<0.0700		<0.0700		<0.0700		<0.0700	
Toxaphene	--	--	500	<2.10		<2.10		<2.10		<2.10		<2.10	
Herbicides (mg/L)	**MCL**	**10 X MCL**	**Regulatory Limit (mg/L)**										
2,4-D	--	--	10.0	<0.0500		<0.0500		<0.0500		<0.0500		<0.0500	
2,4,5-TP (Silvex)	--	--	1.0	<0.0500		<0.0500		<0.0500		<0.0500		<0.0500	
Volatile Organic Compounds (VOCs) (mg/L)	**MCL**	**10 X MCL**	**Regulatory Limit (mg/L)**										
Benzene	--	--	0.5	<0.0140		<0.0140		<0.0140		<0.0140		<0.0140	
Carbon tetrachloride	--	--	0.5	<0.0130		<0.0130		<0.0130		<0.0130		<0.0130	
Chlorobenzene	--	--	100.0	<0.0120		<0.0120		<0.0120		<0.0120		<0.0120	
Chloroform	--	--	6.0	<0.0360		<0.0360		0.0422	J B	<0.0360		<0.0360	
1,2-Dichloroethane	--	--	0.5	<0.0100		<0.0100		<0.0100		<0.0100		<0.0100	
1,1-Dichloroethylene	--	--	0.7	<0.0110	*+	<0.0110		<0.0110		<0.0110		<0.0110	
Methyl ethyl ketone (2-Butanone [MEK])	--	--	200.0	<1.50		<1.50		<1.50		<1.50		<1.50	
Tetrachloroethylene	--	--	0.7	<0.0870		<0.0870		<0.0870		<0.0870		<0.0870	
Trichloroethylene	--	--	0.5	<0.0820		<0.0820		<0.0820		<0.0820		<0.0820	

Table 1. U.S. Army Corps of Engineers Lansing Iowa Dredge Stockpile Analytical Results Summary
Lansing Generating Station / SCS Engineers Project #25222159.00

Method / Parameter Name				S01-S04 Lab Composite	Composite LAN USACE sand 220303	LAN USACE SAND 220311	LAN USACE Sand 230221	LAN USACE Sand 230808
				11/24/2021	3/8/2022	3/15/2022	2/21/2023	8/8/2023
Vinyl chloride	--	--	0.2	<0.0190	<0.0190	<0.0190	<0.0190	<0.0190
Semi-Volatile Organic Compounds (SVOCs) (mg/L)	**MCL**	**10 X MCL**	**Regulatory Limit (mg/L)**					
o-Cresol = 2-Methylphenol	--	--	200.0	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
m-Cresol = 4-Methylphenol (and/or 3-Methylphenol)	--	--	200.0	<0.00380	<0.00380	<0.00380	<0.00380	<0.00380
p-Cresol = 4-Methylphenol (and/or 3-Methylphenol)	--	--	200.0	<0.00380	<0.00380	<0.00380	<0.00380	<0.00380
Cresols = Total Cresols	--	--	200.0	<0.00500	<0.00500	<0.00500	<0.00500	<0.00500
1,4-Dichlorobenzene	--	--	7.5	<0.00650	<0.00650	<0.00650	<0.00650	<0.00650
2,4-Dinitrotoluene	--	--	0.13	<0.00540	<0.00540	<0.00540	<0.00540	<0.00540
Hexachlorobenzene	--	--	0.13	<0.00690	<0.00690	<0.00690	<0.00690	<0.00690
Hexachlorobutadiene	--	--	0.5	<0.00600	<0.00600	<0.00600	<0.00600	<0.00600
Hexachloroethane	--	--	3.0	<0.00640	<0.00640	<0.00640	<0.00640	<0.00640
Nitrobenzene	--	--	2.0	<0.00530	<0.00530	<0.00530	<0.00530	<0.00530
Pentachlorophenol	--	--	100.0	<0.0150	<0.0150	<0.0150	<0.0150	<0.0150
Pyridine	--	--	5.0	<0.00740	<0.00740	<0.00740	<0.00740 *1	<0.00740 *-*1
2,4,5-Trichlorophenol	--	--	400.0	<0.00530	<0.00530	<0.00530	<0.00530	<0.00530
2,4,6-Trichlorophenol	--	--	2.0	<0.00590	<0.00590	<0.00590	<0.00590	<0.00590
Other Parameters								
pH (standard units)*	--	--	--	8.7 HF	8.7 HF	8.7 HF	8.7 HF	8.7 HF

Table 1. U.S. Army Corps of Engineers Lansing Iowa Dredge Stockpile Analytical Results Summary
Lansing Generating Station / SCS Engineers Project #25222159.00

Abbreviations:
mg/L = milligrams per liter
µg/L = micrograms per liter
mg/kg = milligrams per kilogram
-- = Not Applicable
NA = Not Analyzed
MCL = Maximum Contaminant Level

Notes:
* = Parameter not included on the Iowa Department of Natural Resources Beneficial Use Determination: Solid By-Product Management Plan Guide
**If Total Chromiun ≥210 mg/kg, further analysis shall be conducted to determine hexavalent and trivalent results.

Bold values meet or exceed the Maximum Contaminant Level (MCL) or Regulatory Limit.

Lab Notes/Qualifiers:
B = Compound was found in the blank and sample.
F1 = MS and/or MSD recovery exceeds control limits.
F2 = MS/MSD RPD exceeds control limits.
G = The Sample MDC is greater than the requested RL.
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.
U = Result is less than the sample detection limit.
*+ = LCS and/or LCSD is outside acceptance limits, high biased.
*1 = LCS/LCSD RPD exceeds control limits.

Created by:	LMH	Date:	5/12/2022
Last revision by:	REH	Date:	9/21/2023
Checked by:	REO	Date:	9/25/2023
Proj Mgr QA/QC:	BSS	Date:	10/24/2023

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ANALYTICAL REPORT

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-220603-1
Client Project/Site: Lansing Soil Characterization, 25220100

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
12/15/2021 3:45:15 PM
Matthew Hummel, Project Manager I
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Designee for

Shirley Thompson, Client Service Manager
(319)277-2401
Shirley.Thompson@Eurofinset.com

LINKS

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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.

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Case Narrative

Client: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

Job ID: 310-220603-1

Laboratory: Eurofins TestAmerica, Cedar Falls

Narrative

Job Narrative
310-220603-1

Comments
No additional comments.

Receipt
The samples were received on 11/24/2021 2:30 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.4º C.

Receipt Exceptions
A Chain-of-Custody (COC) was not received with these samples: S01-S04 Lab Composite (310-220603-5).

GC/MS VOA
Method 8260D: The continuing calibration verification (CCV) associated with batch 310-337519 recovered above the upper control limit for 1,1-Dichloroethene (54.4%D). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-337519/3).

Method 8260D: The laboratory control sample (LCS) for preparation batch 310-337437 and analytical batch 310-337519 recovered outside control limits for the following analytes: 1,1-Dichloroethene. 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.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Methods 6010C, 6010D: The laboratory control sample (LCS) for preparation batch 310-337432 and 310-337575 and analytical batch 310-337987 recovered outside control limits for the following analytes: Silver. 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
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Organic Prep
Method 1311: Tumbled in plastic due to matrix

S01-S04 Lab Composite (310-220603-5)

No additional analytical or quality issues were noted, other than those described above or 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: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-220603-5	S01-S04 Lab Composite	Solid	11/24/21 00:00	11/24/21 14:30

Detection Summary

Client: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: S01-S04 Lab Composite
Lab Sample ID: 310-220603-5

Analyte	Result	Qualifier	RL	MDL	Unit	Dil Fac	D	Method	Prep Type
Barium	0.345	J	0.500	0.110	mg/L	1		6010C	TCLP
Arsenic	1.06	F2	0.803	0.257	mg/Kg	5	☼	6020B	Total/NA
Barium	26.3	F2	0.803	0.305	mg/Kg	5	☼	6020B	Total/NA
Chromium	2.85	F2	1.20	0.249	mg/Kg	5	☼	6020B	Total/NA
Cobalt	2.31	F2	0.201	0.104	mg/Kg	5	☼	6020B	Total/NA
Copper	1.50	F2	1.20	0.449	mg/Kg	5	☼	6020B	Total/NA
Lead	1.72	J	2.01	0.626	mg/Kg	5	☼	6020B	Total/NA
Lithium	1.44	J F2	2.01	0.546	mg/Kg	5	☼	6020B	Total/NA
Manganese	276	F2 F1	2.01	1.04	mg/Kg	5	☼	6020B	Total/NA
Nickel	3.32	F2	1.20	0.385	mg/Kg	5	☼	6020B	Total/NA
Calcium	2880	F2 F1	120	44.9	mg/Kg	5	☼	6020B	Total/NA
Selenium	0.328	J F2	1.20	0.321	mg/Kg	5	☼	6020B	Total/NA
Thallium	0.253	F2	0.201	0.0963	mg/Kg	5	☼	6020B	Total/NA
Vanadium	6.14	F2	1.20	0.297	mg/Kg	5	☼	6020B	Total/NA
Zinc	8.69	F2	4.01	2.89	mg/Kg	5	☼	6020B	Total/NA
Barium	0.0325	J	0.100	0.0200	mg/L	1		6020B	SPLP West
Calcium	4.86		2.50	1.10	mg/L	1		6020B	SPLP West
Lead	0.00204	J	0.00500	0.00140	mg/L	1		6020B	SPLP West
Cobalt	0.000830	J	0.00250	0.000460	mg/L	1		6020B	SPLP West
Chromium, trivalent	2.85		0.104	0.104	mg/Kg	1	☼	7196A	Total/NA
pH	8.7	HF	0.1	0.1	SU	1		9045D	Soluble
Composited	Completed				NONE	1		Composite	Total/NA

This Detection Summary does not include radiochemical test results.

Client: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: S01-S04 Lab Composite
Lab Sample ID: 310-220603-5

Date Collected: 11/24/21 00:00
Matrix: Solid
Date Received: 11/24/21 14:30

Method: 8260D - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110	*+	0.100	0.0110	mg/L			12/04/21 08:31	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			12/04/21 08:31	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			12/04/21 08:31	20
Benzene	<0.0140		0.100	0.0140	mg/L			12/04/21 08:31	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			12/04/21 08:31	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			12/04/21 08:31	20
Chloroform	<0.0360		0.100	0.0360	mg/L			12/04/21 08:31	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			12/04/21 08:31	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			12/04/21 08:31	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			12/04/21 08:31	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*100*		*80 - 120*		*12/04/21 08:31*	*20*
Toluene-d8 (Surr)	*101*		*80 - 120*		*12/04/21 08:31*	*20*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*12/04/21 08:31*	*20*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		12/03/21 08:30	12/06/21 13:49	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		12/03/21 08:30	12/06/21 13:49	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		12/03/21 08:30	12/06/21 13:49	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		12/03/21 08:30	12/06/21 13:49	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		12/03/21 08:30	12/06/21 13:49	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		12/03/21 08:30	12/06/21 13:49	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		12/03/21 08:30	12/06/21 13:49	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		12/03/21 08:30	12/06/21 13:49	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		12/03/21 08:30	12/06/21 13:49	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		12/03/21 08:30	12/06/21 13:49	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		12/03/21 08:30	12/06/21 13:49	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		12/03/21 08:30	12/06/21 13:49	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		12/03/21 08:30	12/06/21 13:49	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*67*		*14 - 110*	*12/03/21 08:30*	*12/06/21 13:49*	*1*
Phenol-d5 (Surr)	*61*		*10 - 110*	*12/03/21 08:30*	*12/06/21 13:49*	*1*
Nitrobenzene-d5 (Surr)	*79*		*30 - 110*	*12/03/21 08:30*	*12/06/21 13:49*	*1*
2-Fluorobiphenyl (Surr)	*71*		*28 - 110*	*12/03/21 08:30*	*12/06/21 13:49*	*1*
2,4,6-Tribromophenol (Surr)	*85*		*35 - 110*	*12/03/21 08:30*	*12/06/21 13:49*	*1*
Terphenyl-d14 (Surr)	*74*		*39 - 117*	*12/03/21 08:30*	*12/06/21 13:49*	*1*

Method: 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	<1.10		10.0	1.10	ug/L		12/07/21 07:49	12/07/21 13:46	1
Endrin	<0.0500		0.160	0.0500	ug/L		12/07/21 07:49	12/07/21 13:46	1
gamma-BHC (Lindane)	<0.0700		0.160	0.0700	ug/L		12/07/21 07:49	12/07/21 13:46	1
Heptachlor	<0.0600		0.160	0.0600	ug/L		12/07/21 07:49	12/07/21 13:46	1
Heptachlor epoxide	<0.0460		0.160	0.0460	ug/L		12/07/21 07:49	12/07/21 13:46	1
Methoxychlor	<0.0700		0.160	0.0700	ug/L		12/07/21 07:49	12/07/21 13:46	1
Toxaphene	<2.10		10.0	2.10	ug/L		12/07/21 07:49	12/07/21 13:46	1

Client Sample ID: S01-S04 Lab Composite

Lab Sample ID: 310-220603-5

Date Collected: 11/24/21 00:00

Matrix: Solid

Date Received: 11/24/21 14:30

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	*60*	*p*	*10 - 117*	*12/07/21 07:49*	*12/07/21 13:46*	*1*
Tetrachloro-m-xylene (Surr)	*73*		*14 - 115*	*12/07/21 07:49*	*12/07/21 13:46*	*1*

Method: 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		12/08/21 13:45	12/10/21 04:19	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		12/08/21 13:45	12/10/21 04:19	1

Surrogate	%Recovery	Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	*66*		*25 - 130*	*12/08/21 13:45*	*12/10/21 04:19*	*1*

Method: 9056A - Anions, Ion Chromatography - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			12/08/21 15:36	1
Chloride	<1.00		1.00	1.00	mg/L			12/08/21 15:36	1
Sulfate	<1.00		1.00	1.00	mg/L			12/08/21 15:36	1

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.0500		0.100	0.0500	mg/L		12/06/21 09:00	12/07/21 23:31	1
Barium	**0.345**	**J**	0.500	0.110	mg/L		12/06/21 09:00	12/07/21 23:31	1
Cadmium	<0.00440		0.0200	0.00440	mg/L		12/06/21 09:00	12/07/21 23:31	1
Chromium	<0.00870		0.0200	0.00870	mg/L		12/06/21 09:00	12/07/21 23:31	1
Lead	<0.0320		0.100	0.0320	mg/L		12/06/21 09:00	12/07/21 23:31	1
Selenium	<0.0630		0.100	0.0630	mg/L		12/06/21 09:00	12/07/21 23:31	1
Silver	<0.00870	*+	0.0200	0.00870	mg/L		12/06/21 09:00	12/07/21 23:31	1

Method: 6020B - Metals (ICP/MS) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00550		0.0100	0.00550	mg/L		12/06/21 09:00	12/13/21 14:32	1
Arsenic	<0.00380		0.0100	0.00380	mg/L		12/06/21 09:00	12/13/21 14:32	1
Barium	**0.0325**	**J**	0.100	0.0200	mg/L		12/06/21 09:00	12/13/21 14:32	1
Beryllium	<0.00140		0.00500	0.00140	mg/L		12/06/21 09:00	12/13/21 14:32	1
Cadmium	<0.000260		0.00250	0.000260	mg/L		12/06/21 09:00	12/13/21 14:32	1
Boron	<0.290		0.500	0.290	mg/L		12/06/21 09:00	12/13/21 14:32	1
Chromium	<0.00650		0.0250	0.00650	mg/L		12/06/21 09:00	12/13/21 14:32	1
Copper	<0.0160		0.0500	0.0160	mg/L		12/06/21 09:00	12/13/21 14:32	1
Calcium	**4.86**		2.50	1.10	mg/L		12/06/21 09:00	12/13/21 14:32	1
Lead	**0.00204**	**J**	0.00500	0.00140	mg/L		12/06/21 09:00	12/13/21 14:32	1
Selenium	<0.00790		0.0250	0.00790	mg/L		12/06/21 09:00	12/13/21 14:32	1
Cobalt	**0.000830**	**J**	0.00250	0.000460	mg/L		12/06/21 09:00	12/13/21 14:32	1
Thallium	<0.00240		0.00500	0.00240	mg/L		12/06/21 09:00	12/13/21 14:32	1
Lithium	<0.0160		0.0500	0.0160	mg/L		12/06/21 09:00	12/13/21 14:32	1
Molybdenum	<0.00650		0.0250	0.00650	mg/L		12/06/21 09:00	12/13/21 14:32	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		12/03/21 12:07	12/03/21 16:20	1

Method: 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		12/03/21 12:16	12/03/21 17:30	1

Client: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: S01-S04 Lab Composite

Lab Sample ID: 310-220603-5

Date Collected: 11/24/21 00:00
Matrix: Solid
Date Received: 11/24/21 14:30

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	3.8		0.1	0.1	%			11/30/21 09:16	1
Percent Solids	96.2		0.1	0.1	%			11/30/21 09:16	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.7	HF	0.1	0.1	SU			11/30/21 15:31	1

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Completed				NONE			11/30/21 11:15	1

Client: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: S01-S04 Lab Composite

Lab Sample ID: 310-220603-5

Date Collected: 11/24/21 00:00
Matrix: Solid
Date Received: 11/24/21 14:30
Percent Solids: 96.2

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<6.69		9.98	6.69	mg/Kg	☼		12/02/21 12:53	10
Chloride	<60.9		99.8	60.9	mg/Kg	☼		12/02/21 12:53	10
Sulfate	<66.9		99.8	66.9	mg/Kg	☼		12/02/21 12:53	10

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.249	F2	0.803	0.249	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Arsenic	**1.06**	**F2**	0.803	0.257	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Barium	**26.3**	**F2**	0.803	0.305	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Beryllium	<0.144	F2	0.401	0.144	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Boron	<21.7		40.1	21.7	mg/Kg	☼	12/09/21 10:00	12/10/21 16:17	5
Cadmium	<0.112		0.401	0.112	mg/Kg	☼	12/09/21 10:00	12/10/21 16:17	5
Chromium	**2.85**	**F2**	1.20	0.249	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Cobalt	**2.31**	**F2**	0.201	0.104	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Copper	**1.50**	**F2**	1.20	0.449	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Lead	**1.72**	**J**	2.01	0.626	mg/Kg	☼	12/09/21 10:00	12/10/21 16:17	5
Lithium	**1.44**	**J F2**	2.01	0.546	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Manganese	**276**	**F2 F1**	2.01	1.04	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Molybdenum	<0.265	F2	0.803	0.265	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Nickel	**3.32**	**F2**	1.20	0.385	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Calcium	**2880**	**F2 F1**	120	44.9	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Selenium	**0.328**	**J F2**	1.20	0.321	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Silver	<0.0883	F2	0.201	0.0883	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Thallium	**0.253**	**F2**	0.201	0.0963	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Vanadium	**6.14**	**F2**	1.20	0.297	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5
Zinc	**8.69**	**F2**	4.01	2.89	mg/Kg	☼	12/09/21 10:00	12/09/21 23:52	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00815		0.0204	0.00815	mg/Kg	☼	12/09/21 13:29	12/10/21 14:31	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	<0.402		1.04	0.402	mg/Kg	☼	12/02/21 17:10	12/03/21 19:07	1
Chromium, trivalent	**2.85**		0.104	0.104	mg/Kg	☼		12/13/21 15:07	1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

Metals

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control 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.

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

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)
TNTC	Too Numerous To Count

Surrogate Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100

Job ID: 310-220603-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)								
		DBFM	TOL	BFB						
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)						
310-220603-5	S01-S04 Lab Composite	100	101	98						
LB 310-337437/1-A	Method Blank	103	100	111						
LCS 310-337437/2-A	Lab Control Sample	97	98	109						

Surrogate Legend

DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		2FP	PHL	NBZ	FBP	TBP	TPHL		
Lab Sample ID	Client Sample ID	(14-110)	(10-110)	(30-110)	(28-110)	(35-110)	(39-117)		
LCS 310-337461/2-A	Lab Control Sample	67	55	80	77	103	102		
LCS 310-337461/2-A	Lab Control Sample	68	59	81	74	84	77		

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)							
		2FP	PHL	NBZ	FBP	TBP	TPHL		
Lab Sample ID	Client Sample ID	(14-110)	(10-110)	(30-110)	(28-110)	(35-110)	(39-117)		
310-220603-5	S01-S04 Lab Composite	67	61	79	71	85	74		
LB 310-337282/1-C	Method Blank	72	61	86	79	106	96		
LB 310-337441/1-B	Method Blank	68	61	79	70	84	75		

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		DCB1	TCX1						
Lab Sample ID	Client Sample ID	(10-117)	(14-115)						
LCS 310-337810/2-A	Lab Control Sample	91	85						

Surrogate Legend

Surrogate Summary

Client: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCB1	TCX1								
Lab Sample ID	Client Sample ID	(10-117)	(14-115)								
310-220603-5	S01-S04 Lab Composite	60 p	73								
LB 310-337441/1-C	Method Blank	81	69								

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene (Surr)

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCPAA1									
Lab Sample ID	Client Sample ID	(25-130)									
LCS 500-632753/2-A	Lab Control Sample	81									
MB 500-632753/1-A	Method Blank	66									

Surrogate Legend

DCPAA = DCAA

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCPAA1									
Lab Sample ID	Client Sample ID	(25-130)									
310-220603-5	S01-S04 Lab Composite	66									
LB 500-632131/1-B	Method Blank	71									

Surrogate Legend

DCPAA = DCAA

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: LB 310-337437/1-A
Matrix: Solid
Analysis Batch: 337519

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			12/04/21 04:09	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			12/04/21 04:09	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			12/04/21 04:09	20
Benzene	<0.0140		0.100	0.0140	mg/L			12/04/21 04:09	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			12/04/21 04:09	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			12/04/21 04:09	20
Chloroform	<0.0360		0.100	0.0360	mg/L			12/04/21 04:09	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			12/04/21 04:09	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			12/04/21 04:09	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			12/04/21 04:09	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*12/04/21 04:09*	*20*
Toluene-d8 (Surr)	*100*		*80 - 120*		*12/04/21 04:09*	*20*
4-Bromofluorobenzene (Surr)	*111*		*80 - 120*		*12/04/21 04:09*	*20*

Lab Sample ID: LCS 310-337437/2-A
Matrix: Solid
Analysis Batch: 337519

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,1-Dichloroethene	2.00	2.743	*+	mg/L		137	57 - 120
1,2-Dichloroethane	2.00	1.884		mg/L		94	66 - 124
2-Butanone (MEK)	4.00	4.033	J	mg/L		101	50 - 150
Benzene	2.00	2.016		mg/L		101	66 - 120
Carbon tetrachloride	2.00	2.028		mg/L		101	62 - 122
Chlorobenzene	2.00	1.828		mg/L		91	64 - 120
Chloroform	2.00	1.844		mg/L		92	67 - 120
Tetrachloroethene	2.00	1.800		mg/L		90	63 - 120
Trichloroethene	2.00	1.994		mg/L		100	66 - 120
Vinyl chloride	2.00	1.284		mg/L		64	36 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*80 - 120*
Toluene-d8 (Surr)	*98*		*80 - 120*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCS 310-337461/2-A
Matrix: Solid
Analysis Batch: 337559

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337461

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
1,4-Dichlorobenzene	0.0625	0.03102	J	mg/L		50	24 - 110
2,4,5-Trichlorophenol	0.0625	0.05942		mg/L		95	41 - 110
2,4,6-Trichlorophenol	0.0625	0.05841		mg/L		93	39 - 110
2,4-Dinitrotoluene	0.0625	0.05671		mg/L		91	35 - 110

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 310-337461/2-A
Matrix: Solid
Analysis Batch: 337559

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337461

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
2-Methylphenol			0.0625	0.04878	J	mg/L		78	31 - 110		
4-Methylphenol (and/or 3-Methylphenol)			0.0625	0.04971	J	mg/L		80	28 - 110		
Hexachlorobenzene			0.0625	0.05787		mg/L		93	42 - 110		
Hexachlorobutadiene			0.0625	0.03268	J	mg/L		52	27 - 110		
Hexachloroethane			0.0625	0.02555	J	mg/L		41	25 - 110		
Nitrobenzene			0.0625	0.04741	J	mg/L		76	35 - 110		
Pentachlorophenol			0.125	0.08701		mg/L		70	35 - 110		
Pyridine			0.125	0.07838		mg/L		63	10 - 110		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorophenol (Surr)	*67*		*14 - 110*
Phenol-d5 (Surr)	*55*		*10 - 110*
Nitrobenzene-d5 (Surr)	*80*		*30 - 110*
2-Fluorobiphenyl (Surr)	*77*		*28 - 110*
2,4,6-Tribromophenol (Surr)	*103*		*35 - 110*
Terphenyl-d14 (Surr)	*102*		*39 - 117*

Lab Sample ID: LCS 310-337461/2-A
Matrix: Solid
Analysis Batch: 337672

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337461

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
1,4-Dichlorobenzene			0.0625	0.03385	J	mg/L		54	24 - 110		
2,4,5-Trichlorophenol			0.0625	0.05290		mg/L		85	41 - 110		
2,4,6-Trichlorophenol			0.0625	0.05560		mg/L		89	39 - 110		
2,4-Dinitrotoluene			0.0625	0.06108		mg/L		98	35 - 110		
2-Methylphenol			0.0625	0.05482		mg/L		88	31 - 110		
4-Methylphenol (and/or 3-Methylphenol)			0.0625	0.05573		mg/L		89	28 - 110		
Hexachlorobenzene			0.0625	0.05654		mg/L		90	42 - 110		
Hexachlorobutadiene			0.0625	0.03064	J	mg/L		49	27 - 110		
Hexachloroethane			0.0625	0.02817	J	mg/L		45	25 - 110		
Nitrobenzene			0.0625	0.05276		mg/L		84	35 - 110		
Pentachlorophenol			0.125	0.1242		mg/L		99	35 - 110		
Pyridine			0.125	0.09521		mg/L		76	10 - 110		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorophenol (Surr)	*68*		*14 - 110*
Phenol-d5 (Surr)	*59*		*10 - 110*
Nitrobenzene-d5 (Surr)	*81*		*30 - 110*
2-Fluorobiphenyl (Surr)	*74*		*28 - 110*
2,4,6-Tribromophenol (Surr)	*84*		*35 - 110*
Terphenyl-d14 (Surr)	*77*		*39 - 117*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB 310-337282/1-C
Matrix: Solid
Analysis Batch: 337559

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 337461

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		12/03/21 08:30	12/03/21 18:24	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		12/03/21 08:30	12/03/21 18:24	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		12/03/21 08:30	12/03/21 18:24	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		12/03/21 08:30	12/03/21 18:24	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		12/03/21 08:30	12/03/21 18:24	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		12/03/21 08:30	12/03/21 18:24	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		12/03/21 08:30	12/03/21 18:24	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		12/03/21 08:30	12/03/21 18:24	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		12/03/21 08:30	12/03/21 18:24	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		12/03/21 08:30	12/03/21 18:24	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		12/03/21 08:30	12/03/21 18:24	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		12/03/21 08:30	12/03/21 18:24	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		12/03/21 08:30	12/03/21 18:24	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*72*		*14 - 110*	*12/03/21 08:30*	*12/03/21 18:24*	*1*
Phenol-d5 (Surr)	*61*		*10 - 110*	*12/03/21 08:30*	*12/03/21 18:24*	*1*
Nitrobenzene-d5 (Surr)	*86*		*30 - 110*	*12/03/21 08:30*	*12/03/21 18:24*	*1*
2-Fluorobiphenyl (Surr)	*79*		*28 - 110*	*12/03/21 08:30*	*12/03/21 18:24*	*1*
2,4,6-Tribromophenol (Surr)	*106*		*35 - 110*	*12/03/21 08:30*	*12/03/21 18:24*	*1*
Terphenyl-d14 (Surr)	*96*		*39 - 117*	*12/03/21 08:30*	*12/03/21 18:24*	*1*

Lab Sample ID: LB 310-337441/1-B
Matrix: Solid
Analysis Batch: 337672

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 337461

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		12/03/21 08:30	12/06/21 13:23	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		12/03/21 08:30	12/06/21 13:23	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		12/03/21 08:30	12/06/21 13:23	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		12/03/21 08:30	12/06/21 13:23	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		12/03/21 08:30	12/06/21 13:23	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		12/03/21 08:30	12/06/21 13:23	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		12/03/21 08:30	12/06/21 13:23	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		12/03/21 08:30	12/06/21 13:23	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		12/03/21 08:30	12/06/21 13:23	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		12/03/21 08:30	12/06/21 13:23	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		12/03/21 08:30	12/06/21 13:23	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		12/03/21 08:30	12/06/21 13:23	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		12/03/21 08:30	12/06/21 13:23	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*68*		*14 - 110*	*12/03/21 08:30*	*12/06/21 13:23*	*1*
Phenol-d5 (Surr)	*61*		*10 - 110*	*12/03/21 08:30*	*12/06/21 13:23*	*1*
Nitrobenzene-d5 (Surr)	*79*		*30 - 110*	*12/03/21 08:30*	*12/06/21 13:23*	*1*
2-Fluorobiphenyl (Surr)	*70*		*28 - 110*	*12/03/21 08:30*	*12/06/21 13:23*	*1*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB 310-337441/1-B
Matrix: Solid
Analysis Batch: 337672

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 337461

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
2,4,6-Tribromophenol (Surr)	*84*		*35 - 110*	*12/03/21 08:30*	*12/06/21 13:23*	*1*
Terphenyl-d14 (Surr)	*75*		*39 - 117*	*12/03/21 08:30*	*12/06/21 13:23*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: LCS 310-337810/2-A
Matrix: Solid
Analysis Batch: 337815

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 337810

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
Endrin			0.625	0.6445		ug/L		103	35 - 143		
gamma-BHC (Lindane)			0.625	0.5399		ug/L		86	34 - 123		
Heptachlor			0.625	0.5216		ug/L		83	23 - 133		
Heptachlor epoxide			0.625	0.5572		ug/L		89	35 - 129		
Methoxychlor			0.625	0.6701	p	ug/L		107	19 - 150		

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl (Surr)	*91*		*10 - 117*
Tetrachloro-m-xylene (Surr)	*85*		*14 - 115*

Lab Sample ID: LB 310-337441/1-C
Matrix: Solid
Analysis Batch: 337815

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 337810

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	<1.10		10.0	1.10	ug/L		12/07/21 07:49	12/07/21 13:16	1
Endrin	<0.0500		0.160	0.0500	ug/L		12/07/21 07:49	12/07/21 13:16	1
gamma-BHC (Lindane)	<0.0700		0.160	0.0700	ug/L		12/07/21 07:49	12/07/21 13:16	1
Heptachlor	<0.0600		0.160	0.0600	ug/L		12/07/21 07:49	12/07/21 13:16	1
Heptachlor epoxide	<0.0460		0.160	0.0460	ug/L		12/07/21 07:49	12/07/21 13:16	1
Methoxychlor	<0.0700		0.160	0.0700	ug/L		12/07/21 07:49	12/07/21 13:16	1
Toxaphene	<2.10		10.0	2.10	ug/L		12/07/21 07:49	12/07/21 13:16	1

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	*81*		*10 - 117*	*12/07/21 07:49*	*12/07/21 13:16*	*1*
Tetrachloro-m-xylene (Surr)	*69*		*14 - 115*	*12/07/21 07:49*	*12/07/21 13:16*	*1*

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-632753/1-A
Matrix: Solid
Analysis Batch: 633010

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 632753

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.000500		0.00100	0.000500	mg/L		12/08/21 13:45	12/10/21 02:23	1
Silvex (2,4,5-TP)	<0.000500		0.00100	0.000500	mg/L		12/08/21 13:45	12/10/21 02:23	1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: MB 500-632753/1-A
Matrix: Solid
Analysis Batch: 633010

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 632753

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	66		25 - 130	12/08/21 13:45	12/10/21 02:23	1

Lab Sample ID: LCS 500-632753/2-A
Matrix: Solid
Analysis Batch: 633010

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 632753

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
2,4-D	0.0100	0.008350		mg/L		84	30 - 115
Silvex (2,4,5-TP)	0.00250	0.002305		mg/L		92	32 - 115

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCAA	81		25 - 130

Lab Sample ID: LB 500-632131/1-B
Matrix: Solid
Analysis Batch: 633010

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 632753

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		12/08/21 13:45	12/10/21 03:02	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		12/08/21 13:45	12/10/21 03:02	1

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	71		25 - 130	12/08/21 13:45	12/10/21 03:02	1

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-336926/1-A
Matrix: Solid
Analysis Batch: 337370

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<6.69		9.99	6.69	mg/Kg			12/02/21 08:27	10
Chloride	<60.9		99.9	60.9	mg/Kg			12/02/21 08:27	10
Sulfate	<66.9		99.9	66.9	mg/Kg			12/02/21 08:27	10

Lab Sample ID: LCS 310-336926/2-A
Matrix: Solid
Analysis Batch: 337370

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	200	203.8		mg/Kg		102	90 - 110
Chloride	999	1005		mg/Kg		101	90 - 110
Sulfate	999	1050		mg/Kg		105	90 - 110

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LB 310-337436/1-A
Matrix: Solid
Analysis Batch: 338040

Client Sample ID: Method Blank
Prep Type: SPLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			12/08/21 15:36	1
Chloride	<1.00		1.00	1.00	mg/L			12/08/21 15:36	1
Sulfate	<1.00		1.00	1.00	mg/L			12/08/21 15:36	1

Lab Sample ID: LCS 310-337436/2-A
Matrix: Solid
Analysis Batch: 338040

Client Sample ID: Lab Control Sample
Prep Type: SPLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	2.00	2.065		mg/L		103	90 - 110
Chloride	10.0	9.862		mg/L		99	90 - 110
Sulfate	10.0	10.45		mg/L		104	90 - 110

Lab Sample ID: 310-220603-5 MS
Matrix: Solid
Analysis Batch: 338040

Client Sample ID: S01-S04 Lab Composite
Prep Type: SPLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Fluoride	<0.0750		1.00	1.177		mg/L		118	80 - 120
Chloride	<1.00		5.00	4.526		mg/L		91	80 - 120
Sulfate	<1.00		5.00	5.015		mg/L		100	80 - 120

Lab Sample ID: 310-220603-5 MSD
Matrix: Solid
Analysis Batch: 338040

Client Sample ID: S01-S04 Lab Composite
Prep Type: SPLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Fluoride	<0.0750		1.00	1.195		mg/L		120	80 - 120	2	15
Chloride	<1.00		5.00	4.549		mg/L		91	80 - 120	1	15
Sulfate	<1.00		5.00	5.004		mg/L		100	80 - 120	0	15

Method: 6010C - Metals (ICP)

Lab Sample ID: LB 310-337432/1-D
Matrix: Solid
Analysis Batch: 337987

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 337575

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	0.06471	J	0.100	0.0500	mg/L		12/06/21 09:00	12/07/21 22:25	1
Barium	<0.110		0.500	0.110	mg/L		12/06/21 09:00	12/07/21 22:25	1
Cadmium	<0.00440		0.0200	0.00440	mg/L		12/06/21 09:00	12/07/21 22:25	1
Chromium	<0.00870		0.0200	0.00870	mg/L		12/06/21 09:00	12/07/21 22:25	1
Lead	<0.0320		0.100	0.0320	mg/L		12/06/21 09:00	12/07/21 22:25	1
Selenium	<0.0630		0.100	0.0630	mg/L		12/06/21 09:00	12/07/21 22:25	1
Silver	<0.00870		0.0200	0.00870	mg/L		12/06/21 09:00	12/07/21 22:25	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LCS 310-337432/2-D
Matrix: Solid
Analysis Batch: 337987

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 337575

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Arsenic	4.00	4.288		mg/L		107	80 - 120
Barium	2.00	2.137		mg/L		107	80 - 120
Cadmium	2.00	1.941		mg/L		97	80 - 120
Chromium	2.00	1.984		mg/L		99	80 - 120
Lead	4.00	3.788		mg/L		95	80 - 120
Selenium	8.00	8.351		mg/L		104	80 - 120
Silver	2.00	2.461	*+	mg/L		123	80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-338039/1-A
Matrix: Solid
Analysis Batch: 338311

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 338039

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.289		0.933	0.289	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Arsenic	<0.299		0.933	0.299	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Barium	<0.354		0.933	0.354	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Beryllium	<0.168		0.466	0.168	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Chromium	<0.289		1.40	0.289	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Copper	<0.522		1.40	0.522	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Cobalt	<0.121		0.233	0.121	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Manganese	<1.21		2.33	1.21	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Lithium	<0.634		2.33	0.634	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Nickel	<0.448		1.40	0.448	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Calcium	<52.2		140	52.2	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Molybdenum	<0.308		0.933	0.308	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Selenium	<0.373		1.40	0.373	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Silver	<0.103		0.233	0.103	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Thallium	<0.112		0.233	0.112	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Vanadium	<0.345		1.40	0.345	mg/Kg		12/09/21 10:00	12/09/21 23:47	5
Zinc	<3.36		4.66	3.36	mg/Kg		12/09/21 10:00	12/09/21 23:47	5

Lab Sample ID: MB 310-338039/1-A ^5
Matrix: Solid
Analysis Batch: 338423

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 338039

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Boron	<25.2		46.6	25.2	mg/Kg		12/09/21 10:00	12/10/21 16:12	5
Cadmium	<0.131		0.466	0.131	mg/Kg		12/09/21 10:00	12/10/21 16:12	5
Lead	<0.728		2.33	0.728	mg/Kg		12/09/21 10:00	12/10/21 16:12	5

Lab Sample ID: LCS 310-338039/2-A
Matrix: Solid
Analysis Batch: 338311

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 338039

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	148	173.3		mg/Kg		117	80 - 120
Arsenic	148	161.8		mg/Kg		110	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-338039/2-A
Matrix: Solid
Analysis Batch: 338311

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 338039

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Barium	73.9	81.03		mg/Kg		110	80 - 120
Beryllium	73.9	78.49		mg/Kg		106	80 - 120
Chromium	73.9	74.45		mg/Kg		101	80 - 120
Copper	148	156.3		mg/Kg		106	80 - 120
Cobalt	73.9	75.08		mg/Kg		102	80 - 120
Manganese	73.9	74.49		mg/Kg		101	80 - 120
Lithium	148	155.2		mg/Kg		105	80 - 120
Nickel	148	154.6		mg/Kg		105	80 - 120
Calcium	1480	1284		mg/Kg		87	80 - 120
Molybdenum	148	157.7		mg/Kg		107	80 - 120
Selenium	295	309.6		mg/Kg		105	80 - 120
Silver	73.9	75.47		mg/Kg		102	80 - 120
Thallium	148	127.3		mg/Kg		86	80 - 120
Vanadium	73.9	73.80		mg/Kg		100	80 - 120
Zinc	148	157.3		mg/Kg		106	80 - 120

Lab Sample ID: LCS 310-338039/2-A ^20
Matrix: Solid
Analysis Batch: 338423

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 338039

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	148	125.1	J	mg/Kg		85	80 - 120
Cadmium	73.9	64.30		mg/Kg		87	80 - 120
Lead	148	137.2		mg/Kg		93	80 - 120

Lab Sample ID: 310-220603-5 MS
Matrix: Solid
Analysis Batch: 338311

Client Sample ID: S01-S04 Lab Composite
Prep Type: Total/NA
Prep Batch: 338039

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	<0.249	F2	165	165.3		mg/Kg	☼	100	75 - 125
Arsenic	1.06	F2	165	160.6		mg/Kg	☼	97	75 - 125
Barium	26.3	F2	82.4	109.4		mg/Kg	☼	101	75 - 125
Beryllium	<0.144	F2	82.4	77.36		mg/Kg	☼	94	75 - 125
Chromium	2.85	F2	82.4	76.14		mg/Kg	☼	89	75 - 125
Copper	1.50	F2	165	155.1		mg/Kg	☼	93	75 - 125
Cobalt	2.31	F2	82.4	76.12		mg/Kg	☼	90	75 - 125
Manganese	276	F2 F1	82.4	341.0		mg/Kg	☼	78	75 - 125
Lithium	1.44	J F2	165	156.0		mg/Kg	☼	94	75 - 125
Nickel	3.32	F2	165	156.3		mg/Kg	☼	93	75 - 125
Calcium	2880	F2 F1	1650	5131	F1	mg/Kg	☼	137	75 - 125
Molybdenum	<0.265	F2	165	156.9		mg/Kg	☼	95	75 - 125
Selenium	0.328	J F2	330	306.0		mg/Kg	☼	93	75 - 125
Silver	<0.0883	F2	82.4	73.19		mg/Kg	☼	89	75 - 125
Thallium	0.253	F2	165	128.2		mg/Kg	☼	78	75 - 125
Vanadium	6.14	F2	82.4	77.40		mg/Kg	☼	86	75 - 125
Zinc	8.69	F2	165	164.1		mg/Kg	☼	94	75 - 125

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-220603-5 MS
Matrix: Solid
Analysis Batch: 338423

Client Sample ID: S01-S04 Lab Composite
Prep Type: Total/NA
Prep Batch: 338039

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Boron	<21.7		165	156.6	J	mg/Kg	☼	95	75 - 125
Cadmium	<0.112		82.4	79.24		mg/Kg	☼	96	75 - 125
Lead	1.72	J	165	170.6		mg/Kg	☼	102	75 - 125

Lab Sample ID: 310-220603-5 MSD
Matrix: Solid
Analysis Batch: 338311

Client Sample ID: S01-S04 Lab Composite
Prep Type: Total/NA
Prep Batch: 338039

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Antimony	<0.249	F2	167	171.1		mg/Kg	☼	103	75 - 125	3	20
Arsenic	1.06	F2	167	160.6		mg/Kg	☼	96	75 - 125	0	20
Barium	26.3	F2	83.3	106.1		mg/Kg	☼	96	75 - 125	3	20
Beryllium	<0.144	F2	83.3	77.22		mg/Kg	☼	93	75 - 125	0	20
Chromium	2.85	F2	83.3	76.63		mg/Kg	☼	89	75 - 125	1	20
Copper	1.50	F2	167	153.6		mg/Kg	☼	91	75 - 125	1	20
Cobalt	2.31	F2	83.3	76.16		mg/Kg	☼	89	75 - 125	0	20
Manganese	276	F2 F1	83.3	343.0		mg/Kg	☼	80	75 - 125	1	20
Lithium	1.44	J F2	167	155.4		mg/Kg	☼	92	75 - 125	0	20
Nickel	3.32	F2	167	156.1		mg/Kg	☼	92	75 - 125	0	20
Calcium	2880	F2 F1	1670	3932	F1 F2	mg/Kg	☼	63	75 - 125	26	20
Molybdenum	<0.265	F2	167	158.5		mg/Kg	☼	95	75 - 125	1	20
Selenium	0.328	J F2	333	301.4	E	mg/Kg	☼	90	75 - 125	2	20
Silver	<0.0883	F2	83.3	74.67		mg/Kg	☼	90	75 - 125	2	20
Thallium	0.253	F2	167	128.9		mg/Kg	☼	77	75 - 125	0	20
Vanadium	6.14	F2	83.3	79.55		mg/Kg	☼	88	75 - 125	3	20
Zinc	8.69	F2	167	162.1		mg/Kg	☼	92	75 - 125	1	20

Lab Sample ID: 310-220603-5 MSD
Matrix: Solid
Analysis Batch: 338423

Client Sample ID: S01-S04 Lab Composite
Prep Type: Total/NA
Prep Batch: 338039

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Boron	<21.7		167	155.7	J	mg/Kg	☼	93	75 - 125	1	20
Cadmium	<0.112		83.3	77.44		mg/Kg	☼	93	75 - 125	2	20
Lead	1.72	J	167	167.7		mg/Kg	☼	100	75 - 125	2	20

Lab Sample ID: LB 310-337435/1-C
Matrix: Solid
Analysis Batch: 338634

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 337572

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00550		0.0100	0.00550	mg/L		12/06/21 09:00	12/13/21 14:27	1
Arsenic	<0.00380		0.0100	0.00380	mg/L		12/06/21 09:00	12/13/21 14:27	1
Barium	<0.0200		0.100	0.0200	mg/L		12/06/21 09:00	12/13/21 14:27	1
Beryllium	<0.00140		0.00500	0.00140	mg/L		12/06/21 09:00	12/13/21 14:27	1
Boron	<0.290		0.500	0.290	mg/L		12/06/21 09:00	12/13/21 14:27	1
Cadmium	<0.000260		0.00250	0.000260	mg/L		12/06/21 09:00	12/13/21 14:27	1
Chromium	<0.00650		0.0250	0.00650	mg/L		12/06/21 09:00	12/13/21 14:27	1
Copper	<0.0160		0.0500	0.0160	mg/L		12/06/21 09:00	12/13/21 14:27	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LB 310-337435/1-C
Matrix: Solid
Analysis Batch: 338634

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 337572

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Lead	<0.00140		0.00500	0.00140	mg/L		12/06/21 09:00	12/13/21 14:27	1
Cobalt	<0.000460		0.00250	0.000460	mg/L		12/06/21 09:00	12/13/21 14:27	1
Lithium	<0.0160		0.0500	0.0160	mg/L		12/06/21 09:00	12/13/21 14:27	1
Calcium	<1.10		2.50	1.10	mg/L		12/06/21 09:00	12/13/21 14:27	1
Molybdenum	<0.00650		0.0250	0.00650	mg/L		12/06/21 09:00	12/13/21 14:27	1
Selenium	<0.00790		0.0250	0.00790	mg/L		12/06/21 09:00	12/13/21 14:27	1
Thallium	<0.00240		0.00500	0.00240	mg/L		12/06/21 09:00	12/13/21 14:27	1

Lab Sample ID: LCS 310-337435/2-C
Matrix: Solid
Analysis Batch: 338634

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 337572

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	1.00	0.9796		mg/L		98	80 - 120
Arsenic	1.00	0.9754		mg/L		98	80 - 120
Barium	0.500	0.5090		mg/L		102	80 - 120
Beryllium	0.500	0.4973		mg/L		99	80 - 120
Boron	1.00	1.028		mg/L		103	80 - 120
Cadmium	0.500	0.4983		mg/L		100	80 - 120
Chromium	0.500	0.4816		mg/L		96	80 - 120
Copper	1.00	1.034		mg/L		103	80 - 120
Lead	1.00	1.062		mg/L		106	80 - 120
Cobalt	0.500	0.4851		mg/L		97	80 - 120
Lithium	1.00	0.9966		mg/L		100	80 - 120
Calcium	10.0	8.848		mg/L		88	80 - 120
Molybdenum	1.00	1.035		mg/L		104	80 - 120
Selenium	2.00	1.754		mg/L		88	80 - 120
Thallium	1.00	1.006		mg/L		101	80 - 120

Lab Sample ID: 310-220603-5 MS
Matrix: Solid
Analysis Batch: 338634

Client Sample ID: S01-S04 Lab Composite
Prep Type: SPLP West
Prep Batch: 337572

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Antimony	<0.00550		1.00	0.9744		mg/L		97	75 - 125
Arsenic	<0.00380		1.00	0.9702		mg/L		97	75 - 125
Barium	0.0325	J	0.500	0.5367		mg/L		101	75 - 125
Beryllium	<0.00140		0.500	0.4994		mg/L		100	75 - 125
Boron	<0.290		1.00	1.043		mg/L		104	75 - 125
Cadmium	<0.000260		0.500	0.4935		mg/L		99	75 - 125
Chromium	<0.00650		0.500	0.4799		mg/L		96	75 - 125
Copper	<0.0160		1.00	1.022		mg/L		102	75 - 125
Lead	0.00204	J	1.00	1.058		mg/L		106	75 - 125
Cobalt	0.000830	J	0.500	0.4819		mg/L		96	75 - 125
Lithium	<0.0160		1.00	0.9948		mg/L		99	75 - 125
Calcium	4.86		10.0	12.98		mg/L		81	75 - 125
Molybdenum	<0.00650		1.00	1.028		mg/L		103	75 - 125
Selenium	<0.00790		2.00	1.735		mg/L		87	75 - 125
Thallium	<0.00240		1.00	1.015		mg/L		101	75 - 125

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LB 310-337432/1-B
Matrix: Solid
Analysis Batch: 337581
Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 337516

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		12/03/21 12:06	12/03/21 15:54	1

Lab Sample ID: LCS 310-337432/2-B
Matrix: Solid
Analysis Batch: 337581
Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 337516

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0167	0.01812		mg/L		109	80 - 120

Lab Sample ID: 310-220603-5 MS
Matrix: Solid
Analysis Batch: 337581
Client Sample ID: S01-S04 Lab Composite
Prep Type: TCLP
Prep Batch: 337516

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	<0.00150		0.0167	0.01726		mg/L		104	80 - 120

Lab Sample ID: LB 310-337435/1-B
Matrix: Solid
Analysis Batch: 337581
Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 337518

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		12/03/21 12:16	12/03/21 17:26	1

Lab Sample ID: LCS 310-337435/2-B
Matrix: Solid
Analysis Batch: 337581
Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 337518

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.0167	0.01713		mg/L		103	80 - 120

Lab Sample ID: 310-220603-5 MS
Matrix: Solid
Analysis Batch: 337581
Client Sample ID: S01-S04 Lab Composite
Prep Type: SPLP West
Prep Batch: 337518

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	<0.00150		0.0167	0.01700		mg/L		102	80 - 120

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 310-338183/1-A
Matrix: Solid
Analysis Batch: 338424
Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 338183

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00664		0.0166	0.00664	mg/Kg		12/09/21 13:29	12/10/21 14:27	1

Method: 7471B - Mercury (CVAA) (Continued)

Lab Sample ID: LCS 310-338183/2-A
Client Sample ID: Lab Control Sample
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 338424
Prep Batch: 338183

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Mercury	0.147	0.1487		mg/Kg		101	80 - 120

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 500-631889/1-A
Client Sample ID: Method Blank
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 632234
Prep Batch: 631889

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	<0.388		1.00	0.388	mg/Kg		12/02/21 17:10	12/03/21 19:06	1

Lab Sample ID: LCS 500-631889/2-A
Client Sample ID: Lab Control Sample
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 632234
Prep Batch: 631889

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium, hexavalent	10.0	8.816		mg/Kg		88	80 - 120

Lab Sample ID: LCS 500-631889/3-A
Client Sample ID: Lab Control Sample
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 632234
Prep Batch: 631889

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium, hexavalent	1130	1127		mg/Kg		99	80 - 120

Lab Sample ID: 310-220603-5 MS
Client Sample ID: S01-S04 Lab Composite
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 632234
Prep Batch: 631889

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium, hexavalent	<0.402		40.5	32.90		mg/Kg	☼	81	75 - 125

Lab Sample ID: 310-220603-5 MS
Client Sample ID: S01-S04 Lab Composite
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 632234
Prep Batch: 631889

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec. Limits
Chromium, hexavalent	<0.402		1150	1158		mg/Kg	☼	101	75 - 125

Lab Sample ID: 310-220603-5 MSD
Client Sample ID: S01-S04 Lab Composite
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 632234
Prep Batch: 631889

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium, hexavalent	<0.402		40.5	34.00		mg/Kg	☼	84	75 - 125	3	30

Method: 7196A - Chromium, Hexavalent (Continued)

Lab Sample ID: 310-220603-5 MSD
Client Sample ID: S01-S04 Lab Composite
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 632234
Prep Batch: 631889

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec. Limits	RPD	RPD Limit
Chromium, hexavalent	<0.402		1150	1238		mg/Kg	☼	108	75 - 125	7	30

Method: 9045D - pH

Lab Sample ID: LCS 310-337047/1
Client Sample ID: Lab Control Sample
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 337047

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec. Limits		
pH			7.00	7.1		SU		101	98 - 102		

Lab Sample ID: 310-220603-5 DU
Client Sample ID: S01-S04 Lab Composite
Matrix: Solid
Prep Type: Soluble
Analysis Batch: 337047

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	8.7	HF		8.8		SU				1	20

GC/MS VOA

Leach Batch: 337437

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	1311	
LB 310-337437/1-A	Method Blank	TCLP	Solid	1311	
LCS 310-337437/2-A	Lab Control Sample	TCLP	Solid	1311	

Analysis Batch: 337519

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	8260D	337437
LB 310-337437/1-A	Method Blank	TCLP	Solid	8260D	337437
LCS 310-337437/2-A	Lab Control Sample	TCLP	Solid	8260D	337437

GC/MS Semi VOA

Leach Batch: 337282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 310-337282/1-C	Method Blank	TCLP	Solid	1311	

Leach Batch: 337441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	1311	
LB 310-337441/1-B	Method Blank	TCLP	Solid	1311	

Prep Batch: 337461

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	3510C	337441
LB 310-337282/1-C	Method Blank	TCLP	Solid	3510C	337282
LB 310-337441/1-B	Method Blank	TCLP	Solid	3510C	337441
LCS 310-337461/2-A	Lab Control Sample	Total/NA	Solid	3510C	

Analysis Batch: 337559

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 310-337282/1-C	Method Blank	TCLP	Solid	8270E	337461
LCS 310-337461/2-A	Lab Control Sample	Total/NA	Solid	8270E	337461

Analysis Batch: 337672

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	8270E	337461
LB 310-337441/1-B	Method Blank	TCLP	Solid	8270E	337461
LCS 310-337461/2-A	Lab Control Sample	Total/NA	Solid	8270E	337461

GC Semi VOA

Leach Batch: 337441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	1311	
LB 310-337441/1-C	Method Blank	TCLP	Solid	1311	

Prep Batch: 337810

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	3510C	337441
LB 310-337441/1-C	Method Blank	TCLP	Solid	3510C	337441
LCS 310-337810/2-A	Lab Control Sample	Total/NA	Solid	3510C	

GC Semi VOA

Analysis Batch: 337815

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	8081B	337810
LB 310-337441/1-C	Method Blank	TCLP	Solid	8081B	337810
LCS 310-337810/2-A	Lab Control Sample	Total/NA	Solid	8081B	337810

Leach Batch: 632131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	1311	
LB 500-632131/1-B	Method Blank	TCLP	Solid	1311	

Prep Batch: 632753

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	8151A	632131
LB 500-632131/1-B	Method Blank	TCLP	Solid	8151A	632131
MB 500-632753/1-A	Method Blank	Total/NA	Solid	8151A	
LCS 500-632753/2-A	Lab Control Sample	Total/NA	Solid	8151A	

Analysis Batch: 633010

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	8151A	632753
LB 500-632131/1-B	Method Blank	TCLP	Solid	8151A	632753
MB 500-632753/1-A	Method Blank	Total/NA	Solid	8151A	632753
LCS 500-632753/2-A	Lab Control Sample	Total/NA	Solid	8151A	632753

HPLC/IC

Leach Batch: 336926

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Soluble	Solid	DI Leach	
MB 310-336926/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 310-336926/2-A	Lab Control Sample	Soluble	Solid	DI Leach	

Analysis Batch: 337370

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Soluble	Solid	9056A	336926
MB 310-336926/1-A	Method Blank	Soluble	Solid	9056A	336926
LCS 310-336926/2-A	Lab Control Sample	Soluble	Solid	9056A	336926

Leach Batch: 337436

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP	Solid	1312	
LB 310-337436/1-A	Method Blank	SPLP	Solid	1312	
LCS 310-337436/2-A	Lab Control Sample	SPLP	Solid	1312	
310-220603-5 MS	S01-S04 Lab Composite	SPLP	Solid	1312	
310-220603-5 MSD	S01-S04 Lab Composite	SPLP	Solid	1312	

Analysis Batch: 338040

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP	Solid	9056A	337436
LB 310-337436/1-A	Method Blank	SPLP	Solid	9056A	337436
LCS 310-337436/2-A	Lab Control Sample	SPLP	Solid	9056A	337436
310-220603-5 MS	S01-S04 Lab Composite	SPLP	Solid	9056A	337436

HPLC/IC (Continued)

Analysis Batch: 338040 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5 MSD	S01-S04 Lab Composite	SPLP	Solid	9056A	337436

Metals

Leach Batch: 337432

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	1311	
LB 310-337432/1-B	Method Blank	TCLP	Solid	1311	
LB 310-337432/1-D	Method Blank	TCLP	Solid	1311	
LCS 310-337432/2-B	Lab Control Sample	TCLP	Solid	1311	
LCS 310-337432/2-D	Lab Control Sample	TCLP	Solid	1311	
310-220603-5 MS	S01-S04 Lab Composite	TCLP	Solid	1311	

Leach Batch: 337435

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP West	Solid	1312	
LB 310-337435/1-B	Method Blank	SPLP West	Solid	1312	
LB 310-337435/1-C	Method Blank	SPLP West	Solid	1312	
LCS 310-337435/2-B	Lab Control Sample	SPLP West	Solid	1312	
LCS 310-337435/2-C	Lab Control Sample	SPLP West	Solid	1312	
310-220603-5 MS	S01-S04 Lab Composite	SPLP West	Solid	1312	

Prep Batch: 337516

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	7470A	337432
LB 310-337432/1-B	Method Blank	TCLP	Solid	7470A	337432
LCS 310-337432/2-B	Lab Control Sample	TCLP	Solid	7470A	337432
310-220603-5 MS	S01-S04 Lab Composite	TCLP	Solid	7470A	337432

Prep Batch: 337518

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP West	Solid	7470A	337435
LB 310-337435/1-B	Method Blank	SPLP West	Solid	7470A	337435
LCS 310-337435/2-B	Lab Control Sample	SPLP West	Solid	7470A	337435
310-220603-5 MS	S01-S04 Lab Composite	SPLP West	Solid	7470A	337435

Prep Batch: 337572

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP West	Solid	3010A	337435
LB 310-337435/1-C	Method Blank	SPLP West	Solid	3010A	337435
LCS 310-337435/2-C	Lab Control Sample	SPLP West	Solid	3010A	337435
310-220603-5 MS	S01-S04 Lab Composite	SPLP West	Solid	3010A	337435

Prep Batch: 337575

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	3010A	337432
LB 310-337432/1-D	Method Blank	TCLP	Solid	3010A	337432
LCS 310-337432/2-D	Lab Control Sample	TCLP	Solid	3010A	337432

Metals

Analysis Batch: 337581

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP West	Solid	7470A	337518
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	7470A	337516
LB 310-337432/1-B	Method Blank	TCLP	Solid	7470A	337516
LB 310-337435/1-B	Method Blank	SPLP West	Solid	7470A	337518
LCS 310-337432/2-B	Lab Control Sample	TCLP	Solid	7470A	337516
LCS 310-337435/2-B	Lab Control Sample	SPLP West	Solid	7470A	337518
310-220603-5 MS	S01-S04 Lab Composite	SPLP West	Solid	7470A	337518
310-220603-5 MS	S01-S04 Lab Composite	TCLP	Solid	7470A	337516

Analysis Batch: 337987

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	TCLP	Solid	6010C	337575
LB 310-337432/1-D	Method Blank	TCLP	Solid	6010C	337575
LCS 310-337432/2-D	Lab Control Sample	TCLP	Solid	6010C	337575

Prep Batch: 338039

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	3050B	
MB 310-338039/1-A	Method Blank	Total/NA	Solid	3050B	
MB 310-338039/1-A ^5	Method Blank	Total/NA	Solid	3050B	
LCS 310-338039/2-A	Lab Control Sample	Total/NA	Solid	3050B	
LCS 310-338039/2-A ^20	Lab Control Sample	Total/NA	Solid	3050B	
310-220603-5 MS	S01-S04 Lab Composite	Total/NA	Solid	3050B	
310-220603-5 MSD	S01-S04 Lab Composite	Total/NA	Solid	3050B	

Prep Batch: 338183

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	7471B	
MB 310-338183/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 310-338183/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Analysis Batch: 338311

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	6020B	338039
MB 310-338039/1-A	Method Blank	Total/NA	Solid	6020B	338039
LCS 310-338039/2-A	Lab Control Sample	Total/NA	Solid	6020B	338039
310-220603-5 MS	S01-S04 Lab Composite	Total/NA	Solid	6020B	338039
310-220603-5 MSD	S01-S04 Lab Composite	Total/NA	Solid	6020B	338039

Analysis Batch: 338423

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	6020B	338039
MB 310-338039/1-A ^5	Method Blank	Total/NA	Solid	6020B	338039
LCS 310-338039/2-A ^20	Lab Control Sample	Total/NA	Solid	6020B	338039
310-220603-5 MS	S01-S04 Lab Composite	Total/NA	Solid	6020B	338039
310-220603-5 MSD	S01-S04 Lab Composite	Total/NA	Solid	6020B	338039

Analysis Batch: 338424

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	7471B	338183
MB 310-338183/1-A	Method Blank	Total/NA	Solid	7471B	338183

Metals (Continued)

Analysis Batch: 338424 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-338183/2-A	Lab Control Sample	Total/NA	Solid	7471B	338183

Analysis Batch: 338634

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP West	Solid	6020B	337572
LB 310-337435/1-C	Method Blank	SPLP West	Solid	6020B	337572
LCS 310-337435/2-C	Lab Control Sample	SPLP West	Solid	6020B	337572
310-220603-5 MS	S01-S04 Lab Composite	SPLP West	Solid	6020B	337572

General Chemistry

Leach Batch: 336893

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Soluble	Solid	DI Leach	
310-220603-5 DU	S01-S04 Lab Composite	Soluble	Solid	DI Leach	

Analysis Batch: 336990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	Moisture	

Analysis Batch: 337047

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Soluble	Solid	9045D	336893
LCS 310-337047/1	Lab Control Sample	Total/NA	Solid	9045D	
310-220603-5 DU	S01-S04 Lab Composite	Soluble	Solid	9045D	336893

Prep Batch: 631889

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	3060A	
MB 500-631889/1-A	Method Blank	Total/NA	Solid	3060A	
LCS 500-631889/2-A	Lab Control Sample	Total/NA	Solid	3060A	
LCS 500-631889/3-A	Lab Control Sample	Total/NA	Solid	3060A	
310-220603-5 MS	S01-S04 Lab Composite	Total/NA	Solid	3060A	
310-220603-5 MS	S01-S04 Lab Composite	Total/NA	Solid	3060A	
310-220603-5 MSD	S01-S04 Lab Composite	Total/NA	Solid	3060A	
310-220603-5 MSD	S01-S04 Lab Composite	Total/NA	Solid	3060A	

Analysis Batch: 632234

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	7196A	631889
MB 500-631889/1-A	Method Blank	Total/NA	Solid	7196A	631889
LCS 500-631889/2-A	Lab Control Sample	Total/NA	Solid	7196A	631889
LCS 500-631889/3-A	Lab Control Sample	Total/NA	Solid	7196A	631889
310-220603-5 MS	S01-S04 Lab Composite	Total/NA	Solid	7196A	631889
310-220603-5 MS	S01-S04 Lab Composite	Total/NA	Solid	7196A	631889
310-220603-5 MSD	S01-S04 Lab Composite	Total/NA	Solid	7196A	631889
310-220603-5 MSD	S01-S04 Lab Composite	Total/NA	Solid	7196A	631889

Analysis Batch: 633464

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	7196A	

Organic Prep

Analysis Batch: 337013

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	Composite	

Client Sample ID: S01-S04 Lab Composite
Lab Sample ID: 310-220603-5

Date Collected: 11/24/21 00:00
Matrix: Solid
Date Received: 11/24/21 14:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			337437	12/02/21 14:15	JTA	TAL CF
TCLP	Analysis	8260D		20	337519	12/04/21 08:31	TRZ	TAL CF
TCLP	Leach	1311			337441	12/02/21 14:15	JTA	TAL CF
TCLP	Prep	3510C			337461	12/03/21 08:30	JCM	TAL CF
TCLP	Analysis	8270E		1	337672	12/06/21 13:49	DMD	TAL CF
TCLP	Leach	1311			337441	12/02/21 14:15	JTA	TAL CF
TCLP	Prep	3510C			337810	12/07/21 07:49	JCM	TAL CF
TCLP	Analysis	8081B		1	337815	12/07/21 13:46	BBW	TAL CF
TCLP	Leach	1311			632131	12/02/21 14:15	DAK	TAL CHI
TCLP	Prep	8151A			632753	12/08/21 13:45	DAK	TAL CHI
TCLP	Analysis	8151A		1	633010	12/10/21 04:19	JBJ	TAL CHI
SPLP	Leach	1312			337436	12/02/21 14:15	JTA	TAL CF
SPLP	Analysis	9056A		1	338040	12/08/21 15:36	CJT	TAL CF
TCLP	Leach	1311			337432	12/02/21 14:15	JTA	TAL CF
TCLP	Prep	3010A			337575	12/06/21 09:00	ACM2	TAL CF
TCLP	Analysis	6010C		1	337987	12/07/21 23:31	CTB	TAL CF
SPLP West	Leach	1312			337435	12/02/21 14:15	JTA	TAL CF
SPLP West	Prep	3010A			337572	12/06/21 09:00	ACM2	TAL CF
SPLP West	Analysis	6020B		1	338634	12/13/21 14:32	SAP	TAL CF
SPLP West	Leach	1312			337435	12/02/21 14:15	JTA	TAL CF
SPLP West	Prep	7470A			337518	12/03/21 12:16	EAM	TAL CF
SPLP West	Analysis	7470A		1	337581	12/03/21 17:30	EAM	TAL CF
TCLP	Leach	1311			337432	12/02/21 14:15	JTA	TAL CF
TCLP	Prep	7470A			337516	12/03/21 12:07	EAM	TAL CF
TCLP	Analysis	7470A		1	337581	12/03/21 16:20	EAM	TAL CF
Soluble	Leach	DI Leach			336893	11/29/21 14:14	ARG	TAL CF
Soluble	Analysis	9045D		1	337047	11/30/21 15:31	ARG	TAL CF
Total/NA	Analysis	Moisture		1	336990	11/30/21 09:16	SAS	TAL CF
Total/NA	Analysis	Composite		1	337013	11/30/21 11:15	DEM1	TAL CF

Client Sample ID: S01-S04 Lab Composite
Lab Sample ID: 310-220603-5

Date Collected: 11/24/21 00:00
Matrix: Solid
Date Received: 11/24/21 14:30
Percent Solids: 96.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			336926	11/29/21 17:14	JNR	TAL CF
Soluble	Analysis	9056A		10	337370	12/02/21 12:53	CJT	TAL CF
Total/NA	Prep	3050B			338039	12/09/21 10:00	ACM2	TAL CF
Total/NA	Analysis	6020B		5	338311	12/09/21 23:52	SAP	TAL CF
Total/NA	Prep	3050B			338039	12/09/21 10:00	ACM2	TAL CF
Total/NA	Analysis	6020B		5	338423	12/10/21 16:17	SAP	TAL CF
Total/NA	Prep	7471B			338183	12/09/21 13:29	EAM	TAL CF
Total/NA	Analysis	7471B		1	338424	12/10/21 14:31	EAM	TAL CF
Total/NA	Analysis	7196A		1	633464	12/13/21 15:07	PFK	TAL CHI

Lab Chronicle

Client: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: S01-S04 Lab Composite
Lab Sample ID: 310-220603-5

Date Collected: 11/24/21 00:00
Matrix: Solid

Date Received: 11/24/21 14:30
Percent Solids: 96.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3060A			631889	12/02/21 17:10	EAT	TAL CHI
Total/NA	Analysis	7196A		1	632234	12/03/21 19:07	EAT	TAL CHI

Laboratory References:

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

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

Laboratory: Eurofins TestAmerica, Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-21 *

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3010A	Solid	Lithium
6020B	3050B	Solid	Lithium
8270E	3510C	Solid	Total Cresols
Composite		Solid	Composited
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Laboratory: Eurofins TestAmerica, Chicago

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	082	05-01-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
7196A		Solid	Chromium, trivalent

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: SCS Engineers
Job ID: 310-220603-1
Project/Site: Lansing Soil Characterization, 25220100

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	TAL CF
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CF
8081B	Organochlorine Pesticides (GC)	SW846	TAL CF
8151A	Herbicides (GC)	SW846	TAL CHI
9056A	Anions, Ion Chromatography	SW846	TAL CF
6010C	Metals (ICP)	SW846	TAL CF
6020B	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
7471B	Mercury (CVAA)	SW846	TAL CF
7196A	Chromium, Hexavalent	SW846	TAL CHI
7196A	Chromium, Trivalent (Colorimetric)	SW846	TAL CHI
9045D	pH	SW846	TAL CF
Moisture	Percent Moisture	EPA	TAL CF
Composite	Composite	None	TAL CF
1311	TCLP Extraction	SW846	TAL CF
1311	TCLP Zero Headspace Extraction	SW846	TAL CF
1311	TCLP Extraction	SW846	TAL CHI
1312	SPLP Extraction	SW846	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
3050B	Preparation, Metals	SW846	TAL CF
3060A	Alkaline Digestion (Chromium, Hexavalent)	SW846	TAL CHI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL CF
5030B	Purge and Trap	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF
7471B	Preparation, Mercury	SW846	TAL CF
8151A	Extraction (Herbicides)	SW846	TAL CHI
DI Leach	Deionized Water Leaching Procedure	ASTM	TAL CF

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

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

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310-220603 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: ~~Interstate Power Light~~ sjf 11/26/21 SCS Engineers

City/State: CITY Lansing STATE IA Project: LAN USACE

Receipt Information

Date/Time Received: DATE 11/24/21 TIME 1430 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 # ____ of ____	
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: 0 Correction Factor (°C): +0

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): Corrected Temp (°C):

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:	soil jar Hg	
Uncorrected Temp (°C):	4.4	
Corrected Temp (°C):	4.4	

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

2417 Bond Street, University Park, IL 60484
Phone: 708.534.5200 Fax: 708.534.5211

Chain of Custody Record

Lab Job #:

Chain of Custody Number:

Page _____ of _____

Temperature °C of Cooler:

(optional)

Report To
Contact: Eric Nelson
Company: SCS Engineers
Address: 2830 Dairy Drive
Address: Madison, WI.
Phone: 608-381-0753
Fax:
E-Mail: enelson@scsengineers.com

(optional)

Bill To
Contact:
Company:
Address:
Address:
Phone:
Fax:
PO#/Reference#

Client: Interstate Power & Light
Client Project #: 25220100.00
Project Name: LAN USACE Dredge
Project Location/State: Lansing, Iowa
Lab Project #:
Sampler: Eric Nelson
Lab PM:

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	Preservative: None	Preservative: MeOH	Preservative: None							Comments
							Parameter: See Quote #31014207	Parameter: See Quote #31014207	Parameter: Radium							
		S01	11/19/21	8:24	4	S	X	X	X							Radium Samples were not stored on ice
		S02		8:29	4	S	X	X	X							
		S03		8:33	4	S	X	X	X							
		S04		8:38	4	S	X	X	X							Composite S01-S04 for analysis of parameters in quote #31014207 and attached table. analysis of separate samples is not required.

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days X 10 Days ___ 15 Days _____ Other
Requested Due Date _____

Sample Disposal
[ ] Return to Client [X] Disposal by Lab [ ] Archive for _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
[signature]	SCS	11/22/21	1630	[signature]		11/24/21	1430
Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Lab Courier
Shipped
Hand Delivered

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments: Hold all until email authorization and instruction on which samples to analyze. EJN

Lab Comments:

TAL-4124-500 (1209)

12/15/2021

Lansing Stockpile Soil Sampling - Parameter List

Collected 4 samples - composite to a single sample for analysis

	Total	SPLP	TCLP
VOCs			
Benzene			X
Carbon tetrachloride			X
Chlorobenzene			X
Chloroform			X
1,2-Dichloroethane			X
1,1-Dichloroethylene			X
Methyl ethyl ketone			X
Tetrachloroethylene			X
Trichloroethylene			X
Vinyl chloride			X
Pesticides			
Chlordane			X
Endrin			X
Heptachlor (and its epoxide)			X
Lindane			X
Methoxychlor			X
Toxaphene			X
Herbicides			
2,4-D			X
2,4,5-TP (Silvex)			X
SVOCs			
o-Cresol			X
m-Cresol			X
p-Cresol			X
Cresol			X
1,4-Dichlorobenzene			X
2.4-Dinitrotoluene			X
Hexachlorobenzene			X
Hexachloroebutadiene			X
Hexachloroethane			X
Nitrobenzene			X
Pentachlorophenol			X
Pyridine			X
2,4,5-Trichlorophenol			X
2,4,6-Trichlorophenol			X
Metals			
Antimony	X	X	
Arsenic	X	X	X
Barium	X	X	X
Beryllium	X	X	
Boron	X	X	

Cadmium	X	X	X
Calcium	X	X	
Chromium - total	X	X	X
Chromium - hexavalent	X		
Chromium - trivalent	X		
Cobalt	X	X	
Copper	X	X	
Lead	X	X	X
Lithium	X	X	
Manganese	X		
Mercury	X	X	X
Molybdenum	X	X	
Nickel	X		
Selenium	X	X	X
Silver	X		X
Thallium	X	X	
Vanadium	X		
Zinc	X		
pH	X		
Anions			
Chloride	X	X	
Fluoride	X	X	
Sulfate	X	X	
Radium			
Radium 226 + 228	X	X	

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

eurofins | Environment Testing America

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Thompson, Shirley J	Carrier Tracking No(s):	COC No: 310-43994.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Shirley.Thompson@Eurofinset.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State - Iowa; State Program - Iowa		Job #: 310-220603-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 12/27/2021			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Lansing Soil Characterization, 25220100	Project #: 31014222			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Dry_Grind Radium-226/228	9320_Ra228/1312_W Standard Target List	9315_Ra226/1312_W Standard Target List	ICP_Native/ICP_Native_Prep (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:									
S01-S04 Lab Composite (310-220603-5)	11/24/21	Central		Solid			X	X	X	X	1	

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
1	[signature]	11/30/21 1400		FED EX		
2	FED EX			[signature]	DEC 01 2021 0950	EASTL
3				Autumn R. Johnson		

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

12/15/2021

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone 319-277-2401 Fax 319-277-2425

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler	Lab PM: Thompson Shirley J	Carrier Tracking No(s)	COC No: 310-43995 1
Client Contact: Shipping/Receiving	Phone	E-Mail: Shirley Thompson@Eurofinset com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories Inc		Accreditations Required (See note): State - Iowa State Program - Iowa		Job #: 310-220603-1
Address: 2417 Bond Street,	Due Date Requested: 12/27/2021			
City: University Park	TAT Requested (days):			
State Zip: IL, 60484	PO #:			
Phone: 708-534-5200(Tel) 708-534-5211(Fax)	WO #:			
Email	Project #: 31014222			
Project Name: Lansing Soil Characterization 25220100	SSOW#:			
Site				

310-220603 COC

Analysis Requested

Preservation Codes

A	HCL	M	Hexane
B	NaOH	N	None
C	Zn Acetate	O	AsNaO2
D	Nitric Acid	P	Na2O4S
E	NaHSO4	Q	Na2SO3
F	MeOH	R	Na2S2O3
G	Amchlor	S	H2SO4
H	Ascorbic Acid	T	TSP Dodecahydrate
I	Ice	U	Acetone
J	DI Water	V	MCAA
K	EDTA	W	pH 4-5
L	EDA	Z	other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	7196A/3060A	7196A_CR3/ (MOD) Local Method	8151A/1311_T TCLP	Total Number of containers	Special Instructions/Note
			Preservation Code:								
S01-S04 Lab Composite (310-220603-5)	11/24/21	Central		Solid			X	X	X	1	

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	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested I II III IV Other (specify) Primary Deliverable Rank 2	Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	[signature]	11/30/21 1415		[signature]	12/1/21 1030	ETA
2	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
3	Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact. Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: -0.1

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-220603-1

Login Number: 220603

List Source: Eurofins TestAmerica, Cedar Falls

List Number: 1

Creator: Thompson, Shirley J

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-220603-1

Login Number: 220603
List Number: 3
Creator: Scott, Sherri L

List Source: Eurofins TestAmerica, Chicago
List Creation: 12/01/21 11:57 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	-0.1 samples not frozen
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	True	

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-220603-2
Client Project/Site: Lansing Soil Characterization, 25220100

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
1/26/2022 5:40:53 PM

Shirley Thompson, Client Service Manager
(319)277-2401
Shirley.Thompson@Eurofinset.com

LINKS
Review your project results through TotalAccess
Have a Question? Ask The Expert
Visit us at: www.eurofinsus.com/Env

This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Case Narrative

Client: SCS Engineers
Job ID: 310-220603-2
Project/Site: Lansing Soil Characterization, 25220100

Job ID: 310-220603-2

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-220603-2

Comments
No additional comments.

Receipt
The samples were received on 11/24/2021 2:30 PM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.4º C.

Receipt Exceptions

A Chain-of-Custody (COC) was not received with these samples: S01-S04 Lab Composite (310-220603-5).

RAD
Methods 901.1, GA-01-R: Gamma Prep Batch 160-540686
Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from	Reported to Analyte
Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223
Th-227	Ac-227
Th-227	Bi-211
Th-227	Pb-211
Bi-214	Ra-226

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

**The method blank (MB) Z-score is within limits and is located in the level IV raw data

S01-S04 Lab Composite (310-220603-5), (160-44083-A-1-D) and (160-44083-A-1-E DU)

Methods 903.0, 9315: Radium 226 batch 543974
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Job ID: 310-220603-2 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

The GFPC long monthly backgrounds (ICB) were counted for 800 minutes, but due to current software limitations with the Protean instruments the long monthly backgrounds are calculated at 1000 minutes. This discrepancy has been manually updated, and data is correct, but the raw data printouts still show the incorrect time of 1000 minutes. The ICB raw data includes the correct count time of 800 minutes and counts

S01-S04 Lab Composite (310-220603-5), (LCS 160-543974/1-A), (MB 160-543974/20-A) and (240-160987-V-1-A)

Methods 904.0, 9320: Radium 228 batch 543980
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

S01-S04 Lab Composite (310-220603-5), (LCS 160-543980/1-A), (MB 160-543980/20-A), (240-160987-V-1-C), (240-160987-I-1-C MS) and (240-160987-H-1-C MSD)

Method Fill_Geo-21: Gamma Prep Batch 160-540686:

Insufficient sample was provided for the following sample to fill a geometry (e.g. tuna can) calibrated for Ra-226 analysis by gamma spectroscopy: S01-S04 Lab Composite (310-220603-5). The use of a different geometry could potentially bias the results low due to the loss of radon into the headspace of the container.

A 25mL solid geometry was used instead.

Method PrecSep_0:

Method PrecSep-21:

Method PrecSep-21:

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

Metals
Method NONE: preparation batch 160-540410 and 160-540387 and analytical batch 160-540633 The following sample was diluted due to the nature of the sample matrix: sample is Rad natives S01-S04 Lab Composite (310-220603-5). 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.

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

Sample Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100

Job ID: 310-220603-2

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-220603-5	S01-S04 Lab Composite	Solid	11/24/21 00:00	11/24/21 14:30

Client Sample ID: S01-S04 Lab Composite
Lab Sample ID: 310-220603-5

Date Collected: 11/24/21 00:00
Matrix: Solid
Date Received: 11/24/21 14:30

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.323**		0.170	0.174	1.00	0.212	pCi/g	12/07/21 13:58	12/28/21 12:36	1
Radium-228	**0.497**		0.299	0.305		0.307	pCi/g	12/07/21 13:58	12/28/21 12:36	1

Method: 9315 - Radium-226 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.193	U	0.329	0.329	1.00	0.569	pCi/L	12/29/21 10:59	01/20/22 17:48	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.7*		*40 - 110*	*12/29/21 10:59*	*01/20/22 17:48*	*1*

Method: 9320 - Radium-228 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	**1.10**		0.500	0.510	1.00	0.716	pCi/L	12/29/21 11:36	01/19/22 09:08	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*94.7*		*40 - 110*	*12/29/21 11:36*	*01/19/22 09:08*	*1*
Y Carrier	*81.5*		*40 - 110*	*12/29/21 11:36*	*01/19/22 09:08*	*1*

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-220603-2
Project/Site: Lansing Soil Characterization, 25220100

Qualifiers

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

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

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-540686/1-A
Matrix: Solid
Analysis Batch: 543628

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 540686

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	-0.1235	U	0.250	0.250	1.00	0.422	pCi/g	12/07/21 13:58	12/28/21 09:49	1
Radium-228	-0.01846	U	0.0756	0.0757		0.330	pCi/g	12/07/21 13:58	12/28/21 09:49	1

Lab Sample ID: LCS 160-540686/2-A
Matrix: Solid
Analysis Batch: 543629

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 540686

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Americium-241	99.7	94.06		11.2		0.615	pCi/g	94	87 - 116
Cesium-137	29.9	28.57		3.45		0.147	pCi/g	96	87 - 120
Cobalt-60	14.9	14.07		1.72		0.123	pCi/g	94	87 - 115

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-543974/20-A
Matrix: Solid
Analysis Batch: 547233

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 543974

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.01155	U	0.130	0.130	1.00	0.263	pCi/L	12/29/21 10:59	01/20/22 21:54	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*96.5*		*40 - 110*	*12/29/21 10:59*	*01/20/22 21:54*	*1*

Lab Sample ID: LCS 160-543974/1-A
Matrix: Solid
Analysis Batch: 547233

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 543974

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits
Radium-226	15.1	13.32		1.60	1.00	0.398	pCi/L	88	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*91.9*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-543980/20-A
Matrix: Solid
Analysis Batch: 547143

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 543980

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	0.7561		0.322	0.330	1.00	0.453	pCi/L	12/29/21 11:36	01/19/22 09:12	1

Method: 9320 - Radium-228 (GFPC) (Continued)

Lab Sample ID: MB 160-543980/20-A
Matrix: Solid
Analysis Batch: 547143

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 543980

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	96.5		40 - 110	12/29/21 11:36	01/19/22 09:12	1
Y Carrier	83.4		40 - 110	12/29/21 11:36	01/19/22 09:12	1

Lab Sample ID: LCS 160-543980/1-A
Matrix: Solid
Analysis Batch: 547142

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 543980

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec. Limits		
Radium-228			11.9	14.41		1.63	1.00	0.456	pCi/L	121	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	91.9		40 - 110
Y Carrier	82.6		40 - 110

QC Association Summary

Client: SCS Engineers
Job ID: 310-220603-2
Project/Site: Lansing Soil Characterization, 25220100

Rad

Leach Batch: 539634

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	Dry and Grind	

Prep Batch: 540686

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	Total/NA	Solid	Fill_Geo-21	539634
MB 160-540686/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-540686/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	

Leach Batch: 540867

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP West	Solid	1312	

Prep Batch: 543974

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP West	Solid	PrecSep-21	540867
MB 160-543974/20-A	Method Blank	Total/NA	Solid	PrecSep-21	
LCS 160-543974/1-A	Lab Control Sample	Total/NA	Solid	PrecSep-21	

Prep Batch: 543980

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-220603-5	S01-S04 Lab Composite	SPLP West	Solid	PrecSep_0	540867
MB 160-543980/20-A	Method Blank	Total/NA	Solid	PrecSep_0	
LCS 160-543980/1-A	Lab Control Sample	Total/NA	Solid	PrecSep_0	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-220603-2
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: S01-S04 Lab Composite
Lab Sample ID: 310-220603-5
Date Collected: 11/24/21 00:00
Matrix: Solid
Date Received: 11/24/21 14:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Leach	Dry and Grind			539634	12/01/21 13:20	SRE	TAL SL
Total/NA	Prep	Fill_Geo-21			540686	12/07/21 13:58	LTC	TAL SL
Total/NA	Analysis	901.1		1	543628	12/28/21 12:36	JCB	TAL SL
SPLP West	Leach	1312			540867	12/08/21 10:25	LTC	TAL SL
SPLP West	Prep	PrecSep-21			543974	12/29/21 10:59	LPS	TAL SL
SPLP West	Analysis	9315		1	547233	01/20/22 17:48	ANW	TAL SL
SPLP West	Leach	1312			540867	12/08/21 10:25	LTC	TAL SL
SPLP West	Prep	PrecSep_0			543980	12/29/21 11:36	LPS	TAL SL
SPLP West	Analysis	9320		1	547142	01/19/22 09:08	FLC	TAL SL

Laboratory References:
TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-220603-2
Project/Site: Lansing Soil Characterization, 25220100

Laboratory: Eurofins St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	12-01-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
901.1	Fill_Geo-21	Solid	Radium-226
901.1	Fill_Geo-21	Solid	Radium-228
9315	PrecSep-21	Solid	Radium-226
9320	PrecSep_0	Solid	Radium-228

Method Summary

Client: SCS Engineers
Job ID: 310-220603-2
Project/Site: Lansing Soil Characterization, 25220100

Method	Method Description	Protocol	Laboratory
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	TAL SL
9315	Radium-226 (GFPC)	SW846	TAL SL
9320	Radium-228 (GFPC)	SW846	TAL SL
1312	SPLP Extraction	SW846	TAL SL
Dry and Grind	Preparation, Dry and Grind	None	TAL SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	TAL SL
PrecSep_0	Preparation, Precipitate Separation	None	TAL SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	TAL SL

Protocol References:

EPA = US Environmental Protection Agency

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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310-220603 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: ~~Interstate Power Light~~ sjf 11/26/21 SCS Engineers

City/State: CITY Lansing STATE IA Project: LAN USACE

Receipt Information

Date/Time Received: DATE 11/24/21 TIME 1430 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 # ____ of ____	
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: 0 Correction Factor (°C): +0

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): Corrected Temp (°C):

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used:	soil jar Hg	
Uncorrected Temp (°C):	4.4	
Corrected Temp (°C):	4.4	

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

2417 Bond Street, University Park, IL 60484
Phone: 708.534.5200 Fax: 708.534.5211

Chain of Custody Record

Lab Job #: _____

Chain of Custody Number: _____

Page _____ of _____

Temperature °C of Cooler: _____

(optional)

Report To
Contact: Eric Nelson
Company: SCS Engineers
Address: 2830 Dairy Drive
Address: Madison, WI.
Phone: 608-381-0753
Fax:
E-Mail: enelson@scsengineers.com

(optional)

Bill To
Contact:
Company:
Address:
Address:
Phone:
Fax:
PO#/Reference#

Client: Interstate Power & Light
Client Project #: 25220100.00
Project Name: LAN USACE Dredge
Project Location/State: Lansing, Iowa
Lab Project #:
Sampler: Eric Nelson
Lab PM:

Lab ID	MS/MSD	Sample ID	Sampling Date	Sampling Time	# of Containers	Matrix	Preservative: None	Preservative: MeOH	Preservative: None						
							Parameter: See Quote #31014207	Parameter: See Quote #31014207	Parameter: Radium						
		S01	11/19/21	8:24	4	S	X	X	X						
		S02		8:29	4	S	X	X	X						
		S03		8:33	4	S	X	X	X						
		S04		8:38	4	S	X	X	X						

Preservative Key
1. HCL, Cool to 4°
2. H2SO4, Cool to 4°
3. HNO3, Cool to 4°
4. NaOH, Cool to 4°
5. NaOH/Zn, Cool to 4°
6. NaHSO4
7. Cool to 4°
8. None
9. Other

Comments

Radium samples were not stored on ice

Composite S01-S04 for analysis of parameters in quote #31014207 and attached table. analysis of separate samples is not required.

Turnaround Time Required (Business Days)
___ 1 Day ___ 2 Days ___ 5 Days ___ 7 Days X 10 Days ___ 15 Days _____ Other
Requested Due Date _____

Sample Disposal
[ ] Return to Client [X] Disposal by Lab [ ] Archive for _____ Months (A fee may be assessed if samples are retained longer than 1 month)

Relinquished By	Company	Date	Time	Received By	Company	Date	Time
[signature]	SCS	11/22/21	1630	[signature]		11/24/21	1430
Relinquished By	Company	Date	Time	Received By	Company	Date	Time
Relinquished By	Company	Date	Time	Received By	Company	Date	Time

Lab Courier
Shipped
Hand Delivered

Matrix Key
WW – Wastewater
W – Water
S – Soil
SL – Sludge
MS – Miscellaneous
OL – Oil
A – Air
SE – Sediment
SO – Soil
L – Leachate
WI – Wipe
DW – Drinking Water
O – Other

Client Comments: Hold all until email authorization and instruction on which samples to analyze. EJN

Lab Comments:

TAL-4124-500 (1209)

1/26/2022

Lansing Stockpile Soil Sampling - Parameter List

Collected 4 samples - composite to a single sample for analysis

	Total	SPLP	TCLP
VOCs			
Benzene			X
Carbon tetrachloride			X
Chlorobenzene			X
Chloroform			X
1,2-Dichloroethane			X
1,1-Dichloroethylene			X
Methyl ethyl ketone			X
Tetrachloroethylene			X
Trichloroethylene			X
Vinyl chloride			X
Pesticides			
Chlordane			X
Endrin			X
Heptachlor (and its epoxide)			X
Lindane			X
Methoxychlor			X
Toxaphene			X
Herbicides			
2,4-D			X
2,4,5-TP (Silvex)			X
SVOCs			
o-Cresol			X
m-Cresol			X
p-Cresol			X
Cresol			X
1,4-Dichlorobenzene			X
2.4-Dinitrotoluene			X
Hexachlorobenzene			X
Hexachloroebutadiene			X
Hexachloroethane			X
Nitrobenzene			X
Pentachlorophenol			X
Pyridine			X
2,4,5-Trichlorophenol			X
2,4,6-Trichlorophenol			X
Metals			
Antimony	X	X	
Arsenic	X	X	X
Barium	X	X	X
Beryllium	X	X	
Boron	X	X	

Cadmium	X	X	X
Calcium	X	X	
Chromium - total	X	X	X
Chromium - hexavalent	X		
Chromium - trivalent	X		
Cobalt	X	X	
Copper	X	X	
Lead	X	X	X
Lithium	X	X	
Manganese	X		
Mercury	X	X	X
Molybdenum	X	X	
Nickel	X		
Selenium	X	X	X
Silver	X		X
Thallium	X	X	
Vanadium	X		
Zinc	X		
pH	X		
Anions			
Chloride	X	X	
Fluoride	X	X	
Sulfate	X	X	
Radium			
Radium 226 + 228	X	X	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-220603-2

Login Number: 220603
List Number: 1
Creator: Thompson, Shirley J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-220603-2

Login Number: 220603
List Number: 2
Creator: Johnson, Autumn R

List Source: Eurofins St. Louis
List Creation: 12/01/21 11:52 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: SCS Engineers
Job ID: 310-220603-2
Project/Site: Lansing Soil Characterization, 25220100

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
LCS 160-543974/1-A	Lab Control Sample	91.9
MB 160-543974/20-A	Method Blank	96.5

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
310-220603-5	S01-S04 Lab Composite	94.7

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
LCS 160-543980/1-A	Lab Control Sample	91.9	82.6
MB 160-543980/20-A	Method Blank	96.5	83.4

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
310-220603-5	S01-S04 Lab Composite	94.7	81.5

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

eurofins | Environment Testing America



ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-226499-1
Laboratory Sample Delivery Group: Lansing Iowa
Client Project/Site: Lansing Soil Characterization, 25220100.00
Revision: 1

For:
SCS Engineers
2830 Dairy Dr
Madison, Wisconsin 53718

Attn: Brandon Suchomel

Authorized for release by:
4/19/2022 7:31:49 PM

Shirley Thompson, Client Service Manager
(319)277-2401
Shirley.Thompson@et.eurofinsus.com

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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.

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Job ID: 310-226499-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-226499-1

Comments
Revised report. Original report omitted Narrative from the St. Louis Laboratory.

Receipt
The samples were received on 3/8/2022 10:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.3º C.

GC/MS VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC/MS Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

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

GC Semi VOA
Method 8081B: The surrogate recovery for the blank associated with preparation batch 310-346399 and 310-346593 and analytical batch 310-346616 was outside the upper control limits.

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

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

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

Organic Prep
Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-346399 and 310-346593. The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.

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

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

Job Narrative
310-226499-2

Comments
No additional comments.

Receipt
The samples were received on 3/8/2022 10:15 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.3º C.

RAD
Method 901.1: Gamma Prep Batch 160-554785

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often,

Job ID: 310-226499-1 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from	Reported to Analyte
Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223
Th-227	Ac-227
Th-227	Bi-211
Th-227	Pb-211
Bi-214	Ra-226

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Composite LAN USACE sand 220303 (310-226499-5), (MB 160-554785/1-A) and (310-226499-B-5-D DU)

Method 9315: Radium-226 batch 556923
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Composite LAN USACE sand 220303 (310-226499-5), (LCS 160-556923/1-A), (LCSD 160-556923/2-A) and (MB 160-556923/5-A)

Method 9320: Radium-228 batch 556934
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Composite LAN USACE sand 220303 (310-226499-5), (LCS 160-556934/1-A), (LCSD 160-556934/2-A) and (MB 160-556934/5-A)

Method PrecSep_0: Radium-228 Prep Batch 160-556934

The following samples were prepared at a reduced aliquot due to Matrix: Composite LAN USACE sand 220303 (310-226499-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep-21: Radium-226 Prep Batch 160-556923

The following samples were prepared at a reduced aliquot due to Matrix: Composite LAN USACE sand 220303 (310-226499-5). A

Job ID: 310-226499-1 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

Metals
Method NONE: preparation batch 160-554320 and analytical batch 160-555278 The following sample was diluted due to the nature of the sample matrix: sample is Rad natives Composite LAN USACE sand 220303 (310-226499-5). 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.

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

Sample Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100.00

Job ID: 310-226499-1
SDG: Lansing Iowa

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-226499-5	Composite LAN USACE sand 220303	Solid	03/08/22 12:24	03/08/22 10:38

Client Sample ID: Composite LAN USACE sand 220303

Lab Sample ID: 310-226499-5

Date Collected: 03/08/22 12:24
Matrix: Solid
Date Received: 03/08/22 10:38

Method: 8260D - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			03/16/22 18:28	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			03/16/22 18:28	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			03/16/22 18:28	20
Benzene	<0.0140		0.100	0.0140	mg/L			03/16/22 18:28	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			03/16/22 18:28	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			03/16/22 18:28	20
Chloroform	<0.0360		0.100	0.0360	mg/L			03/16/22 18:28	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			03/16/22 18:28	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			03/16/22 18:28	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			03/16/22 18:28	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*104*		*80 - 120*		*03/16/22 18:28*	*20*
Toluene-d8 (Surr)	*96*		*80 - 120*		*03/16/22 18:28*	*20*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*03/16/22 18:28*	*20*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		03/16/22 12:25	03/17/22 13:19	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		03/16/22 12:25	03/17/22 13:19	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		03/16/22 12:25	03/17/22 13:19	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		03/16/22 12:25	03/17/22 13:19	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		03/16/22 12:25	03/17/22 13:19	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		03/16/22 12:25	03/17/22 13:19	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		03/16/22 12:25	03/17/22 13:19	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		03/16/22 12:25	03/17/22 13:19	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		03/16/22 12:25	03/17/22 13:19	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		03/16/22 12:25	03/17/22 13:19	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		03/16/22 12:25	03/17/22 13:19	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		03/16/22 12:25	03/17/22 13:19	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		03/16/22 12:25	03/17/22 13:19	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*74*		*14 - 110*	*03/16/22 12:25*	*03/17/22 13:19*	*1*
Phenol-d5 (Surr)	*65*		*10 - 110*	*03/16/22 12:25*	*03/17/22 13:19*	*1*
Nitrobenzene-d5 (Surr)	*78*		*30 - 110*	*03/16/22 12:25*	*03/17/22 13:19*	*1*
2-Fluorobiphenyl (Surr)	*63*		*28 - 110*	*03/16/22 12:25*	*03/17/22 13:19*	*1*
2,4,6-Tribromophenol (Surr)	*100*		*35 - 110*	*03/16/22 12:25*	*03/17/22 13:19*	*1*
Terphenyl-d14 (Surr)	*78*		*39 - 117*	*03/16/22 12:25*	*03/17/22 13:19*	*1*

Method: 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	<1.10		10.0	1.10	ug/L		03/15/22 09:25	03/15/22 15:40	1
Endrin	<0.0500		0.160	0.0500	ug/L		03/15/22 09:25	03/15/22 15:40	1
gamma-BHC (Lindane)	<0.0700		0.160	0.0700	ug/L		03/15/22 09:25	03/15/22 15:40	1
Heptachlor	<0.0600		0.160	0.0600	ug/L		03/15/22 09:25	03/15/22 15:40	1
Heptachlor epoxide	<0.0460		0.160	0.0460	ug/L		03/15/22 09:25	03/15/22 15:40	1
Methoxychlor	<0.0700		0.160	0.0700	ug/L		03/15/22 09:25	03/15/22 15:40	1
Toxaphene	<2.10		10.0	2.10	ug/L		03/15/22 09:25	03/15/22 15:40	1

Client Sample ID: Composite LAN USACE sand 220303

Lab Sample ID: 310-226499-5

Date Collected: 03/08/22 12:24
Matrix: Solid
Date Received: 03/08/22 10:38

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*79*		*10 - 117*	*03/15/22 09:25*	*03/15/22 15:40*	*1*
Tetrachloro-m-xylene (Surr)	*82*		*14 - 115*	*03/15/22 09:25*	*03/15/22 15:40*	*1*

Method: 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		03/16/22 10:22	03/17/22 16:15	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		03/16/22 10:22	03/17/22 16:15	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*76*		*25 - 130*	*03/16/22 10:22*	*03/17/22 16:15*	*1*

Method: 9056A - Anions, Ion Chromatography - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			03/21/22 13:54	1
Chloride	<0.500		1.00	0.500	mg/L			03/21/22 13:54	1
Sulfate	**0.964**	**J**	1.00	0.610	mg/L			03/21/22 13:54	1

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.0500		0.100	0.0500	mg/L		03/14/22 09:00	03/15/22 10:46	1
Barium	**0.432**	**J**	0.500	0.110	mg/L		03/14/22 09:00	03/15/22 10:46	1
Cadmium	<0.00530		0.0200	0.00530	mg/L		03/14/22 09:00	03/15/22 10:46	1
Chromium	<0.00870		0.0200	0.00870	mg/L		03/14/22 09:00	03/15/22 10:46	1
Lead	<0.0320		0.100	0.0320	mg/L		03/14/22 09:00	03/15/22 10:46	1
Selenium	<0.0630		0.100	0.0630	mg/L		03/14/22 09:00	03/15/22 10:46	1
Silver	**0.00987**	**J B**	0.0200	0.00870	mg/L		03/14/22 09:00	03/15/22 10:46	1

Method: 6020B - Metals (ICP/MS) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00550		0.0100	0.00550	mg/L		03/17/22 09:00	03/24/22 16:38	1
Arsenic	<0.00380		0.0100	0.00380	mg/L		03/17/22 09:00	03/24/22 16:38	1
Barium	**0.0395**	**J**	0.100	0.0200	mg/L		03/17/22 09:00	03/24/22 16:38	1
Beryllium	<0.00140		0.00500	0.00140	mg/L		03/17/22 09:00	03/24/22 16:38	1
Cadmium	<0.000280		0.00250	0.000280	mg/L		03/17/22 09:00	03/24/22 16:38	1
Boron	<0.290		0.500	0.290	mg/L		03/17/22 09:00	03/24/22 16:38	1
Chromium	<0.00720		0.0250	0.00720	mg/L		03/17/22 09:00	03/24/22 16:38	1
Copper	<0.0160		0.0500	0.0160	mg/L		03/17/22 09:00	03/24/22 16:38	1
Calcium	**5.39**		2.50	1.30	mg/L		03/17/22 09:00	03/24/22 16:38	1
Lead	**0.00222**	**J**	0.00500	0.00160	mg/L		03/17/22 09:00	03/24/22 16:38	1
Selenium	<0.00830		0.0250	0.00830	mg/L		03/17/22 09:00	03/24/22 16:38	1
Cobalt	**0.00156**	**J**	0.00250	0.000950	mg/L		03/17/22 09:00	03/24/22 16:38	1
Thallium	**0.00358**	**J**	0.00500	0.00240	mg/L		03/17/22 09:00	03/24/22 16:38	1
Lithium	<0.0160		0.0500	0.0160	mg/L		03/17/22 09:00	03/24/22 16:38	1
Molybdenum	<0.00920		0.0250	0.00920	mg/L		03/17/22 09:00	03/24/22 16:38	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00120		0.00200	0.00120	mg/L		03/14/22 15:19	03/15/22 15:18	1

Method: 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00120		0.00200	0.00120	mg/L		03/16/22 15:40	03/18/22 17:08	1

Client Sample ID: Composite LAN USACE sand 220303

Lab Sample ID: 310-226499-5

Date Collected: 03/08/22 12:24
Matrix: Solid
Date Received: 03/08/22 10:38

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	4.2		0.1	0.1	%			03/08/22 14:00	1
Percent Solids	95.8		0.1	0.1	%			03/08/22 14:00	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.7	HF	0.1	0.1	SU			03/09/22 10:02	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.363		0.128	0.135	1.00	0.114	pCi/g	03/11/22 13:00	04/01/22 13:48	1
Radium-228	0.237		0.177	0.179		0.220	pCi/g	03/11/22 13:00	04/01/22 13:48	1

Method: 9315 - Radium-226 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.140	U	0.0925	0.0930	1.00	0.140	pCi/L	03/24/22 14:04	04/15/22 08:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.2*		*40 - 110*	*03/24/22 14:04*	*04/15/22 08:03*	*1*

Method: 9320 - Radium-228 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.567	U	0.305	0.305	1.00	0.567	pCi/L	03/24/22 15:05	04/06/22 12:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*84.2*		*40 - 110*	*03/24/22 15:05*	*04/06/22 12:26*	*1*
Y Carrier	*86.7*		*40 - 110*	*03/24/22 15:05*	*04/06/22 12:26*	*1*

Client Sample ID: Composite LAN USACE sand 220303

Lab Sample ID: 310-226499-5

Date Collected: 03/08/22 12:24
Matrix: Solid
Date Received: 03/08/22 10:38
Percent Solids: 95.8

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<4.27		9.70	4.27	mg/Kg	☼		03/15/22 20:32	10
Chloride	<47.5		97.0	47.5	mg/Kg	☼		03/15/22 20:32	10
Sulfate	<38.8		97.0	38.8	mg/Kg	☼		03/15/22 20:32	10

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.350		0.813	0.350	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Arsenic	**1.18**		0.813	0.293	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Barium	**30.1**		0.813	0.342	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Beryllium	<0.146		0.407	0.146	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Boron	<12.2		40.7	12.2	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Cadmium	<0.122		0.407	0.122	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Chromium	**3.48**		1.22	0.390	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Cobalt	**2.58**		0.203	0.106	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Copper	**1.47**		1.22	0.618	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Lead	**1.48**	**J**	2.03	0.634	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Lithium	**1.89**	**J**	2.03	0.553	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Manganese	**293**	**F1 F2**	2.03	1.06	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Molybdenum	<0.268		0.813	0.268	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Nickel	**3.03**		1.22	0.472	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Calcium	**2140**		122	47.2	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Selenium	<0.504		1.22	0.504	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Silver	<0.122		0.203	0.122	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Thallium	<0.163		0.203	0.163	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Vanadium	**6.30**		1.22	0.301	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5
Zinc	**9.49**		4.07	2.03	mg/Kg	☼	03/19/22 09:30	03/24/22 16:16	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00707		0.0177	0.00707	mg/Kg	☼	03/17/22 16:35	03/21/22 16:56	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	**0.482**	**J**	1.03	0.400	mg/Kg	☼	03/26/22 12:00	03/29/22 12:58	1
Chromium, trivalent	<0.104		0.104	0.104	mg/Kg	☼		03/22/22 10:17	1

Definitions/Glossary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100.00

Job ID: 310-226499-1
SDG: Lansing Iowa

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
S1+	Surrogate recovery exceeds control limits, high biased.

HPLC/IC

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control 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.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

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

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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

Surrogate Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100.00

Job ID: 310-226499-1
SDG: Lansing Iowa

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)		
		DBFM	TOL	BFB
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)
310-226499-5	Composite LAN USACE sand 22	104	96	108
LB 310-346595/1-A	Method Blank	106	96	109
LB 310-346744/1-A	Method Blank	106	97	108
LCS 310-346595/2-A	Lab Control Sample	95	101	100
LCS 310-346744/2-A	Lab Control Sample	97	101	97

Surrogate Legend

DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		2FP	2FP	PHL	PHL	NBZ	NBZ	FBP	FBP
Lab Sample ID	Client Sample ID	(14-110)	(14-110)	(10-110)	(10-110)	(30-110)	(30-110)	(28-110)	(28-110)
LCS 310-346796/2-A	Lab Control Sample	74	74	64	64	81	81	69	69

		Percent Surrogate Recovery (Acceptance Limits)			
		TBP	TBP	TPHL	TPHL
Lab Sample ID	Client Sample ID	(35-110)	(35-110)	(39-117)	(39-117)
LCS 310-346796/2-A	Lab Control Sample	102	102	89	89

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		2FP	PHL	NBZ	FBP	TBP	TPHL
Lab Sample ID	Client Sample ID	(14-110)	(10-110)	(30-110)	(28-110)	(35-110)	(39-117)
310-226499-5	Composite LAN USACE sand 22	74	65	78	63	100	78
LB 310-346297/1-B	Method Blank	79	71	90	74	110	103
LB 310-346399/1-C	Method Blank	71	62	78	68	91	86

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Surrogate Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100.00

Job ID: 310-226499-1
SDG: Lansing Iowa

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCB1	TCX1
Lab Sample ID	Client Sample ID	(10-117)	(14-115)
LCS 310-346593/2-A	Lab Control Sample	100	91
LCSD 310-346593/3-A	Lab Control Sample Dup	99	84

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)	
		DCB1	TCX1
Lab Sample ID	Client Sample ID	(10-117)	(14-115)
310-226499-5	Composite LAN USACE sand 22	79	82
LB 310-346399/1-B	Method Blank	119 S1+	96

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene (Surr)

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)
		DCPAA1
Lab Sample ID	Client Sample ID	(25-130)
LCS 500-647259/2-A	Lab Control Sample	79
MB 500-647259/1-A	Method Blank	77

Surrogate Legend

DCPAA = DCAA

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)
		DCPAA1
Lab Sample ID	Client Sample ID	(25-130)
310-226499-5	Composite LAN USACE sand 22	76
310-226499-5 MS	Composite LAN USACE sand 220303	72
LB 500-647110/1-B	Method Blank	74

Surrogate Legend

DCPAA = DCAA

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: LB 310-346595/1-A
Matrix: Solid
Analysis Batch: 346754

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			03/16/22 11:14	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			03/16/22 11:14	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			03/16/22 11:14	20
Benzene	<0.0140		0.100	0.0140	mg/L			03/16/22 11:14	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			03/16/22 11:14	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			03/16/22 11:14	20
Chloroform	<0.0360		0.100	0.0360	mg/L			03/16/22 11:14	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			03/16/22 11:14	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			03/16/22 11:14	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			03/16/22 11:14	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*106*		*80 - 120*		*03/16/22 11:14*	*20*
Toluene-d8 (Surr)	*96*		*80 - 120*		*03/16/22 11:14*	*20*
4-Bromofluorobenzene (Surr)	*109*		*80 - 120*		*03/16/22 11:14*	*20*

Lab Sample ID: LB 310-346744/1-A
Matrix: Solid
Analysis Batch: 346754

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			03/16/22 17:16	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			03/16/22 17:16	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			03/16/22 17:16	20
Benzene	<0.0140		0.100	0.0140	mg/L			03/16/22 17:16	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			03/16/22 17:16	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			03/16/22 17:16	20
Chloroform	<0.0360		0.100	0.0360	mg/L			03/16/22 17:16	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			03/16/22 17:16	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			03/16/22 17:16	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			03/16/22 17:16	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*106*		*80 - 120*		*03/16/22 17:16*	*20*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/16/22 17:16*	*20*
4-Bromofluorobenzene (Surr)	*108*		*80 - 120*		*03/16/22 17:16*	*20*

Lab Sample ID: LCS 310-346595/2-A
Matrix: Solid
Analysis Batch: 346754

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1-Dichloroethene	2.00	1.394		mg/L		70	57 - 120
1,2-Dichloroethane	2.00	1.793		mg/L		90	66 - 124
2-Butanone (MEK)	4.00	3.633	J	mg/L		91	50 - 150
Benzene	2.00	1.838		mg/L		92	66 - 120
Carbon tetrachloride	2.00	1.932		mg/L		97	62 - 122
Chlorobenzene	2.00	1.835		mg/L		92	64 - 120

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LCS 310-346595/2-A
Matrix: Solid
Analysis Batch: 346754

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chloroform	2.00	1.781		mg/L		89	67 - 120
Tetrachloroethene	2.00	2.071		mg/L		104	63 - 120
Trichloroethene	2.00	1.870		mg/L		93	66 - 120
Vinyl chloride	2.00	1.549		mg/L		77	36 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*80 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*

Lab Sample ID: LCS 310-346744/2-A
Matrix: Solid
Analysis Batch: 346754

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1-Dichloroethene	2.00	1.391		mg/L		70	57 - 120
1,2-Dichloroethane	2.00	1.729		mg/L		86	66 - 124
2-Butanone (MEK)	4.00	3.901	J	mg/L		98	50 - 150
Benzene	2.00	1.769		mg/L		88	66 - 120
Carbon tetrachloride	2.00	1.862		mg/L		93	62 - 122
Chlorobenzene	2.00	1.780		mg/L		89	64 - 120
Chloroform	2.00	1.764		mg/L		88	67 - 120
Tetrachloroethene	2.00	1.974		mg/L		99	63 - 120
Trichloroethene	2.00	1.788		mg/L		89	66 - 120
Vinyl chloride	2.00	1.516		mg/L		76	36 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*97*		*80 - 120*
Toluene-d8 (Surr)	*101*		*80 - 120*
4-Bromofluorobenzene (Surr)	*97*		*80 - 120*

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCS 310-346796/2-A
Matrix: Solid
Analysis Batch: 346798

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346796

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.0625	0.03266	J	mg/L		52	24 - 110
1,4-Dichlorobenzene	0.0625	0.03266	J	mg/L		52	24 - 110
2,4,5-Trichlorophenol	0.0625	0.05015		mg/L		80	41 - 110
2,4,5-Trichlorophenol	0.0625	0.05015		mg/L		80	41 - 110
2,4,6-Trichlorophenol	0.0625	0.05629		mg/L		90	39 - 110
2,4,6-Trichlorophenol	0.0625	0.05629		mg/L		90	39 - 110
2,4-Dinitrotoluene	0.0625	0.04709	J	mg/L		75	35 - 110
2,4-Dinitrotoluene	0.0625	0.04709	J	mg/L		75	35 - 110
2-Methylphenol	0.0625	0.05411		mg/L		87	31 - 110
2-Methylphenol	0.0625	0.05411		mg/L		87	31 - 110

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 310-346796/2-A
Matrix: Solid
Analysis Batch: 346798

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346796

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
4-Methylphenol (and/or 3-Methylphenol)	0.0625	0.05513		mg/L		88	28 - 110
4-Methylphenol (and/or 3-Methylphenol)	0.0625	0.05513		mg/L		88	28 - 110
Hexachlorobenzene	0.0625	0.06302		mg/L		101	42 - 110
Hexachlorobenzene	0.0625	0.06302		mg/L		101	42 - 110
Hexachlorobutadiene	0.0625	0.02939	J	mg/L		47	27 - 110
Hexachlorobutadiene	0.0625	0.02939	J	mg/L		47	27 - 110
Hexachloroethane	0.0625	0.02711	J	mg/L		43	25 - 110
Hexachloroethane	0.0625	0.02711	J	mg/L		43	25 - 110
Nitrobenzene	0.0625	0.05267		mg/L		84	35 - 110
Nitrobenzene	0.0625	0.05267		mg/L		84	35 - 110
Pentachlorophenol	0.125	0.06720		mg/L		54	35 - 110
Pentachlorophenol	0.125	0.06720		mg/L		54	35 - 110
Pyridine	0.125	0.08180		mg/L		65	10 - 110
Pyridine	0.125	0.08180		mg/L		65	10 - 110

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorophenol (Surr)	*74*		*14 - 110*
2-Fluorophenol (Surr)	*74*		*14 - 110*
Phenol-d5 (Surr)	*64*		*10 - 110*
Phenol-d5 (Surr)	*64*		*10 - 110*
Nitrobenzene-d5 (Surr)	*81*		*30 - 110*
Nitrobenzene-d5 (Surr)	*81*		*30 - 110*
2-Fluorobiphenyl (Surr)	*69*		*28 - 110*
2-Fluorobiphenyl (Surr)	*69*		*28 - 110*
2,4,6-Tribromophenol (Surr)	*102*		*35 - 110*
2,4,6-Tribromophenol (Surr)	*102*		*35 - 110*
Terphenyl-d14 (Surr)	*89*		*39 - 117*
Terphenyl-d14 (Surr)	*89*		*39 - 117*

Lab Sample ID: LB 310-346297/1-B
Matrix: Solid
Analysis Batch: 346799

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346796

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		03/16/22 12:25	03/16/22 20:56	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		03/16/22 12:25	03/16/22 20:56	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		03/16/22 12:25	03/16/22 20:56	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		03/16/22 12:25	03/16/22 20:56	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		03/16/22 12:25	03/16/22 20:56	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		03/16/22 12:25	03/16/22 20:56	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		03/16/22 12:25	03/16/22 20:56	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		03/16/22 12:25	03/16/22 20:56	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		03/16/22 12:25	03/16/22 20:56	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		03/16/22 12:25	03/16/22 20:56	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		03/16/22 12:25	03/16/22 20:56	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		03/16/22 12:25	03/16/22 20:56	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB 310-346297/1-B
Matrix: Solid
Analysis Batch: 346799

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346796

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Total Cresols	<0.00500		0.0500	0.00500	mg/L		03/16/22 12:25	03/16/22 20:56	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*79*		*14 - 110*	*03/16/22 12:25*	*03/16/22 20:56*	*1*
Phenol-d5 (Surr)	*71*		*10 - 110*	*03/16/22 12:25*	*03/16/22 20:56*	*1*
Nitrobenzene-d5 (Surr)	*90*		*30 - 110*	*03/16/22 12:25*	*03/16/22 20:56*	*1*
2-Fluorobiphenyl (Surr)	*74*		*28 - 110*	*03/16/22 12:25*	*03/16/22 20:56*	*1*
2,4,6-Tribromophenol (Surr)	*110*		*35 - 110*	*03/16/22 12:25*	*03/16/22 20:56*	*1*
Terphenyl-d14 (Surr)	*103*		*39 - 117*	*03/16/22 12:25*	*03/16/22 20:56*	*1*

Lab Sample ID: LB 310-346399/1-C
Matrix: Solid
Analysis Batch: 346883

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346796

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		03/16/22 12:25	03/17/22 12:02	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		03/16/22 12:25	03/17/22 12:02	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		03/16/22 12:25	03/17/22 12:02	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		03/16/22 12:25	03/17/22 12:02	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		03/16/22 12:25	03/17/22 12:02	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		03/16/22 12:25	03/17/22 12:02	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		03/16/22 12:25	03/17/22 12:02	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		03/16/22 12:25	03/17/22 12:02	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		03/16/22 12:25	03/17/22 12:02	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		03/16/22 12:25	03/17/22 12:02	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		03/16/22 12:25	03/17/22 12:02	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		03/16/22 12:25	03/17/22 12:02	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		03/16/22 12:25	03/17/22 12:02	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*71*		*14 - 110*	*03/16/22 12:25*	*03/17/22 12:02*	*1*
Phenol-d5 (Surr)	*62*		*10 - 110*	*03/16/22 12:25*	*03/17/22 12:02*	*1*
Nitrobenzene-d5 (Surr)	*78*		*30 - 110*	*03/16/22 12:25*	*03/17/22 12:02*	*1*
2-Fluorobiphenyl (Surr)	*68*		*28 - 110*	*03/16/22 12:25*	*03/17/22 12:02*	*1*
2,4,6-Tribromophenol (Surr)	*91*		*35 - 110*	*03/16/22 12:25*	*03/17/22 12:02*	*1*
Terphenyl-d14 (Surr)	*86*		*39 - 117*	*03/16/22 12:25*	*03/17/22 12:02*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: LCS 310-346593/2-A
Matrix: Solid
Analysis Batch: 346616

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346593

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Endrin	0.625	0.7831		ug/L		125	35 - 143
gamma-BHC (Lindane)	0.625	0.7558		ug/L		121	34 - 123
Heptachlor	0.625	0.5722		ug/L		92	23 - 133
Heptachlor epoxide	0.625	0.7663		ug/L		123	35 - 129

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 310-346593/2-A
Matrix: Solid
Analysis Batch: 346616

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346593

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Methoxychlor			0.625	0.8060		ug/L		129	19 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*100*		*10 - 117*
Tetrachloro-m-xylene (Surr)	*91*		*14 - 115*

Lab Sample ID: LCSD 310-346593/3-A
Matrix: Solid
Analysis Batch: 346616

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 346593

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Endrin			0.625	0.8102		ug/L		130	35 - 143	2	35
gamma-BHC (Lindane)			0.625	0.7600		ug/L		122	34 - 123	1	35
Heptachlor			0.625	0.5395		ug/L		86	23 - 133	6	35
Heptachlor epoxide			0.625	0.7753		ug/L		124	35 - 129	0	35
Methoxychlor			0.625	0.8637		ug/L		138	19 - 150	7	32

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*99*		*10 - 117*
Tetrachloro-m-xylene (Surr)	*84*		*14 - 115*

Lab Sample ID: LB 310-346399/1-B
Matrix: Solid
Analysis Batch: 346616

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346593

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	<1.10		10.0	1.10	ug/L		03/15/22 09:25	03/15/22 14:54	1
Endrin	<0.0500		0.160	0.0500	ug/L		03/15/22 09:25	03/15/22 14:54	1
gamma-BHC (Lindane)	<0.0700		0.160	0.0700	ug/L		03/15/22 09:25	03/15/22 14:54	1
Heptachlor	<0.0600		0.160	0.0600	ug/L		03/15/22 09:25	03/15/22 14:54	1
Heptachlor epoxide	<0.0460		0.160	0.0460	ug/L		03/15/22 09:25	03/15/22 14:54	1
Methoxychlor	<0.0700		0.160	0.0700	ug/L		03/15/22 09:25	03/15/22 14:54	1
Toxaphene	<2.10		10.0	2.10	ug/L		03/15/22 09:25	03/15/22 14:54	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*119*	*S1+*	*10 - 117*	*03/15/22 09:25*	*03/15/22 14:54*	*1*
Tetrachloro-m-xylene (Surr)	*96*		*14 - 115*	*03/15/22 09:25*	*03/15/22 14:54*	*1*

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-647259/1-A
Matrix: Solid
Analysis Batch: 647407

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 647259

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.000500		0.00100	0.000500	mg/L		03/16/22 10:22	03/17/22 14:57	1
Silvex (2,4,5-TP)	<0.000500		0.00100	0.000500	mg/L		03/16/22 10:22	03/17/22 14:57	1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: MB 500-647259/1-A
Matrix: Solid
Analysis Batch: 647407

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 647259

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	77		25 - 130	03/16/22 10:22	03/17/22 14:57	1

Lab Sample ID: LCS 500-647259/2-A
Matrix: Solid
Analysis Batch: 647407

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 647259

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	0.0100	0.005607		mg/L		56	30 - 115
Silvex (2,4,5-TP)	0.00250	0.001904		mg/L		76	32 - 115

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCAA	79		25 - 130

Lab Sample ID: LB 500-647110/1-B
Matrix: Solid
Analysis Batch: 647407

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 647259

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		03/16/22 10:22	03/17/22 15:36	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		03/16/22 10:22	03/17/22 15:36	1

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	74		25 - 130	03/16/22 10:22	03/17/22 15:36	1

Lab Sample ID: 310-226499-5 MS
Matrix: Solid
Analysis Batch: 647407

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: TCLP
Prep Batch: 647259

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	<0.0500		1.00	0.5851		mg/L		59	30 - 115
Silvex (2,4,5-TP)	<0.0500		0.250	0.1756		mg/L		70	32 - 115

Surrogate	MS %Recovery	MS Qualifier	Limits
DCAA	72		25 - 130

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-346596/1-A
Matrix: Solid
Analysis Batch: 346774

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<4.27		9.70	4.27	mg/Kg			03/15/22 20:00	10
Chloride	<47.5		97.0	47.5	mg/Kg			03/15/22 20:00	10
Sulfate	<38.8		97.0	38.8	mg/Kg			03/15/22 20:00	10

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LCS 310-346596/2-A
Matrix: Solid
Analysis Batch: 346774

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Fluoride			194	176.0		mg/Kg		91	90 - 110		
Chloride			970	943.6		mg/Kg		97	90 - 110		
Sulfate			970	954.2		mg/Kg		98	90 - 110		

Lab Sample ID: 310-226499-5 MS
Matrix: Solid
Analysis Batch: 346774

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	<4.27		97.0	88.28		mg/Kg	☼	91	80 - 120
Chloride	<47.5		485	453.0		mg/Kg	☼	93	80 - 120
Sulfate	<38.8		485	470.8		mg/Kg	☼	97	80 - 120

Lab Sample ID: 310-226499-5 MSD
Matrix: Solid
Analysis Batch: 346774

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	<4.27		97.0	80.77		mg/Kg	☼	83	80 - 120	9	15
Chloride	<47.5		485	443.0		mg/Kg	☼	91	80 - 120	2	15
Sulfate	<38.8		485	470.7		mg/Kg	☼	97	80 - 120	0	15

Lab Sample ID: LB 310-346736/1-A
Matrix: Solid
Analysis Batch: 347456

Client Sample ID: Method Blank
Prep Type: SPLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			03/21/22 13:23	1
Chloride	<0.500		1.00	0.500	mg/L			03/21/22 13:23	1
Sulfate	<0.610		1.00	0.610	mg/L			03/21/22 13:23	1

Lab Sample ID: LCS 310-346736/2-A
Matrix: Solid
Analysis Batch: 347456

Client Sample ID: Lab Control Sample
Prep Type: SPLP

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Fluoride			2.00	2.039		mg/L		102	90 - 110		
Chloride			10.0	10.05		mg/L		100	90 - 110		
Sulfate			10.0	10.36		mg/L		104	90 - 110		

Method: 6010C - Metals (ICP)

Lab Sample ID: LB 310-346398/1-B
Matrix: Solid
Analysis Batch: 346672

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346413

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.0500		0.100	0.0500	mg/L		03/14/22 09:00	03/15/22 10:10	1
Barium	<0.110		0.500	0.110	mg/L		03/14/22 09:00	03/15/22 10:10	1
Cadmium	<0.00530		0.0200	0.00530	mg/L		03/14/22 09:00	03/15/22 10:10	1

Method: 6010C - Metals (ICP) (Continued)

Lab Sample ID: LB 310-346398/1-B
Matrix: Solid
Analysis Batch: 346672

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346413

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium	<0.00870		0.0200	0.00870	mg/L		03/14/22 09:00	03/15/22 10:10	1
Lead	<0.0320		0.100	0.0320	mg/L		03/14/22 09:00	03/15/22 10:10	1
Selenium	<0.0630		0.100	0.0630	mg/L		03/14/22 09:00	03/15/22 10:10	1
Silver	0.009797	J	0.0200	0.00870	mg/L		03/14/22 09:00	03/15/22 10:10	1

Lab Sample ID: LCS 310-346398/2-B
Matrix: Solid
Analysis Batch: 346672

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 346413

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	4.00	4.458		mg/L		111	80 - 120
Barium	2.00	2.051		mg/L		103	80 - 120
Cadmium	2.00	2.054		mg/L		103	80 - 120
Chromium	2.00	2.012		mg/L		101	80 - 120
Lead	4.00	4.228		mg/L		106	80 - 120
Selenium	8.00	8.917		mg/L		111	80 - 120
Silver	2.00	2.275		mg/L		114	80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-346605/1-A ^5
Matrix: Solid
Analysis Batch: 347743

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 346605

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.368		0.856	0.368	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Arsenic	<0.308		0.856	0.308	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Barium	<0.360		0.856	0.360	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Beryllium	<0.154		0.428	0.154	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Boron	<12.8		42.8	12.8	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Cadmium	<0.128		0.428	0.128	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Chromium	<0.411		1.28	0.411	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Copper	<0.651		1.28	0.651	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Lead	<0.668		2.14	0.668	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Cobalt	<0.111		0.214	0.111	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Manganese	<1.11		2.14	1.11	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Lithium	<0.582		2.14	0.582	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Nickel	<0.497		1.28	0.497	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Calcium	<49.7		128	49.7	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Molybdenum	<0.283		0.856	0.283	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Selenium	<0.531		1.28	0.531	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Silver	<0.128		0.214	0.128	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Thallium	<0.171		0.214	0.171	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Vanadium	<0.317		1.28	0.317	mg/Kg		03/19/22 09:30	03/24/22 15:57	5
Zinc	<2.14		4.28	2.14	mg/Kg		03/19/22 09:30	03/24/22 15:57	5

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-346605/2-A ^20
Matrix: Solid
Analysis Batch: 347743

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346605

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	144	148.0		mg/Kg		103	80 - 120
Arsenic	144	135.4		mg/Kg		94	80 - 120
Barium	71.8	67.70		mg/Kg		94	80 - 120
Beryllium	71.8	71.50		mg/Kg		100	80 - 120
Boron	144	132.0	J	mg/Kg		92	80 - 120
Cadmium	71.8	72.23		mg/Kg		101	80 - 120
Chromium	71.8	66.80		mg/Kg		93	80 - 120
Copper	144	143.6		mg/Kg		100	80 - 120
Lead	144	140.9		mg/Kg		98	80 - 120
Cobalt	71.8	68.72		mg/Kg		96	80 - 120
Manganese	71.8	64.78		mg/Kg		90	80 - 120
Lithium	144	141.7		mg/Kg		99	80 - 120
Nickel	144	137.3		mg/Kg		96	80 - 120
Calcium	1440	1262		mg/Kg		88	80 - 120
Molybdenum	144	136.0		mg/Kg		95	80 - 120
Selenium	287	269.5		mg/Kg		94	80 - 120
Silver	71.8	71.86		mg/Kg		100	80 - 120
Thallium	144	142.7		mg/Kg		99	80 - 120
Vanadium	71.8	67.51		mg/Kg		94	80 - 120
Zinc	144	134.7		mg/Kg		94	80 - 120

Lab Sample ID: 310-226499-5 MS
Matrix: Solid
Analysis Batch: 347743

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: Total/NA
Prep Batch: 346605

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<0.350		158	158.2		mg/Kg	☼	100	75 - 125
Arsenic	1.18		158	153.5		mg/Kg	☼	96	75 - 125
Barium	30.1		79.0	118.8		mg/Kg	☼	112	75 - 125
Beryllium	<0.146		79.0	78.89		mg/Kg	☼	100	75 - 125
Boron	<12.2		158	151.8	J	mg/Kg	☼	96	75 - 125
Cadmium	<0.122		79.0	81.10		mg/Kg	☼	103	75 - 125
Chromium	3.48		79.0	78.40		mg/Kg	☼	95	75 - 125
Copper	1.47		158	163.0		mg/Kg	☼	102	75 - 125
Lead	1.48	J	158	162.1		mg/Kg	☼	102	75 - 125
Cobalt	2.58		79.0	79.69		mg/Kg	☼	98	75 - 125
Manganese	293	F1 F2	79.0	443.9	F1	mg/Kg	☼	191	75 - 125
Lithium	1.89	J	158	161.3		mg/Kg	☼	101	75 - 125
Nickel	3.03		158	159.5		mg/Kg	☼	99	75 - 125
Calcium	2140		1580	3465		mg/Kg	☼	84	75 - 125
Molybdenum	<0.268		158	152.6		mg/Kg	☼	97	75 - 125
Selenium	<0.504		316	304.9		mg/Kg	☼	96	75 - 125
Silver	<0.122		79.0	80.04		mg/Kg	☼	101	75 - 125
Thallium	<0.163		158	159.9		mg/Kg	☼	101	75 - 125
Vanadium	6.30		79.0	80.73		mg/Kg	☼	94	75 - 125
Zinc	9.49		158	162.0		mg/Kg	☼	96	75 - 125

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-226499-5 MSD
Matrix: Solid
Analysis Batch: 347743

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: Total/NA
Prep Batch: 346605

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	<0.350		157	159.8		mg/Kg	☼	102	75 - 125	1	20
Arsenic	1.18		157	154.9		mg/Kg	☼	98	75 - 125	1	20
Barium	30.1		78.6	108.0		mg/Kg	☼	99	75 - 125	9	20
Beryllium	<0.146		78.6	80.06		mg/Kg	☼	102	75 - 125	1	20
Boron	<12.2		157	153.4	J	mg/Kg	☼	98	75 - 125	1	20
Cadmium	<0.122		78.6	82.12		mg/Kg	☼	104	75 - 125	1	20
Chromium	3.48		78.6	79.43		mg/Kg	☼	97	75 - 125	1	20
Copper	1.47		157	164.6		mg/Kg	☼	104	75 - 125	1	20
Lead	1.48	J	157	163.9		mg/Kg	☼	103	75 - 125	1	20
Cobalt	2.58		78.6	80.50		mg/Kg	☼	99	75 - 125	1	20
Manganese	293	F1 F2	78.6	353.8	F2	mg/Kg	☼	77	75 - 125	23	20
Lithium	1.89	J	157	164.2		mg/Kg	☼	103	75 - 125	2	20
Nickel	3.03		157	160.2		mg/Kg	☼	100	75 - 125	0	20
Calcium	2140		1570	3700		mg/Kg	☼	99	75 - 125	7	20
Molybdenum	<0.268		157	156.6		mg/Kg	☼	100	75 - 125	3	20
Selenium	<0.504		315	308.8		mg/Kg	☼	98	75 - 125	1	20
Silver	<0.122		78.6	81.56		mg/Kg	☼	104	75 - 125	2	20
Thallium	<0.163		157	165.0		mg/Kg	☼	105	75 - 125	3	20
Vanadium	6.30		78.6	82.62		mg/Kg	☼	97	75 - 125	2	20
Zinc	9.49		157	165.8		mg/Kg	☼	99	75 - 125	2	20

Lab Sample ID: LB 310-346733/1-C
Matrix: Solid
Analysis Batch: 347849

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 346858

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00550		0.0100	0.00550	mg/L		03/17/22 09:00	03/25/22 16:04	1
Arsenic	<0.00380		0.0100	0.00380	mg/L		03/17/22 09:00	03/25/22 16:04	1
Barium	<0.0200		0.100	0.0200	mg/L		03/17/22 09:00	03/25/22 16:04	1
Beryllium	<0.00140		0.00500	0.00140	mg/L		03/17/22 09:00	03/25/22 16:04	1
Boron	<0.290		0.500	0.290	mg/L		03/17/22 09:00	03/25/22 16:04	1
Cadmium	<0.000280		0.00250	0.000280	mg/L		03/17/22 09:00	03/25/22 16:04	1
Chromium	<0.00720		0.0250	0.00720	mg/L		03/17/22 09:00	03/25/22 16:04	1
Copper	<0.0160		0.0500	0.0160	mg/L		03/17/22 09:00	03/25/22 16:04	1
Lead	<0.00160		0.00500	0.00160	mg/L		03/17/22 09:00	03/25/22 16:04	1
Cobalt	<0.000950		0.00250	0.000950	mg/L		03/17/22 09:00	03/25/22 16:04	1
Lithium	<0.0160		0.0500	0.0160	mg/L		03/17/22 09:00	03/25/22 16:04	1
Calcium	<1.30		2.50	1.30	mg/L		03/17/22 09:00	03/25/22 16:04	1
Molybdenum	<0.00920		0.0250	0.00920	mg/L		03/17/22 09:00	03/25/22 16:04	1
Selenium	<0.00830		0.0250	0.00830	mg/L		03/17/22 09:00	03/25/22 16:04	1
Thallium	<0.00240		0.00500	0.00240	mg/L		03/17/22 09:00	03/25/22 16:04	1

Lab Sample ID: LCS 310-346733/2-C
Matrix: Solid
Analysis Batch: 347743

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 346858

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Antimony			1.00	1.082		mg/L		108	80 - 120		
Arsenic			1.00	0.9581		mg/L		96	80 - 120		

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-346733/2-C
Matrix: Solid
Analysis Batch: 347743

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 346858

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Barium	0.500	0.4850		mg/L		97	80 - 120
Beryllium	0.500	0.5043		mg/L		101	80 - 120
Boron	1.00	1.008		mg/L		101	80 - 120
Cadmium	0.500	0.5220		mg/L		104	80 - 120
Chromium	0.500	0.4895		mg/L		98	80 - 120
Copper	1.00	1.052		mg/L		105	80 - 120
Lead	1.00	1.030		mg/L		103	80 - 120
Cobalt	0.500	0.5042		mg/L		101	80 - 120
Lithium	1.00	0.9949		mg/L		99	80 - 120
Calcium	10.0	9.934		mg/L		99	80 - 120
Molybdenum	1.00	1.003		mg/L		100	80 - 120
Selenium	2.00	1.816		mg/L		91	80 - 120
Thallium	1.00	1.067		mg/L		107	80 - 120

Lab Sample ID: 310-226499-5 MS
Matrix: Solid
Analysis Batch: 347743

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: SPLP West
Prep Batch: 346858

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<0.00550		1.00	1.073		mg/L		107	75 - 125
Arsenic	<0.00380		1.00	0.9481		mg/L		95	75 - 125
Barium	0.0395	J	0.500	0.5123		mg/L		95	75 - 125
Beryllium	<0.00140		0.500	0.4953		mg/L		99	75 - 125
Boron	<0.290		1.00	1.048		mg/L		105	75 - 125
Cadmium	<0.000280		0.500	0.5215		mg/L		104	75 - 125
Chromium	<0.00720		0.500	0.4871		mg/L		97	75 - 125
Copper	<0.0160		1.00	1.041		mg/L		104	75 - 125
Lead	0.00222	J	1.00	1.012		mg/L		101	75 - 125
Cobalt	0.00156	J	0.500	0.4958		mg/L		99	75 - 125
Lithium	<0.0160		1.00	1.004		mg/L		100	75 - 125
Calcium	5.39		10.0	14.13		mg/L		87	75 - 125
Molybdenum	<0.00920		1.00	0.9911		mg/L		99	75 - 125
Selenium	<0.00830		2.00	1.785		mg/L		89	75 - 125
Thallium	0.00358	J	1.00	1.045		mg/L		104	75 - 125

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LB 310-346398/1-C
Matrix: Solid
Analysis Batch: 346699

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346546

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00120		0.00200	0.00120	mg/L		03/14/22 15:19	03/15/22 14:48	1

Lab Sample ID: LCS 310-346398/2-C
Matrix: Solid
Analysis Batch: 346699

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 346546

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0167	0.01624		mg/L		97	80 - 120

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LB 310-346733/1-B
Matrix: Solid
Analysis Batch: 347066

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 346814

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00120		0.00200	0.00120	mg/L		03/16/22 15:40	03/18/22 17:03	1

Lab Sample ID: LCS 310-346733/2-B
Matrix: Solid
Analysis Batch: 347066

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 346814

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0167	0.01578		mg/L		95	80 - 120

Lab Sample ID: 310-226499-5 MS
Matrix: Solid
Analysis Batch: 347066

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: SPLP West
Prep Batch: 346814

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.00120		0.0167	0.01589		mg/L		95	80 - 120

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 310-346938/1-A
Matrix: Solid
Analysis Batch: 347175

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 346938

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00627		0.0157	0.00627	mg/Kg		03/17/22 16:35	03/21/22 16:48	1

Lab Sample ID: LCS 310-346938/2-A
Matrix: Solid
Analysis Batch: 347175

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346938

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.153	0.1516		mg/Kg		99	80 - 120

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 500-648869/1-A
Matrix: Solid
Analysis Batch: 649266

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 648869

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	<0.388		1.00	0.388	mg/Kg		03/26/22 12:00	03/29/22 12:57	1

Lab Sample ID: LCS 500-648869/2-A
Matrix: Solid
Analysis Batch: 649266

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 648869

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium, hexavalent	10.0	8.536		mg/Kg		85	80 - 120

Method: 7196A - Chromium, Hexavalent (Continued)

Lab Sample ID: LCS 500-648869/3-A
Matrix: Solid
Analysis Batch: 649266

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 648869

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Chromium, hexavalent			1250	1120		mg/Kg		90	80 - 120		

Lab Sample ID: 310-226499-5 MS
Matrix: Solid
Analysis Batch: 649266

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: Total/NA
Prep Batch: 648869

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chromium, hexavalent	0.482	J	41.2	33.92		mg/Kg	☼	81	75 - 125		

Lab Sample ID: 310-226499-5 MS
Matrix: Solid
Analysis Batch: 649266

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: Total/NA
Prep Batch: 648869

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Chromium, hexavalent	0.482	J	1240	1092		mg/Kg	☼	88	75 - 125		

Lab Sample ID: 310-226499-5 MSD
Matrix: Solid
Analysis Batch: 649266

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: Total/NA
Prep Batch: 648869

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chromium, hexavalent	0.482	J	41.1	34.38		mg/Kg	☼	82	75 - 125	1	30

Lab Sample ID: 310-226499-5 MSD
Matrix: Solid
Analysis Batch: 649266

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: Total/NA
Prep Batch: 648869

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Chromium, hexavalent	0.482	J	1260	1161		mg/Kg	☼	92	75 - 125	6	30

Method: 9045D - pH

Lab Sample ID: LCS 310-346028/1
Matrix: Solid
Analysis Batch: 346028

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

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
pH			7.00	7.0		SU		100	98 - 102		

Lab Sample ID: 310-226499-5 DU
Matrix: Solid
Analysis Batch: 346028

Client Sample ID: Composite LAN USACE sand 220303
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier		DU Result	DU Qualifier	Unit	D			RPD	RPD Limit
pH	8.7	HF		8.7		SU				0.2	20

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-554785/1-A
Matrix: Solid
Analysis Batch: 558245

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 554785

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.209	U	0.0475	0.0477	1.00	0.209	pCi/g	03/11/22 13:00	04/01/22 14:29	1
Radium-228	<0.279	U	0.166	0.167		0.279	pCi/g	03/11/22 13:00	04/01/22 14:29	1

Lab Sample ID: LCS 160-554785/2-A
Matrix: Solid
Analysis Batch: 558243

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 554785

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Americium-241	96.2	100.6		11.8		1.24	pCi/g	105	75 - 125
Cesium-137	25.9	28.52		3.00		0.260	pCi/g	110	75 - 125
Cobalt-60	7.98	8.600		0.915		0.0423	pCi/g	108	75 - 125

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-556923/5-A
Matrix: Solid
Analysis Batch: 560460

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 556923

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.0990	U	0.0546	0.0546	1.00	0.0990	pCi/L	03/24/22 14:04	04/15/22 08:03	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.1*		*40 - 110*	*03/24/22 14:04*	*04/15/22 08:03*	*1*

Lab Sample ID: LCS 160-556923/1-A
Matrix: Solid
Analysis Batch: 560482

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 556923

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	11.3	10.38		1.08	1.00	0.108	pCi/L	92	75 - 125

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*97.8*		*40 - 110*

Lab Sample ID: LCSD 160-556923/2-A
Matrix: Solid
Analysis Batch: 560460

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 556923

Analyte	Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226	11.3	10.13		1.06	1.00	0.0787	pCi/L	89	75 - 125	0.12	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*98.0*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-556934/5-A
Matrix: Solid
Analysis Batch: 558744

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 556934

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.363	U	0.222	0.223	1.00	0.363	pCi/L	03/24/22 15:05	04/06/22 12:27	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.1*		*40 - 110*	*03/24/22 15:05*	*04/06/22 12:27*	*1*
Y Carrier	*86.4*		*40 - 110*	*03/24/22 15:05*	*04/06/22 12:27*	*1*

Lab Sample ID: LCS 160-556934/1-A
Matrix: Solid
Analysis Batch: 558744

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 556934

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.73	8.351		0.995	1.00	0.397	pCi/L	96	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*97.8*		*40 - 110*
Y Carrier	*85.2*		*40 - 110*

Lab Sample ID: LCSD 160-556934/2-A
Matrix: Solid
Analysis Batch: 558744

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 556934

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.73	8.496		0.999	1.00	0.364	pCi/L	97	75 - 125	0.07	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*98.0*		*40 - 110*
Y Carrier	*87.9*		*40 - 110*

QC Association Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100.00

Job ID: 310-226499-1
SDG: Lansing Iowa

GC/MS VOA

Leach Batch: 346595

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 310-346595/1-A	Method Blank	TCLP	Solid	1311	
LCS 310-346595/2-A	Lab Control Sample	TCLP	Solid	1311	

Leach Batch: 346744

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	1311	
LB 310-346744/1-A	Method Blank	TCLP	Solid	1311	
LCS 310-346744/2-A	Lab Control Sample	TCLP	Solid	1311	

Analysis Batch: 346754

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	8260D	346744
LB 310-346595/1-A	Method Blank	TCLP	Solid	8260D	346595
LB 310-346744/1-A	Method Blank	TCLP	Solid	8260D	346744
LCS 310-346595/2-A	Lab Control Sample	TCLP	Solid	8260D	346595
LCS 310-346744/2-A	Lab Control Sample	TCLP	Solid	8260D	346744

GC/MS Semi VOA

Leach Batch: 346297

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 310-346297/1-B	Method Blank	TCLP	Solid	1311	

Leach Batch: 346399

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	1311	
LB 310-346399/1-C	Method Blank	TCLP	Solid	1311	

Prep Batch: 346796

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	3510C	346399
LB 310-346297/1-B	Method Blank	TCLP	Solid	3510C	346297
LB 310-346399/1-C	Method Blank	TCLP	Solid	3510C	346399
LCS 310-346796/2-A	Lab Control Sample	Total/NA	Solid	3510C	

Analysis Batch: 346798

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-346796/2-A	Lab Control Sample	Total/NA	Solid	8270E	346796

Analysis Batch: 346799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 310-346297/1-B	Method Blank	TCLP	Solid	8270E	346796
LCS 310-346796/2-A	Lab Control Sample	Total/NA	Solid	8270E	346796

Analysis Batch: 346883

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	8270E	346796
LB 310-346399/1-C	Method Blank	TCLP	Solid	8270E	346796

GC Semi VOA

Leach Batch: 346399

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	1311	
LB 310-346399/1-B	Method Blank	TCLP	Solid	1311	

Prep Batch: 346593

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	3510C	346399
LB 310-346399/1-B	Method Blank	TCLP	Solid	3510C	346399
LCS 310-346593/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 310-346593/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

Analysis Batch: 346616

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	8081B	346593
LB 310-346399/1-B	Method Blank	TCLP	Solid	8081B	346593
LCS 310-346593/2-A	Lab Control Sample	Total/NA	Solid	8081B	346593
LCSD 310-346593/3-A	Lab Control Sample Dup	Total/NA	Solid	8081B	346593

Leach Batch: 647110

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	1311	
LB 500-647110/1-B	Method Blank	TCLP	Solid	1311	
310-226499-5 MS	Composite LAN USACE sand 220303	TCLP	Solid	1311	

Prep Batch: 647259

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	8151A	647110
LB 500-647110/1-B	Method Blank	TCLP	Solid	8151A	647110
MB 500-647259/1-A	Method Blank	Total/NA	Solid	8151A	
LCS 500-647259/2-A	Lab Control Sample	Total/NA	Solid	8151A	
310-226499-5 MS	Composite LAN USACE sand 220303	TCLP	Solid	8151A	647110

Analysis Batch: 647407

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	8151A	647259
LB 500-647110/1-B	Method Blank	TCLP	Solid	8151A	647259
MB 500-647259/1-A	Method Blank	Total/NA	Solid	8151A	647259
LCS 500-647259/2-A	Lab Control Sample	Total/NA	Solid	8151A	647259
310-226499-5 MS	Composite LAN USACE sand 220303	TCLP	Solid	8151A	647259

HPLC/IC

Leach Batch: 346596

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Soluble	Solid	DI Leach	
MB 310-346596/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 310-346596/2-A	Lab Control Sample	Soluble	Solid	DI Leach	
310-226499-5 MS	Composite LAN USACE sand 220303	Soluble	Solid	DI Leach	
310-226499-5 MSD	Composite LAN USACE sand 220303	Soluble	Solid	DI Leach	

HPLC/IC

Leach Batch: 346736

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP	Solid	1312	
LB 310-346736/1-A	Method Blank	SPLP	Solid	1312	
LCS 310-346736/2-A	Lab Control Sample	SPLP	Solid	1312	

Analysis Batch: 346774

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Soluble	Solid	9056A	346596
MB 310-346596/1-A	Method Blank	Soluble	Solid	9056A	346596
LCS 310-346596/2-A	Lab Control Sample	Soluble	Solid	9056A	346596
310-226499-5 MS	Composite LAN USACE sand 220303	Soluble	Solid	9056A	346596
310-226499-5 MSD	Composite LAN USACE sand 220303	Soluble	Solid	9056A	346596

Analysis Batch: 347456

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP	Solid	9056A	346736
LB 310-346736/1-A	Method Blank	SPLP	Solid	9056A	346736
LCS 310-346736/2-A	Lab Control Sample	SPLP	Solid	9056A	346736

Metals

Leach Batch: 346398

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	1311	
LB 310-346398/1-B	Method Blank	TCLP	Solid	1311	
LB 310-346398/1-C	Method Blank	TCLP	Solid	1311	
LCS 310-346398/2-B	Lab Control Sample	TCLP	Solid	1311	
LCS 310-346398/2-C	Lab Control Sample	TCLP	Solid	1311	

Prep Batch: 346413

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	3010A	346398
LB 310-346398/1-B	Method Blank	TCLP	Solid	3010A	346398
LCS 310-346398/2-B	Lab Control Sample	TCLP	Solid	3010A	346398

Prep Batch: 346546

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	7470A	346398
LB 310-346398/1-C	Method Blank	TCLP	Solid	7470A	346398
LCS 310-346398/2-C	Lab Control Sample	TCLP	Solid	7470A	346398

Prep Batch: 346605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	3050B	
MB 310-346605/1-A ^5	Method Blank	Total/NA	Solid	3050B	
LCS 310-346605/2-A ^20	Lab Control Sample	Total/NA	Solid	3050B	
310-226499-5 MS	Composite LAN USACE sand 220303	Total/NA	Solid	3050B	
310-226499-5 MSD	Composite LAN USACE sand 220303	Total/NA	Solid	3050B	

Analysis Batch: 346672

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	6010C	346413

Metals (Continued)

Analysis Batch: 346672 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 310-346398/1-B	Method Blank	TCLP	Solid	6010C	346413
LCS 310-346398/2-B	Lab Control Sample	TCLP	Solid	6010C	346413

Analysis Batch: 346699

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	TCLP	Solid	7470A	346546
LB 310-346398/1-C	Method Blank	TCLP	Solid	7470A	346546
LCS 310-346398/2-C	Lab Control Sample	TCLP	Solid	7470A	346546

Leach Batch: 346733

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP West	Solid	1312	
LB 310-346733/1-B	Method Blank	SPLP West	Solid	1312	
LB 310-346733/1-C	Method Blank	SPLP West	Solid	1312	
LCS 310-346733/2-B	Lab Control Sample	SPLP West	Solid	1312	
LCS 310-346733/2-C	Lab Control Sample	SPLP West	Solid	1312	
310-226499-5 MS	Composite LAN USACE sand 220303	SPLP West	Solid	1312	

Prep Batch: 346814

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP West	Solid	7470A	346733
LB 310-346733/1-B	Method Blank	SPLP West	Solid	7470A	346733
LCS 310-346733/2-B	Lab Control Sample	SPLP West	Solid	7470A	346733
310-226499-5 MS	Composite LAN USACE sand 220303	SPLP West	Solid	7470A	346733

Prep Batch: 346858

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP West	Solid	3010A	346733
LB 310-346733/1-C	Method Blank	SPLP West	Solid	3010A	346733
LCS 310-346733/2-C	Lab Control Sample	SPLP West	Solid	3010A	346733
310-226499-5 MS	Composite LAN USACE sand 220303	SPLP West	Solid	3010A	346733

Prep Batch: 346938

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	7471B	
MB 310-346938/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 310-346938/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Analysis Batch: 347066

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP West	Solid	7470A	346814
LB 310-346733/1-B	Method Blank	SPLP West	Solid	7470A	346814
LCS 310-346733/2-B	Lab Control Sample	SPLP West	Solid	7470A	346814
310-226499-5 MS	Composite LAN USACE sand 220303	SPLP West	Solid	7470A	346814

Analysis Batch: 347175

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	7471B	346938
MB 310-346938/1-A	Method Blank	Total/NA	Solid	7471B	346938
LCS 310-346938/2-A	Lab Control Sample	Total/NA	Solid	7471B	346938

Metals

Analysis Batch: 347743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP West	Solid	6020B	346858
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	6020B	346605
MB 310-346605/1-A ^5	Method Blank	Total/NA	Solid	6020B	346605
LCS 310-346605/2-A ^20	Lab Control Sample	Total/NA	Solid	6020B	346605
LCS 310-346733/2-C	Lab Control Sample	SPLP West	Solid	6020B	346858
310-226499-5 MS	Composite LAN USACE sand 220303	SPLP West	Solid	6020B	346858
310-226499-5 MS	Composite LAN USACE sand 220303	Total/NA	Solid	6020B	346605
310-226499-5 MSD	Composite LAN USACE sand 220303	Total/NA	Solid	6020B	346605

Analysis Batch: 347849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 310-346733/1-C	Method Blank	SPLP West	Solid	6020B	346858

General Chemistry

Analysis Batch: 345916

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	Moisture	

Leach Batch: 345993

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Soluble	Solid	DI Leach	
310-226499-5 DU	Composite LAN USACE sand 220303	Soluble	Solid	DI Leach	

Analysis Batch: 346028

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Soluble	Solid	9045D	345993
LCS 310-346028/1	Lab Control Sample	Total/NA	Solid	9045D	
310-226499-5 DU	Composite LAN USACE sand 220303	Soluble	Solid	9045D	345993

Analysis Batch: 648131

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	7196A	

Prep Batch: 648869

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	3060A	
MB 500-648869/1-A	Method Blank	Total/NA	Solid	3060A	
LCS 500-648869/2-A	Lab Control Sample	Total/NA	Solid	3060A	
LCS 500-648869/3-A	Lab Control Sample	Total/NA	Solid	3060A	
310-226499-5 MS	Composite LAN USACE sand 220303	Total/NA	Solid	3060A	
310-226499-5 MS	Composite LAN USACE sand 220303	Total/NA	Solid	3060A	
310-226499-5 MSD	Composite LAN USACE sand 220303	Total/NA	Solid	3060A	
310-226499-5 MSD	Composite LAN USACE sand 220303	Total/NA	Solid	3060A	

Analysis Batch: 649266

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	7196A	648869
MB 500-648869/1-A	Method Blank	Total/NA	Solid	7196A	648869
LCS 500-648869/2-A	Lab Control Sample	Total/NA	Solid	7196A	648869
LCS 500-648869/3-A	Lab Control Sample	Total/NA	Solid	7196A	648869

General Chemistry (Continued)

Analysis Batch: 649266 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5 MS	Composite LAN USACE sand 220303	Total/NA	Solid	7196A	648869
310-226499-5 MS	Composite LAN USACE sand 220303	Total/NA	Solid	7196A	648869
310-226499-5 MSD	Composite LAN USACE sand 220303	Total/NA	Solid	7196A	648869
310-226499-5 MSD	Composite LAN USACE sand 220303	Total/NA	Solid	7196A	648869

Rad

Leach Batch: 554544

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	Dry and Grind	

Prep Batch: 554785

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	Total/NA	Solid	Fill_Geo-21	554544
MB 160-554785/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-554785/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	

Leach Batch: 556449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP West	Solid	1312	

Prep Batch: 556923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP West	Solid	PrecSep-21	556449
MB 160-556923/5-A	Method Blank	Total/NA	Solid	PrecSep-21	
LCS 160-556923/1-A	Lab Control Sample	Total/NA	Solid	PrecSep-21	
LCSD 160-556923/2-A	Lab Control Sample Dup	Total/NA	Solid	PrecSep-21	

Prep Batch: 556934

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226499-5	Composite LAN USACE sand 220303	SPLP West	Solid	PrecSep_0	556449
MB 160-556934/5-A	Method Blank	Total/NA	Solid	PrecSep_0	
LCS 160-556934/1-A	Lab Control Sample	Total/NA	Solid	PrecSep_0	
LCSD 160-556934/2-A	Lab Control Sample Dup	Total/NA	Solid	PrecSep_0	

Client Sample ID: Composite LAN USACE sand 220303

Lab Sample ID: 310-226499-5
Matrix: Solid
Date Collected: 03/08/22 12:24
Date Received: 03/08/22 10:38

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			346744	03/15/22 15:40	JTA	TAL CF
TCLP	Analysis	8260D		20	346754	03/16/22 18:28	TRZ	TAL CF
TCLP	Leach	1311			346399	03/11/22 13:00	JTA	TAL CF
TCLP	Prep	3510C			346796	03/16/22 12:25	JCM	TAL CF
TCLP	Analysis	8270E		1	346883	03/17/22 13:19	DMD	TAL CF
TCLP	Leach	1311			346399	03/11/22 13:00	JTA	TAL CF
TCLP	Prep	3510C			346593	03/15/22 09:25	JCM	TAL CF
TCLP	Analysis	8081B		1	346616	03/15/22 15:40	BBW	TAL CF
TCLP	Leach	1311			647110	03/11/22 13:00	DAK	TAL CHI
TCLP	Prep	8151A			647259	03/16/22 10:22	ALW	TAL CHI
TCLP	Analysis	8151A		1	647407	03/17/22 16:15	JBJ	TAL CHI
SPLP	Leach	1312			346736	03/15/22 15:15	JTA	TAL CF
SPLP	Analysis	9056A		1	347456	03/21/22 13:54	JNR	TAL CF
TCLP	Leach	1311			346398	03/11/22 13:00	JTA	TAL CF
TCLP	Prep	3010A			346413	03/14/22 09:00	ACM2	TAL CF
TCLP	Analysis	6010C		1	346672	03/15/22 10:46	CTB	TAL CF
SPLP West	Leach	1312			346733	03/15/22 15:15	JTA	TAL CF
SPLP West	Prep	3010A			346858	03/17/22 09:00	ACM2	TAL CF
SPLP West	Analysis	6020B		1	347743	03/24/22 16:38	SAP	TAL CF
SPLP West	Leach	1312			346733	03/15/22 15:15	JTA	TAL CF
SPLP West	Prep	7470A			346814	03/16/22 15:40	EAM	TAL CF
SPLP West	Analysis	7470A		1	347066	03/18/22 17:08	EAM	TAL CF
TCLP	Leach	1311			346398	03/11/22 13:00	JTA	TAL CF
TCLP	Prep	7470A			346546	03/14/22 15:19	EAM	TAL CF
TCLP	Analysis	7470A		1	346699	03/15/22 15:18	EAM	TAL CF
Soluble	Leach	DI Leach			345993	03/09/22 08:20	ARG	TAL CF
Soluble	Analysis	9045D		1	346028	03/09/22 10:02	ARG	TAL CF
Total/NA	Analysis	Moisture		1	345916	03/08/22 14:00	SJN	TAL CF
Total/NA	Leach	Dry and Grind			554544	03/10/22 11:22	LTC	TAL SL
Total/NA	Prep	Fill_Geo-21			554785	03/11/22 13:00	LTC	TAL SL
Total/NA	Analysis	901.1		1	558247	04/01/22 13:48	CAH	TAL SL
SPLP West	Leach	1312			556449	03/22/22 09:41	LTC	TAL SL
SPLP West	Prep	PrecSep-21			556923	03/24/22 14:04	LPS	TAL SL
SPLP West	Analysis	9315		1	560460	04/15/22 08:03	FLC	TAL SL
SPLP West	Leach	1312			556449	03/22/22 09:41	LTC	TAL SL
SPLP West	Prep	PrecSep_0			556934	03/24/22 15:05	LPS	TAL SL
SPLP West	Analysis	9320		1	558744	04/06/22 12:26	FLC	TAL SL

Client Sample ID: Composite LAN USACE sand 220303

Lab Sample ID: 310-226499-5
Matrix: Solid
Date Collected: 03/08/22 12:24
Percent Solids: 95.8
Date Received: 03/08/22 10:38

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			346596	03/15/22 12:00	JNR	TAL CF
Soluble	Analysis	9056A		10	346774	03/15/22 20:32	JNR	TAL CF

Lab Chronicle

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100.00

Job ID: 310-226499-1
SDG: Lansing Iowa

Client Sample ID: Composite LAN USACE sand 220303

Date Collected: 03/08/22 12:24
Date Received: 03/08/22 10:38

Lab Sample ID: 310-226499-5

Matrix: Solid
Percent Solids: 95.8

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3050B			346605	03/19/22 09:30	ACM2	TAL CF
Total/NA	Analysis	6020B		5	347743	03/24/22 16:16	SAP	TAL CF
Total/NA	Prep	7471B			346938	03/17/22 16:35	SAP	TAL CF
Total/NA	Analysis	7471B		1	347175	03/21/22 16:56	EAM	TAL CF
Total/NA	Analysis	7196A		1	648131	03/22/22 10:17	NC	TAL CHI
Total/NA	Prep	3060A			648869	03/26/22 12:00	EAT	TAL CHI
Total/NA	Analysis	7196A		1	649266	03/29/22 12:58	EAT	TAL CHI

Laboratory References:

TAL CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

TAL CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100.00

Job ID: 310-226499-1
SDG: Lansing Iowa

Laboratory: Eurofins 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 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	04-29-22
Georgia	State	N/A	04-29-22
Georgia (DW)	State	939	04-30-21 *
Hawaii	State	NA	04-29-22
Illinois	NELAP	IL00035	04-29-22
Indiana	State	C-IL-02	04-29-22
Iowa	State	082	05-01-22
Kansas	NELAP	E-10161	10-31-22
Kentucky (UST)	State	AI # 108083	04-29-22
Kentucky (WW)	State	KY90023	12-31-22
Louisiana	NELAP	02046	06-30-22
Mississippi	State	NA	04-30-22
North Carolina (WW/SW)	State	291	12-31-22
North Dakota	State	R-194	04-29-22
Oklahoma	State	8908	08-31-22
South Carolina	State	77001003	04-29-22
USDA	US Federal Programs	P330-18-00018	02-11-24
Wisconsin	State	999580010	08-31-22
Wyoming	State	8TMS-Q	04-30-22

Laboratory: Eurofins St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	12-01-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100.00

Job ID: 310-226499-1
SDG: Lansing Iowa

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	TAL CF
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CF
8081B	Organochlorine Pesticides (GC)	SW846	TAL CF
8151A	Herbicides (GC)	SW846	TAL CHI
9056A	Anions, Ion Chromatography	SW846	TAL CF
6010C	Metals (ICP)	SW846	TAL CF
6020B	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
7471B	Mercury (CVAA)	SW846	TAL CF
7196A	Chromium, Hexavalent	SW846	TAL CHI
7196A	Chromium, Trivalent (Colorimetric)	SW846	TAL CHI
9045D	pH	SW846	TAL CF
Moisture	Percent Moisture	EPA	TAL CF
1311	TCLP Extraction	SW846	TAL CF
1311	TCLP Zero Headspace Extraction	SW846	TAL CF
1311	TCLP Extraction	SW846	TAL CHI
1312	SPLP Extraction	SW846	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
3050B	Preparation, Metals	SW846	TAL CF
3060A	Alkaline Digestion (Chromium, Hexavalent)	SW846	TAL CHI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL CF
5030B	Purge and Trap	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF
7471B	Preparation, Mercury	SW846	TAL CF
8151A	Extraction (Herbicides)	SW846	TAL CHI
DI Leach	Deionized Water Leaching Procedure	ASTM	TAL CF

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

TAL CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

eurofins | Environment Testing America

310-226499 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State: CITY Madison | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 3-8-22 | TIME 1015 | Received By: CC

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 # _____ of _____
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes:* Cooler custody seals intact? ☐ Yes ☐ No
Sample Custody Seals Present? No	☐ 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: N | Correction Factor (°C): 0.0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): | Corrected Temp (°C):

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:	8oz soil jar	
Uncorrected Temp (°C):	4.3	
Corrected Temp (°C):	4.3	

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

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

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Client Information	Sampler: Erin Haaser	Lab PM: Thompson, Shirley	Carrier Tracking No(s):	COC No.
Client Contact: Brandon Suchomel	Phone	E-Mail: shirley.thompson@eurofinset.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID	Analysis Requested		Job #:
Address: 2830 Dairy Drive	Due Date Requested:			Preservation Codes:
City: Madison	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: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-224-2830	PO #: 25220100.00			
Email: bsuchomel@scsengineers.com	WO #:			Other:
Project Name: Lansing Generating Station 25220100.00	Project #:			
Site: Lansing, IA	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	See Attached Table	Total Number of containers	Special Instructions/Note:
			Preservation Code:					
LAN USACE Sand 220303 A	3/3/22	9:15 am	G	S		X		Composite these grab samples and run the composite sample for attached parameter list. Identify composite sample as LAN USACE Sand 220303
LAN USACE Sand 220303 B	3/3/22	10:45 am	G	S		X		
LAN USACE Sand 220303 C	3/3/22	1:00 pm	G	S		X		
LAN USACE Sand 220303 D	03/03/22	3:05 pm	G	S		X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by: | Date: | Time: | Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	03/07/2022 9:00				
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.: | Cooler Temperature(s) °C and Other Remarks.

Ver: 01/16/2019

USACE Dredge Stockpile Sampling - Parameter List

Collected 4 samples - Laboratory to composite to a single sample for analysis

	Total	SPLP	TCLP
VOCs			
Benzene			X
Carbon tetrachloride			X
Chlorobenzene			X
Chloroform			X
1,2-Dichloroethane			X
1,1-Dichloroethylene			X
Methyl ethyl ketone			X
Tetrachloroethylene			X
Trichloroethylene			X
Vinyl chloride			X
Pesticides			
Chlordane			X
Endrin			X
Heptachlor (and its epoxide)			X
Lindane			X
Methoxychlor			X
Toxaphene			X
Herbicides			
2,4-D			X
2,4,5-TP (Silvex)			X
SVOCs			
o-Cresol			X
m-Cresol			X
p-Cresol			X
Cresol			X
1,4-Dichlorobenzene			X
2.4-Dinitrotoluene			X
Hexachlorobenzene			X
Hexachloroebutadiene			X
Hexachloroethane			X
Nitrobenzene			X
Pentachlorophenol			X
Pyridine			X
2,4,5-Trichlorophenol			X
2,4,6-Trichlorophenol			X
Metals			
Antimony	X	X	
Arsenic	X	X	X
Barium	X	X	X
Beryllium	X	X	
Boron	X	X	

Cadmium	X	X	X
Calcium	X	X	
Chromium - total	X	X	X
Chromium - hexavalent	X		
Chromium - trivalent	X		
Cobalt	X	X	
Copper	X	X	
Lead	X	X	X
Lithium	X	X	
Manganese	X		
Mercury	X	X	X
Molybdenum	X	X	
Nickel	X		
Selenium	X	X	X
Silver	X		X
Thallium	X	X	
Vanadium	X		
Zinc	X		
pH	X		
Anions			
Chloride	X	X	
Fluoride	X	X	
Sulfate	X	X	
Radium			
Radium 226 + 228	X	X	

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler	Lab PM: Thompson Shirley J	Carrier Tracking No(s)	COC No: 310-47532 1
Client Contact: Shipping/Receiving	Phone	E-Mail: Shirley.Thompson@Eurofinset.com	State of Origin: Iowa	Page: Page 1 of 1
Company: Eurofins Environment Testing North Centr		Accreditations Required (See note): State - Iowa State Program - Iowa		Job #: 310-226499-1
Address: 2417 Bond Street	Due Date Requested: 3/23/2022			
City: University Park	TAT Requested (days):			
State, Zip: IL, 60484	PO #:			
Phone: 708-534-5200(Tel) 708-534-5211(Fax)	WO #: 226499 COC			
Email				
Project Name: Lansing Soil Characterization 25220100 00	Project #: 31014222			
Site:	SSOW#:			

Analysis Requested

Preservation Codes

A HCL	M Hexane
B NaOH	N None
C Zn Acetate	O AsNaO2
D Nitric Acid	P Na2O4S
E NaHSO4	Q - Na2SO3
F MeOH	R Na2S2O3
G Amchlor	S H2SO4
H Ascorbic Acid	T - TSP Dodecahydrate
I Ice	U Acetone
J DI Water	V - MCAA
K EDTA	W - pH 4-5
L EDA	Z other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	7196A/3060A	7196A_CR3/ (MOD) Local Method	8151A/1311_T TCLP	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
Composite LAN USACE sand 220303 (310-226499-5)	3/8/22	12 24 Central		Solid			X	X	X	1	

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central LLC places the ownership of method analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed the samples must be shipped back to the Eurofins Environment Testing North Central LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central LLC attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said complicance to Eurofins Environment Testing North Central LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested I, II, III IV, Other (specify) Primary Deliverable Rank 2	Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
	3/9/22 1445			3/15/22 1005	EFCF
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: 1.1-70.6

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-226499-1
SDG Number: Lansing Iowa

Login Number: 226499
List Number: 1
Creator: Thompson, Shirley J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	False	Lab to composite sample and split as needed
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-226499-1
SDG Number: Lansing Iowa

Login Number: 226499
List Number: 3
Creator: Buckley, Paula M

List Source: Eurofins Chicago
List Creation: 03/15/22 11:40 AM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.6
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100.00

Job ID: 310-226499-1
SDG: Lansing Iowa

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
LCS 160-556923/1-A	Lab Control Sample	97.8
LCSD 160-556923/2-A	Lab Control Sample Dup	98.0
MB 160-556923/5-A	Method Blank	91.1

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid — **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(40-110)
310-226499-5	Composite LAN USACE sand 22	84.2

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
LCS 160-556934/1-A	Lab Control Sample	97.8	85.2
LCSD 160-556934/2-A	Lab Control Sample Dup	98.0	87.9
MB 160-556934/5-A	Method Blank	91.1	86.4

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid — **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(40-110)	(40-110)
310-226499-5	Composite LAN USACE sand 22	84.2	86.7

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

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ANALYTICAL REPORT

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Tel: (319)277-2401

Laboratory Job ID: 310-226941-1
Client Project/Site: Lansing Soil Characterization, 25220100

For:
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Attn: Meghan Blodgett

Authorized for release by:
4/21/2022 8:10:09 AM

Shirley Thompson, Client Service Manager
(319)277-2401
Shirley.Thompson@et.eurofinsus.com

LINKS

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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.

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Job ID: 310-226941-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-226941-1

Comments
No additional comments.

Receipt
The samples were received on 3/15/2022 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.5º C.

GC/MS VOA
Method 8260D: The continuing calibration verification (CCV) associated with batch 310-347090 recovered above the upper control limit for 1,1-Dichloroethene (27.3%D). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported. The associated sample is impacted: (CCV 310-347090/3).

Method 8260D: The method blank for preparation batch 310-346850 and analytical batch 310-347090 contained Chloroform above the method detection limit. This target analyte concentration was less than the reporting limit (RL); therefore, re-extraction and/or re-analysis of samples was not performed.

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

GC/MS Semi VOA
Methods 8270D, 8270E: The continuing calibration verification (CCV) associated with batch 310-347471 recovered above the upper control limit for Pyridine (25.5%D). The samples associated with this CCV were non-detects for the affected analytes; therefore, the data have been reported.

Method 8270E: The continuing calibration verification (CCV) associated with batch 310-347472 recovered above the upper control limit for Pyridine (24.8%D). 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
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

GC Semi VOA
No analytical or quality issues were noted, other than those described in the Definitions/Glossary page.

Metals
Method 6020B: Batch preparation batch 310-347623 and analytical batch 310-349305 is reported without a matrix spike/matrix spike duplicate (MS/MSD). The batch MS/MSD was originally performed on another client's sample, and this test was canceled at client request. This MS/MSD result does not have immediate bearing on any samples except for the actual sample spiked. The associated laboratory control sample (LCS) met acceptance criteria and provides long-term precision and accuracy for this batch.
LAN USACE SAND 220311 (310-226941-5)

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

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

Organic Prep
Method 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-346849 and 310-346973. The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.

Job ID: 310-226941-1 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

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

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

Narrative

Job Narrative
310-226941-2

Comments
No additional comments.

Receipt
The samples were received on 3/15/2022 9:50 AM. Unless otherwise noted below, the samples arrived in good condition, and where required, properly preserved and on ice. The temperature of the cooler at receipt was 4.5º C.

RAD
Methods 901.1, GA-01-R: Gamma Prep Batch 160-556267

Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:

Inferred from	Reported to Analyte
Th-234	Pa-234
Th-234	U-238
Pb-210	Po-210
Pb-210	Bi-210
Cs-137	Ba-137m
Pb-212	Po-216
Xe-131m	Xe-131
Sb-125	Te-125m
Ag-108m	Ag-108
Rh-106	Ru-106
Pb-212	Th-228
Pb-212	Ra-224
U-235	Th-231
Ac-228	Th-232
Ac-228	Ra-228
Th-227	Ra-223
Th-227	Ac-227
Th-227	Bi-211
Th-227	Pb-211
Bi-214	Ra-226

Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative.

Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

LAN USACE SAND 220311 (310-226941-5), (MB 160-556267/1-A) and (310-226941-E-5-D DU)

Method 9315: Radium-226 batch 556923
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

Job ID: 310-226941-1 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

LAN USACE SAND 220311 (310-226941-5), (LCS 160-556923/1-A), (LCSD 160-556923/2-A) and (MB 160-556923/5-A)

Method 9320: Radium-228 batch 556934
Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.

LAN USACE SAND 220311 (310-226941-5), (LCS 160-556934/1-A), (LCSD 160-556934/2-A) and (MB 160-556934/5-A)

Method PrecSep_0: Radium-228 Prep Batch 160-556934

The following samples were prepared at a reduced aliquot due to Matrix: LAN USACE SAND 220311 (310-226941-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method PrecSep-21: Radium-226 Prep Batch 160-556923

The following samples were prepared at a reduced aliquot due to Matrix: LAN USACE SAND 220311 (310-226941-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

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

Metals
Method NONE: preparation batch 160-556227 and analytical batch 160-559075 The following sample was diluted due to the nature of the sample matrix: sample is Rad natives LAN USACE SAND 220311 (310-226941-5). 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.

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

Sample Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100

Job ID: 310-226941-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-226941-5	LAN USACE SAND 220311	Solid	03/15/22 10:35	03/15/22 09:50

Client: SCS Engineers
Job ID: 310-226941-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE SAND 220311
Lab Sample ID: 310-226941-5
Date Collected: 03/15/22 10:35
Matrix: Solid
Date Received: 03/15/22 09:50

Method: 8260D - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			03/20/22 19:28	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			03/20/22 19:28	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			03/20/22 19:28	20
Benzene	<0.0140		0.100	0.0140	mg/L			03/20/22 19:28	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			03/20/22 19:28	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			03/20/22 19:28	20
Chloroform	**0.0422**	**J B**	0.100	0.0360	mg/L			03/20/22 19:28	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			03/20/22 19:28	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			03/20/22 19:28	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			03/20/22 19:28	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*103*		*80 - 120*		*03/20/22 19:28*	*20*
Toluene-d8 (Surr)	*96*		*80 - 120*		*03/20/22 19:28*	*20*
4-Bromofluorobenzene (Surr)	*98*		*80 - 120*		*03/20/22 19:28*	*20*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		03/18/22 08:27	03/23/22 17:48	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		03/18/22 08:27	03/23/22 17:48	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		03/18/22 08:27	03/23/22 17:48	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		03/18/22 08:27	03/23/22 17:48	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		03/18/22 08:27	03/23/22 17:48	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		03/18/22 08:27	03/23/22 17:48	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		03/18/22 08:27	03/23/22 17:48	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		03/18/22 08:27	03/23/22 17:48	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		03/18/22 08:27	03/23/22 17:48	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		03/18/22 08:27	03/23/22 17:48	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		03/18/22 08:27	03/23/22 17:48	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		03/18/22 08:27	03/23/22 17:48	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		03/18/22 08:27	03/23/22 17:48	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*65*		*14 - 110*	*03/18/22 08:27*	*03/23/22 17:48*	*1*
Phenol-d5 (Surr)	*57*		*10 - 110*	*03/18/22 08:27*	*03/23/22 17:48*	*1*
Nitrobenzene-d5 (Surr)	*83*		*30 - 110*	*03/18/22 08:27*	*03/23/22 17:48*	*1*
2-Fluorobiphenyl (Surr)	*65*		*28 - 110*	*03/18/22 08:27*	*03/23/22 17:48*	*1*
2,4,6-Tribromophenol (Surr)	*66*		*35 - 110*	*03/18/22 08:27*	*03/23/22 17:48*	*1*
Terphenyl-d14 (Surr)	*73*		*39 - 117*	*03/18/22 08:27*	*03/23/22 17:48*	*1*

Method: 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	<1.10		10.0	1.10	ug/L		03/18/22 08:14	03/24/22 12:14	1
Endrin	<0.0500		0.160	0.0500	ug/L		03/18/22 08:14	03/24/22 12:14	1
gamma-BHC (Lindane)	<0.0700		0.160	0.0700	ug/L		03/18/22 08:14	03/24/22 12:14	1
Heptachlor	<0.0600		0.160	0.0600	ug/L		03/18/22 08:14	03/24/22 12:14	1
Heptachlor epoxide	<0.0460		0.160	0.0460	ug/L		03/18/22 08:14	03/24/22 12:14	1
Methoxychlor	<0.0700		0.160	0.0700	ug/L		03/18/22 08:14	03/24/22 12:14	1
Toxaphene	<2.10		10.0	2.10	ug/L		03/18/22 08:14	03/24/22 12:14	1

Client Sample ID: LAN USACE SAND 220311
Lab Sample ID: 310-226941-5

Date Collected: 03/15/22 10:35
Matrix: Solid
Date Received: 03/15/22 09:50

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*61*		*10 - 117*	*03/18/22 08:14*	*03/24/22 12:14*	*1*
Tetrachloro-m-xylene (Surr)	*70*		*14 - 115*	*03/18/22 08:14*	*03/24/22 12:14*	*1*

Method: 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		03/21/22 07:35	03/23/22 09:58	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		03/21/22 07:35	03/23/22 09:58	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*87*		*25 - 130*	*03/21/22 07:35*	*03/23/22 09:58*	*1*

Method: 9056A - Anions, Ion Chromatography - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			03/21/22 08:58	1
Chloride	<0.500		1.00	0.500	mg/L			03/21/22 08:58	1
Sulfate	<0.610		1.00	0.610	mg/L			03/21/22 08:58	1

Method: 6010C - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.100		0.200	0.100	mg/L		03/18/22 08:15	03/21/22 14:28	1
Barium	**0.275**	**J**	0.500	0.110	mg/L		03/18/22 08:15	03/21/22 14:28	1
Cadmium	<0.00780		0.0200	0.00780	mg/L		03/18/22 08:15	03/21/22 14:28	1
Chromium	<0.00870		0.0200	0.00870	mg/L		03/18/22 08:15	03/21/22 14:28	1
Lead	<0.0500		0.100	0.0500	mg/L		03/18/22 08:15	03/21/22 14:28	1
Selenium	<0.0670		0.100	0.0670	mg/L		03/18/22 08:15	03/21/22 14:28	1
Silver	<0.00940		0.0200	0.00940	mg/L		03/18/22 08:15	03/21/22 14:28	1

Method: 6020B - Metals (ICP/MS) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	**0.0115**		0.0100	0.00550	mg/L		03/18/22 08:15	04/01/22 23:22	1
Arsenic	**0.00396**	**J**	0.0100	0.00380	mg/L		03/18/22 08:15	03/31/22 23:30	1
Barium	**0.0327**	**J**	0.100	0.0200	mg/L		03/18/22 08:15	03/31/22 23:30	1
Beryllium	<0.00140		0.00500	0.00140	mg/L		03/18/22 08:15	03/31/22 23:30	1
Cadmium	<0.000280		0.00250	0.000280	mg/L		03/18/22 08:15	03/31/22 23:30	1
Boron	<0.290		0.500	0.290	mg/L		03/18/22 08:15	03/31/22 23:30	1
Chromium	**0.00774**	**J**	0.0250	0.00720	mg/L		03/18/22 08:15	03/31/22 23:30	1
Copper	<0.0160		0.0500	0.0160	mg/L		03/18/22 08:15	03/31/22 23:30	1
Calcium	**6.60**		2.50	1.30	mg/L		03/18/22 08:15	03/31/22 23:30	1
Lead	**0.00208**	**J**	0.00500	0.00160	mg/L		03/18/22 08:15	03/31/22 23:30	1
Selenium	<0.00830		0.0250	0.00830	mg/L		03/18/22 08:15	03/31/22 23:30	1
Cobalt	**0.00133**	**J**	0.00250	0.000950	mg/L		03/18/22 08:15	03/31/22 23:30	1
Thallium	<0.00240		0.00500	0.00240	mg/L		03/18/22 08:15	03/31/22 23:30	1
Lithium	<0.0160		0.0500	0.0160	mg/L		03/18/22 08:15	03/31/22 23:30	1
Molybdenum	**0.00957**	**J**	0.0250	0.00920	mg/L		03/18/22 08:15	04/01/22 23:22	1

Method: 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00120		0.00200	0.00120	mg/L		03/21/22 15:31	03/22/22 16:51	1

Method: 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00120		0.00200	0.00120	mg/L		03/21/22 15:33	03/22/22 17:08	1

Client Sample ID: LAN USACE SAND 220311
Lab Sample ID: 310-226941-5
Date Collected: 03/15/22 10:35
Matrix: Solid
Date Received: 03/15/22 09:50

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture	14.6		0.1	0.1	%			03/17/22 13:50	1
Percent Solids	85.4		0.1	0.1	%			03/17/22 13:50	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH	8.7	HF	0.1	0.1	SU			03/21/22 22:32	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.285		0.124	0.129	1.00	0.115	pCi/g	03/21/22 12:48	04/11/22 09:34	1
Radium-228	0.436		0.187	0.194		0.250	pCi/g	03/21/22 12:48	04/11/22 09:34	1

Method: 9315 - Radium-226 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.131	U	0.0655	0.0655	1.00	0.131	pCi/L	03/24/22 14:04	04/15/22 08:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.9*		*40 - 110*	*03/24/22 14:04*	*04/15/22 08:03*	*1*

Method: 9320 - Radium-228 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.622	U	0.323	0.324	1.00	0.622	pCi/L	03/24/22 15:05	04/06/22 12:26	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*86.9*		*40 - 110*	*03/24/22 15:05*	*04/06/22 12:26*	*1*
Y Carrier	*80.7*		*40 - 110*	*03/24/22 15:05*	*04/06/22 12:26*	*1*

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Composited				NONE			03/29/22 07:49	1

Client Sample ID: LAN USACE SAND 220311
Lab Sample ID: 310-226941-5

Date Collected: 03/15/22 10:35
Matrix: Solid
Date Received: 03/15/22 09:50
Percent Solids: 85.4

Method: 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<4.91		11.2	4.91	mg/Kg	☼		03/23/22 13:30	10
Chloride	<54.7		112	54.7	mg/Kg	☼		03/23/22 13:30	10
Sulfate	<44.6		112	44.6	mg/Kg	☼		03/23/22 13:30	10

Method: 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.407		0.948	0.407	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Arsenic	**1.26**		0.948	0.341	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Barium	**31.8**		0.948	0.398	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Beryllium	<0.171		0.474	0.171	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Boron	<14.2		47.4	14.2	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Cadmium	<0.142		0.474	0.142	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Chromium	**3.62**		1.42	0.455	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Cobalt	**2.61**		0.237	0.123	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Copper	**1.30**	**J**	1.42	0.720	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Lead	**1.79**	**J**	2.37	0.739	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Lithium	**1.47**	**J**	2.37	0.644	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Manganese	**271**		2.37	1.23	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Molybdenum	<0.313		0.948	0.313	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Nickel	**3.61**		1.42	0.550	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Calcium	**10400**		142	55.0	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Selenium	<0.588		1.42	0.588	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Silver	<0.142		0.237	0.142	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Thallium	<0.190		0.237	0.190	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Vanadium	**5.66**		1.42	0.351	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5
Zinc	**9.66**		4.74	2.37	mg/Kg	☼	03/28/22 10:00	04/08/22 14:10	5

Method: 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00804		0.0201	0.00804	mg/Kg	☼	03/29/22 13:55	03/30/22 17:08	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	<0.425		1.09	0.425	mg/Kg	☼	04/07/22 13:40	04/08/22 15:10	1
Chromium, trivalent	**3.62**		0.117	0.117	mg/Kg	☼		04/08/22 16:01	1

Definitions/Glossary

Client: SCS Engineers
Job ID: 310-226941-1
Project/Site: Lansing Soil Characterization, 25220100

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

Metals

Qualifier	Qualifier Description
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.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

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

Surrogate Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100

Job ID: 310-226941-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)							
		DBFM	TOL	BFB					
Lab Sample ID	Client Sample ID	(80-120)	(80-120)	(80-120)					
310-226941-5	LAN USACE SAND 220311	103	96	98					
LB 310-346850/1-A	Method Blank	98	97	96					
LCS 310-346850/2-A	Lab Control Sample	98	99	100					

Surrogate Legend

DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		2FP	2FP	PHL	PHL	NBZ	NBZ	FBP	FBP
Lab Sample ID	Client Sample ID	(14-110)	(14-110)	(10-110)	(10-110)	(30-110)	(30-110)	(28-110)	(28-110)
LCS 310-346976/2-A	Lab Control Sample	70	70	60	60	88	88	74	74

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	TBP	TPHL	TPHL				
Lab Sample ID	Client Sample ID	(35-110)	(35-110)	(39-117)	(39-117)				
LCS 310-346976/2-A	Lab Control Sample	73	73	79	79				

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)							
		2FP	2FP	PHL	PHL	NBZ	NBZ	FBP	FBP
Lab Sample ID	Client Sample ID	(14-110)	(14-110)	(10-110)	(10-110)	(30-110)	(30-110)	(28-110)	(28-110)
310-226941-5	LAN USACE SAND 220311	65	65	57	57	83	83	65	65
LB 310-346849/1-D	Method Blank	62	62	55	55	82	82	64	64

		Percent Surrogate Recovery (Acceptance Limits)							
		TBP	TBP	TPHL	TPHL				
Lab Sample ID	Client Sample ID	(35-110)	(35-110)	(39-117)	(39-117)				
310-226941-5	LAN USACE SAND 220311	66	66	73	73				
LB 310-346849/1-D	Method Blank	62	62	74	74				

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Surrogate Summary

Client: SCS Engineers
Job ID: 310-226941-1
Project/Site: Lansing Soil Characterization, 25220100

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCB1	TCX1								
Lab Sample ID	Client Sample ID	(10-117)	(14-115)								
LCS 310-346973/2-A	Lab Control Sample	95	87								
LCSD 310-346973/3-A	Lab Control Sample Dup	94	83								

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)

TCX = Tetrachloro-m-xylene (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCB1	TCX1								
Lab Sample ID	Client Sample ID	(10-117)	(14-115)								
310-226941-5	LAN USACE SAND 220311	61	70								
LB 310-346849/1-C	Method Blank	93	79								

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)

TCX = Tetrachloro-m-xylene (Surr)

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCPAA1									
Lab Sample ID	Client Sample ID	(25-130)									
LCS 500-647872/2-A	Lab Control Sample	93									
MB 500-647872/1-A	Method Blank	89									

Surrogate Legend

DCPAA = DCAA

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCPAA1									
Lab Sample ID	Client Sample ID	(25-130)									
310-226941-5	LAN USACE SAND 220311	87									
310-226941-5 MS	LAN USACE SAND 220311	86									
LB 500-647849/1-B	Method Blank	39									

Surrogate Legend

DCPAA = DCAA

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: LB 310-346850/1-A
Matrix: Solid
Analysis Batch: 347090

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			03/20/22 17:34	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			03/20/22 17:34	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			03/20/22 17:34	20
Benzene	<0.0140		0.100	0.0140	mg/L			03/20/22 17:34	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			03/20/22 17:34	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			03/20/22 17:34	20
Chloroform	0.04022	J	0.100	0.0360	mg/L			03/20/22 17:34	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			03/20/22 17:34	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			03/20/22 17:34	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			03/20/22 17:34	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*98*		*80 - 120*		*03/20/22 17:34*	*20*
Toluene-d8 (Surr)	*97*		*80 - 120*		*03/20/22 17:34*	*20*
4-Bromofluorobenzene (Surr)	*96*		*80 - 120*		*03/20/22 17:34*	*20*

Lab Sample ID: LCS 310-346850/2-A
Matrix: Solid
Analysis Batch: 347090

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1-Dichloroethene	2.00	1.443		mg/L		72	57 - 120
1,2-Dichloroethane	2.00	1.706		mg/L		85	66 - 124
2-Butanone (MEK)	4.00	3.538	J	mg/L		88	50 - 150
Benzene	2.00	1.653		mg/L		83	66 - 120
Carbon tetrachloride	2.00	1.649		mg/L		82	62 - 122
Chlorobenzene	2.00	1.794		mg/L		90	64 - 120
Chloroform	2.00	1.655		mg/L		83	67 - 120
Tetrachloroethene	2.00	1.731		mg/L		87	63 - 120
Trichloroethene	2.00	1.671		mg/L		84	66 - 120
Vinyl chloride	2.00	1.997		mg/L		100	36 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*98*		*80 - 120*
Toluene-d8 (Surr)	*99*		*80 - 120*
4-Bromofluorobenzene (Surr)	*100*		*80 - 120*

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCS 310-346976/2-A
Matrix: Solid
Analysis Batch: 347471

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346976

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.0625	0.02896	J	mg/L		46	24 - 110
1,4-Dichlorobenzene	0.0625	0.02896	J	mg/L		46	24 - 110
2,4,5-Trichlorophenol	0.0625	0.04692	J	mg/L		75	41 - 110
2,4,5-Trichlorophenol	0.0625	0.04692	J	mg/L		75	41 - 110

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 310-346976/2-A
Matrix: Solid
Analysis Batch: 347471

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346976

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4,6-Trichlorophenol	0.0625	0.04656	J	mg/L		74	39 - 110
2,4,6-Trichlorophenol	0.0625	0.04656	J	mg/L		74	39 - 110
2,4-Dinitrotoluene	0.0625	0.04977	J	mg/L		80	35 - 110
2,4-Dinitrotoluene	0.0625	0.04977	J	mg/L		80	35 - 110
2-Methylphenol	0.0625	0.06056		mg/L		97	31 - 110
2-Methylphenol	0.0625	0.06056		mg/L		97	31 - 110
4-Methylphenol (and/or 3-Methylphenol)	0.0625	0.05311		mg/L		85	28 - 110
4-Methylphenol (and/or 3-Methylphenol)	0.0625	0.05311		mg/L		85	28 - 110
Hexachlorobenzene	0.0625	0.04631	J	mg/L		74	42 - 110
Hexachlorobenzene	0.0625	0.04631	J	mg/L		74	42 - 110
Hexachlorobutadiene	0.0625	0.02837	J	mg/L		45	27 - 110
Hexachlorobutadiene	0.0625	0.02837	J	mg/L		45	27 - 110
Hexachloroethane	0.0625	0.02755	J	mg/L		44	25 - 110
Hexachloroethane	0.0625	0.02755	J	mg/L		44	25 - 110
Nitrobenzene	0.0625	0.04852	J	mg/L		78	35 - 110
Nitrobenzene	0.0625	0.04852	J	mg/L		78	35 - 110
Pentachlorophenol	0.125	0.09533		mg/L		76	35 - 110
Pentachlorophenol	0.125	0.09533		mg/L		76	35 - 110
Pyridine	0.125	0.09022		mg/L		72	10 - 110
Pyridine	0.125	0.09022		mg/L		72	10 - 110

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorophenol (Surr)	*70*		*14 - 110*
2-Fluorophenol (Surr)	*70*		*14 - 110*
Phenol-d5 (Surr)	*60*		*10 - 110*
Phenol-d5 (Surr)	*60*		*10 - 110*
Nitrobenzene-d5 (Surr)	*88*		*30 - 110*
Nitrobenzene-d5 (Surr)	*88*		*30 - 110*
2-Fluorobiphenyl (Surr)	*74*		*28 - 110*
2-Fluorobiphenyl (Surr)	*74*		*28 - 110*
2,4,6-Tribromophenol (Surr)	*73*		*35 - 110*
2,4,6-Tribromophenol (Surr)	*73*		*35 - 110*
Terphenyl-d14 (Surr)	*79*		*39 - 117*
Terphenyl-d14 (Surr)	*79*		*39 - 117*

Lab Sample ID: LB 310-346849/1-D
Matrix: Solid
Analysis Batch: 347471

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346976

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		03/18/22 08:27	03/23/22 15:14	1
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		03/18/22 08:27	03/23/22 15:14	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		03/18/22 08:27	03/23/22 15:14	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		03/18/22 08:27	03/23/22 15:14	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		03/18/22 08:27	03/23/22 15:14	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		03/18/22 08:27	03/23/22 15:14	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		03/18/22 08:27	03/23/22 15:14	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB 310-346849/1-D
Matrix: Solid
Analysis Batch: 347472

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346976

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		03/18/22 08:27	03/23/22 15:14	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		03/18/22 08:27	03/23/22 15:14	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		03/18/22 08:27	03/23/22 15:14	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		03/18/22 08:27	03/23/22 15:14	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		03/18/22 08:27	03/23/22 15:14	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		03/18/22 08:27	03/23/22 15:14	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		03/18/22 08:27	03/23/22 15:14	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		03/18/22 08:27	03/23/22 15:14	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		03/18/22 08:27	03/23/22 15:14	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		03/18/22 08:27	03/23/22 15:14	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		03/18/22 08:27	03/23/22 15:14	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		03/18/22 08:27	03/23/22 15:14	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		03/18/22 08:27	03/23/22 15:14	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		03/18/22 08:27	03/23/22 15:14	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		03/18/22 08:27	03/23/22 15:14	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		03/18/22 08:27	03/23/22 15:14	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		03/18/22 08:27	03/23/22 15:14	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		03/18/22 08:27	03/23/22 15:14	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		03/18/22 08:27	03/23/22 15:14	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*62*		*14 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
2-Fluorophenol (Surr)	*62*		*14 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
Phenol-d5 (Surr)	*55*		*10 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
Phenol-d5 (Surr)	*55*		*10 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
Nitrobenzene-d5 (Surr)	*82*		*30 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
Nitrobenzene-d5 (Surr)	*82*		*30 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
2-Fluorobiphenyl (Surr)	*64*		*28 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
2-Fluorobiphenyl (Surr)	*64*		*28 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
2,4,6-Tribromophenol (Surr)	*62*		*35 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
2,4,6-Tribromophenol (Surr)	*62*		*35 - 110*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
Terphenyl-d14 (Surr)	*74*		*39 - 117*	*03/18/22 08:27*	*03/23/22 15:14*	*1*
Terphenyl-d14 (Surr)	*74*		*39 - 117*	*03/18/22 08:27*	*03/23/22 15:14*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: LCS 310-346973/2-A
Matrix: Solid
Analysis Batch: 347605

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346973

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Endrin	0.625	0.6420		ug/L		103	35 - 143
gamma-BHC (Lindane)	0.625	0.6031		ug/L		96	34 - 123
Heptachlor	0.625	0.4503		ug/L		72	23 - 133
Heptachlor epoxide	0.625	0.6136		ug/L		98	35 - 129
Methoxychlor	0.625	0.6307		ug/L		101	19 - 150

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCS 310-346973/2-A
Matrix: Solid
Analysis Batch: 347605

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 346973

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCB Decachlorobiphenyl (Surr)	95		10 - 117
Tetrachloro-m-xylene (Surr)	87		14 - 115

Lab Sample ID: LCSD 310-346973/3-A
Matrix: Solid
Analysis Batch: 347605

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 346973

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Endrin			0.625	0.6364		ug/L		102	35 - 143	1	35
gamma-BHC (Lindane)			0.625	0.5916		ug/L		95	34 - 123	2	35
Heptachlor			0.625	0.5147		ug/L		82	23 - 133	13	35
Heptachlor epoxide			0.625	0.6115		ug/L		98	35 - 129	0	35
Methoxychlor			0.625	0.6350		ug/L		102	19 - 150	1	32

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
DCB Decachlorobiphenyl (Surr)	94		10 - 117
Tetrachloro-m-xylene (Surr)	83		14 - 115

Lab Sample ID: LB 310-346849/1-C
Matrix: Solid
Analysis Batch: 347605

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346973

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	<1.10		10.0	1.10	ug/L		03/18/22 08:14	03/24/22 11:28	1
Endrin	<0.0500		0.160	0.0500	ug/L		03/18/22 08:14	03/24/22 11:28	1
gamma-BHC (Lindane)	<0.0700		0.160	0.0700	ug/L		03/18/22 08:14	03/24/22 11:28	1
Heptachlor	<0.0600		0.160	0.0600	ug/L		03/18/22 08:14	03/24/22 11:28	1
Heptachlor epoxide	<0.0460		0.160	0.0460	ug/L		03/18/22 08:14	03/24/22 11:28	1
Methoxychlor	<0.0700		0.160	0.0700	ug/L		03/18/22 08:14	03/24/22 11:28	1
Toxaphene	<2.10		10.0	2.10	ug/L		03/18/22 08:14	03/24/22 11:28	1

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	93		10 - 117	03/18/22 08:14	03/24/22 11:28	1
Tetrachloro-m-xylene (Surr)	79		14 - 115	03/18/22 08:14	03/24/22 11:28	1

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-647872/1-A
Matrix: Solid
Analysis Batch: 648344

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 647872

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.000500		0.00100	0.000500	mg/L		03/21/22 07:35	03/23/22 08:40	1
Silvex (2,4,5-TP)	<0.000500		0.00100	0.000500	mg/L		03/21/22 07:35	03/23/22 08:40	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	89		25 - 130	03/21/22 07:35	03/23/22 08:40	1

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: LCS 500-647872/2-A
Matrix: Solid
Analysis Batch: 648344

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 647872

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	0.0100	0.007434		mg/L		74	30 - 115
Silvex (2,4,5-TP)	0.00250	0.002165		mg/L		87	32 - 115

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCAA	*93*		*25 - 130*

Lab Sample ID: LB 500-647849/1-B
Matrix: Solid
Analysis Batch: 648344

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 647872

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		03/21/22 07:35	03/23/22 09:19	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		03/21/22 07:35	03/23/22 09:19	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*39*		*25 - 130*	*03/21/22 07:35*	*03/23/22 09:19*	*1*

Lab Sample ID: 310-226941-5 MS
Matrix: Solid
Analysis Batch: 648344

Client Sample ID: LAN USACE SAND 220311
Prep Type: TCLP
Prep Batch: 647872

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	<0.0500		1.00	0.7259		mg/L		73	30 - 115
Silvex (2,4,5-TP)	<0.0500		0.250	0.2145		mg/L		86	32 - 115

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCAA	*86*		*25 - 130*

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-347233/1-A
Matrix: Solid
Analysis Batch: 347539

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<4.02		9.13	4.02	mg/Kg			03/23/22 14:17	10
Chloride	<44.7		91.3	44.7	mg/Kg			03/23/22 14:17	10
Sulfate	<36.5		91.3	36.5	mg/Kg			03/23/22 14:17	10

Lab Sample ID: LCS 310-347233/2-A
Matrix: Solid
Analysis Batch: 347539

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	183	181.2		mg/Kg		99	90 - 110
Chloride	913	917.8		mg/Kg		101	90 - 110
Sulfate	913	943.6		mg/Kg		103	90 - 110

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: 310-226941-5 MS
Matrix: Solid
Analysis Batch: 347539

Client Sample ID: LAN USACE SAND 220311
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	<4.91		112	116.9		mg/Kg	☼	105	80 - 120
Chloride	<54.7		558	544.7		mg/Kg	☼	98	80 - 120
Sulfate	<44.6		558	571.2		mg/Kg	☼	102	80 - 120

Lab Sample ID: 310-226941-5 MSD
Matrix: Solid
Analysis Batch: 347539

Client Sample ID: LAN USACE SAND 220311
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	<4.91		112	103.4		mg/Kg	☼	93	80 - 120	12	15
Chloride	<54.7		558	519.5		mg/Kg	☼	93	80 - 120	5	15
Sulfate	<44.6		558	563.9		mg/Kg	☼	101	80 - 120	1	15

Lab Sample ID: LB 310-346853/1-A
Matrix: Solid
Analysis Batch: 347811

Client Sample ID: Method Blank
Prep Type: SPLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			03/21/22 08:26	1
Chloride	<0.500		1.00	0.500	mg/L			03/21/22 08:26	1
Sulfate	<0.610		1.00	0.610	mg/L			03/21/22 08:26	1

Lab Sample ID: LCS 310-346853/2-A
Matrix: Solid
Analysis Batch: 347811

Client Sample ID: Lab Control Sample
Prep Type: SPLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	2.00	2.023		mg/L		101	90 - 110
Chloride	10.0	9.829		mg/L		98	90 - 110
Sulfate	10.0	10.27		mg/L		103	90 - 110

Lab Sample ID: 310-226941-5 MS
Matrix: Solid
Analysis Batch: 347811

Client Sample ID: LAN USACE SAND 220311
Prep Type: SPLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	<0.0750		1.00	0.8885		mg/L		89	80 - 120
Chloride	<0.500		5.00	5.080		mg/L		102	80 - 120
Sulfate	<0.610		5.00	5.464		mg/L		109	80 - 120

Lab Sample ID: 310-226941-5 MSD
Matrix: Solid
Analysis Batch: 347811

Client Sample ID: LAN USACE SAND 220311
Prep Type: SPLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	<0.0750		1.00	1.036		mg/L		104	80 - 120	15	15
Chloride	<0.500		5.00	5.005		mg/L		100	80 - 120	1	15
Sulfate	<0.610		5.00	5.446		mg/L		109	80 - 120	0	15

Method: 6010C - Metals (ICP)

Lab Sample ID: LB 310-346848/1-B
Matrix: Solid
Analysis Batch: 347332

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 346946

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.100		0.200	0.100	mg/L		03/18/22 08:15	03/21/22 13:30	1
Barium	<0.110		0.500	0.110	mg/L		03/18/22 08:15	03/21/22 13:30	1
Cadmium	<0.00780		0.0200	0.00780	mg/L		03/18/22 08:15	03/21/22 13:30	1
Chromium	<0.00870		0.0200	0.00870	mg/L		03/18/22 08:15	03/21/22 13:30	1
Lead	<0.0500		0.100	0.0500	mg/L		03/18/22 08:15	03/21/22 13:30	1
Selenium	<0.0670		0.100	0.0670	mg/L		03/18/22 08:15	03/21/22 13:30	1
Silver	<0.00940		0.0200	0.00940	mg/L		03/18/22 08:15	03/21/22 13:30	1

Lab Sample ID: LCS 310-346848/2-B
Matrix: Solid
Analysis Batch: 347332

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 346946

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	4.00	4.101		mg/L		103	80 - 120
Barium	2.00	1.977		mg/L		99	80 - 120
Cadmium	2.00	1.975		mg/L		99	80 - 120
Chromium	2.00	1.939		mg/L		97	80 - 120
Lead	4.00	3.881		mg/L		97	80 - 120
Selenium	8.00	8.414		mg/L		105	80 - 120
Silver	2.00	2.080		mg/L		104	80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-347623/1-A ^5
Matrix: Solid
Analysis Batch: 349305

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 347623

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.345		0.802	0.345	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Arsenic	<0.289		0.802	0.289	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Barium	<0.337		0.802	0.337	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Beryllium	<0.144		0.401	0.144	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Boron	<12.0		40.1	12.0	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Cadmium	<0.120		0.401	0.120	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Chromium	<0.385		1.20	0.385	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Copper	<0.609		1.20	0.609	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Lead	<0.626		2.00	0.626	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Cobalt	<0.104		0.200	0.104	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Manganese	<1.04		2.00	1.04	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Lithium	<0.545		2.00	0.545	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Nickel	<0.465		1.20	0.465	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Calcium	<46.5		120	46.5	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Molybdenum	<0.265		0.802	0.265	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Selenium	<0.497		1.20	0.497	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Silver	<0.120		0.200	0.120	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Thallium	<0.160		0.200	0.160	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Vanadium	<0.297		1.20	0.297	mg/Kg		03/28/22 10:00	04/08/22 14:04	5
Zinc	<2.00		4.01	2.00	mg/Kg		03/28/22 10:00	04/08/22 14:04	5

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-347623/2-A ^20
Matrix: Solid
Analysis Batch: 349305

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 347623

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	188	193.1		mg/Kg		103	80 - 120
Arsenic	188	189.7		mg/Kg		101	80 - 120
Barium	93.9	92.57		mg/Kg		99	80 - 120
Beryllium	93.9	91.81		mg/Kg		98	80 - 120
Boron	188	185.3	J	mg/Kg		99	80 - 120
Cadmium	93.9	100.3		mg/Kg		107	80 - 120
Chromium	93.9	86.63		mg/Kg		92	80 - 120
Copper	188	186.6		mg/Kg		99	80 - 120
Lead	188	192.4		mg/Kg		102	80 - 120
Cobalt	93.9	99.39		mg/Kg		106	80 - 120
Manganese	93.9	88.49		mg/Kg		94	80 - 120
Lithium	188	166.1		mg/Kg		88	80 - 120
Nickel	188	178.2		mg/Kg		95	80 - 120
Calcium	1880	1887		mg/Kg		100	80 - 120
Molybdenum	188	187.8		mg/Kg		100	80 - 120
Selenium	376	373.3		mg/Kg		99	80 - 120
Silver	93.9	94.89		mg/Kg		101	80 - 120
Thallium	188	192.3		mg/Kg		102	80 - 120
Vanadium	93.9	89.59		mg/Kg		95	80 - 120
Zinc	188	173.3		mg/Kg		92	80 - 120

Lab Sample ID: LB 310-346851/1-B
Matrix: Solid
Analysis Batch: 348535

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 346948

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.00380		0.0100	0.00380	mg/L		03/18/22 08:15	03/31/22 23:22	1
Barium	<0.0200		0.100	0.0200	mg/L		03/18/22 08:15	03/31/22 23:22	1
Beryllium	<0.00140		0.00500	0.00140	mg/L		03/18/22 08:15	03/31/22 23:22	1
Boron	<0.290		0.500	0.290	mg/L		03/18/22 08:15	03/31/22 23:22	1
Cadmium	<0.000280		0.00250	0.000280	mg/L		03/18/22 08:15	03/31/22 23:22	1
Chromium	<0.00720		0.0250	0.00720	mg/L		03/18/22 08:15	03/31/22 23:22	1
Copper	<0.0160		0.0500	0.0160	mg/L		03/18/22 08:15	03/31/22 23:22	1
Lead	<0.00160		0.00500	0.00160	mg/L		03/18/22 08:15	03/31/22 23:22	1
Cobalt	<0.000950		0.00250	0.000950	mg/L		03/18/22 08:15	03/31/22 23:22	1
Lithium	<0.0160		0.0500	0.0160	mg/L		03/18/22 08:15	03/31/22 23:22	1
Calcium	<1.30		2.50	1.30	mg/L		03/18/22 08:15	03/31/22 23:22	1
Selenium	<0.00830		0.0250	0.00830	mg/L		03/18/22 08:15	03/31/22 23:22	1
Thallium	<0.00240		0.00500	0.00240	mg/L		03/18/22 08:15	03/31/22 23:22	1

Lab Sample ID: LB 310-346851/1-B
Matrix: Solid
Analysis Batch: 348588

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 346948

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00550		0.0100	0.00550	mg/L		03/18/22 08:15	04/01/22 23:15	1
Molybdenum	<0.00920		0.0250	0.00920	mg/L		03/18/22 08:15	04/01/22 23:15	1

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-346851/2-B
Matrix: Solid
Analysis Batch: 348535

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 346948

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.00	1.007		mg/L		101	80 - 120
Barium	0.500	0.5460		mg/L		109	80 - 120
Beryllium	0.500	0.4754		mg/L		95	80 - 120
Boron	1.00	1.101		mg/L		110	80 - 120
Cadmium	0.500	0.4730		mg/L		95	80 - 120
Chromium	0.500	0.4985		mg/L		100	80 - 120
Copper	1.00	1.033		mg/L		103	80 - 120
Lead	1.00	1.020		mg/L		102	80 - 120
Cobalt	0.500	0.4978		mg/L		100	80 - 120
Lithium	1.00	0.9600		mg/L		96	80 - 120
Calcium	10.0	9.815		mg/L		98	80 - 120
Selenium	2.00	1.973		mg/L		99	80 - 120
Thallium	1.00	1.008		mg/L		101	80 - 120

Lab Sample ID: LCS 310-346851/2-B
Matrix: Solid
Analysis Batch: 348588

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 346948

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	1.00	1.075		mg/L		108	80 - 120
Molybdenum	1.00	1.020		mg/L		102	80 - 120

Lab Sample ID: 310-226941-5 MS
Matrix: Solid
Analysis Batch: 348535

Client Sample ID: LAN USACE SAND 220311
Prep Type: SPLP West
Prep Batch: 346948

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.00396	J	1.00	0.9996		mg/L		100	75 - 125
Barium	0.0327	J	0.500	0.5777		mg/L		109	75 - 125
Beryllium	<0.00140		0.500	0.4651		mg/L		93	75 - 125
Boron	<0.290		1.00	1.144		mg/L		114	75 - 125
Cadmium	<0.000280		0.500	0.4719		mg/L		94	75 - 125
Chromium	0.00774	J	0.500	0.4972		mg/L		98	75 - 125
Copper	<0.0160		1.00	1.022		mg/L		102	75 - 125
Lead	0.00208	J	1.00	1.015		mg/L		101	75 - 125
Cobalt	0.00133	J	0.500	0.4902		mg/L		98	75 - 125
Lithium	<0.0160		1.00	0.9421		mg/L		94	75 - 125
Calcium	6.60		10.0	15.28		mg/L		87	75 - 125
Selenium	<0.00830		2.00	1.963		mg/L		98	75 - 125
Thallium	<0.00240		1.00	1.009		mg/L		101	75 - 125

Lab Sample ID: 310-226941-5 MS
Matrix: Solid
Analysis Batch: 348588

Client Sample ID: LAN USACE SAND 220311
Prep Type: SPLP West
Prep Batch: 346948

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	0.0115		1.00	1.070		mg/L		106	75 - 125
Molybdenum	0.00957	J	1.00	1.020		mg/L		101	75 - 125

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LB 310-346848/1-D
Matrix: Solid
Analysis Batch: 347405

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 347238

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00120		0.00200	0.00120	mg/L		03/21/22 15:31	03/22/22 16:26	1

Lab Sample ID: LCS 310-346848/2-D
Matrix: Solid
Analysis Batch: 347405

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 347238

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0167	0.01612		mg/L		97	80 - 120

Lab Sample ID: LB 310-346851/1-C
Matrix: Solid
Analysis Batch: 347405

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 347239

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00120		0.00200	0.00120	mg/L		03/21/22 15:33	03/22/22 17:00	1

Lab Sample ID: LCS 310-346851/2-C
Matrix: Solid
Analysis Batch: 347405

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 347239

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0167	0.01565		mg/L		94	80 - 120

Lab Sample ID: 310-226941-5 MS
Matrix: Solid
Analysis Batch: 347405

Client Sample ID: LAN USACE SAND 220311
Prep Type: SPLP West
Prep Batch: 347239

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.00120		0.0167	0.01607		mg/L		96	80 - 120

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 310-348090/1-A
Matrix: Solid
Analysis Batch: 348261

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 348090

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00723		0.0181	0.00723	mg/Kg		03/29/22 13:55	03/30/22 16:27	1

Lab Sample ID: LCS 310-348090/2-A
Matrix: Solid
Analysis Batch: 348261

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 348090

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.154	0.1500		mg/Kg		98	80 - 120

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 500-650601/1-A
Matrix: Solid
Analysis Batch: 650963

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 650601

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	<0.388		1.00	0.388	mg/Kg		04/07/22 13:40	04/08/22 14:58	1

Lab Sample ID: LCS 500-650601/2-A
Matrix: Solid
Analysis Batch: 650963

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 650601

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium, hexavalent	10.0	8.332		mg/Kg		83	80 - 120

Lab Sample ID: LCS 500-650601/3-A
Matrix: Solid
Analysis Batch: 650963

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 650601

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium, hexavalent	1210	1170		mg/Kg		97	80 - 120

Method: 9045D - pH

Lab Sample ID: LCS 310-347263/1
Matrix: Solid
Analysis Batch: 347263

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	98 - 102

Lab Sample ID: 310-226941-5 DU
Matrix: Solid
Analysis Batch: 347263

Client Sample ID: LAN USACE SAND 220311
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	8.7	HF	8.6		SU		0.3	20

Method: Moisture - Percent Moisture

Lab Sample ID: 310-226941-5 DU
Matrix: Solid
Analysis Batch: 346914

Client Sample ID: LAN USACE SAND 220311
Prep Type: Total/NA

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
Percent Moisture	14.6		14.7		%		0.7	39
Percent Solids	85.4		85.3		%		0.1	10

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-556267/1-A
Matrix: Solid
Analysis Batch: 559609

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 556267

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.374	U	0.128	0.128	1.00	0.374	pCi/g	03/21/22 12:48	04/11/22 10:10	1

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: MB 160-556267/1-A
Matrix: Solid
Analysis Batch: 559609

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 556267

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.230	U	0.223	0.223		0.230	pCi/g	03/21/22 12:48	04/11/22 10:10	1

Lab Sample ID: LCS 160-556267/2-A
Matrix: Solid
Analysis Batch: 559610

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 556267

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Americium-241			96.2	94.09		9.87		0.993	pCi/g	98	75 - 125		
Cesium-137			25.9	24.59		2.61		0.157	pCi/g	95	75 - 125		
Cobalt-60			7.95	7.320		0.775		0.0551	pCi/g	92	75 - 125		

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-556923/5-A
Matrix: Solid
Analysis Batch: 560460

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 556923

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.0990	U	0.0546	0.0546	1.00	0.0990	pCi/L	03/24/22 14:04	04/15/22 08:03	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.1*		*40 - 110*	*03/24/22 14:04*	*04/15/22 08:03*	*1*

Lab Sample ID: LCS 160-556923/1-A
Matrix: Solid
Analysis Batch: 560482

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 556923

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	10.38		1.08	1.00	0.108	pCi/L	92	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*97.8*		*40 - 110*

Lab Sample ID: LCSD 160-556923/2-A
Matrix: Solid
Analysis Batch: 560460

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 556923

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	10.13		1.06	1.00	0.0787	pCi/L	89	75 - 125	0.12	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*98.0*		*40 - 110*

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-556934/5-A
Matrix: Solid
Analysis Batch: 558744

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 556934

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.363	U	0.222	0.223	1.00	0.363	pCi/L	03/24/22 15:05	04/06/22 12:27	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*91.1*		*40 - 110*	*03/24/22 15:05*	*04/06/22 12:27*	*1*
Y Carrier	*86.4*		*40 - 110*	*03/24/22 15:05*	*04/06/22 12:27*	*1*

Lab Sample ID: LCS 160-556934/1-A
Matrix: Solid
Analysis Batch: 558744

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 556934

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.73	8.351		0.995	1.00	0.397	pCi/L	96	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*97.8*		*40 - 110*
Y Carrier	*85.2*		*40 - 110*

Lab Sample ID: LCSD 160-556934/2-A
Matrix: Solid
Analysis Batch: 558744

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 556934

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.73	8.496		0.999	1.00	0.364	pCi/L	97	75 - 125	0.07	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*98.0*		*40 - 110*
Y Carrier	*87.9*		*40 - 110*

GC/MS VOA

Leach Batch: 346850

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	1311	
LB 310-346850/1-A	Method Blank	TCLP	Solid	1311	
LCS 310-346850/2-A	Lab Control Sample	TCLP	Solid	1311	

Analysis Batch: 347090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	8260D	346850
LB 310-346850/1-A	Method Blank	TCLP	Solid	8260D	346850
LCS 310-346850/2-A	Lab Control Sample	TCLP	Solid	8260D	346850

GC/MS Semi VOA

Leach Batch: 346849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	1311	
LB 310-346849/1-D	Method Blank	TCLP	Solid	1311	

Prep Batch: 346976

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	3510C	346849
LB 310-346849/1-D	Method Blank	TCLP	Solid	3510C	346849
LCS 310-346976/2-A	Lab Control Sample	Total/NA	Solid	3510C	

Analysis Batch: 347471

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LB 310-346849/1-D	Method Blank	TCLP	Solid	8270E	346976
LCS 310-346976/2-A	Lab Control Sample	Total/NA	Solid	8270E	346976

Analysis Batch: 347472

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	8270E	346976
LB 310-346849/1-D	Method Blank	TCLP	Solid	8270E	346976
LCS 310-346976/2-A	Lab Control Sample	Total/NA	Solid	8270E	346976

GC Semi VOA

Leach Batch: 346849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	1311	
LB 310-346849/1-C	Method Blank	TCLP	Solid	1311	

Prep Batch: 346973

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	3510C	346849
LB 310-346849/1-C	Method Blank	TCLP	Solid	3510C	346849
LCS 310-346973/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 310-346973/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

Analysis Batch: 347605

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	8081B	346973
LB 310-346849/1-C	Method Blank	TCLP	Solid	8081B	346973

GC Semi VOA (Continued)

Analysis Batch: 347605 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
LCS 310-346973/2-A	Lab Control Sample	Total/NA	Solid	8081B	346973
LCSD 310-346973/3-A	Lab Control Sample Dup	Total/NA	Solid	8081B	346973

Leach Batch: 647849

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	1311	
LB 500-647849/1-B	Method Blank	TCLP	Solid	1311	
310-226941-5 MS	LAN USACE SAND 220311	TCLP	Solid	1311	

Prep Batch: 647872

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	8151A	647849
LB 500-647849/1-B	Method Blank	TCLP	Solid	8151A	647849
MB 500-647872/1-A	Method Blank	Total/NA	Solid	8151A	
LCS 500-647872/2-A	Lab Control Sample	Total/NA	Solid	8151A	
310-226941-5 MS	LAN USACE SAND 220311	TCLP	Solid	8151A	647849

Analysis Batch: 648344

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	8151A	647872
LB 500-647849/1-B	Method Blank	TCLP	Solid	8151A	647872
MB 500-647872/1-A	Method Blank	Total/NA	Solid	8151A	647872
LCS 500-647872/2-A	Lab Control Sample	Total/NA	Solid	8151A	647872
310-226941-5 MS	LAN USACE SAND 220311	TCLP	Solid	8151A	647872

HPLC/IC

Leach Batch: 346853

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP	Solid	1312	
LB 310-346853/1-A	Method Blank	SPLP	Solid	1312	
LCS 310-346853/2-A	Lab Control Sample	SPLP	Solid	1312	
310-226941-5 MS	LAN USACE SAND 220311	SPLP	Solid	1312	
310-226941-5 MSD	LAN USACE SAND 220311	SPLP	Solid	1312	

Leach Batch: 347233

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Soluble	Solid	DI Leach	
MB 310-347233/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 310-347233/2-A	Lab Control Sample	Soluble	Solid	DI Leach	
310-226941-5 MS	LAN USACE SAND 220311	Soluble	Solid	DI Leach	
310-226941-5 MSD	LAN USACE SAND 220311	Soluble	Solid	DI Leach	

Analysis Batch: 347539

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Soluble	Solid	9056A	347233
MB 310-347233/1-A	Method Blank	Soluble	Solid	9056A	347233
LCS 310-347233/2-A	Lab Control Sample	Soluble	Solid	9056A	347233
310-226941-5 MS	LAN USACE SAND 220311	Soluble	Solid	9056A	347233
310-226941-5 MSD	LAN USACE SAND 220311	Soluble	Solid	9056A	347233

HPLC/IC

Analysis Batch: 347811

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP	Solid	9056A	346853
LB 310-346853/1-A	Method Blank	SPLP	Solid	9056A	346853
LCS 310-346853/2-A	Lab Control Sample	SPLP	Solid	9056A	346853
310-226941-5 MS	LAN USACE SAND 220311	SPLP	Solid	9056A	346853
310-226941-5 MSD	LAN USACE SAND 220311	SPLP	Solid	9056A	346853

Metals

Leach Batch: 346848

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	1311	
LB 310-346848/1-B	Method Blank	TCLP	Solid	1311	
LB 310-346848/1-D	Method Blank	TCLP	Solid	1311	
LCS 310-346848/2-B	Lab Control Sample	TCLP	Solid	1311	
LCS 310-346848/2-D	Lab Control Sample	TCLP	Solid	1311	

Leach Batch: 346851

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP West	Solid	1312	
LB 310-346851/1-B	Method Blank	SPLP West	Solid	1312	
LB 310-346851/1-C	Method Blank	SPLP West	Solid	1312	
LCS 310-346851/2-B	Lab Control Sample	SPLP West	Solid	1312	
LCS 310-346851/2-C	Lab Control Sample	SPLP West	Solid	1312	
310-226941-5 MS	LAN USACE SAND 220311	SPLP West	Solid	1312	

Prep Batch: 346946

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	3010A	346848
LB 310-346848/1-B	Method Blank	TCLP	Solid	3010A	346848
LCS 310-346848/2-B	Lab Control Sample	TCLP	Solid	3010A	346848

Prep Batch: 346948

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP West	Solid	3010A	346851
LB 310-346851/1-B	Method Blank	SPLP West	Solid	3010A	346851
LCS 310-346851/2-B	Lab Control Sample	SPLP West	Solid	3010A	346851
310-226941-5 MS	LAN USACE SAND 220311	SPLP West	Solid	3010A	346851

Prep Batch: 347238

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	7470A	346848
LB 310-346848/1-D	Method Blank	TCLP	Solid	7470A	346848
LCS 310-346848/2-D	Lab Control Sample	TCLP	Solid	7470A	346848

Prep Batch: 347239

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP West	Solid	7470A	346851
LB 310-346851/1-C	Method Blank	SPLP West	Solid	7470A	346851
LCS 310-346851/2-C	Lab Control Sample	SPLP West	Solid	7470A	346851
310-226941-5 MS	LAN USACE SAND 220311	SPLP West	Solid	7470A	346851

Metals

Analysis Batch: 347332

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	6010C	346946
LB 310-346848/1-B	Method Blank	TCLP	Solid	6010C	346946
LCS 310-346848/2-B	Lab Control Sample	TCLP	Solid	6010C	346946

Analysis Batch: 347405

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP West	Solid	7470A	347239
310-226941-5	LAN USACE SAND 220311	TCLP	Solid	7470A	347238
LB 310-346848/1-D	Method Blank	TCLP	Solid	7470A	347238
LB 310-346851/1-C	Method Blank	SPLP West	Solid	7470A	347239
LCS 310-346848/2-D	Lab Control Sample	TCLP	Solid	7470A	347238
LCS 310-346851/2-C	Lab Control Sample	SPLP West	Solid	7470A	347239
310-226941-5 MS	LAN USACE SAND 220311	SPLP West	Solid	7470A	347239

Prep Batch: 347623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	3050B	
MB 310-347623/1-A ^5	Method Blank	Total/NA	Solid	3050B	
LCS 310-347623/2-A ^20	Lab Control Sample	Total/NA	Solid	3050B	

Prep Batch: 348090

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	7471B	
MB 310-348090/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 310-348090/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Analysis Batch: 348261

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	7471B	348090
MB 310-348090/1-A	Method Blank	Total/NA	Solid	7471B	348090
LCS 310-348090/2-A	Lab Control Sample	Total/NA	Solid	7471B	348090

Analysis Batch: 348535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP West	Solid	6020B	346948
LB 310-346851/1-B	Method Blank	SPLP West	Solid	6020B	346948
LCS 310-346851/2-B	Lab Control Sample	SPLP West	Solid	6020B	346948
310-226941-5 MS	LAN USACE SAND 220311	SPLP West	Solid	6020B	346948

Analysis Batch: 348588

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP West	Solid	6020B	346948
LB 310-346851/1-B	Method Blank	SPLP West	Solid	6020B	346948
LCS 310-346851/2-B	Lab Control Sample	SPLP West	Solid	6020B	346948
310-226941-5 MS	LAN USACE SAND 220311	SPLP West	Solid	6020B	346948

Analysis Batch: 349305

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	6020B	347623
MB 310-347623/1-A ^5	Method Blank	Total/NA	Solid	6020B	347623
LCS 310-347623/2-A ^20	Lab Control Sample	Total/NA	Solid	6020B	347623

General Chemistry

Leach Batch: 346860

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Soluble	Solid	DI Leach	
310-226941-5 DU	LAN USACE SAND 220311	Soluble	Solid	DI Leach	

Analysis Batch: 346914

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	Moisture	
310-226941-5 DU	LAN USACE SAND 220311	Total/NA	Solid	Moisture	

Analysis Batch: 347263

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Soluble	Solid	9045D	346860
LCS 310-347263/1	Lab Control Sample	Total/NA	Solid	9045D	
310-226941-5 DU	LAN USACE SAND 220311	Soluble	Solid	9045D	346860

Prep Batch: 650601

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	3060A	
MB 500-650601/1-A	Method Blank	Total/NA	Solid	3060A	
LCS 500-650601/2-A	Lab Control Sample	Total/NA	Solid	3060A	
LCS 500-650601/3-A	Lab Control Sample	Total/NA	Solid	3060A	

Analysis Batch: 650963

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	7196A	650601
MB 500-650601/1-A	Method Blank	Total/NA	Solid	7196A	650601
LCS 500-650601/2-A	Lab Control Sample	Total/NA	Solid	7196A	650601
LCS 500-650601/3-A	Lab Control Sample	Total/NA	Solid	7196A	650601

Analysis Batch: 650967

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	7196A	

Rad

Leach Batch: 555935

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	Dry and Grind	

Prep Batch: 556267

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	Fill_Geo-21	555935
MB 160-556267/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-556267/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	

Leach Batch: 556449

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP West	Solid	1312	

Prep Batch: 556923

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP West	Solid	PrecSep-21	556449

Rad (Continued)

Prep Batch: 556923 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
MB 160-556923/5-A	Method Blank	Total/NA	Solid	PrecSep-21	
LCS 160-556923/1-A	Lab Control Sample	Total/NA	Solid	PrecSep-21	
LCSD 160-556923/2-A	Lab Control Sample Dup	Total/NA	Solid	PrecSep-21	

Prep Batch: 556934

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	SPLP West	Solid	PrecSep_0	556449
MB 160-556934/5-A	Method Blank	Total/NA	Solid	PrecSep_0	
LCS 160-556934/1-A	Lab Control Sample	Total/NA	Solid	PrecSep_0	
LCSD 160-556934/2-A	Lab Control Sample Dup	Total/NA	Solid	PrecSep_0	

Organic Prep

Analysis Batch: 348018

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-226941-5	LAN USACE SAND 220311	Total/NA	Solid	Composite	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-226941-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE SAND 220311
Lab Sample ID: 310-226941-5
Date Collected: 03/15/22 10:35
Matrix: Solid
Date Received: 03/15/22 09:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
TCLP	Leach	1311			346850	03/16/22 14:20	JTA	TAL CF
TCLP	Analysis	8260D		20	347090	03/20/22 19:28	TRZ	TAL CF
TCLP	Leach	1311			346849	03/16/22 14:20	JTA	TAL CF
TCLP	Prep	3510C			346976	03/18/22 08:27	JCM	TAL CF
TCLP	Analysis	8270E		1	347472	03/23/22 17:48	DMD	TAL CF
TCLP	Leach	1311			346849	03/16/22 14:20	JTA	TAL CF
TCLP	Prep	3510C			346973	03/18/22 08:14	JCM	TAL CF
TCLP	Analysis	8081B		1	347605	03/24/22 12:14	BBW	TAL CF
TCLP	Leach	1311			647849	03/16/22 14:20	DAK	TAL CHI
TCLP	Prep	8151A			647872	03/21/22 07:35	DAK	TAL CHI
TCLP	Analysis	8151A		1	648344	03/23/22 09:58	JBJ	TAL CHI
SPLP	Leach	1312			346853	03/16/22 14:20	JTA	TAL CF
SPLP	Analysis	9056A		1	347811	03/21/22 08:58	JNR	TAL CF
TCLP	Leach	1311			346848	03/16/22 14:20	JTA	TAL CF
TCLP	Prep	3010A			346946	03/18/22 08:15	ACM2	TAL CF
TCLP	Analysis	6010C		1	347332	03/21/22 14:28	CTB	TAL CF
SPLP West	Leach	1312			346851	03/16/22 14:20	JTA	TAL CF
SPLP West	Prep	3010A			346948	03/18/22 08:15	ACM2	TAL CF
SPLP West	Analysis	6020B		1	348535	03/31/22 23:30	SAP	TAL CF
SPLP West	Leach	1312			346851	03/16/22 14:20	JTA	TAL CF
SPLP West	Prep	3010A			346948	03/18/22 08:15	ACM2	TAL CF
SPLP West	Analysis	6020B		1	348588	04/01/22 23:22	SAP	TAL CF
SPLP West	Leach	1312			346851	03/16/22 14:20	JTA	TAL CF
SPLP West	Prep	7470A			347239	03/21/22 15:33	EAM	TAL CF
SPLP West	Analysis	7470A		1	347405	03/22/22 17:08	EAM	TAL CF
TCLP	Leach	1311			346848	03/16/22 14:20	JTA	TAL CF
TCLP	Prep	7470A			347238	03/21/22 15:31	EAM	TAL CF
TCLP	Analysis	7470A		1	347405	03/22/22 16:51	EAM	TAL CF
Soluble	Leach	DI Leach			346860	03/17/22 09:02	ARG	TAL CF
Soluble	Analysis	9045D		1	347263	03/21/22 22:32	JMH	TAL CF
Total/NA	Analysis	Moisture		1	346914	03/17/22 13:50	SJN	TAL CF
Total/NA	Leach	Dry and Grind			555935	03/18/22 15:54	ZTH	TAL SL
Total/NA	Prep	Fill_Geo-21			556267	03/21/22 12:48	SRE	TAL SL
Total/NA	Analysis	901.1		1	559586	04/11/22 09:34	CAH	TAL SL
SPLP West	Leach	1312			556449	03/22/22 09:41	LTC	TAL SL
SPLP West	Prep	PrecSep-21			556923	03/24/22 14:04	LPS	TAL SL
SPLP West	Analysis	9315		1	560460	04/15/22 08:03	FLC	TAL SL
SPLP West	Leach	1312			556449	03/22/22 09:41	LTC	TAL SL
SPLP West	Prep	PrecSep_0			556934	03/24/22 15:05	LPS	TAL SL
SPLP West	Analysis	9320		1	558744	04/06/22 12:26	FLC	TAL SL
Total/NA	Analysis	Composite		1	348018	03/29/22 07:49	JTA	TAL CF

Lab Chronicle

Client: SCS Engineers
Job ID: 310-226941-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE SAND 220311
Lab Sample ID: 310-226941-5

Date Collected: 03/15/22 10:35
Matrix: Solid

Date Received: 03/15/22 09:50
Percent Solids: 85.4

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Soluble	Leach	DI Leach			347233	03/21/22 15:20	JNR	TAL CF
Soluble	Analysis	9056A		10	347539	03/23/22 13:30	JNR	TAL CF
Total/NA	Prep	3050B			347623	03/28/22 10:00	ACM2	TAL CF
Total/NA	Analysis	6020B		5	349305	04/08/22 14:10	SAP	TAL CF
Total/NA	Prep	7471B			348090	03/29/22 13:55	EAM	TAL CF
Total/NA	Analysis	7471B		1	348261	03/30/22 17:08	EAM	TAL CF
Total/NA	Analysis	7196A		1	650967	04/08/22 16:01	PFK	TAL CHI
Total/NA	Prep	3060A			650601	04/07/22 13:40	EAT	TAL CHI
Total/NA	Analysis	7196A		1	650963	04/08/22 15:10	EAT	TAL CHI

Laboratory References:

TAL CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

TAL CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-226941-1
Project/Site: Lansing Soil Characterization, 25220100

Laboratory: Eurofins 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 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	04-29-22
Georgia	State	N/A	04-29-22
Georgia (DW)	State	939	04-30-21 *
Hawaii	State	NA	04-29-22
Illinois	NELAP	IL00035	04-29-22
Indiana	State	C-IL-02	04-29-22
Iowa	State	082	05-01-22
Kansas	NELAP	E-10161	10-31-22
Kentucky (UST)	State	AI # 108083	04-29-22
Kentucky (WW)	State	KY90023	12-31-22
Louisiana	NELAP	02046	06-30-22
Mississippi	State	NA	04-30-22
North Carolina (WW/SW)	State	291	12-31-22
North Dakota	State	R-194	04-29-22
Oklahoma	State	8908	08-31-22
South Carolina	State	77001003	04-29-22
USDA	US Federal Programs	P330-18-00018	02-11-24
Wisconsin	State	999580010	08-31-22
Wyoming	State	8TMS-Q	04-30-22

Laboratory: Eurofins St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	12-01-22

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte

* Accreditation/Certification renewal pending - accreditation/certification considered valid.

Method Summary

Client: SCS Engineers
Job ID: 310-226941-1
Project/Site: Lansing Soil Characterization, 25220100

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	TAL CF
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	TAL CF
8081B	Organochlorine Pesticides (GC)	SW846	TAL CF
8151A	Herbicides (GC)	SW846	TAL CHI
9056A	Anions, Ion Chromatography	SW846	TAL CF
6010C	Metals (ICP)	SW846	TAL CF
6020B	Metals (ICP/MS)	SW846	TAL CF
7470A	Mercury (CVAA)	SW846	TAL CF
7471B	Mercury (CVAA)	SW846	TAL CF
7196A	Chromium, Hexavalent	SW846	TAL CHI
7196A	Chromium, Trivalent (Colorimetric)	SW846	TAL CHI
9045D	pH	SW846	TAL CF
Moisture	Percent Moisture	EPA	TAL CF
Composite	Composite	None	TAL CF
1311	TCLP Extraction	SW846	TAL CF
1311	TCLP Zero Headspace Extraction	SW846	TAL CF
1311	TCLP Extraction	SW846	TAL CHI
1312	SPLP Extraction	SW846	TAL CF
3010A	Preparation, Total Metals	SW846	TAL CF
3050B	Preparation, Metals	SW846	TAL CF
3060A	Alkaline Digestion (Chromium, Hexavalent)	SW846	TAL CHI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL CF
5030B	Purge and Trap	SW846	TAL CF
7470A	Preparation, Mercury	SW846	TAL CF
7471B	Preparation, Mercury	SW846	TAL CF
8151A	Extraction (Herbicides)	SW846	TAL CHI
DI Leach	Deionized Water Leaching Procedure	ASTM	TAL CF

Protocol References:

ASTM = ASTM International
EPA = US Environmental Protection Agency
None = None
SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401
TAL CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

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310-226941 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client SCS

City/State | CITY | STATE WI | Project

Receipt Information

Date/Time Received | DATE 3/15/22 | TIME 0950 | Received By n

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 # ____ of ____
Cooler Custody Seals Present? No	☒ Yes	☐ No	*If yes*	Cooler custody seals intact? ☒ Yes ☐
Sample Custody Seals Present? No	☐ Yes	☒ No	*If yes*	Sample custody seals intact? ☐ Yes ☐
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 N | Correction Factor (°C) +0.0

• Temp Blank Temperature – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C) | Corrected Temp (°C)

• Sample Container Temperature

	CONTAINER 1	CONTAINER 2
Container(s) used	soil jar 802	
Uncorrected Temp (°C)	4.5	
Corrected Temp (°C)	4.5	

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

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Hoaster, Erin	Lab PM: Thompson, Shirley	Carrier Tracking No(s):	COC No:
Client Contact: Brandon Suchomel	Phone:	E-Mail: shirley.thompson@eurofinset.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:	Analysis Requested		Job #:
Address: 2830 Dairy Drive	Due Date Requested:			Preservation Codes:
City: Madison	TAT Requested (days):			A HCL M Hexane B NaOH N None C Zn Acetate O AsNaO2 D Nitric Acid P Na2O4S E NaHSO4 Q Na2SO3 F MeOH R Na2S2O3 G Amchlor S H2SO4 H Ascorbic Acid T TSP Dodecahydrate I Ice U Acetone J DI Water V MCAA K EDTA W pH 4-5 L EDA Z other (specify) Other:
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-224-2830	PO #: 25220100.00			
Email: bsuchomel@scsengineers.com	WO #:			
Project Name: Lansing Generating Station 25220100.00	Project #:			
Site: Lansing, IA	SSOW#:			

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	See Attached Table	Total Number of containers	Special Instructions/Note:
			Preservation Code:				I		
LAN USACE Sand 220311-A	3/11/22	7:30	G	S			X	1	Composite these grab samples and run the composite sample for attached parameter list. Identify composite sample as LAN USACE Sand 220311
LAN USACE Sand 220311-B	3/11/22	8:30	G	S			X	1	
LAN USACE Sand 220311-C	3/11/22	9:30	G	S			X	1	
LAN USACE Sand 220311-D	3/11/22	10:30	G	S			X	1	
									LAN USACE Sand 220311

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested: I II III, IV Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time: 03/14/2022 9:00	Company SCS			
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time: 3/15/22 0915	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks:

Ver 01/16/2019

USACE Dredge Stockpile Sampling - Parameter List

Collected 4 samples - Laboratory to composite to a single sample for analysis

	Total	SPLP	TCLP
VOCs			
Benzene			X
Carbon tetrachloride			X
Chlorobenzene			X
Chloroform			X
1,2-Dichloroethane			X
1,1-Dichloroethylene			X
Methyl ethyl ketone			X
Tetrachloroethylene			X
Trichloroethylene			X
Vinyl chloride			X
Pesticides			
Chlordane			X
Endrin			X
Heptachlor (and its epoxide)			X
Lindane			X
Methoxychlor			X
Toxaphene			X
Herbicides			
2,4-D			X
2,4,5-TP (Silvex)			X
SVOCs			
o-Cresol			X
m-Cresol			X
p-Cresol			X
Cresol			X
1,4-Dichlorobenzene			X
2 4-Dinitrotoluene			X
Hexachlorobenzene			X
Hexachloroebutadiene			X
Hexachloroethane			X
Nitrobenzene			X
Pentachlorophenol			X
Pyridine			X
2,4,5-Trichlorophenol			X
2,4,6-Trichlorophenol			X
Metals			
Antimony	X	X	
Arsenic	X	X	X
Barium	X	X	X
Beryllium	X	X	
Boron	X	X	

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone 319-277-2401 Fax 319-277-2425

Chain of Custody Record

eurofins Environment Testing America

Client Information (Sub Contract Lab)	Sampler	Lab PM: Thompson Shirley J	Carrier Tracking No(s)	COC No: 310-47668 1
Client Contact: Shipping/Receiving	Phone	E-Mail: Shirley.Thompson@Eurofinset.com	State of Origin: Iowa	Page: Page 1 of 1
Company: Eurofins Environment Testing North Centr		Accreditations Required (See note): State - Iowa State Program - Iowa		Job #: 310-226941-1
Address: 2417 Bond Street	Due Date Requested: 4/3/2022			
City: University Park	TAT Requested (days):			
State, Zip: IL, 60484				
Phone: 708-534-5200(Tel) 708-534-5211(Fax)	PO #:			
Email:	WO #:			
Project Name: Lansing Soil Characterization 25220100	Project #: 31014222			
Site:	SSOW#:			

Analysis Requested

Preservation Codes.

A - HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H - Ascorbic Acid, I Ice, J DI Water, K EDTA, L - EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Z other (specify)

Other:

Sample Identification - 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)	7196A/3060A	7196A_CR3/ (MOD) Local Method	8151A/1311_T TCLP	226941 COC	Total Number of containers	Special Instructions/Note:
			Preservation Code:									
LAN USACE SAND 220311 (310-226941-5)	3/15/22	10:35 Central		Solid			X	X	X		1	

Note. Since laboratory accreditations are subject to change Eurofins Environment Testing North Central LLC places the ownership of method analyte & accreditation compliance upon out subcontract laboratories. This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided Any changes to accreditation status should be brought to Eurofins Environment Testing North Central LLC attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central LLC.

Possible Hazard Identification	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)***
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested I II III, IV Other (specify) Primary Deliverable Rank 2	Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

	Relinquished by:	Date/Time	Company	Received by:	Date/Time:	Company
1	[signature]	3/17/22 1535		Stephanie Hernandez	3/18/22 1025	~~EETA~~
2	Relinquished by:	Date/Time	Company	Received by:	Date/Time	Company
3	Relinquished by:	Date/Time	Company	Received by:	Date/Time:	Company

Custody Seals Intact: ∆ Yes ∆ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks: 0.5+0.0

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-226941-1

Login Number: 226941
List Number: 1
Creator: Homolar, Dana J

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-226941-1

Login Number: 226941
List Number: 3
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago
List Creation: 03/18/22 05:31 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	0.0
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	N/A	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: SCS Engineers
Job ID: 310-226941-1
Project/Site: Lansing Soil Characterization, 25220100

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (40-110)
LCS 160-556923/1-A	Lab Control Sample	97.8
LCSD 160-556923/2-A	Lab Control Sample Dup	98.0
MB 160-556923/5-A	Method Blank	91.1

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid — **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)
Lab Sample ID	Client Sample ID	Ba (40-110)
310-226941-5	LAN USACE SAND 220311	86.9

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
LCS 160-556934/1-A	Lab Control Sample	97.8	85.2
LCSD 160-556934/2-A	Lab Control Sample Dup	98.0	87.9
MB 160-556934/5-A	Method Blank	91.1	86.4

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid — **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)	
Lab Sample ID	Client Sample ID	Ba (40-110)	Y (40-110)
310-226941-5	LAN USACE SAND 220311	86.9	80.7

Tracer/Carrier Legend

Ba = Ba Carrier
Y = Y Carrier

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ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 4/7/2023 9:06:01 AM

JOB DESCRIPTION

Lansing Generating Station
SDG NUMBER 25222159.00

JOB NUMBER

310-250172-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

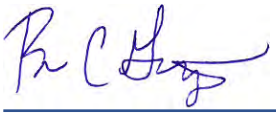
my EOL

Job Notes

The test results in this report meet all NELAP requirements for parameters for which accreditation is required or available. Any exceptions to the NELAP requirements are noted in this report. Pursuant to NELAP, this report may not be reproduced, except in full, without the written approval of the laboratory. This report is confidential and is intended for the sole use of Eurofins Environment Testing North Central, LLC and its client. All questions regarding this report should be directed to the Eurofins Environment Testing North Central, LLC Project Manager who has signed this report.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



Generated
4/7/2023 9:06:01 AM

Authorized for release by
Brian Graettinger, Business Unit Manager
Brian.Graettinger@et.eurofinsus.com
Designee for
Shirley Thompson, Client Service Manager
Shirley.Thompson@et.eurofinsus.com
(319)277-2401

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Job ID: 310-250172-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-250172-1

Receipt
The samples were received on 2/23/2023 10:30 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 3.1°C

Receipt Exceptions
An Internal Chain-of-Custody (ICOC) was not received with these samples: LAN USACE Sand 230221 Composite (310-250172-1).

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

GC/MS Semi VOA
Method 8270E: Tumbled in plastic due to matrix. LAN USACE Sand 230221 Composite (310-250172-1)

Method 8270E: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-380033 and 310-380119.The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.

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

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

Pesticides
Method 8081B: Tumbled in plastic due to matrix. LAN USACE Sand 230221 Composite (310-250172-1)

Method 8081B: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-380033 and 310-380114.The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.

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

HPLC/IC
Method 9056A_ORGFM_28D: The method blank for preparation batch 380019 contained Sulfate above the reporting limit (RL). None of the samples associated with this method blank contained the target compound; therefore, re-extraction and/or re-analysis of samples were not performed.

Method 9056A_ORGFM_28D: The laboratory control sample (LCS) for preparation batch 310-380019 and analytical batch 310-380359 recovered outside control limits for the following analytes: Sulfate. These analytes were biased high in the LCS and were not detected in the associated samples; therefore, the data have been reported. LAN USACE Sand 230221 Composite (310-250172-1)

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

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

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

Gamma Spectroscopy

Job ID: 310-250172-1 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

Method 901.1_Ra: Gamma Prep Batch 160-602232:Insufficient sample was provided for the following sample to fill a tuna can geometry calibrated for Ra-226 analysis by gamma spectroscopy: LAN USACE Sand 230221 Composite (310-250172-1). The use of a 100mL solid geometry could potentially bias the results low due to the loss of radon into the headspace of the container.

Method 901.1_Ra: Gamma Prep Batch 160-602232Many isotopes requested for analysis do not have any gamma emissions, or the gamma emissions they do have are very poor. Often, such analytes are reported by gamma spectrometry assuming secular equilibrium with a longer-lived parent. The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:Inferred from Reported to AnalyteTh-234 Pa-234Th-234 U-238Pb-210 Po-210Pb-210 Bi-210Cs-137 Ba-137mPb-212 Po-216Xe-131m Xe-131Sb-12 Te-125mAg-108m Ag-108Rh-106 Ru-106Pb-212 Th-228Pb-212 Ra-224U-235 Th-231Ac-228 Th-232Ac-228 Ra-228Th-227 Ra-223Th-227 Ac-227Th-227 Bi-211Th-227 Pb-211Bi-214 Ra-226Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. LAN USACE Sand 230221 Composite (310-250172-1)

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

Gas Flow Proportional Counter

Method 9315_Ra226: Radium-226 Prep Batch 160-603678The following sample was prepared at a reduced aliquot due to Matrix: LAN USACE Sand 230221 Composite (310-250172-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method 9315_Ra226: Radium-226 batch 603678Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.LAN USACE Sand 230221 Composite (310-250172-1), (LCS 160-603678/2-A), (LCSD 160-603678/3-A) and (MB 160-603678/1-A)

Method 9320_Ra228: Radium-228 Prep Batch 160-603701The following sample was prepared at a reduced aliquot due to Matrix: LAN USACE Sand 230221 Composite (310-250172-1). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method 9320_Ra228: Radium-228 batch 603701The detection goal was not met for the following sample(s). Sample was prepped at a reduced volume due to the presence of matrix interferences: LAN USACE Sand 230221 Composite (310-250172-1). Analytical results are reported with the detection limit achieved.

Method 9320_Ra228: Radium-228 batch 603701Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date.LAN USACE Sand 230221 Composite (310-250172-1), (LCS 160-603701/2-A), (LCSD 160-603701/3-A) and (MB 160-603701/1-A)

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

Organic Prep

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

Sample Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-250172-1	LAN USACE Sand 230221 Composite	Solid	02/21/23 17:10	02/23/23 10:30
310-250172-2	LAN USACE Sand 230221-A	Solid	02/21/23 11:55	02/23/23 10:30
310-250172-3	LAN USACE Sand 230221-B	Solid	02/21/23 16:11	02/23/23 10:30
310-250172-4	LAN USACE Sand 230221-C	Solid	02/21/23 16:54	02/23/23 10:30
310-250172-5	LAN USACE Sand 230221-D	Solid	02/21/23 17:10	02/23/23 10:30

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Client Sample ID: LAN USACE Sand 230221 Composite
Date Collected: 02/21/23 17:10
Date Received: 02/23/23 10:30

Lab Sample ID: 310-250172-1
Matrix: Solid

Method: SW846 8260D - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			02/28/23 16:17	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			02/28/23 16:17	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			02/28/23 16:17	20
Benzene	<0.0140		0.100	0.0140	mg/L			02/28/23 16:17	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			03/01/23 13:55	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			02/28/23 16:17	20
Chloroform	<0.0360		0.100	0.0360	mg/L			02/28/23 16:17	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			02/28/23 16:17	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			02/28/23 16:17	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			02/28/23 16:17	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*113*		*80 - 121*		*02/28/23 16:17*	*20*
Dibromofluoromethane (Surr)	*115*		*80 - 121*		*03/01/23 13:55*	*20*
Toluene-d8 (Surr)	*90*		*80 - 120*		*02/28/23 16:17*	*20*
Toluene-d8 (Surr)	*94*		*80 - 120*		*03/01/23 13:55*	*20*
4-Bromofluorobenzene (Surr)	*97*		*80 - 121*		*02/28/23 16:17*	*20*
4-Bromofluorobenzene (Surr)	*97*		*80 - 121*		*03/01/23 13:55*	*20*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		02/28/23 08:51	03/01/23 14:53	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		02/28/23 08:51	03/01/23 14:53	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		02/28/23 08:51	03/01/23 14:53	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		02/28/23 08:51	03/01/23 14:53	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		02/28/23 08:51	03/01/23 14:53	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		02/28/23 08:51	03/01/23 14:53	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		02/28/23 08:51	03/01/23 14:53	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		02/28/23 08:51	03/01/23 14:53	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		02/28/23 08:51	03/01/23 14:53	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		02/28/23 08:51	03/01/23 14:53	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		02/28/23 08:51	03/01/23 14:53	1
Pyridine	<0.00740	*1	0.0500	0.00740	mg/L		02/28/23 08:51	03/01/23 14:53	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		02/28/23 08:51	03/01/23 14:53	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*70*		*13 - 110*	*02/28/23 08:51*	*03/01/23 14:53*	*1*
Phenol-d5 (Surr)	*64*		*18 - 110*	*02/28/23 08:51*	*03/01/23 14:53*	*1*
Nitrobenzene-d5 (Surr)	*104*		*32 - 113*	*02/28/23 08:51*	*03/01/23 14:53*	*1*
2-Fluorobiphenyl (Surr)	*81*		*30 - 110*	*02/28/23 08:51*	*03/01/23 14:53*	*1*
2,4,6-Tribromophenol (Surr)	*75*		*11 - 130*	*02/28/23 08:51*	*03/01/23 14:53*	*1*
Terphenyl-d14 (Surr)	*102*		*33 - 120*	*02/28/23 08:51*	*03/01/23 14:53*	*1*

Method: SW846 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Endrin	<0.0000500		0.000160	0.0000500	mg/L		02/28/23 08:48	03/07/23 13:25	1
gamma-BHC (Lindane)	<0.0000700		0.000160	0.0000700	mg/L		02/28/23 08:48	03/07/23 13:25	1
Heptachlor	<0.0000600		0.000160	0.0000600	mg/L		02/28/23 08:48	03/07/23 13:25	1
Heptachlor epoxide	<0.0000460		0.000160	0.0000460	mg/L		02/28/23 08:48	03/07/23 13:25	1
Methoxychlor	<0.0000700		0.000160	0.0000700	mg/L		02/28/23 08:48	03/07/23 13:25	1

Client Sample ID: LAN USACE Sand 230221 Composite
Date Collected: 02/21/23 17:10
Date Received: 02/23/23 10:30

Lab Sample ID: 310-250172-1
Matrix: Solid

Method: SW846 8081B - Organochlorine Pesticides (GC) - TCLP (Continued)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Toxaphene	<0.00210		0.0100	0.00210	mg/L		02/28/23 08:48	03/07/23 13:25	1
Chlordane (technical)	<0.00110		0.0100	0.00110	mg/L		02/28/23 08:48	03/07/23 13:25	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*47*		*11 - 122*	*02/28/23 08:48*	*03/07/23 13:25*	*1*
Tetrachloro-m-xylene (Surr)	*59*		*23 - 123*	*02/28/23 08:48*	*03/07/23 13:25*	*1*

Method: SW846 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		03/06/23 09:31	03/07/23 12:17	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		03/06/23 09:31	03/07/23 12:17	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*72*		*25 - 130*	*03/06/23 09:31*	*03/07/23 12:17*	*1*

Method: SW846 9056A - Anions, Ion Chromatography - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			02/28/23 15:12	1
Chloride	<0.500		1.00	0.500	mg/L			02/28/23 15:12	1
Sulfate	<0.610	*+	1.00	0.610	mg/L			02/28/23 15:12	1

Method: SW846 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.100		0.200	0.100	mg/L		03/01/23 09:50	03/02/23 10:45	1
Barium	**0.211**	**J**	0.500	0.110	mg/L		03/01/23 09:50	03/02/23 10:45	1
Cadmium	<0.00780		0.0200	0.00780	mg/L		03/01/23 09:50	03/02/23 10:45	1
Chromium	<0.00870		0.0200	0.00870	mg/L		03/01/23 09:50	03/02/23 10:45	1
Lead	<0.0500		0.100	0.0500	mg/L		03/01/23 09:50	03/02/23 10:45	1
Selenium	<0.0670		0.100	0.0670	mg/L		03/01/23 09:50	03/02/23 10:45	1
Silver	<0.00940		0.0200	0.00940	mg/L		03/01/23 09:50	03/02/23 10:45	1

Method: SW846 6020B - Metals (ICP/MS) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00550		0.0100	0.00550	mg/L		03/03/23 09:55	03/06/23 14:10	1
Arsenic	**0.00389**	**J**	0.0100	0.00380	mg/L		03/03/23 09:55	03/06/23 14:10	1
Barium	**0.0253**	**J**	0.100	0.0200	mg/L		03/03/23 09:55	03/06/23 14:10	1
Beryllium	<0.00140		0.00500	0.00140	mg/L		03/03/23 09:55	03/06/23 14:10	1
Boron	<0.290		0.500	0.290	mg/L		03/03/23 09:55	03/06/23 14:10	1
Cadmium	**0.000695**	**J B**	0.00250	0.000280	mg/L		03/03/23 09:55	03/06/23 14:10	1
Calcium	**3.50**		2.50	1.30	mg/L		03/03/23 09:55	03/06/23 14:10	1
Chromium	**0.00747**	**J**	0.0250	0.00720	mg/L		03/03/23 09:55	03/06/23 14:10	1
Cobalt	**0.00174**	**J B**	0.00250	0.000950	mg/L		03/03/23 09:55	03/06/23 14:10	1
Copper	<0.0160		0.0500	0.0160	mg/L		03/03/23 09:55	03/06/23 14:10	1
Lead	**0.00263**	**J**	0.00500	0.00160	mg/L		03/03/23 09:55	03/06/23 14:10	1
Lithium	<0.0160		0.0500	0.0160	mg/L		03/03/23 09:55	03/06/23 14:10	1
Molybdenum	<0.00920		0.0250	0.00920	mg/L		03/03/23 09:55	03/06/23 14:10	1
Selenium	<0.00830		0.0250	0.00830	mg/L		03/03/23 09:55	03/06/23 14:10	1
Thallium	**0.00402**	**J**	0.00500	0.00240	mg/L		03/03/23 09:55	03/06/23 14:10	1

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Client Sample ID: LAN USACE Sand 230221 Composite

Lab Sample ID: 310-250172-1

Date Collected: 02/21/23 17:10
Matrix: Solid
Date Received: 02/23/23 10:30

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		02/28/23 11:31	03/01/23 14:39	1

Method: SW846 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		02/28/23 11:33	03/01/23 15:07	1

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	3.1		0.1	0.1	%			02/23/23 14:26	1
Percent Solids (EPA Moisture)	96.9		0.1	0.1	%			02/23/23 14:26	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9045D)	8.7	HF	0.1	0.1	SU			03/01/23 12:52	1

Method: EPA 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	0.307		0.147	0.151	1.00	0.159	pCi/g	03/02/23 16:22	03/23/23 02:53	1
Radium-228	0.333		0.124	0.130		0.0926	pCi/g	03/02/23 16:22	03/23/23 02:53	1

Method: SW846 9315 - Radium-226 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.335	U	0.141	0.141	1.00	0.335	pCi/L	03/15/23 09:03	04/06/23 07:38	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.5*		*30 - 110*	*03/15/23 09:03*	*04/06/23 07:38*	*1*

Method: SW846 9320 - Radium-228 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<1.89	U G	1.10	1.10	1.00	1.89	pCi/L	03/15/23 11:27	03/28/23 12:27	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*89.5*		*30 - 110*	*03/15/23 11:27*	*03/28/23 12:27*	*1*
Y Carrier	*80.7*		*30 - 110*	*03/15/23 11:27*	*03/28/23 12:27*	*1*

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Client Sample ID: LAN USACE Sand 230221 Composite

Lab Sample ID: 310-250172-1
Date Collected: 02/21/23 17:10
Matrix: Solid
Date Received: 02/23/23 10:30
Percent Solids: 96.9

Method: SW846 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<4.25		9.66	4.25	mg/Kg	☼		03/02/23 00:37	10
Chloride	<47.3		96.6	47.3	mg/Kg	☼		03/02/23 00:37	10
Sulfate	<38.6		96.6	38.6	mg/Kg	☼		03/02/23 00:37	10

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.347		0.807	0.347	mg/Kg	☼	03/29/23 10:38	03/29/23 16:04	5
Arsenic	**1.36**	**F1**	0.952	0.343	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Barium	**32.9**	**F1**	0.952	0.400	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Beryllium	**0.192**	**J F1**	0.476	0.171	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Boron	<14.3	F1	47.6	14.3	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Cadmium	<0.143	F1	0.476	0.143	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Calcium	**2230**	**F1**	143	55.2	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Chromium	**3.43**	**B**	1.43	0.457	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Cobalt	**2.91**	**F1**	0.238	0.124	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Copper	**1.66**	**F1 B**	1.43	0.723	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Lead	**1.71**	**J F1**	2.38	0.742	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Lithium	**1.94**	**J F1**	2.38	0.647	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Manganese	**317**	**F2 F1**	2.38	1.24	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Molybdenum	**0.345**	**J F1**	0.952	0.314	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Nickel	**3.65**		1.21	0.468	mg/Kg	☼	03/29/23 10:38	03/29/23 16:04	5
Selenium	**0.670**	**J F1**	1.43	0.590	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Silver	<0.143	F1	0.238	0.143	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Thallium	**0.299**		0.238	0.190	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Vanadium	**6.42**		1.43	0.352	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5
Zinc	**9.77**		4.76	2.38	mg/Kg	☼	03/08/23 10:05	03/08/23 15:17	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00758		0.0185	0.00758	mg/Kg	☼	02/27/23 10:37	02/28/23 11:46	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent (SW846 7196A)	**0.576**	**J**	1.00	0.388	mg/Kg	☼	02/27/23 07:30	02/28/23 09:28	1
Chromium, trivalent (SW846 7196A)	**2.85**		0.103	0.103	mg/Kg	☼		04/05/23 13:14	1

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Client Sample ID: LAN USACE Sand 230221-A
Date Collected: 02/21/23 11:55
Date Received: 02/23/23 10:30

Lab Sample ID: 310-250172-2
Matrix: Solid

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Yes				NONE			02/28/23 14:03	1

Client Sample Results

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Client Sample ID: LAN USACE Sand 230221-B
Date Collected: 02/21/23 16:11
Date Received: 02/23/23 10:30

Lab Sample ID: 310-250172-3
Matrix: Solid

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Yes				NONE			02/28/23 14:03	1

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Client Sample ID: LAN USACE Sand 230221-C
Date Collected: 02/21/23 16:54
Date Received: 02/23/23 10:30

Lab Sample ID: 310-250172-4
Matrix: Solid

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Yes				NONE			02/28/23 14:03	1

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Client Sample ID: LAN USACE Sand 230221-D
Date Collected: 02/21/23 17:10
Date Received: 02/23/23 10:30

Lab Sample ID: 310-250172-5
Matrix: Solid

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Yes				NONE			02/28/23 14:03	1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*1	LCS/LCSD RPD exceeds control limits.
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC Semi VOA

Qualifier	Qualifier Description
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

HPLC/IC

Qualifier	Qualifier Description
*+	LCS and/or LCSD is outside acceptance limits, high biased.

Metals

Qualifier	Qualifier Description
B	Compound was found in the blank and sample.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
F2	MS/MSD RPD exceeds control 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.

Rad

Qualifier	Qualifier Description
G	The Sample MDC is greater than the requested RL.
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated

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

Surrogate Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)		
		DBFM	TOL	BFB
Lab Sample ID	Client Sample ID	(80-121)	(80-120)	(80-121)
310-250172-1	LAN USACE Sand 230221 Compos	113	90	97
310-250172-1	LAN USACE Sand 230221 Composite	115	94	97
LB 310-380012/1-A	Method Blank	109	94	99
LB 310-380012/1-A	Method Blank	117	91	98
LCS 310-380012/2-A	Lab Control Sample	96	94	98
LCS 310-380012/2-A	Lab Control Sample	95	96	101

Surrogate Legend

DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)					
		2FP	PHL	NBZ	FBP	TBP	TPHL
Lab Sample ID	Client Sample ID	(13-110)	(18-110)	(32-113)	(30-110)	(11-130)	(33-120)
LCS 310-380119/2-A	Lab Control Sample	72	66	96	79	75	99
LCSD 310-380119/3-A	Lab Control Sample Dup	70	65	98	86	78	107

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)					
		2FP	PHL	NBZ	FBP	TBP	TPHL
Lab Sample ID	Client Sample ID	(13-110)	(18-110)	(32-113)	(30-110)	(11-130)	(33-120)
310-250172-1	LAN USACE Sand 230221 Compos	70	64	104	81	75	102
LB 310-380033/1-C	Method Blank	70	62	102	75	74	98

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Surrogate Summary

Client: SCS Engineers
Job ID: 310-250172-1
Project/Site: Lansing Generating Station
SDG: 25222159.00

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCB1	TCX1								
Lab Sample ID	Client Sample ID	(11-122)	(23-123)								
LCS 310-380114/2-A	Lab Control Sample	31	36								
LCSD 310-380114/3-A	Lab Control Sample Dup	41	62								

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)

TCX = Tetrachloro-m-xylene (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCB1	TCX1								
Lab Sample ID	Client Sample ID	(11-122)	(23-123)								
310-250172-1	LAN USACE Sand 230221 Compos	47	59								
LB 310-380033/1-B	Method Blank	36	60								

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)

TCX = Tetrachloro-m-xylene (Surr)

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCPAA1									
Lab Sample ID	Client Sample ID	(25-130)									
LCS 500-701230/2-A	Lab Control Sample	79									
LCSD 500-701230/3-A	Lab Control Sample Dup	76									
MB 500-701230/1-A	Method Blank	72									

Surrogate Legend

DCPAA = DCAA

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCPAA1									
Lab Sample ID	Client Sample ID	(25-130)									
310-250172-1	LAN USACE Sand 230221 Compos	72									
310-250172-1 MS	LAN USACE Sand 230221 Composite	72									
LB 500-701073/1-B	Method Blank	71									

Surrogate Legend

DCPAA = DCAA

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: LB 310-380012/1-A
Matrix: Solid
Analysis Batch: 380139

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			02/28/23 13:52	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			02/28/23 13:52	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			02/28/23 13:52	20
Benzene	<0.0140		0.100	0.0140	mg/L			02/28/23 13:52	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			02/28/23 13:52	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			02/28/23 13:52	20
Chloroform	<0.0360		0.100	0.0360	mg/L			02/28/23 13:52	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			02/28/23 13:52	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			02/28/23 13:52	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			02/28/23 13:52	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*109*		*80 - 121*		*02/28/23 13:52*	*20*
Toluene-d8 (Surr)	*94*		*80 - 120*		*02/28/23 13:52*	*20*
4-Bromofluorobenzene (Surr)	*99*		*80 - 121*		*02/28/23 13:52*	*20*

Lab Sample ID: LCS 310-380012/2-A
Matrix: Solid
Analysis Batch: 380139

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1-Dichloroethene	2.00	1.850		mg/L		93	46 - 124
1,2-Dichloroethane	2.00	2.035		mg/L		102	61 - 120
2-Butanone (MEK)	4.00	3.943	J	mg/L		99	47 - 150
Benzene	2.00	1.943		mg/L		97	68 - 120
Carbon tetrachloride	2.00	1.583		mg/L		79	65 - 120
Chlorobenzene	2.00	1.711		mg/L		86	66 - 120
Chloroform	2.00	2.144		mg/L		107	64 - 120
Tetrachloroethene	2.00	1.837		mg/L		92	60 - 120
Trichloroethene	2.00	2.029		mg/L		101	69 - 120
Vinyl chloride	2.00	1.372		mg/L		69	41 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*96*		*80 - 121*
Toluene-d8 (Surr)	*94*		*80 - 120*
4-Bromofluorobenzene (Surr)	*98*		*80 - 121*

Lab Sample ID: LB 310-380012/1-A
Matrix: Solid
Analysis Batch: 380249

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			03/01/23 12:17	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			03/01/23 12:17	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			03/01/23 12:17	20
Benzene	<0.0140		0.100	0.0140	mg/L			03/01/23 12:17	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			03/01/23 12:17	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			03/01/23 12:17	20

Method: 8260D - Volatile Organic Compounds by GC/MS (Continued)

Lab Sample ID: LB 310-380012/1-A
Matrix: Solid
Analysis Batch: 380249

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chloroform	<0.0360		0.100	0.0360	mg/L			03/01/23 12:17	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			03/01/23 12:17	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			03/01/23 12:17	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			03/01/23 12:17	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*117*		*80 - 121*		*03/01/23 12:17*	*20*
Toluene-d8 (Surr)	*91*		*80 - 120*		*03/01/23 12:17*	*20*
4-Bromofluorobenzene (Surr)	*98*		*80 - 121*		*03/01/23 12:17*	*20*

Lab Sample ID: LCS 310-380012/2-A
Matrix: Solid
Analysis Batch: 380249

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1-Dichloroethene	2.00	1.610		mg/L		81	46 - 124
1,2-Dichloroethane	2.00	2.038		mg/L		102	61 - 120
2-Butanone (MEK)	4.00	4.241	J	mg/L		106	47 - 150
Benzene	2.00	1.936		mg/L		97	68 - 120
Carbon tetrachloride	2.00	1.838		mg/L		92	65 - 120
Chlorobenzene	2.00	1.716		mg/L		86	66 - 120
Chloroform	2.00	2.156		mg/L		108	64 - 120
Tetrachloroethene	2.00	1.864		mg/L		93	60 - 120
Trichloroethene	2.00	2.007		mg/L		100	69 - 120
Vinyl chloride	2.00	1.338		mg/L		67	41 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*95*		*80 - 121*
Toluene-d8 (Surr)	*96*		*80 - 120*
4-Bromofluorobenzene (Surr)	*101*		*80 - 121*

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCS 310-380119/2-A
Matrix: Solid
Analysis Batch: 380224

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 380119

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.125	0.07000		mg/L		56	28 - 110
2,4,5-Trichlorophenol	0.125	0.1002		mg/L		80	43 - 118
2,4,6-Trichlorophenol	0.125	0.09598		mg/L		77	41 - 120
2,4-Dinitrotoluene	0.125	0.09871		mg/L		79	44 - 118
2-Methylphenol	0.125	0.1001		mg/L		80	40 - 117
4-Methylphenol (and/or 3-Methylphenol)	0.125	0.09899		mg/L		79	41 - 115
Hexachlorobenzene	0.125	0.09362		mg/L		75	47 - 117
Hexachlorobutadiene	0.125	0.06505		mg/L		52	24 - 110
Hexachloroethane	0.125	0.06559		mg/L		52	19 - 110
Nitrobenzene	0.125	0.1128		mg/L		90	42 - 113

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 310-380119/2-A
Matrix: Solid
Analysis Batch: 380224

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 380119

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Pentachlorophenol			0.250	0.1051		mg/L		42	11 - 148		
Pyridine			0.250	0.04900	J	mg/L		20	10 - 110		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorophenol (Surr)	*72*		*13 - 110*
Phenol-d5 (Surr)	*66*		*18 - 110*
Nitrobenzene-d5 (Surr)	*96*		*32 - 113*
2-Fluorobiphenyl (Surr)	*79*		*30 - 110*
2,4,6-Tribromophenol (Surr)	*75*		*11 - 130*
Terphenyl-d14 (Surr)	*99*		*33 - 120*

Lab Sample ID: LCSD 310-380119/3-A
Matrix: Solid
Analysis Batch: 380224

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 380119

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,4-Dichlorobenzene			0.125	0.07080		mg/L		57	28 - 110	1	35
2,4,5-Trichlorophenol			0.125	0.1097		mg/L		88	43 - 118	9	35
2,4,6-Trichlorophenol			0.125	0.1032		mg/L		83	41 - 120	7	35
2,4-Dinitrotoluene			0.125	0.1054		mg/L		84	44 - 118	7	35
2-Methylphenol			0.125	0.1008		mg/L		81	40 - 117	1	35
4-Methylphenol (and/or 3-Methylphenol)			0.125	0.1009		mg/L		81	41 - 115	2	35
Hexachlorobenzene			0.125	0.1016		mg/L		81	47 - 117	8	35
Hexachlorobutadiene			0.125	0.06567		mg/L		53	24 - 110	1	35
Hexachloroethane			0.125	0.06686		mg/L		53	19 - 110	2	35
Nitrobenzene			0.125	0.1140		mg/L		91	42 - 113	1	35
Pentachlorophenol			0.250	0.1228		mg/L		49	11 - 148	16	35
Pyridine			0.250	0.2009	*1	mg/L		80	10 - 110	122	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorophenol (Surr)	*70*		*13 - 110*
Phenol-d5 (Surr)	*65*		*18 - 110*
Nitrobenzene-d5 (Surr)	*98*		*32 - 113*
2-Fluorobiphenyl (Surr)	*86*		*30 - 110*
2,4,6-Tribromophenol (Surr)	*78*		*11 - 130*
Terphenyl-d14 (Surr)	*107*		*33 - 120*

Lab Sample ID: LB 310-380033/1-C
Matrix: Solid
Analysis Batch: 380224

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 380119

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		02/28/23 08:51	03/01/23 13:34	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		02/28/23 08:51	03/01/23 13:34	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		02/28/23 08:51	03/01/23 13:34	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		02/28/23 08:51	03/01/23 13:34	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		02/28/23 08:51	03/01/23 13:34	1

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB 310-380033/1-C
Matrix: Solid
Analysis Batch: 380224

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 380119

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		02/28/23 08:51	03/01/23 13:34	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		02/28/23 08:51	03/01/23 13:34	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		02/28/23 08:51	03/01/23 13:34	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		02/28/23 08:51	03/01/23 13:34	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		02/28/23 08:51	03/01/23 13:34	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		02/28/23 08:51	03/01/23 13:34	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		02/28/23 08:51	03/01/23 13:34	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		02/28/23 08:51	03/01/23 13:34	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*70*		*13 - 110*	*02/28/23 08:51*	*03/01/23 13:34*	*1*
Phenol-d5 (Surr)	*62*		*18 - 110*	*02/28/23 08:51*	*03/01/23 13:34*	*1*
Nitrobenzene-d5 (Surr)	*102*		*32 - 113*	*02/28/23 08:51*	*03/01/23 13:34*	*1*
2-Fluorobiphenyl (Surr)	*75*		*30 - 110*	*02/28/23 08:51*	*03/01/23 13:34*	*1*
2,4,6-Tribromophenol (Surr)	*74*		*11 - 130*	*02/28/23 08:51*	*03/01/23 13:34*	*1*
Terphenyl-d14 (Surr)	*98*		*33 - 120*	*02/28/23 08:51*	*03/01/23 13:34*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: LCS 310-380114/2-A
Matrix: Solid
Analysis Batch: 380636

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 380114

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Endrin			0.00125	0.0009273		mg/L		74	41 - 141		
gamma-BHC (Lindane)			0.00125	0.0007876		mg/L		63	36 - 136		
Heptachlor			0.00125	0.0008192		mg/L		66	26 - 127		
Heptachlor epoxide			0.00125	0.0008284		mg/L		66	39 - 138		
Methoxychlor			0.00125	0.0009057	p	mg/L		72	10 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*31*		*11 - 122*
Tetrachloro-m-xylene (Surr)	*36*		*23 - 123*

Lab Sample ID: LCSD 310-380114/3-A
Matrix: Solid
Analysis Batch: 380636

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 380114

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Endrin			0.00125	0.0009167		mg/L		73	41 - 141	1	35
gamma-BHC (Lindane)			0.00125	0.0008100		mg/L		65	36 - 136	3	35
Heptachlor			0.00125	0.0006995		mg/L		56	26 - 127	16	35
Heptachlor epoxide			0.00125	0.0008723		mg/L		70	39 - 138	5	35
Methoxychlor			0.00125	0.0008677	p	mg/L		69	10 - 150	4	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*41*		*11 - 122*

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCSD 310-380114/3-A
Matrix: Solid
Analysis Batch: 380636

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 380114

Surrogate	LCSD %Recovery	LCSD Qualifier	Limits
Tetrachloro-m-xylene (Surr)	*62*		*23 - 123*

Lab Sample ID: LB 310-380033/1-B
Matrix: Solid
Analysis Batch: 380636

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 380114

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Endrin	<0.0000500		0.000160	0.0000500	mg/L		02/28/23 08:48	03/07/23 12:46	1
gamma-BHC (Lindane)	<0.0000700		0.000160	0.0000700	mg/L		02/28/23 08:48	03/07/23 12:46	1
Heptachlor	<0.0000600		0.000160	0.0000600	mg/L		02/28/23 08:48	03/07/23 12:46	1
Heptachlor epoxide	<0.0000460		0.000160	0.0000460	mg/L		02/28/23 08:48	03/07/23 12:46	1
Methoxychlor	<0.0000700		0.000160	0.0000700	mg/L		02/28/23 08:48	03/07/23 12:46	1
Toxaphene	<0.00210		0.0100	0.00210	mg/L		02/28/23 08:48	03/07/23 12:46	1
Chlordane (technical)	<0.00110		0.0100	0.00110	mg/L		02/28/23 08:48	03/07/23 12:46	1

Surrogate	LB %Recovery	LB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCB Decachlorobiphenyl (Surr)	*36*		*11 - 122*	*02/28/23 08:48*	*03/07/23 12:46*	*1*
Tetrachloro-m-xylene (Surr)	*60*		*23 - 123*	*02/28/23 08:48*	*03/07/23 12:46*	*1*

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-701230/1-A
Matrix: Solid
Analysis Batch: 701382

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 701230

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.000500		0.00100	0.000500	mg/L		03/06/23 09:31	03/07/23 10:18	1
Silvex (2,4,5-TP)	<0.000500		0.00100	0.000500	mg/L		03/06/23 09:31	03/07/23 10:18	1

Surrogate	MB %Recovery	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
DCAA	*72*		*25 - 130*	*03/06/23 09:31*	*03/07/23 10:18*	*1*

Lab Sample ID: LCS 500-701230/2-A
Matrix: Solid
Analysis Batch: 701382

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 701230

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	0.0101	0.007998		mg/L		80	30 - 115
Silvex (2,4,5-TP)	0.00250	0.001920		mg/L		77	32 - 115

Surrogate	LCS %Recovery	LCS Qualifier	Limits
DCAA	*79*		*25 - 130*

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: LCSD 500-701230/3-A
Matrix: Solid
Analysis Batch: 701382

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 701230

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,4-D			0.0101	0.007572		mg/L		75	30 - 115	5	20
Silvex (2,4,5-TP)			0.00250	0.001812		mg/L		72	32 - 115	6	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCAA	*76*		*25 - 130*

Lab Sample ID: LB 500-701073/1-B
Matrix: Solid
Analysis Batch: 701382

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 701230

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		03/06/23 09:31	03/07/23 11:29	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		03/06/23 09:31	03/07/23 11:29	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*71*		*25 - 130*	*03/06/23 09:31*	*03/07/23 11:29*	*1*

Lab Sample ID: 310-250172-1 MS
Matrix: Solid
Analysis Batch: 701382

Client Sample ID: LAN USACE Sand 230221 Composite
Prep Type: TCLP
Prep Batch: 701230

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	<0.0500		1.01	0.7487		mg/L		75	30 - 115
Silvex (2,4,5-TP)	<0.0500		0.250	0.1694		mg/L		68	32 - 115

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCAA	*72*		*25 - 130*

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-380273/1-A
Matrix: Solid
Analysis Batch: 380373

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<4.26		9.68	4.26	mg/Kg			03/01/23 21:46	10
Chloride	<47.4		96.8	47.4	mg/Kg			03/01/23 21:46	10
Sulfate	<38.7		96.8	38.7	mg/Kg			03/01/23 21:46	10

Lab Sample ID: LCS 310-380273/2-A
Matrix: Solid
Analysis Batch: 380373

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	194	199.1		mg/Kg		103	90 - 110
Chloride	968	935.5		mg/Kg		97	90 - 110
Sulfate	968	953.4		mg/Kg		98	90 - 110

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LB 310-380019/1-A
Matrix: Solid
Analysis Batch: 380359

Client Sample ID: Method Blank
Prep Type: SPLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			02/28/23 14:43	1
Chloride	<0.500		1.00	0.500	mg/L			02/28/23 14:43	1
Sulfate	1.583		1.00	0.610	mg/L			02/28/23 14:43	1

Lab Sample ID: LCS 310-380019/2-A
Matrix: Solid
Analysis Batch: 380359

Client Sample ID: Lab Control Sample
Prep Type: SPLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	2.00	1.968		mg/L		98	90 - 110
Chloride	10.0	9.522		mg/L		95	90 - 110
Sulfate	10.0	11.30	*+	mg/L		113	90 - 110

Lab Sample ID: 310-250172-1 MS
Matrix: Solid
Analysis Batch: 380359

Client Sample ID: LAN USACE Sand 230221 Composite
Prep Type: SPLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride	<0.0750		1.00	1.025		mg/L		102	80 - 120
Chloride	<0.500		5.00	4.658		mg/L		93	80 - 120
Sulfate	<0.610	*+	5.00	5.273		mg/L		105	80 - 120

Lab Sample ID: 310-250172-1 MSD
Matrix: Solid
Analysis Batch: 380359

Client Sample ID: LAN USACE Sand 230221 Composite
Prep Type: SPLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	<0.0750		1.00	1.009		mg/L		101	80 - 120	2	15
Chloride	<0.500		5.00	4.653		mg/L		93	80 - 120	0	15
Sulfate	<0.610	*+	5.00	5.325		mg/L		107	80 - 120	1	15

Method: 6010D - Metals (ICP)

Lab Sample ID: LB 310-380032/1-C
Matrix: Solid
Analysis Batch: 380350

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 380226

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.100		0.200	0.100	mg/L		03/01/23 09:50	03/02/23 10:33	1
Barium	<0.110		0.500	0.110	mg/L		03/01/23 09:50	03/02/23 10:33	1
Cadmium	<0.00780		0.0200	0.00780	mg/L		03/01/23 09:50	03/02/23 10:33	1
Chromium	<0.00870		0.0200	0.00870	mg/L		03/01/23 09:50	03/02/23 10:33	1
Lead	<0.0500		0.100	0.0500	mg/L		03/01/23 09:50	03/02/23 10:33	1
Selenium	<0.0670		0.100	0.0670	mg/L		03/01/23 09:50	03/02/23 10:33	1
Silver	<0.00940		0.0200	0.00940	mg/L		03/01/23 09:50	03/02/23 10:33	1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LCS 310-380032/2-C
Matrix: Solid
Analysis Batch: 380350

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 380226

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	4.00	4.088		mg/L		102	80 - 120
Barium	2.00	1.859		mg/L		93	80 - 120
Cadmium	2.00	1.968		mg/L		98	80 - 120
Chromium	2.00	1.953		mg/L		98	80 - 120
Lead	4.00	3.830		mg/L		96	80 - 120
Selenium	8.00	8.310		mg/L		104	80 - 120
Silver	2.00	2.030		mg/L		102	80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-380579/1-A ^5
Matrix: Solid
Analysis Batch: 380884

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 380579

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.415		0.964	0.415	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Arsenic	<0.347		0.964	0.347	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Barium	<0.405		0.964	0.405	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Beryllium	<0.174		0.482	0.174	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Boron	<14.5		48.2	14.5	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Cadmium	<0.145		0.482	0.145	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Calcium	<55.9		145	55.9	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Chromium	0.5335	J	1.45	0.463	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Cobalt	<0.125		0.241	0.125	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Copper	1.437	J	1.45	0.733	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Lead	<0.752		2.41	0.752	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Lithium	<0.656		2.41	0.656	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Manganese	<1.25		2.41	1.25	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Molybdenum	<0.318		0.964	0.318	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Nickel	3.083		1.45	0.559	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Selenium	<0.598		1.45	0.598	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Silver	<0.145		0.241	0.145	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Thallium	<0.193		0.241	0.193	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Vanadium	<0.357		1.45	0.357	mg/Kg		03/08/23 10:05	03/08/23 15:12	5
Zinc	<2.41		4.82	2.41	mg/Kg		03/08/23 10:05	03/08/23 15:12	5

Lab Sample ID: LCS 310-380579/2-A ^20
Matrix: Solid
Analysis Batch: 380884

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 380579

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	191	211.4		mg/Kg		111	80 - 120
Barium	95.3	109.7		mg/Kg		115	80 - 120
Beryllium	95.3	111.2		mg/Kg		117	80 - 120
Boron	191	212.1		mg/Kg		111	80 - 120
Cadmium	95.3	110.6		mg/Kg		116	80 - 120
Calcium	1910	2105		mg/Kg		110	80 - 120
Chromium	95.3	101.0		mg/Kg		106	80 - 120
Cobalt	95.3	113.7		mg/Kg		119	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-380579/2-A ^20
Matrix: Solid
Analysis Batch: 380884

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 380579

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Copper	191	227.4		mg/Kg		119	80 - 120
Lead	191	213.2		mg/Kg		112	80 - 120
Lithium	191	224.8		mg/Kg		118	80 - 120
Manganese	95.3	101.4		mg/Kg		106	80 - 120
Molybdenum	191	213.0		mg/Kg		112	80 - 120
Nickel	191	218.9		mg/Kg		115	80 - 120
Selenium	381	422.1		mg/Kg		111	80 - 120
Silver	95.3	114.1		mg/Kg		120	80 - 120
Thallium	191	177.6		mg/Kg		93	80 - 120
Vanadium	95.3	102.0		mg/Kg		107	80 - 120
Zinc	191	199.9		mg/Kg		105	80 - 120

Lab Sample ID: 310-250172-1 MS
Matrix: Solid
Analysis Batch: 380884

Client Sample ID: LAN USACE Sand 230221 Composite
Prep Type: Total/NA
Prep Batch: 380579

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.36	F1	191	220.2		mg/Kg	☼	114	75 - 125
Barium	32.9	F1	95.7	159.6	F1	mg/Kg	☼	132	75 - 125
Beryllium	0.192	J F1	95.7	113.9		mg/Kg	☼	119	75 - 125
Boron	<14.3	F1	191	217.7		mg/Kg	☼	114	75 - 125
Cadmium	<0.143	F1	95.7	112.7		mg/Kg	☼	118	75 - 125
Calcium	2230	F1	1910	4282		mg/Kg	☼	107	75 - 125
Chromium	3.43	B	95.7	108.9		mg/Kg	☼	110	75 - 125
Cobalt	2.91	F1	95.7	122.7		mg/Kg	☼	125	75 - 125
Copper	1.66	F1 B	191	235.8		mg/Kg	☼	122	75 - 125
Lead	1.71	J F1	191	224.9		mg/Kg	☼	117	75 - 125
Lithium	1.94	J F1	191	232.4		mg/Kg	☼	120	75 - 125
Manganese	317	F2 F1	95.7	575.6	F1	mg/Kg	☼	270	75 - 125
Molybdenum	0.345	J F1	191	220.5		mg/Kg	☼	115	75 - 125
Selenium	0.670	J F1	383	439.3	E	mg/Kg	☼	115	75 - 125
Silver	<0.143	F1	95.7	118.1		mg/Kg	☼	123	75 - 125
Thallium	0.299		191	183.6		mg/Kg	☼	96	75 - 125
Vanadium	6.42		95.7	111.4		mg/Kg	☼	110	75 - 125
Zinc	9.77		191	216.3		mg/Kg	☼	108	75 - 125

Lab Sample ID: 310-250172-1 MSD
Matrix: Solid
Analysis Batch: 380884

Client Sample ID: LAN USACE Sand 230221 Composite
Prep Type: Total/NA
Prep Batch: 380579

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	1.36	F1	190	246.4	F1	mg/Kg	☼	129	75 - 125	11	20
Barium	32.9	F1	95.1	160.3	F1	mg/Kg	☼	134	75 - 125	0	20
Beryllium	0.192	J F1	95.1	127.2	F1	mg/Kg	☼	134	75 - 125	11	20
Boron	<14.3	F1	190	240.7	F1	mg/Kg	☼	127	75 - 125	10	20
Cadmium	<0.143	F1	95.1	128.0	F1	mg/Kg	☼	135	75 - 125	13	20
Calcium	2230	F1	1900	4696	F1	mg/Kg	☼	130	75 - 125	9	20
Chromium	3.43	B	95.1	121.4		mg/Kg	☼	124	75 - 125	11	20
Cobalt	2.91	F1	95.1	135.7	F1	mg/Kg	☼	140	75 - 125	10	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-250172-1 MSD
Matrix: Solid
Analysis Batch: 380884

Client Sample ID: LAN USACE Sand 230221 Composite
Prep Type: Total/NA
Prep Batch: 380579

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Copper	1.66	F1 B	190	262.6	F1	mg/Kg	☼	137	75 - 125	11	20
Lead	1.71	J F1	190	250.8	F1	mg/Kg	☼	131	75 - 125	11	20
Lithium	1.94	J F1	190	260.4	F1	mg/Kg	☼	136	75 - 125	11	20
Manganese	317	F2 F1	95.1	448.6	F1 F2	mg/Kg	☼	139	75 - 125	25	20
Molybdenum	0.345	J F1	190	246.3	F1	mg/Kg	☼	129	75 - 125	11	20
Selenium	0.670	J F1	380	491.1	E F1	mg/Kg	☼	129	75 - 125	11	20
Silver	<0.143	F1	95.1	133.6	F1	mg/Kg	☼	140	75 - 125	12	20
Thallium	0.299		190	200.5		mg/Kg	☼	105	75 - 125	9	20
Vanadium	6.42		95.1	123.7		mg/Kg	☼	123	75 - 125	10	20
Zinc	9.77		190	239.2		mg/Kg	☼	121	75 - 125	10	20

Lab Sample ID: MB 310-382361/1-A ^5
Matrix: Solid
Analysis Batch: 382647

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 382361

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.342		0.796	0.342	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Arsenic	<0.287		0.796	0.287	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Barium	<0.334		0.796	0.334	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Beryllium	<0.143		0.398	0.143	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Boron	<11.9		39.8	11.9	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Cadmium	<0.119		0.398	0.119	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Calcium	<46.2		119	46.2	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Chromium	<0.382		1.19	0.382	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Cobalt	<0.104		0.199	0.104	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Copper	<0.605		1.19	0.605	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Lead	<0.621		1.99	0.621	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Lithium	<0.541		1.99	0.541	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Manganese	<1.04		1.99	1.04	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Molybdenum	<0.263		0.796	0.263	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Nickel	<0.462		1.19	0.462	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Selenium	<0.494		1.19	0.494	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Silver	<0.119		0.199	0.119	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Thallium	<0.159		0.199	0.159	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Vanadium	<0.295		1.19	0.295	mg/Kg		03/29/23 10:38	03/29/23 15:57	5
Zinc	<1.99		3.98	1.99	mg/Kg		03/29/23 10:38	03/29/23 15:57	5

Lab Sample ID: LCS 310-382361/2-A ^20
Matrix: Solid
Analysis Batch: 382647

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 382361

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	163	177.0		mg/Kg		108	80 - 120
Arsenic	163	181.6		mg/Kg		111	80 - 120
Barium	81.7	94.31		mg/Kg		115	80 - 120
Beryllium	81.7	91.22		mg/Kg		112	80 - 120
Boron	163	173.3		mg/Kg		106	80 - 120
Cadmium	81.7	97.03		mg/Kg		119	80 - 120
Calcium	1630	1765		mg/Kg		108	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-382361/2-A ^20
Matrix: Solid
Analysis Batch: 382647

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 382361

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium	81.7	89.53		mg/Kg		110	80 - 120
Cobalt	81.7	88.60		mg/Kg		108	80 - 120
Copper	163	182.2		mg/Kg		112	80 - 120
Lead	163	183.5		mg/Kg		112	80 - 120
Lithium	163	178.3		mg/Kg		109	80 - 120
Manganese	81.7	88.54		mg/Kg		108	80 - 120
Molybdenum	163	180.7		mg/Kg		111	80 - 120
Nickel	163	181.4		mg/Kg		111	80 - 120
Selenium	327	353.5		mg/Kg		108	80 - 120
Silver	81.7	90.83		mg/Kg		111	80 - 120
Thallium	163	168.3		mg/Kg		103	80 - 120
Vanadium	81.7	88.28		mg/Kg		108	80 - 120
Zinc	163	174.9		mg/Kg		107	80 - 120

Lab Sample ID: LB 310-380017/1-C
Matrix: Solid
Analysis Batch: 380599

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 380332

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00550		0.0100	0.00550	mg/L		03/03/23 09:55	03/06/23 14:04	1
Arsenic	<0.00380		0.0100	0.00380	mg/L		03/03/23 09:55	03/06/23 14:04	1
Barium	<0.0200		0.100	0.0200	mg/L		03/03/23 09:55	03/06/23 14:04	1
Beryllium	<0.00140		0.00500	0.00140	mg/L		03/03/23 09:55	03/06/23 14:04	1
Boron	<0.290		0.500	0.290	mg/L		03/03/23 09:55	03/06/23 14:04	1
Cadmium	0.0003950	J	0.00250	0.000280	mg/L		03/03/23 09:55	03/06/23 14:04	1
Calcium	<1.30		2.50	1.30	mg/L		03/03/23 09:55	03/06/23 14:04	1
Chromium	<0.00720		0.0250	0.00720	mg/L		03/03/23 09:55	03/06/23 14:04	1
Cobalt	0.001195	J	0.00250	0.000950	mg/L		03/03/23 09:55	03/06/23 14:04	1
Copper	<0.0160		0.0500	0.0160	mg/L		03/03/23 09:55	03/06/23 14:04	1
Lead	<0.00160		0.00500	0.00160	mg/L		03/03/23 09:55	03/06/23 14:04	1
Lithium	<0.0160		0.0500	0.0160	mg/L		03/03/23 09:55	03/06/23 14:04	1
Molybdenum	<0.00920		0.0250	0.00920	mg/L		03/03/23 09:55	03/06/23 14:04	1
Selenium	<0.00830		0.0250	0.00830	mg/L		03/03/23 09:55	03/06/23 14:04	1
Thallium	<0.00240		0.00500	0.00240	mg/L		03/03/23 09:55	03/06/23 14:04	1

Lab Sample ID: LCS 310-380017/2-C
Matrix: Solid
Analysis Batch: 380599

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 380332

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	1.00	1.054		mg/L		105	80 - 120
Arsenic	1.00	0.9743		mg/L		97	80 - 120
Barium	0.500	0.5003		mg/L		100	80 - 120
Beryllium	0.500	0.5212		mg/L		104	80 - 120
Boron	1.00	1.068		mg/L		107	80 - 120
Cadmium	0.500	0.4913		mg/L		98	80 - 120
Calcium	10.0	10.80		mg/L		108	80 - 120
Chromium	0.500	0.4778		mg/L		96	80 - 120
Cobalt	0.500	0.4879		mg/L		98	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-380017/2-C
Matrix: Solid
Analysis Batch: 380599

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 380332

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Copper	1.00	1.102		mg/L		110	80 - 120
Lead	1.00	1.014		mg/L		101	80 - 120
Lithium	1.00	1.063		mg/L		106	80 - 120
Molybdenum	1.00	0.9969		mg/L		100	80 - 120
Selenium	2.00	1.904		mg/L		95	80 - 120
Thallium	1.00	0.9086		mg/L		91	80 - 120

Lab Sample ID: 310-250172-1 MS
Matrix: Solid
Analysis Batch: 380599

Client Sample ID: LAN USACE Sand 230221 Composite
Prep Type: SPLP West
Prep Batch: 380332

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<0.00550		1.00	1.052		mg/L		105	75 - 125
Arsenic	0.00389	J	1.00	0.9792		mg/L		98	75 - 125
Barium	0.0253	J	0.500	0.5227		mg/L		99	75 - 125
Beryllium	<0.00140		0.500	0.5259		mg/L		105	75 - 125
Boron	<0.290		1.00	1.040		mg/L		104	75 - 125
Cadmium	0.000695	J B	0.500	0.4851		mg/L		97	75 - 125
Calcium	3.50		10.0	13.37		mg/L		99	75 - 125
Chromium	0.00747	J	0.500	0.4859		mg/L		96	75 - 125
Cobalt	0.00174	J B	0.500	0.4806		mg/L		96	75 - 125
Copper	<0.0160		1.00	1.097		mg/L		110	75 - 125
Lead	0.00263	J	1.00	1.031		mg/L		103	75 - 125
Lithium	<0.0160		1.00	1.075		mg/L		107	75 - 125
Molybdenum	<0.00920		1.00	0.9857		mg/L		99	75 - 125
Selenium	<0.00830		2.00	1.914		mg/L		96	75 - 125
Thallium	0.00402	J	1.00	0.9213		mg/L		92	75 - 125

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LB 310-380032/1-B
Matrix: Solid
Analysis Batch: 380282

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 380146

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		02/28/23 11:31	03/01/23 14:31	1

Lab Sample ID: LCS 310-380032/2-B
Matrix: Solid
Analysis Batch: 380282

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 380146

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0167	0.01710		mg/L		103	80 - 120

Lab Sample ID: LB 310-380017/1-B
Matrix: Solid
Analysis Batch: 380282

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 380148

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		02/28/23 11:33	03/01/23 15:03	1

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LCS 310-380017/2-B
Matrix: Solid
Analysis Batch: 380282

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 380148

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0167	0.01729		mg/L		104	80 - 120

Lab Sample ID: 310-250172-1 MS
Matrix: Solid
Analysis Batch: 380282

Client Sample ID: LAN USACE Sand 230221 Composite
Prep Type: SPLP West
Prep Batch: 380148

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.00150		0.0167	0.01702		mg/L		102	80 - 120

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 310-380040/1-A
Matrix: Solid
Analysis Batch: 380162

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 380040

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00808		0.0197	0.00808	mg/Kg		02/27/23 10:37	02/28/23 11:31	1

Lab Sample ID: LCS 310-380040/2-A
Matrix: Solid
Analysis Batch: 380162

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 380040

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.163	0.1637		mg/Kg		101	80 - 120

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 500-700229/1-A
Matrix: Solid
Analysis Batch: 700504

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 700229

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	<0.388		1.00	0.388	mg/Kg		02/27/23 07:30	02/28/23 09:25	1

Lab Sample ID: LCS 500-700229/2-A
Matrix: Solid
Analysis Batch: 700504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 700229

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium, hexavalent	20.0	18.98		mg/Kg		95	80 - 120

Lab Sample ID: LCS 500-700229/3-A
Matrix: Solid
Analysis Batch: 700504

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 700229

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium, hexavalent	1820	1569		mg/Kg		86	80 - 120

Method: 9045D - pH

Lab Sample ID: LCS 310-380266/1
Matrix: Solid
Analysis Batch: 380266

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		101	98 - 102

Lab Sample ID: 310-250172-1 DU
Matrix: Solid
Analysis Batch: 380266

Client Sample ID: LAN USACE Sand 230221 Composite
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	8.7	HF	8.9		SU		2	20

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-602232/1-A
Matrix: Solid
Analysis Batch: 604772

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 602232

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.266	U	0.149	0.149	1.00	0.266	pCi/g	03/02/23 16:22	03/23/23 08:58	1
Radium-228	<0.149	U	0.0648	0.0648		0.149	pCi/g	03/02/23 16:22	03/23/23 08:58	1

Lab Sample ID: LCS 160-602232/2-A
Matrix: Solid
Analysis Batch: 604771

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 602232

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Americium-241	96.1	95.21		11.4		1.13	pCi/g	99	75 - 125
Cesium-137	25.4	25.55		3.12		0.224	pCi/g	101	75 - 125
Cobalt-60	7.02	7.256		0.917		0.0857	pCi/g	103	75 - 125

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-603678/1-A
Matrix: Solid
Analysis Batch: 606320

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 603678

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.0919	U	0.0365	0.0365	1.00	0.0919	pCi/L	03/15/23 09:03	04/06/23 07:37	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*85.6*		*30 - 110*	*03/15/23 09:03*	*04/06/23 07:37*	*1*

Lab Sample ID: LCS 160-603678/2-A
Matrix: Solid
Analysis Batch: 606320

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 603678

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Radium-226	11.3	11.47		1.19	1.00	0.107	pCi/L	101	75 - 125

Method: 9315 - Radium-226 (GFPC) (Continued)

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	89.3		30 - 110

Lab Sample ID: LCSD 160-603678/3-A
Matrix: Solid
Analysis Batch: 606320

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 603678

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	11.83		1.22	1.00	0.0981	pCi/L	104	75 - 125	0.15	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	88.1		30 - 110

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-603701/1-A
Matrix: Solid
Analysis Batch: 605258

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 603701

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.623	U	0.337	0.337	1.00	0.623	pCi/L	03/15/23 11:27	03/28/23 12:26	1

Carrier	MB %Yield	MB Qualifier	Limits	Prepared	Analyzed	Dil Fac
Ba Carrier	85.6		30 - 110	03/15/23 11:27	03/28/23 12:26	1
Y Carrier	83.7		30 - 110	03/15/23 11:27	03/28/23 12:26	1

Lab Sample ID: LCS 160-603701/2-A
Matrix: Solid
Analysis Batch: 605258

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 603701

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			8.08	9.038		1.25	1.00	0.488	pCi/L	112	75 - 125		

Carrier	LCS %Yield	LCS Qualifier	Limits
Ba Carrier	89.3		30 - 110
Y Carrier	85.2		30 - 110

Lab Sample ID: LCSD 160-603701/3-A
Matrix: Solid
Analysis Batch: 605258

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 603701

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			8.08	8.671		1.23	1.00	0.516	pCi/L	107	75 - 125	0.15	1

Carrier	LCSD %Yield	LCSD Qualifier	Limits
Ba Carrier	88.1		30 - 110
Y Carrier	83.7		30 - 110

GC/MS VOA

Leach Batch: 380012

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	1311	
LB 310-380012/1-A	Method Blank	TCLP	Solid	1311	
LCS 310-380012/2-A	Lab Control Sample	TCLP	Solid	1311	

Analysis Batch: 380139

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	8260D	380012
LB 310-380012/1-A	Method Blank	TCLP	Solid	8260D	380012
LCS 310-380012/2-A	Lab Control Sample	TCLP	Solid	8260D	380012

Analysis Batch: 380249

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	8260D	380012
LB 310-380012/1-A	Method Blank	TCLP	Solid	8260D	380012
LCS 310-380012/2-A	Lab Control Sample	TCLP	Solid	8260D	380012

GC/MS Semi VOA

Leach Batch: 380033

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	1311	
LB 310-380033/1-C	Method Blank	TCLP	Solid	1311	

Prep Batch: 380119

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	3510C	380033
LB 310-380033/1-C	Method Blank	TCLP	Solid	3510C	380033
LCS 310-380119/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 310-380119/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

Analysis Batch: 380224

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	8270E	380119
LB 310-380033/1-C	Method Blank	TCLP	Solid	8270E	380119
LCS 310-380119/2-A	Lab Control Sample	Total/NA	Solid	8270E	380119
LCSD 310-380119/3-A	Lab Control Sample Dup	Total/NA	Solid	8270E	380119

GC Semi VOA

Leach Batch: 380033

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	1311	
LB 310-380033/1-B	Method Blank	TCLP	Solid	1311	

Prep Batch: 380114

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	3510C	380033
LB 310-380033/1-B	Method Blank	TCLP	Solid	3510C	380033
LCS 310-380114/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 310-380114/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

GC Semi VOA

Analysis Batch: 380636

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	8081B	380114
LB 310-380033/1-B	Method Blank	TCLP	Solid	8081B	380114
LCS 310-380114/2-A	Lab Control Sample	Total/NA	Solid	8081B	380114
LCSD 310-380114/3-A	Lab Control Sample Dup	Total/NA	Solid	8081B	380114

Leach Batch: 701073

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	1311	
LB 500-701073/1-B	Method Blank	TCLP	Solid	1311	
310-250172-1 MS	LAN USACE Sand 230221 Composite	TCLP	Solid	1311	

Prep Batch: 701230

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	8151A	701073
LB 500-701073/1-B	Method Blank	TCLP	Solid	8151A	701073
MB 500-701230/1-A	Method Blank	Total/NA	Solid	8151A	
LCS 500-701230/2-A	Lab Control Sample	Total/NA	Solid	8151A	
LCSD 500-701230/3-A	Lab Control Sample Dup	Total/NA	Solid	8151A	
310-250172-1 MS	LAN USACE Sand 230221 Composite	TCLP	Solid	8151A	701073

Analysis Batch: 701382

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	8151A	701230
LB 500-701073/1-B	Method Blank	TCLP	Solid	8151A	701230
MB 500-701230/1-A	Method Blank	Total/NA	Solid	8151A	701230
LCS 500-701230/2-A	Lab Control Sample	Total/NA	Solid	8151A	701230
LCSD 500-701230/3-A	Lab Control Sample Dup	Total/NA	Solid	8151A	701230
310-250172-1 MS	LAN USACE Sand 230221 Composite	TCLP	Solid	8151A	701230

HPLC/IC

Leach Batch: 380019

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP	Solid	1312	
LB 310-380019/1-A	Method Blank	SPLP	Solid	1312	
LCS 310-380019/2-A	Lab Control Sample	SPLP	Solid	1312	
310-250172-1 MS	LAN USACE Sand 230221 Composite	SPLP	Solid	1312	
310-250172-1 MSD	LAN USACE Sand 230221 Composite	SPLP	Solid	1312	

Leach Batch: 380273

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Soluble	Solid	DI Leach	
MB 310-380273/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 310-380273/2-A	Lab Control Sample	Soluble	Solid	DI Leach	

Analysis Batch: 380359

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP	Solid	9056A	380019
LB 310-380019/1-A	Method Blank	SPLP	Solid	9056A	380019
LCS 310-380019/2-A	Lab Control Sample	SPLP	Solid	9056A	380019
310-250172-1 MS	LAN USACE Sand 230221 Composite	SPLP	Solid	9056A	380019

HPLC/IC (Continued)

Analysis Batch: 380359 (Continued)

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1 MSD	LAN USACE Sand 230221 Composite	SPLP	Solid	9056A	380019

Analysis Batch: 380373

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Soluble	Solid	9056A	380273
MB 310-380273/1-A	Method Blank	Soluble	Solid	9056A	380273
LCS 310-380273/2-A	Lab Control Sample	Soluble	Solid	9056A	380273

Metals

Leach Batch: 380017

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP West	Solid	1312	
LB 310-380017/1-B	Method Blank	SPLP West	Solid	1312	
LB 310-380017/1-C	Method Blank	SPLP West	Solid	1312	
LCS 310-380017/2-B	Lab Control Sample	SPLP West	Solid	1312	
LCS 310-380017/2-C	Lab Control Sample	SPLP West	Solid	1312	
310-250172-1 MS	LAN USACE Sand 230221 Composite	SPLP West	Solid	1312	

Leach Batch: 380032

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	1311	
LB 310-380032/1-B	Method Blank	TCLP	Solid	1311	
LB 310-380032/1-C	Method Blank	TCLP	Solid	1311	
LCS 310-380032/2-B	Lab Control Sample	TCLP	Solid	1311	
LCS 310-380032/2-C	Lab Control Sample	TCLP	Solid	1311	

Prep Batch: 380040

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	7471B	
MB 310-380040/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 310-380040/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Prep Batch: 380146

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	7470A	380032
LB 310-380032/1-B	Method Blank	TCLP	Solid	7470A	380032
LCS 310-380032/2-B	Lab Control Sample	TCLP	Solid	7470A	380032

Prep Batch: 380148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP West	Solid	7470A	380017
LB 310-380017/1-B	Method Blank	SPLP West	Solid	7470A	380017
LCS 310-380017/2-B	Lab Control Sample	SPLP West	Solid	7470A	380017
310-250172-1 MS	LAN USACE Sand 230221 Composite	SPLP West	Solid	7470A	380017

Analysis Batch: 380162

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	7471B	380040
MB 310-380040/1-A	Method Blank	Total/NA	Solid	7471B	380040
LCS 310-380040/2-A	Lab Control Sample	Total/NA	Solid	7471B	380040

Metals

Prep Batch: 380226

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	3010A	380032
LB 310-380032/1-C	Method Blank	TCLP	Solid	3010A	380032
LCS 310-380032/2-C	Lab Control Sample	TCLP	Solid	3010A	380032

Analysis Batch: 380282

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP West	Solid	7470A	380148
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	7470A	380146
LB 310-380017/1-B	Method Blank	SPLP West	Solid	7470A	380148
LB 310-380032/1-B	Method Blank	TCLP	Solid	7470A	380146
LCS 310-380017/2-B	Lab Control Sample	SPLP West	Solid	7470A	380148
LCS 310-380032/2-B	Lab Control Sample	TCLP	Solid	7470A	380146
310-250172-1 MS	LAN USACE Sand 230221 Composite	SPLP West	Solid	7470A	380148

Prep Batch: 380332

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP West	Solid	3010A	380017
LB 310-380017/1-C	Method Blank	SPLP West	Solid	3010A	380017
LCS 310-380017/2-C	Lab Control Sample	SPLP West	Solid	3010A	380017
310-250172-1 MS	LAN USACE Sand 230221 Composite	SPLP West	Solid	3010A	380017

Analysis Batch: 380350

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	TCLP	Solid	6010D	380226
LB 310-380032/1-C	Method Blank	TCLP	Solid	6010D	380226
LCS 310-380032/2-C	Lab Control Sample	TCLP	Solid	6010D	380226

Prep Batch: 380579

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	3050B	
MB 310-380579/1-A ^5	Method Blank	Total/NA	Solid	3050B	
LCS 310-380579/2-A ^20	Lab Control Sample	Total/NA	Solid	3050B	
310-250172-1 MS	LAN USACE Sand 230221 Composite	Total/NA	Solid	3050B	
310-250172-1 MSD	LAN USACE Sand 230221 Composite	Total/NA	Solid	3050B	

Analysis Batch: 380599

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP West	Solid	6020B	380332
LB 310-380017/1-C	Method Blank	SPLP West	Solid	6020B	380332
LCS 310-380017/2-C	Lab Control Sample	SPLP West	Solid	6020B	380332
310-250172-1 MS	LAN USACE Sand 230221 Composite	SPLP West	Solid	6020B	380332

Analysis Batch: 380884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	6020B	380579
MB 310-380579/1-A ^5	Method Blank	Total/NA	Solid	6020B	380579
LCS 310-380579/2-A ^20	Lab Control Sample	Total/NA	Solid	6020B	380579
310-250172-1 MS	LAN USACE Sand 230221 Composite	Total/NA	Solid	6020B	380579
310-250172-1 MSD	LAN USACE Sand 230221 Composite	Total/NA	Solid	6020B	380579

Metals

Prep Batch: 382361

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	3050B	
MB 310-382361/1-A ^5	Method Blank	Total/NA	Solid	3050B	
LCS 310-382361/2-A ^20	Lab Control Sample	Total/NA	Solid	3050B	

Analysis Batch: 382647

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	6020B	382361
MB 310-382361/1-A ^5	Method Blank	Total/NA	Solid	6020B	382361
LCS 310-382361/2-A ^20	Lab Control Sample	Total/NA	Solid	6020B	382361

General Chemistry

Analysis Batch: 379854

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	Moisture	

Leach Batch: 380253

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Soluble	Solid	DI Leach	
310-250172-1 DU	LAN USACE Sand 230221 Composite	Soluble	Solid	DI Leach	

Analysis Batch: 380266

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Soluble	Solid	9045D	380253
LCS 310-380266/1	Lab Control Sample	Total/NA	Solid	9045D	
310-250172-1 DU	LAN USACE Sand 230221 Composite	Soluble	Solid	9045D	380253

Prep Batch: 700229

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	3060A	
MB 500-700229/1-A	Method Blank	Total/NA	Solid	3060A	
LCS 500-700229/2-A	Lab Control Sample	Total/NA	Solid	3060A	
LCS 500-700229/3-A	Lab Control Sample	Total/NA	Solid	3060A	

Analysis Batch: 700504

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	7196A	700229
MB 500-700229/1-A	Method Blank	Total/NA	Solid	7196A	700229
LCS 500-700229/2-A	Lab Control Sample	Total/NA	Solid	7196A	700229
LCS 500-700229/3-A	Lab Control Sample	Total/NA	Solid	7196A	700229

Analysis Batch: 705141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	7196A	

Rad

Leach Batch: 601848

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	Dry and Grind	

Rad

Prep Batch: 602232

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	Total/NA	Solid	Fill_Geo-21	601848
MB 160-602232/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-602232/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	

Leach Batch: 602345

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP West	Solid	1312	

Prep Batch: 603678

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP West	Solid	PrecSep-21	602345
MB 160-603678/1-A	Method Blank	Total/NA	Solid	PrecSep-21	
LCS 160-603678/2-A	Lab Control Sample	Total/NA	Solid	PrecSep-21	
LCSD 160-603678/3-A	Lab Control Sample Dup	Total/NA	Solid	PrecSep-21	

Prep Batch: 603701

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-1	LAN USACE Sand 230221 Composite	SPLP West	Solid	PrecSep_0	602345
MB 160-603701/1-A	Method Blank	Total/NA	Solid	PrecSep_0	
LCS 160-603701/2-A	Lab Control Sample	Total/NA	Solid	PrecSep_0	
LCSD 160-603701/3-A	Lab Control Sample Dup	Total/NA	Solid	PrecSep_0	

Organic Prep

Analysis Batch: 380171

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-250172-2	LAN USACE Sand 230221-A	Total/NA	Solid	Composite	
310-250172-3	LAN USACE Sand 230221-B	Total/NA	Solid	Composite	
310-250172-4	LAN USACE Sand 230221-C	Total/NA	Solid	Composite	
310-250172-5	LAN USACE Sand 230221-D	Total/NA	Solid	Composite	

Lab Chronicle

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Client Sample ID: LAN USACE Sand 230221 Composite

Lab Sample ID: 310-250172-1

Date Collected: 02/21/23 17:10
Date Received: 02/23/23 10:30

Matrix: Solid

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			380012	FK4Z	EET CF	02/27/23 14:00 - 02/28/23 06:15 [1]
TCLP	Analysis	8260D		20	380139	FE5V	EET CF	02/28/23 16:17
TCLP	Leach	1311			380012	FK4Z	EET CF	02/27/23 14:00 - 02/28/23 06:15 [1]
TCLP	Analysis	8260D		20	380249	FE5V	EET CF	03/01/23 13:55
TCLP	Leach	1311			380033	FK4Z	EET CF	02/27/23 14:00 - 02/28/23 06:15 [1]
TCLP	Prep	3510C			380119	Y6AF	EET CF	02/28/23 08:51
TCLP	Analysis	8270E		1	380224	L0FS	EET CF	03/01/23 14:53
TCLP	Leach	1311			380033	FK4Z	EET CF	02/27/23 14:00 - 02/28/23 06:15 [1]
TCLP	Prep	3510C			380114	Y6AF	EET CF	02/28/23 08:48
TCLP	Analysis	8081B		1	380636	BW2O	EET CF	03/07/23 13:25
TCLP	Leach	1311			701073	DAK	EET CHI	02/27/23 14:00 - 02/28/23 06:15 [1]
TCLP	Prep	8151A			701230	DAK	EET CHI	03/06/23 09:31
TCLP	Analysis	8151A		1	701382	SS	EET CHI	03/07/23 12:17
SPLP	Leach	1312			380019	FK4Z	EET CF	02/27/23 14:00 - 02/28/23 06:15 [1]
SPLP	Analysis	9056A		1	380359	QTZ5	EET CF	02/28/23 15:12
TCLP	Leach	1311			380032	FK4Z	EET CF	02/27/23 14:00 - 02/28/23 06:15 [1]
TCLP	Prep	3010A			380226	KCK5	EET CF	03/01/23 09:50
TCLP	Analysis	6010D		1	380350	ZRI4	EET CF	03/02/23 10:45
SPLP West	Leach	1312			380017	FK4Z	EET CF	02/27/23 14:00 - 02/28/23 06:15 [1]
SPLP West	Prep	3010A			380332	KCK5	EET CF	03/03/23 09:55
SPLP West	Analysis	6020B		1	380599	DHM5	EET CF	03/06/23 14:10
SPLP West	Leach	1312			380017	FK4Z	EET CF	02/27/23 14:00 - 02/28/23 06:15 [1]
SPLP West	Prep	7470A			380148	XXW3	EET CF	02/28/23 11:33
SPLP West	Analysis	7470A		1	380282	DHM5	EET CF	03/01/23 15:07
TCLP	Leach	1311			380032	FK4Z	EET CF	02/27/23 14:00 - 02/28/23 06:15 [1]
TCLP	Prep	7470A			380146	XXW3	EET CF	02/28/23 11:31
TCLP	Analysis	7470A		1	380282	DHM5	EET CF	03/01/23 14:39
Soluble	Leach	DI Leach			380253	HE7K	EET CF	03/01/23 11:00
Soluble	Analysis	9045D		1	380266	HE7K	EET CF	03/01/23 12:52
Total/NA	Analysis	Moisture		1	379854	A3GU	EET CF	02/23/23 14:26
Total/NA	Leach	Dry and Grind			601848	SAC	EET SL	02/28/23 12:06
Total/NA	Prep	Fill_Geo-21			602232	SAC	EET SL	03/02/23 16:22
Total/NA	Analysis	901.1		1	604766	CAH	EET SL	03/23/23 02:53
SPLP West	Leach	1312			602345	SRE	EET SL	02/27/23 14:00 - 02/28/23 06:15 [1]
SPLP West	Prep	PrecSep-21			603678	DJP	EET SL	03/15/23 09:03
SPLP West	Analysis	9315		1	606320	FLC	EET SL	04/06/23 07:38
SPLP West	Leach	1312			602345	SRE	EET SL	02/27/23 14:00 - 02/28/23 06:15 [1]
SPLP West	Prep	PrecSep_0			603701	DJP	EET SL	03/15/23 11:27
SPLP West	Analysis	9320		1	605258	FLC	EET SL	03/28/23 12:27

Lab Chronicle

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Client Sample ID: LAN USACE Sand 230221 Composite

Lab Sample ID: 310-250172-1

Date Collected: 02/21/23 17:10
Matrix: Solid
Date Received: 02/23/23 10:30
Percent Solids: 96.9

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Soluble	Leach	DI Leach			380273	QTZ5	EET CF	03/01/23 14:35
Soluble	Analysis	9056A		10	380373	QTZ5	EET CF	03/02/23 00:37
Total/NA	Prep	3050B			382361	DHM5	EET CF	03/29/23 10:38
Total/NA	Analysis	6020B		5	382647	A6US	EET CF	03/29/23 16:04
Total/NA	Prep	3050B			380579	KCK5	EET CF	03/08/23 10:05
Total/NA	Analysis	6020B		5	380884	A6US	EET CF	03/08/23 15:17
Total/NA	Prep	7471B			380040	XXW3	EET CF	02/27/23 10:37
Total/NA	Analysis	7471B		1	380162	DHM5	EET CF	02/28/23 11:46
Total/NA	Analysis	7196A		1	705141	PFK	EET CHI	04/05/23 13:14
Total/NA	Prep	3060A			700229	PFK	EET CHI	02/27/23 07:30 - 02/27/23 08:30 [1]
Total/NA	Analysis	7196A		1	700504	PFK	EET CHI	02/28/23 09:28

Client Sample ID: LAN USACE Sand 230221-A

Lab Sample ID: 310-250172-2

Date Collected: 02/21/23 11:55
Matrix: Solid
Date Received: 02/23/23 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Composite		1	380171	FK4Z	EET CF	02/28/23 14:03

Client Sample ID: LAN USACE Sand 230221-B

Lab Sample ID: 310-250172-3

Date Collected: 02/21/23 16:11
Matrix: Solid
Date Received: 02/23/23 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Composite		1	380171	FK4Z	EET CF	02/28/23 14:03

Client Sample ID: LAN USACE Sand 230221-C

Lab Sample ID: 310-250172-4

Date Collected: 02/21/23 16:54
Matrix: Solid
Date Received: 02/23/23 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Composite		1	380171	FK4Z	EET CF	02/28/23 14:03

Client Sample ID: LAN USACE Sand 230221-D

Lab Sample ID: 310-250172-5

Date Collected: 02/21/23 17:10
Matrix: Solid
Date Received: 02/23/23 10:30

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Composite		1	380171	FK4Z	EET CF	02/28/23 14:03

[1] Completion dates and times are reported or not reported per method requirements or individual lab discretion.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3010A	Solid	Lithium
6020B	3050B	Solid	Lithium
8270E	3510C	Solid	Pyridine
8270E	3510C	Solid	Total Cresols
Composite		Solid	Composited
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Laboratory: Eurofins Chicago

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	082	05-01-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
7196A		Solid	Chromium, trivalent

Laboratory: Eurofins St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	12-01-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
901.1	Fill_Geo-21	Solid	Radium-226
901.1	Fill_Geo-21	Solid	Radium-228
9315	PrecSep-21	Solid	Radium-226
9320	PrecSep_0	Solid	Radium-228

Method Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CF
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	EET CF
8081B	Organochlorine Pesticides (GC)	SW846	EET CF
8151A	Herbicides (GC)	SW846	EET CHI
9056A	Anions, Ion Chromatography	SW846	EET CF
6010D	Metals (ICP)	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
7471B	Mercury (CVAA)	SW846	EET CF
7196A	Chromium, Hexavalent	SW846	EET CHI
7196A	Chromium, Trivalent (Colorimetric)	SW846	EET CHI
9045D	pH	SW846	EET CF
Moisture	Percent Moisture	EPA	EET CF
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	EET SL
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	EET SL
Composite	Composite	None	EET CF
1311	TCLP Extraction	SW846	EET CF
1311	TCLP Zero Headspace Extraction	SW846	EET CF
1311	TCLP Extraction	SW846	EET CHI
1312	SPLP Extraction	SW846	EET CF
1312	SPLP Extraction	SW846	EET SL
3010A	Preparation, Total Metals	SW846	EET CF
3050B	Preparation, Metals	SW846	EET CF
3060A	Alkaline Digestion (Chromium, Hexavalent)	SW846	EET CHI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET CF
5030B	Purge and Trap	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
7471B	Preparation, Mercury	SW846	EET CF
8151A	Extraction (Herbicides)	SW846	EET CHI
DI Leach	Deionized Water Leaching Procedure	ASTM	EET CF
Dry and Grind	Preparation, Dry and Grind	None	EET SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

eurofins | Environment Testing America

310-250172 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS

City/State: CITY | STATE WI | Project:

Receipt Information

Date/Time Received: DATE 2-23-23 | TIME 1030 | Received By: MU

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 # _____ of _____
Cooler Custody Seals Present? No	☑ Yes	☐ No	*If yes:* Cooler custody seals intact? ☑ Yes ☐ No
Sample Custody Seals Present? No	☐ 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: U | Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): 3.1 | Corrected Temp (°C): 3.1

• **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

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Joe Stone	Lab PM: Thompson, Shirley	Carrier Tracking No(s)	COC No:
Client Contact: Brandon Suchomel	Phone:	E-Mail: shirley.thompson@eurofinset.com	State of Origin:	Page: Page 1 of 1
Company: SCS Engineers	PWSID:			Job #:
Address: 2830 Dairy Drive	Due Date Requested:			
City: Madison	TAT Requested (days):			
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No			
Phone: 608-224-2830	PO #: 25222159 00			
Email: bsuchomel@scsengineers.com	WO #:			
Project Name: Lansing Generating Station 25222159 00	Project #:			
Site: Lansing, IA	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other:

Sample Identification	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	See Attached Table	Total Number of containers	Special Instructions/Note:
			Preservation Code:				I		
LAN USACE Sand 230221-A	2/21/23	11 55	G	S			X	1	Composite these grab samples and run the composite sample for attached parameter list. Identify composite sample as LAN USACE Sand 230221
LAN USACE Sand 230221-B		16:11	G	S			X	1	
LAN USACE Sand 230221-C		16 54	G	S			X	1	
LAN USACE Sand 230221-D		17 10	G	S			X	1	

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements.

Empty Kit Relinquished by:	Date:	Time.	Method of Shipment:

	Relinquished by	Date/Time	Company	Received by	Date/Time	Company
1	Joe Stone	12:23 2/22/23	SCS		2-23-23 1030	
2						
3						

Custody Seals Intact: Δ Yes Δ No | Custody Seal No.

Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

USACE Dredge Stockpile Sampling - Parameter List

Collected 4 samples - Laboratory to composite to a single sample for analysis

	Total	SPLP	TCLP
VOCs			
Benzene			X
Carbon tetrachloride			X
Chlorobenzene			X
Chloroform			X
1,2-Dichloroethane			X
1,1-Dichloroethylene			X
Methyl ethyl ketone			X
Tetrachloroethylene			X
Trichloroethylene			X
Vinyl chloride			X
Pesticides			
Chlordane			X
Endrin			X
Heptachlor (and its epoxide)			X
Lindane			X
Methoxychlor			X
Toxaphene			X
Herbicides			
2,4-D			X
2,4,5-TP (Silvex)			X
SVOCs			
o-Cresol			X
m-Cresol			X
p-Cresol			X
Cresol			X
1,4-Dichlorobenzene			X
2.4-Dinitrotoluene			X
Hexachlorobenzene			X
Hexachloroebutadiene			X
Hexachloroethane			X
Nitrobenzene			X
Pentachlorophenol			X
Pyridine			X
2,4,5-Trichlorophenol			X
2,4,6-Trichlorophenol			X
Metals			
Antimony	X	X	
Arsenic	X	X	X
Barium	X	X	X
Beryllium	X	X	
Boron	X	X	

Cadmium	X	X	X
Calcium	X	X	
Chromium - total	X	X	X
Chromium - hexavalent	X		
Chromium - trivalent	X		
Cobalt	X	X	
Copper	X	X	
Lead	X	X	X
Lithium	X	X	
Manganese	X		
Mercury	X	X	X
Molybdenum	X	X	
Nickel	X		
Selenium	X	X	X
Silver	X		X
Thallium	X	X	
Vanadium	X		
Zinc	X		
pH	X		
Anions			
Chloride	X	X	
Fluoride	X	X	
Sulfate	X	X	
Radium			
Radium 226 + 228	X	X	

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Thompson, Shirley J	Carrier Tracking No(s):	COC No: 310-58783.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: Shirley.Thompson@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State - Iowa; State Program - Iowa		Job #: 310-250172-1
Address: 13715 Rider Trail North,	Due Date Requested: 3/27/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Lansing Generating Station	Project #: 31014222			
Site:	SSOW#:			

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	9320_Ra228/1312_W Standard Target List	9315_Ra226/1312_W Standard Target List	901.1_Ra/Dry_Grind Radium-226/228	ICP_Native/ICP_Native_Prep (MOD) Local Method	Total Number of containers	Special Instructions/Note:
			Preservation Code:									
LAN USACE Sand 230221 Composite (310-250172-1)	2/21/23	17:10 Central		Solid			X	X	X	X	1	CF to Leach send Ext to STL

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification: Unconfirmed	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month): ☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	2/24/23 1205		FEDEX		
Relinquished by: FEDEX	Date/Time	Company	Received by: Briana Sharkey-Hernandez	Date/Time: 2/27/23 0855	Company: ETSTL
Relinquished by	Date/Time	Company	Received by		Company

Custody Seals Intact: ☐ Yes ☐ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone 319 277 2401 Fax 319-277-2425

Chain of Custody Record

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310-250172 COC

Client Information (Sub Contract Lab)	Sampler	Lab PM: Thompson Shirley J		COC No: 310-58795 1
Client Contact: Shipping/Receiving	Phone	E-Mail: Shirley Thompson@et eurofinsus com	State of Origin: Iowa	Page: Page 1 of 1
Company: Eurofins Environment Testing North Centr		Accreditations Required (See note): State Iowa State Program Iowa		Job #: 310-250172-1
Address: 2417 Bond Street	Due Date Requested: 3/27/2023			
City: University Park	TAT Requested (days):			
State Zip: IL 60484	PO #:			
Phone: 708-534-5200(Tel) 708-534-5211(Fax)	WO #:			
Email:	Project #: 31014222			
Project Name: Lansing Generating Station	SSOW#:			
Site:				

Analysis Requested

Preservation Codes

A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	8151A/1311_T TCLP	7196A/3060A	7196A_CR3/ (MOD) Local Method	Total Number of containers	Special Instructions/Note
			Preservation Code								
LAN USACE Sand 230221 Composite (310-250172-1)	2/21/23	17 10 Central		Solid			X	X	X	1	CF to Leach send TCLP LEachate to CHI

Note Since laboratory accreditations are subject to change Eurofins Environment Testing North Central LLC places the ownership of method analyte & accreditation compliance upon our subcontract laboratories This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed the samples must be shipped back to the Eurofins Environment Testing North Central LLC laboratory or other instructions will be provided Any changes to accreditation status should be brought to Eurofins Environment Testing North Central LLC attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central LLC

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested I II III IV Other (specify) Primary Deliverable Rank 2	Special Instructions/QC Requirements

Empty Kit Relinquished by	Date	Time	Method of Shipment

	Date/Time	Company	Received by	Date/Time	Company
Relinquished by: T Mk	2/24/23 1405		Stephanie Hernandez	2/25/23 0931	EETA
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
		-0.3 +-0.5

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-250172-1
SDG Number: 25222159.00

Login Number: 250172
List Number: 1
Creator: Costello, Mackenzie K

List Source: Eurofins Cedar Falls

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-250172-1
SDG Number: 25222159.00

Login Number: 250172
List Number: 2
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago
List Creation: 02/25/23 02:19 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	-0.5 Samples not frozen
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	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: 310-250172-1
SDG Number: 25222159.00

Login Number: 250172
List Number: 3
Creator: Sharkey-Gonzalez, Briana L

List Source: Eurofins St. Louis
List Creation: 02/27/23 06:09 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: SCS Engineers
Project/Site: Lansing Generating Station

Job ID: 310-250172-1
SDG: 25222159.00

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
LCS 160-603678/2-A	Lab Control Sample	89.3
LCSD 160-603678/3-A	Lab Control Sample Dup	88.1
MB 160-603678/1-A	Method Blank	85.6

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid — **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
310-250172-1	LAN USACE Sand 230221 Compos	89.5

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid — **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
LCS 160-603701/2-A	Lab Control Sample	89.3	85.2
LCSD 160-603701/3-A	Lab Control Sample Dup	88.1	83.7
MB 160-603701/1-A	Method Blank	85.6	83.7

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid — **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
310-250172-1	LAN USACE Sand 230221 Compos	89.5	80.7

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

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ANALYTICAL REPORT

PREPARED FOR

Attn: Meghan Blodgett
SCS Engineers
2830 Dairy Drive
Madison, Wisconsin 53718

Generated 9/21/2023 10:00:27 AM

JOB DESCRIPTION

Lansing Soil Characterization, 25220100

JOB NUMBER

310-262448-1

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613

See page two for job notes and contact information.

my EOL

Job Notes

This report may not be reproduced except in full, and with written approval from the laboratory. The results relate only to the samples tested. For questions please contact the Project Manager at the e-mail address or telephone number listed on this page.

The test results in this report relate only to the samples as received by the laboratory and will meet all requirements of the methodology, with any exceptions noted. This report shall not be reproduced except in full, without the express written approval of the laboratory. All questions should be directed to the Eurofins Environment Testing North Central, LLC Project Manager.

Authorization



Generated
9/21/2023 10:00:27 AM

Authorized for release by
Meredith Liechti, Service Center Manager
meredith.liechti@et.eurofinsus.com
(319)277-2401

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Job ID: 310-262448-1

Laboratory: Eurofins Cedar Falls

Narrative

Job Narrative
310-262448-1

Analytical test results meet all requirements of the associated regulatory program listed on the Accreditation/Certification Summary Page unless otherwise noted under the individual analysis. Data qualifiers are applied to indicate exceptions. Noncompliant quality control (QC) is further explained in narrative comments.

Matrix QC may not be reported if insufficient sample or site-specific QC samples were not submitted. In these situations, to demonstrate precision and accuracy at a batch level, a LCS/LCSD may be performed, unless otherwise specified in the method.
Surrogate and/or isotope dilution analyte recoveries (if applicable) which are outside of the QC window are confirmed unless attributed to a dilution or otherwise noted in the narrative.

Regulated compliance samples (e.g. SDWA, NPDES) must comply with the associated agency requirements/permits.

Receipt
The samples were received on 8/11/2023 9:40 AM. Unless otherwise noted below, the samples arrived in good condition, and, where required, properly preserved and on ice. The temperature of the cooler at receipt time was 1.5°C

Receipt Exceptions
A Chain-of-Custody (COC) was not received with these samples: No ICOC present for TCLP Leachate sample received 8/17/23.

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

GC/MS Semi VOA
Method 8270E: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-396683 and 310-396755.The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.

Method 8270E: Tumbled in plastic due to matrix LAN USACE Sand 230808-lab composite (310-262448-5)

Method 8270E: The RPD of the laboratory control sample (LCS) and laboratory control sample duplicate (LCSD) for preparation batch 310-396755 and analytical batch 310-396885 recovered outside control limits for the following analytes: Pyridine.

Method 8270E: The laboratory control sample duplicate (LCSD) for preparation batch 310-396755 and analytical batch 310-396885 recovered outside control limits for the following analytes: Pyridine.

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

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

Pesticides
Method 8081B: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with preparation batch 310-396683 and 310-396756.The laboratory control sample (LCS) was performed in duplicate (LCSD) to provide precision data for this batch.

Method 8081B: Tumbled in plastic due to matrix LAN USACE Sand 230808-lab composite (310-262448-5)

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

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

Job ID: 310-262448-1 (Continued)

Laboratory: Eurofins Cedar Falls (Continued)

Metals

Method 6020B: The continuing calibration verification (CCV) associated with batch 310-397621 recovered above the upper control limit for Boron. 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.

General Chemistry

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

Gamma Spectroscopy

Method 901.1_Ra: Gamma 160-624743Many isotopes requested by gamma spectrometry analysis do not have any gamma emissions, the gamma emissions they do have are very poor, and/or are reported by assuming secular equilibrium with a longer-lived parent (or vice-versa). For example, Th-232 (which does not have a good gamma-ray) is often reported assuming the shorter-lived Ra-228 daughter is in equilibrium with the Th-232 parent. Or, Pb-214 and/or Bi-214, daughters of potentially volatile Rn-222 in the Ra-226 decay chain, may not be in equilibrium with the parent unless sufficient time has been allowed since the break in equilibrium (e.g. 21 days in the case of Ra-226-supported ingrowth). The client should ensure that such inference is acceptable for their sample based upon process knowledge. The following assumptions were made for this report:Inferred from Reported to AnalyteTh-234 Pa-234Th-234 U-238Pb-210 Po-210Pb-210 Bi-210Cs-137 Ba-137mPb-212 Po-216Xe-131m Xe-131Sb-125 Te-125mAg-108m Ag-108Rh-106 Ru-106Pb-212 Th-228Pb-212 Ra-224U-235 Th-231Ac-228 Th-232Ac-228 Ra-228Th-227 Ra-223Th-227 Ac-227Th-227 Bi-211Th-227 Pb-211Bi-214 Ra-226Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. LAN USACE Sand 230808-lab composite (310-262448-5) and (310-262448-G-5-C DU)

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

Gas Flow Proportional Counter

Method 9315_Ra226: Radium-226 Prep Batch 160-624741The following sample was prepared at a reduced aliquot due to Matrix: LAN USACE Sand 230808-lab composite (310-262448-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method 9315_Ra226: Radium-226 prep batch 160-624741:Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. LAN USACE Sand 230808-lab composite (310-262448-5), (LCS 160-624741/2-A), (LCSD 160-624741/3-A) and (MB 160-624741/1-A)

Method 9320_Ra228: Radium-228 Prep Batch 160-624742The following sample was prepared at a reduced aliquot due to Matrix: LAN USACE Sand 230808-lab composite (310-262448-5). A laboratory control sample/ laboratory control sample duplicate (LCS/LCSD) were prepared instead of a sample duplicate (DUP) to demonstrate batch precision.

Method 9320_Ra228: Radium-228 prep batch 160-624742:Any minimum detectable concentration (MDC), critical value (DLC), or Safe Drinking Water Act detection limit (SDWA DL) is sample-specific unless otherwise stated elsewhere in this narrative. Radiochemistry sample results are reported with the count date/time applied as the Activity Reference Date. LAN USACE Sand 230808-lab composite (310-262448-5), (LCS 160-624742/2-A), (LCSD 160-624742/3-A) and (MB 160-624742/1-A)

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

Organic Prep

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

Sample Summary

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
310-262448-1	LAN USACE Sand 230808-A	Solid	08/08/23 00:00	08/11/23 09:40
310-262448-2	LAN USACE Sand 230808-B	Solid	08/08/23 00:00	08/11/23 09:40
310-262448-3	LAN USACE Sand 230808-C	Solid	08/08/23 12:00	08/11/23 09:40
310-262448-4	LAN USACE Sand 230808-D	Solid	08/08/23 12:00	08/11/23 09:40
310-262448-5	LAN USACE Sand 230808-lab composite	Solid	08/10/23 00:00	08/11/23 09:40

Client Sample Results

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE Sand 230808-A
Lab Sample ID: 310-262448-1
Date Collected: 08/08/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Yes				NONE			08/18/23 10:25	1

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE Sand 230808-B
Lab Sample ID: 310-262448-2
Date Collected: 08/08/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Yes				NONE			08/18/23 10:25	1

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE Sand 230808-C
Lab Sample ID: 310-262448-3
Date Collected: 08/08/23 12:00
Matrix: Solid
Date Received: 08/11/23 09:40

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Yes				NONE			08/18/23 10:25	1

Client Sample Results

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE Sand 230808-D
Lab Sample ID: 310-262448-4
Date Collected: 08/08/23 12:00
Matrix: Solid
Date Received: 08/11/23 09:40

Method: Composite - Composite

Analyte	Result	Qualifier	NONE	NONE	Unit	D	Prepared	Analyzed	Dil Fac
Composited	Yes				NONE			08/18/23 10:25	1

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE Sand 230808-lab composite
Lab Sample ID: 310-262448-5
Date Collected: 08/10/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40

Method: SW846 8260D - Volatile Organic Compounds by GC/MS - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			08/24/23 07:36	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			08/24/23 07:36	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			08/24/23 07:36	20
Benzene	<0.0140		0.100	0.0140	mg/L			08/24/23 07:36	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			08/24/23 07:36	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			08/24/23 07:36	20
Chloroform	<0.0360		0.100	0.0360	mg/L			08/24/23 07:36	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			08/24/23 07:36	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			08/24/23 07:36	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			08/24/23 07:36	20

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*97*		*80 - 121*		*08/24/23 07:36*	*20*
Toluene-d8 (Surr)	*101*		*80 - 120*		*08/24/23 07:36*	*20*
4-Bromofluorobenzene (Surr)	*102*		*80 - 121*		*08/24/23 07:36*	*20*

Method: SW846 8270E - Semivolatile Organic Compounds (GC/MS) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		08/16/23 08:22	08/17/23 20:51	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		08/16/23 08:22	08/17/23 20:51	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		08/16/23 08:22	08/17/23 20:51	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		08/16/23 08:22	08/17/23 20:51	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		08/16/23 08:22	08/17/23 20:51	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		08/16/23 08:22	08/17/23 20:51	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		08/16/23 08:22	08/17/23 20:51	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		08/16/23 08:22	08/17/23 20:51	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		08/16/23 08:22	08/17/23 20:51	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		08/16/23 08:22	08/17/23 20:51	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		08/16/23 08:22	08/17/23 20:51	1
Pyridine	<0.00740	*- *1	0.0500	0.00740	mg/L		08/16/23 08:22	08/17/23 20:51	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		08/16/23 08:22	08/17/23 20:51	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*76*		*25 - 110*	*08/16/23 08:22*	*08/17/23 20:51*	*1*
Phenol-d5 (Surr)	*66*		*21 - 110*	*08/16/23 08:22*	*08/17/23 20:51*	*1*
Nitrobenzene-d5 (Surr)	*110*		*45 - 129*	*08/16/23 08:22*	*08/17/23 20:51*	*1*
2-Fluorobiphenyl (Surr)	*104*		*39 - 118*	*08/16/23 08:22*	*08/17/23 20:51*	*1*
2,4,6-Tribromophenol (Surr)	*92*		*27 - 136*	*08/16/23 08:22*	*08/17/23 20:51*	*1*
Terphenyl-d14 (Surr)	*98*		*12 - 144*	*08/16/23 08:22*	*08/17/23 20:51*	*1*

Method: SW846 8081B - Organochlorine Pesticides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	<1.10		10.0	1.10	ug/L		08/16/23 08:25	08/18/23 13:16	1
Endrin	<0.0500		0.160	0.0500	ug/L		08/16/23 08:25	08/18/23 13:16	1
gamma-BHC (Lindane)	<0.0700		0.160	0.0700	ug/L		08/16/23 08:25	08/18/23 13:16	1
Heptachlor	<0.0600		0.160	0.0600	ug/L		08/16/23 08:25	08/18/23 13:16	1
Heptachlor epoxide	<0.0460		0.160	0.0460	ug/L		08/16/23 08:25	08/18/23 13:16	1
Methoxychlor	<0.0700		0.160	0.0700	ug/L		08/16/23 08:25	08/18/23 13:16	1
Toxaphene	<2.10		10.0	2.10	ug/L		08/16/23 08:25	08/18/23 13:16	1

Client Sample ID: LAN USACE Sand 230808-lab composite — **Lab Sample ID: 310-262448-5**
Date Collected: 08/10/23 00:00 — **Matrix: Solid**
Date Received: 08/11/23 09:40

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*41*		*11 - 122*	*08/16/23 08:25*	*08/18/23 13:16*	*1*
Tetrachloro-m-xylene (Surr)	*69*		*23 - 123*	*08/16/23 08:25*	*08/18/23 13:16*	*1*

Method: SW846 8151A - Herbicides (GC) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		08/21/23 08:50	08/24/23 10:16	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		08/21/23 08:50	08/24/23 10:16	1

Surrogate	*%Recovery*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*77*		*25 - 130*	*08/21/23 08:50*	*08/24/23 10:16*	*1*

Method: SW846 9056A - Anions, Ion Chromatography - SPLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			08/29/23 21:30	1
Chloride	<0.500		1.00	0.500	mg/L			08/29/23 21:30	1
Sulfate	<0.500		1.00	0.500	mg/L			08/29/23 21:30	1

Method: SW846 6010D - Metals (ICP) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.0300		0.100	0.0300	mg/L		08/16/23 09:30	08/17/23 10:49	1
Barium	**0.331**		0.200	0.0400	mg/L		08/16/23 09:30	08/17/23 10:49	1
Cadmium	<0.00390		0.0200	0.00390	mg/L		08/16/23 09:30	08/17/23 10:49	1
Chromium	<0.00600		0.0200	0.00600	mg/L		08/16/23 09:30	08/17/23 10:49	1
Lead	<0.0260		0.100	0.0260	mg/L		08/16/23 09:30	08/17/23 10:49	1
Selenium	<0.0290		0.100	0.0290	mg/L		08/16/23 09:30	08/17/23 10:49	1
Silver	<0.0140		0.0500	0.0140	mg/L		08/16/23 09:30	08/17/23 10:49	1

Method: SW846 6020B - Metals (ICP/MS) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00500	^3+ F1	0.0100	0.00500	mg/L		08/16/23 09:30	09/20/23 12:51	5
Arsenic	**0.00464**	**J F1**	0.0100	0.00420	mg/L		08/16/23 09:30	09/15/23 21:00	5
Barium	**0.0688**	**F1**	0.0500	0.0150	mg/L		08/16/23 09:30	09/15/23 21:00	5
Beryllium	<0.00170	F1	0.00500	0.00170	mg/L		08/16/23 09:30	09/15/23 21:00	5
Cadmium	<0.000500		0.00250	0.000500	mg/L		08/16/23 09:30	09/15/23 21:00	5
Boron	<0.380	F1	1.00	0.380	mg/L		08/16/23 09:30	09/15/23 21:00	5
Chromium	**0.0145**	**J F1**	0.0250	0.00850	mg/L		08/16/23 09:30	09/15/23 21:00	5
Copper	**0.0104**	**J B**	0.0250	0.00900	mg/L		08/16/23 09:30	09/19/23 08:18	5
Calcium	**5.22**		2.50	1.40	mg/L		08/16/23 09:30	09/15/23 21:00	5
Lead	**0.00573**	**F1**	0.00500	0.00160	mg/L		08/16/23 09:30	09/15/23 21:00	5
Selenium	<0.00830		0.0250	0.00830	mg/L		08/16/23 09:30	09/15/23 21:00	5
Cobalt	**0.00191**	**J**	0.00250	0.000850	mg/L		08/16/23 09:30	09/15/23 21:00	5
Thallium	**0.00153**	**J**	0.00500	0.00130	mg/L		08/16/23 09:30	09/15/23 21:00	5
Lithium	<0.0160	F1	0.0500	0.0160	mg/L		08/16/23 09:30	09/15/23 21:00	5
Molybdenum	<0.00920		0.0250	0.00920	mg/L		08/16/23 09:30	09/15/23 21:00	5

Method: SW846 7470A - Mercury (CVAA) - TCLP

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		08/16/23 11:18	08/17/23 13:09	1

Method: SW846 7470A - Mercury (CVAA) - SPLP West

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		08/16/23 11:20	08/17/23 13:15	1

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE Sand 230808-lab composite
Lab Sample ID: 310-262448-5

Date Collected: 08/10/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40

General Chemistry

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
Percent Moisture (EPA Moisture)	**6.8**		0.1	0.1	%			08/14/23 10:56	1
Percent Solids (EPA Moisture)	**93.2**		0.1	0.1	%			08/14/23 10:56	1

General Chemistry - Soluble

Analyte	Result	Qualifier	RL	RL	Unit	D	Prepared	Analyzed	Dil Fac
pH (SW846 9045D)	**8.7**	**HF**	1.0	1.0	SU			08/15/23 19:05	1

Method: EPA 901.1 - Radium-226 & Other Gamma Emitters (GS)

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	**0.282**		0.114	0.117	1.00	0.121	pCi/g	08/18/23 13:33	09/12/23 12:53	1
Radium-228	<0.275	U	0.223	0.223		0.275	pCi/g	08/18/23 13:33	09/12/23 12:53	1

Method: SW846 9315 - Radium-226 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.165	U	0.110	0.110	1.00	0.165	pCi/L	08/18/23 13:11	09/11/23 09:03	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.4*		*30 - 110*	*08/18/23 13:11*	*09/11/23 09:03*	*1*

Method: SW846 9320 - Radium-228 (GFPC) - SPLP West

Analyte	Result	Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.968	U	0.480	0.480	1.00	0.968	pCi/L	08/18/23 13:16	09/05/23 12:43	1

Carrier	*%Yield*	*Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*77.4*		*30 - 110*	*08/18/23 13:16*	*09/05/23 12:43*	*1*
Y Carrier	*78.5*		*30 - 110*	*08/18/23 13:16*	*09/05/23 12:43*	*1*

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE Sand 230808-lab composite
Lab Sample ID: 310-262448-5
Date Collected: 08/10/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40
Percent Solids: 93.2

Method: SW846 9056A - Anions, Ion Chromatography - Soluble

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<7.53		20.1	7.53	mg/Kg	☼		08/22/23 01:08	10
Chloride	<45.2		100	45.2	mg/Kg	☼		08/22/23 01:08	10
Sulfate	<42.2		100	42.2	mg/Kg	☼		08/22/23 01:08	10

Method: SW846 6020B - Metals (ICP/MS)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.354		0.824	0.354	mg/Kg	☼	08/23/23 08:52	08/24/23 13:25	5
Arsenic	**1.48**		0.824	0.346	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Barium	**43.7**		0.824	0.412	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Beryllium	**0.184**	**J**	0.412	0.165	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Boron	<20.6		41.2	20.6	mg/Kg	☼	08/23/23 08:52	08/24/23 13:25	5
Cadmium	<0.157		0.412	0.157	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Chromium	**5.22**		1.24	0.536	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Cobalt	**3.63**		0.412	0.148	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Copper	**2.86**		1.24	0.503	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Lead	**1.79**	**J**	2.06	0.643	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Lithium	**2.33**		2.06	0.561	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Manganese	**401**		2.06	1.07	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Molybdenum	<0.404		0.824	0.404	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Nickel	**5.51**		1.24	0.561	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Calcium	**2420**	**F1**	124	47.8	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Selenium	**0.666**	**J**	1.24	0.528	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Silver	<0.239		0.412	0.239	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Thallium	**0.536**		0.412	0.190	mg/Kg	☼	08/23/23 08:52	08/26/23 00:02	5
Vanadium	**8.37**		1.24	0.305	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5
Zinc	**13.1**		4.12	2.14	mg/Kg	☼	08/23/23 08:52	08/23/23 23:43	5

Method: SW846 7471B - Mercury (CVAA)

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00716	H	0.0175	0.00716	mg/Kg	☼	09/11/23 10:40	09/12/23 14:33	1

General Chemistry

Analyte	Result	Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent (SW846 7196A)	<0.409		1.05	0.409	mg/Kg	☼	08/24/23 08:00	08/28/23 16:11	1
Chromium, trivalent (SW846 7196A)	**5.22**		0.107	0.107	mg/Kg	☼		09/05/23 11:48	1

Qualifiers

GC/MS VOA

Qualifier	Qualifier Description
J	Result is less than the RL but greater than or equal to the MDL and the concentration is an approximate value.

GC/MS Semi VOA

Qualifier	Qualifier Description
*-	LCS and/or LCSD is outside acceptance limits, low biased.
*1	LCS/LCSD RPD exceeds control limits.

GC Semi VOA

Qualifier	Qualifier Description
p	The %RPD between the primary and confirmation column/detector is >40%. The lower value has been reported.

Metals

Qualifier	Qualifier Description
^+	Continuing Calibration Verification (CCV) is outside acceptance limits, high biased.
^3+	Reporting Limit Check Standard is outside acceptance limits, high biased
4	MS, MSD: The analyte present in the original sample is greater than 4 times the matrix spike concentration; therefore, control limits are not applicable.
B	Compound was found in the blank and sample.
E	Result exceeded calibration range.
F1	MS and/or MSD recovery exceeds control limits.
H	Sample was prepped or analyzed beyond the specified holding time. This does not meet regulatory requirements.
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	Parameter with a holding time of 15 minutes. Test performed by laboratory at client's request. Sample was analyzed outside of hold time.

Rad

Qualifier	Qualifier Description
U	Result is less than the sample detection limit.

Glossary

Abbreviation	These commonly used abbreviations may or may not be present in this report.
¤	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CFU	Colony Forming Unit
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MCL	EPA recommended "Maximum Contaminant Level"
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
MPN	Most Probable Number
MQL	Method Quantitation Limit
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
NEG	Negative / Absent

Glossary (Continued)

Abbreviation	These commonly used abbreviations may or may not be present in this report.
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

Surrogate Summary

Client: SCS Engineers
Project/Site: Lansing Soil Characterization, 25220100

Job ID: 310-262448-1

Method: 8260D - Volatile Organic Compounds by GC/MS

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)								
		DBFM	TOL	BFB						
Lab Sample ID	Client Sample ID	(80-121)	(80-120)	(80-121)						
310-262448-5	LAN USACE Sand 230808-lab comp	97	101	102						
LB 310-396953/1-A	Method Blank	98	101	104						
LCS 310-396953/2-A	Lab Control Sample	94	105	101						

Surrogate Legend

DBFM = Dibromofluoromethane (Surr)
TOL = Toluene-d8 (Surr)
BFB = 4-Bromofluorobenzene (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		2FP	PHL	NBZ	FBP	TBP	TPHL		
Lab Sample ID	Client Sample ID	(25-110)	(21-110)	(45-129)	(39-118)	(27-136)	(12-144)		
LCS 310-396755/2-A	Lab Control Sample	85	75	110	107	91	103		
LCSD 310-396755/3-A	Lab Control Sample Dup	81	72	103	100	86	102		

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)							
		2FP	PHL	NBZ	FBP	TBP	TPHL		
Lab Sample ID	Client Sample ID	(25-110)	(21-110)	(45-129)	(39-118)	(27-136)	(12-144)		
310-262448-5	LAN USACE Sand 230808-lab comp	76	66	110	104	92	98		
LB 310-396683/1-B	Method Blank	72	63	93	84	82	84		

Surrogate Legend

2FP = 2-Fluorophenol (Surr)
PHL = Phenol-d5 (Surr)
NBZ = Nitrobenzene-d5 (Surr)
FBP = 2-Fluorobiphenyl (Surr)
TBP = 2,4,6-Tribromophenol (Surr)
TPHL = Terphenyl-d14 (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)							
		DCB1	TCX1						
Lab Sample ID	Client Sample ID	(11-122)	(23-123)						
LCS 310-396756/2-A	Lab Control Sample	72	72						
LCSD 310-396756/3-A	Lab Control Sample Dup	77	80						

Surrogate Legend

Surrogate Summary

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene (Surr)

Method: 8081B - Organochlorine Pesticides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCB1	TCX1								
Lab Sample ID	Client Sample ID	(11-122)	(23-123)								
310-262448-5	LAN USACE Sand 230808-lab comp	41	69								
LB 310-396683/1-C	Method Blank	71	74								

Surrogate Legend

DCB = DCB Decachlorobiphenyl (Surr)
TCX = Tetrachloro-m-xylene (Surr)

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCPAA1									
Lab Sample ID	Client Sample ID	(25-130)									
LCS 500-728652/2-A	Lab Control Sample	85									
LCSD 500-728652/3-A	Lab Control Sample Dup	85									
MB 500-728652/1-A	Method Blank	78									

Surrogate Legend

DCPAA = DCAA

Method: 8151A - Herbicides (GC)

Matrix: Solid **Prep Type: TCLP**

		Percent Surrogate Recovery (Acceptance Limits)									
		DCPAA1									
Lab Sample ID	Client Sample ID	(25-130)									
310-262448-5	LAN USACE Sand 230808-lab comp	77									
310-262448-5 MS	LAN USACE Sand 230808-lab composite	85									
LB 500-728441/1-B	Method Blank	79									

Surrogate Legend

DCPAA = DCAA

Method: 8260D - Volatile Organic Compounds by GC/MS

Lab Sample ID: LB 310-396953/1-A
Matrix: Solid
Analysis Batch: 397535

Client Sample ID: Method Blank
Prep Type: TCLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,1-Dichloroethene	<0.0110		0.100	0.0110	mg/L			08/24/23 04:19	20
1,2-Dichloroethane	<0.0100		0.100	0.0100	mg/L			08/24/23 04:19	20
2-Butanone (MEK)	<1.50		5.00	1.50	mg/L			08/24/23 04:19	20
Benzene	<0.0140		0.100	0.0140	mg/L			08/24/23 04:19	20
Carbon tetrachloride	<0.0130		0.100	0.0130	mg/L			08/24/23 04:19	20
Chlorobenzene	<0.0120		0.100	0.0120	mg/L			08/24/23 04:19	20
Chloroform	<0.0360		0.100	0.0360	mg/L			08/24/23 04:19	20
Tetrachloroethene	<0.0870		0.200	0.0870	mg/L			08/24/23 04:19	20
Trichloroethene	<0.0820		0.200	0.0820	mg/L			08/24/23 04:19	20
Vinyl chloride	<0.0190		0.100	0.0190	mg/L			08/24/23 04:19	20

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Dibromofluoromethane (Surr)	*98*		*80 - 121*		*08/24/23 04:19*	*20*
Toluene-d8 (Surr)	*101*		*80 - 120*		*08/24/23 04:19*	*20*
4-Bromofluorobenzene (Surr)	*104*		*80 - 121*		*08/24/23 04:19*	*20*

Lab Sample ID: LCS 310-396953/2-A
Matrix: Solid
Analysis Batch: 397535

Client Sample ID: Lab Control Sample
Prep Type: TCLP

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,1-Dichloroethene	2.00	1.652		mg/L		83	46 - 124
1,2-Dichloroethane	2.00	1.637		mg/L		82	61 - 120
2-Butanone (MEK)	4.00	4.077	J	mg/L		102	47 - 150
Benzene	2.00	1.734		mg/L		87	68 - 120
Carbon tetrachloride	2.00	1.585		mg/L		79	65 - 120
Chlorobenzene	2.00	1.857		mg/L		93	66 - 120
Chloroform	2.00	1.678		mg/L		84	64 - 120
Tetrachloroethene	2.00	1.664		mg/L		83	60 - 120
Trichloroethene	2.00	1.705		mg/L		85	69 - 120
Vinyl chloride	2.00	1.783		mg/L		89	41 - 120

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
Dibromofluoromethane (Surr)	*94*		*80 - 121*
Toluene-d8 (Surr)	*105*		*80 - 120*
4-Bromofluorobenzene (Surr)	*101*		*80 - 121*

Method: 8270E - Semivolatile Organic Compounds (GC/MS)

Lab Sample ID: LCS 310-396755/2-A
Matrix: Solid
Analysis Batch: 396885

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 396755

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
1,4-Dichlorobenzene	0.125	0.09815		mg/L		79	32 - 110
2,4,5-Trichlorophenol	0.125	0.1205		mg/L		96	35 - 133
2,4,6-Trichlorophenol	0.125	0.1290		mg/L		103	28 - 139
2,4-Dinitrotoluene	0.125	0.1212		mg/L		97	47 - 137

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LCS 310-396755/2-A
Matrix: Solid
Analysis Batch: 396885

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 396755

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
2-Methylphenol			0.125	0.1206		mg/L		96	47 - 118		
4-Methylphenol (and/or 3-Methylphenol)			0.125	0.1185		mg/L		95	46 - 117		
Hexachlorobenzene			0.125	0.1363		mg/L		109	48 - 119		
Hexachlorobutadiene			0.125	0.1022		mg/L		82	32 - 110		
Hexachloroethane			0.125	0.09179		mg/L		73	31 - 110		
Nitrobenzene			0.125	0.1293		mg/L		103	47 - 116		
Pentachlorophenol			0.250	0.2646		mg/L		106	26 - 133		
Pyridine			0.250	0.1449		mg/L		58	10 - 110		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
2-Fluorophenol (Surr)	*85*		*25 - 110*
Phenol-d5 (Surr)	*75*		*21 - 110*
Nitrobenzene-d5 (Surr)	*110*		*45 - 129*
2-Fluorobiphenyl (Surr)	*107*		*39 - 118*
2,4,6-Tribromophenol (Surr)	*91*		*27 - 136*
Terphenyl-d14 (Surr)	*103*		*12 - 144*

Lab Sample ID: LCSD 310-396755/3-A
Matrix: Solid
Analysis Batch: 396885

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 396755

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
1,4-Dichlorobenzene			0.125	0.07919		mg/L		63	32 - 110	21	35
2,4,5-Trichlorophenol			0.125	0.1092		mg/L		87	35 - 133	10	35
2,4,6-Trichlorophenol			0.125	0.1182		mg/L		95	28 - 139	9	35
2,4-Dinitrotoluene			0.125	0.1109		mg/L		89	47 - 137	9	35
2-Methylphenol			0.125	0.1085		mg/L		87	47 - 118	11	35
4-Methylphenol (and/or 3-Methylphenol)			0.125	0.1074		mg/L		86	46 - 117	10	35
Hexachlorobenzene			0.125	0.1275		mg/L		102	48 - 119	7	35
Hexachlorobutadiene			0.125	0.08464		mg/L		68	32 - 110	19	35
Hexachloroethane			0.125	0.07336		mg/L		59	31 - 110	22	35
Nitrobenzene			0.125	0.1142		mg/L		91	47 - 116	12	35
Pentachlorophenol			0.250	0.2178		mg/L		87	26 - 133	19	35
Pyridine			0.250	<0.00740	*- *1	mg/L		3	10 - 110	183	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
2-Fluorophenol (Surr)	*81*		*25 - 110*
Phenol-d5 (Surr)	*72*		*21 - 110*
Nitrobenzene-d5 (Surr)	*103*		*45 - 129*
2-Fluorobiphenyl (Surr)	*100*		*39 - 118*
2,4,6-Tribromophenol (Surr)	*86*		*27 - 136*
Terphenyl-d14 (Surr)	*102*		*12 - 144*

Method: 8270E - Semivolatile Organic Compounds (GC/MS) (Continued)

Lab Sample ID: LB 310-396683/1-B
Matrix: Solid
Analysis Batch: 396885

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 396755

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
1,4-Dichlorobenzene	<0.00650		0.0500	0.00650	mg/L		08/16/23 08:22	08/17/23 19:04	1
2,4,5-Trichlorophenol	<0.00530		0.0500	0.00530	mg/L		08/16/23 08:22	08/17/23 19:04	1
2,4,6-Trichlorophenol	<0.00590		0.0500	0.00590	mg/L		08/16/23 08:22	08/17/23 19:04	1
2,4-Dinitrotoluene	<0.00540		0.0500	0.00540	mg/L		08/16/23 08:22	08/17/23 19:04	1
2-Methylphenol	<0.00500		0.0500	0.00500	mg/L		08/16/23 08:22	08/17/23 19:04	1
4-Methylphenol (and/or 3-Methylphenol)	<0.00380		0.0500	0.00380	mg/L		08/16/23 08:22	08/17/23 19:04	1
Hexachlorobenzene	<0.00690		0.0500	0.00690	mg/L		08/16/23 08:22	08/17/23 19:04	1
Hexachlorobutadiene	<0.00600		0.0500	0.00600	mg/L		08/16/23 08:22	08/17/23 19:04	1
Hexachloroethane	<0.00640		0.0500	0.00640	mg/L		08/16/23 08:22	08/17/23 19:04	1
Nitrobenzene	<0.00530		0.0500	0.00530	mg/L		08/16/23 08:22	08/17/23 19:04	1
Pentachlorophenol	<0.0150		0.0500	0.0150	mg/L		08/16/23 08:22	08/17/23 19:04	1
Pyridine	<0.00740		0.0500	0.00740	mg/L		08/16/23 08:22	08/17/23 19:04	1
Total Cresols	<0.00500		0.0500	0.00500	mg/L		08/16/23 08:22	08/17/23 19:04	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
2-Fluorophenol (Surr)	*72*		*25 - 110*	*08/16/23 08:22*	*08/17/23 19:04*	*1*
Phenol-d5 (Surr)	*63*		*21 - 110*	*08/16/23 08:22*	*08/17/23 19:04*	*1*
Nitrobenzene-d5 (Surr)	*93*		*45 - 129*	*08/16/23 08:22*	*08/17/23 19:04*	*1*
2-Fluorobiphenyl (Surr)	*84*		*39 - 118*	*08/16/23 08:22*	*08/17/23 19:04*	*1*
2,4,6-Tribromophenol (Surr)	*82*		*27 - 136*	*08/16/23 08:22*	*08/17/23 19:04*	*1*
Terphenyl-d14 (Surr)	*84*		*12 - 144*	*08/16/23 08:22*	*08/17/23 19:04*	*1*

Method: 8081B - Organochlorine Pesticides (GC)

Lab Sample ID: LCS 310-396756/2-A
Matrix: Solid
Analysis Batch: 397059

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 396756

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Endrin			1.25	0.9986		ug/L		80	41 - 141		
gamma-BHC (Lindane)			1.25	0.8333		ug/L		67	36 - 136		
Heptachlor			1.25	0.8082		ug/L		65	26 - 127		
Heptachlor epoxide			1.25	0.8491		ug/L		68	39 - 138		
Methoxychlor			1.25	0.8963		ug/L		72	10 - 150		

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*72*		*11 - 122*
Tetrachloro-m-xylene (Surr)	*72*		*23 - 123*

Lab Sample ID: LCSD 310-396756/3-A
Matrix: Solid
Analysis Batch: 397059

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 396756

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Endrin			1.25	1.011		ug/L		81	41 - 141	1	35
gamma-BHC (Lindane)			1.25	0.8671		ug/L		69	36 - 136	4	35
Heptachlor			1.25	0.8229		ug/L		66	26 - 127	2	35

Method: 8081B - Organochlorine Pesticides (GC) (Continued)

Lab Sample ID: LCSD 310-396756/3-A
Matrix: Solid
Analysis Batch: 397059

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 396756

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Heptachlor epoxide			1.25	0.8757		ug/L		70	39 - 138	3	35
Methoxychlor			1.25	0.9101	p	ug/L		73	10 - 150	2	35

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCB Decachlorobiphenyl (Surr)	*77*		*11 - 122*
Tetrachloro-m-xylene (Surr)	*80*		*23 - 123*

Lab Sample ID: LB 310-396683/1-C
Matrix: Solid
Analysis Batch: 397059

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 396756

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chlordane (technical)	<1.10		10.0	1.10	ug/L		08/16/23 08:25	08/18/23 12:11	1
Endrin	<0.0500		0.160	0.0500	ug/L		08/16/23 08:25	08/18/23 12:11	1
gamma-BHC (Lindane)	<0.0700		0.160	0.0700	ug/L		08/16/23 08:25	08/18/23 12:11	1
Heptachlor	<0.0600		0.160	0.0600	ug/L		08/16/23 08:25	08/18/23 12:11	1
Heptachlor epoxide	<0.0460		0.160	0.0460	ug/L		08/16/23 08:25	08/18/23 12:11	1
Methoxychlor	<0.0700		0.160	0.0700	ug/L		08/16/23 08:25	08/18/23 12:11	1
Toxaphene	<2.10		10.0	2.10	ug/L		08/16/23 08:25	08/18/23 12:11	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCB Decachlorobiphenyl (Surr)	*71*		*11 - 122*	*08/16/23 08:25*	*08/18/23 12:11*	*1*
Tetrachloro-m-xylene (Surr)	*74*		*23 - 123*	*08/16/23 08:25*	*08/18/23 12:11*	*1*

Method: 8151A - Herbicides (GC)

Lab Sample ID: MB 500-728652/1-A
Matrix: Solid
Analysis Batch: 729215

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 728652

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.000500		0.00100	0.000500	mg/L		08/21/23 08:50	08/24/23 08:48	1
Silvex (2,4,5-TP)	<0.000500		0.00100	0.000500	mg/L		08/21/23 08:50	08/24/23 08:48	1

Surrogate	*MB %Recovery*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*78*		*25 - 130*	*08/21/23 08:50*	*08/24/23 08:48*	*1*

Lab Sample ID: LCS 500-728652/2-A
Matrix: Solid
Analysis Batch: 729215

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 728652

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D			0.0101	0.007603		mg/L		76	30 - 115
Silvex (2,4,5-TP)			0.00250	0.001966		mg/L		79	32 - 115

Surrogate	*LCS %Recovery*	*LCS Qualifier*	*Limits*
DCAA	*85*		*25 - 130*

Method: 8151A - Herbicides (GC) (Continued)

Lab Sample ID: LCSD 500-728652/3-A
Matrix: Solid
Analysis Batch: 729215

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 728652

Analyte			Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
2,4-D			0.0101	0.007699		mg/L		77	30 - 115	1	20
Silvex (2,4,5-TP)			0.00250	0.001982		mg/L		79	32 - 115	1	20

Surrogate	*LCSD %Recovery*	*LCSD Qualifier*	*Limits*
DCAA	*85*		*25 - 130*

Lab Sample ID: LB 500-728441/1-B
Matrix: Solid
Analysis Batch: 729215

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 728652

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
2,4-D	<0.0500		0.100	0.0500	mg/L		08/21/23 08:50	08/24/23 09:41	1
Silvex (2,4,5-TP)	<0.0500		0.100	0.0500	mg/L		08/21/23 08:50	08/24/23 09:41	1

Surrogate	*LB %Recovery*	*LB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
DCAA	*79*		*25 - 130*	*08/21/23 08:50*	*08/24/23 09:41*	*1*

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 729215

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: TCLP
Prep Batch: 728652

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
2,4-D	<0.0500		1.01	0.7600		mg/L		76	30 - 115
Silvex (2,4,5-TP)	<0.0500		0.250	0.2003		mg/L		80	32 - 115

Surrogate	*MS %Recovery*	*MS Qualifier*	*Limits*
DCAA	*85*		*25 - 130*

Method: 9056A - Anions, Ion Chromatography

Lab Sample ID: MB 310-396990/1-A
Matrix: Solid
Analysis Batch: 397430

Client Sample ID: Method Blank
Prep Type: Soluble

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<7.24		19.3	7.24	mg/Kg			08/21/23 19:28	10
Chloride	<43.4		96.5	43.4	mg/Kg			08/21/23 19:28	10
Sulfate	<40.5		96.5	40.5	mg/Kg			08/21/23 19:28	10

Lab Sample ID: LCS 310-396990/2-A
Matrix: Solid
Analysis Batch: 397430

Client Sample ID: Lab Control Sample
Prep Type: Soluble

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Fluoride			193	185.3		mg/Kg		96	90 - 110
Chloride			965	963.1		mg/Kg		100	90 - 110
Sulfate			965	1026		mg/Kg		106	90 - 110

Method: 9056A - Anions, Ion Chromatography (Continued)

Lab Sample ID: LB 310-396680/1-A
Matrix: Solid
Analysis Batch: 398143

Client Sample ID: Method Blank
Prep Type: SPLP

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Fluoride	<0.0750		0.200	0.0750	mg/L			08/29/23 21:01	1
Chloride	<0.500		1.00	0.500	mg/L			08/29/23 21:01	1
Sulfate	<0.500		1.00	0.500	mg/L			08/29/23 21:01	1

Lab Sample ID: LCS 310-396680/2-A
Matrix: Solid
Analysis Batch: 398143

Client Sample ID: Lab Control Sample
Prep Type: SPLP

Analyte			Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits		
Fluoride			2.00	1.988		mg/L		99	90 - 110		
Chloride			10.0	9.197		mg/L		92	90 - 110		
Sulfate			10.0	10.33		mg/L		103	90 - 110		

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 398143

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: SPLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits		
Fluoride	<0.0750		1.00	1.057		mg/L		106	80 - 120		
Chloride	<0.500		5.00	4.941		mg/L		99	80 - 120		
Sulfate	<0.500		5.00	5.703		mg/L		114	80 - 120		

Lab Sample ID: 310-262448-5 MSD
Matrix: Solid
Analysis Batch: 398143

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: SPLP

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Fluoride	<0.0750		1.00	1.054		mg/L		105	80 - 120	0	15
Chloride	<0.500		5.00	4.941		mg/L		99	80 - 120	0	15
Sulfate	<0.500		5.00	5.694		mg/L		114	80 - 120	0	15

Method: 6010D - Metals (ICP)

Lab Sample ID: LB 310-396682/1-B
Matrix: Solid
Analysis Batch: 397006

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 396765

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.0300		0.100	0.0300	mg/L		08/16/23 09:30	08/17/23 09:50	1
Barium	<0.0400		0.200	0.0400	mg/L		08/16/23 09:30	08/17/23 09:50	1
Cadmium	<0.00390		0.0200	0.00390	mg/L		08/16/23 09:30	08/17/23 09:50	1
Chromium	<0.00600		0.0200	0.00600	mg/L		08/16/23 09:30	08/17/23 09:50	1
Lead	<0.0260		0.100	0.0260	mg/L		08/16/23 09:30	08/17/23 09:50	1
Selenium	<0.0290		0.100	0.0290	mg/L		08/16/23 09:30	08/17/23 09:50	1
Silver	<0.0140		0.0500	0.0140	mg/L		08/16/23 09:30	08/17/23 09:50	1

Method: 6010D - Metals (ICP) (Continued)

Lab Sample ID: LCS 310-396682/2-B
Matrix: Solid
Analysis Batch: 397006

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 396765

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	4.00	4.045		mg/L		101	80 - 120
Barium	2.00	1.955		mg/L		98	80 - 120
Cadmium	2.00	1.912		mg/L		96	80 - 120
Chromium	2.00	1.915		mg/L		96	80 - 120
Lead	4.00	3.769		mg/L		94	80 - 120
Selenium	8.00	8.188		mg/L		102	80 - 120
Silver	2.00	1.852		mg/L		93	80 - 120

Method: 6020B - Metals (ICP/MS)

Lab Sample ID: MB 310-396811/1-A ^5
Matrix: Solid
Analysis Batch: 397621

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 396811

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Arsenic	<0.225		0.536	0.225	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Barium	<0.268		0.536	0.268	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Beryllium	<0.107		0.268	0.107	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Cadmium	<0.102		0.268	0.102	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Chromium	<0.349		0.805	0.349	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Copper	<0.327		0.805	0.327	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Lead	<0.418		1.34	0.418	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Cobalt	<0.0966		0.268	0.0966	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Manganese	<0.697		1.34	0.697	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Lithium	<0.365		1.34	0.365	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Nickel	<0.365		0.805	0.365	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Calcium	<31.1		80.5	31.1	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Molybdenum	<0.263		0.536	0.263	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Selenium	<0.343		0.805	0.343	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Silver	<0.156		0.268	0.156	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Vanadium	<0.198		0.805	0.198	mg/Kg		08/23/23 08:52	08/23/23 23:38	5
Zinc	<1.39		2.68	1.39	mg/Kg		08/23/23 08:52	08/23/23 23:38	5

Lab Sample ID: MB 310-396811/1-A ^5
Matrix: Solid
Analysis Batch: 397697

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 396811

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.231		0.536	0.231	mg/Kg		08/23/23 08:52	08/24/23 13:20	5
Boron	<13.4		26.8	13.4	mg/Kg		08/23/23 08:52	08/24/23 13:20	5

Lab Sample ID: MB 310-396811/1-A ^5
Matrix: Solid
Analysis Batch: 397908

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 396811

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Thallium	<0.123		0.268	0.123	mg/Kg		08/23/23 08:52	08/25/23 23:57	5

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-396811/2-A ^20
Matrix: Solid
Analysis Batch: 397697

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 396811

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	95.4	113.7		mg/Kg		119	80 - 120
Boron	95.4	105.5		mg/Kg		111	80 - 120

Lab Sample ID: LCS 310-396811/2-A ^20
Matrix: Solid
Analysis Batch: 397908

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 396811

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Thallium	95.4	83.04		mg/Kg		87	80 - 120

Lab Sample ID: LCS 310-396811/2-A ^5
Matrix: Solid
Analysis Batch: 397621

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 396811

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	95.4	96.54		mg/Kg		101	80 - 120
Barium	47.7	50.42		mg/Kg		106	80 - 120
Beryllium	47.7	49.64		mg/Kg		104	80 - 120
Cadmium	47.7	48.57		mg/Kg		102	80 - 120
Chromium	47.7	48.09		mg/Kg		101	80 - 120
Copper	95.4	100.9		mg/Kg		106	80 - 120
Lead	95.4	98.79		mg/Kg		104	80 - 120
Cobalt	47.7	49.03		mg/Kg		103	80 - 120
Manganese	47.7	44.55		mg/Kg		93	80 - 120
Lithium	95.4	98.93		mg/Kg		104	80 - 120
Nickel	95.4	100.1		mg/Kg		105	80 - 120
Calcium	954	902.0		mg/Kg		95	80 - 120
Molybdenum	95.4	94.68		mg/Kg		99	80 - 120
Selenium	191	191.8		mg/Kg		101	80 - 120
Silver	47.7	49.85		mg/Kg		104	80 - 120
Vanadium	47.7	48.47		mg/Kg		102	80 - 120
Zinc	95.4	98.42		mg/Kg		103	80 - 120

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 397621

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: Total/NA
Prep Batch: 396811

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	1.48		154	155.2		mg/Kg	☼	100	75 - 125
Barium	43.7		77.2	116.5		mg/Kg	☼	94	75 - 125
Beryllium	0.184	J	77.2	77.79		mg/Kg	☼	101	75 - 125
Cadmium	<0.157		77.2	77.77		mg/Kg	☼	101	75 - 125
Chromium	5.22		77.2	79.85		mg/Kg	☼	97	75 - 125
Copper	2.86		154	161.7		mg/Kg	☼	103	75 - 125
Lead	1.79	J	154	158.1		mg/Kg	☼	101	75 - 125
Cobalt	3.63		77.2	80.57		mg/Kg	☼	100	75 - 125
Manganese	401		77.2	472.3	4	mg/Kg	☼	93	75 - 125
Lithium	2.33		154	159.3		mg/Kg	☼	102	75 - 125
Nickel	5.51		154	162.9		mg/Kg	☼	102	75 - 125

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 397621

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: Total/NA
Prep Batch: 396811

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Calcium	2420	F1	1540	3701		mg/Kg	☼	83	75 - 125
Molybdenum	<0.404		154	153.0		mg/Kg	☼	99	75 - 125
Selenium	0.666	J	309	306.8		mg/Kg	☼	99	75 - 125
Silver	<0.239		77.2	80.96		mg/Kg	☼	105	75 - 125
Vanadium	8.37		77.2	81.59		mg/Kg	☼	95	75 - 125
Zinc	13.1		154	165.7		mg/Kg	☼	99	75 - 125

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 397697

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: Total/NA
Prep Batch: 396811

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<0.354		154	173.5		mg/Kg	☼	112	75 - 125
Boron	<20.6		154	168.2		mg/Kg	☼	109	75 - 125

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 397908

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: Total/NA
Prep Batch: 396811

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Thallium	0.536		154	145.1		mg/Kg	☼	94	75 - 125

Lab Sample ID: 310-262448-5 MSD
Matrix: Solid
Analysis Batch: 397621

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: Total/NA
Prep Batch: 396811

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Arsenic	1.48		164	161.4		mg/Kg	☼	97	75 - 125	4	20
Barium	43.7		82.2	118.7		mg/Kg	☼	91	75 - 125	2	20
Beryllium	0.184	J	82.2	80.66		mg/Kg	☼	98	75 - 125	4	20
Cadmium	<0.157		82.2	80.91		mg/Kg	☼	98	75 - 125	4	20
Chromium	5.22		82.2	82.10		mg/Kg	☼	94	75 - 125	3	20
Copper	2.86		164	166.6		mg/Kg	☼	100	75 - 125	3	20
Lead	1.79	J	164	164.1		mg/Kg	☼	99	75 - 125	4	20
Cobalt	3.63		82.2	82.92		mg/Kg	☼	96	75 - 125	3	20
Manganese	401		82.2	459.8	4	mg/Kg	☼	72	75 - 125	3	20
Lithium	2.33		164	168.3		mg/Kg	☼	101	75 - 125	6	20
Nickel	5.51		164	166.4		mg/Kg	☼	98	75 - 125	2	20
Calcium	2420	F1	1640	3559	F1	mg/Kg	☼	69	75 - 125	4	20
Molybdenum	<0.404		164	160.8		mg/Kg	☼	98	75 - 125	5	20
Selenium	0.666	J	329	318.8		mg/Kg	☼	97	75 - 125	4	20
Silver	<0.239		82.2	85.17		mg/Kg	☼	104	75 - 125	5	20
Vanadium	8.37		82.2	84.22		mg/Kg	☼	92	75 - 125	3	20
Zinc	13.1		164	171.8		mg/Kg	☼	97	75 - 125	4	20

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: 310-262448-5 MSD
Client Sample ID: LAN USACE Sand 230808-lab composite
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 397697
Prep Batch: 396811

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Antimony	<0.354		164	197.4		mg/Kg	☼	120	75 - 125	13	20
Boron	<20.6		164	198.8		mg/Kg	☼	121	75 - 125	17	20

Lab Sample ID: 310-262448-5 MSD
Client Sample ID: LAN USACE Sand 230808-lab composite
Matrix: Solid
Prep Type: Total/NA
Analysis Batch: 397908
Prep Batch: 396811

Analyte	Sample Result	Sample Qualifier	Spike Added	MSD Result	MSD Qualifier	Unit	D	%Rec	%Rec Limits	RPD	RPD Limit
Thallium	0.536		164	132.2		mg/Kg	☼	80	75 - 125	9	20

Lab Sample ID: LB 310-396679/1-B ^5
Client Sample ID: Method Blank
Matrix: Solid
Prep Type: SPLP West
Analysis Batch: 399799
Prep Batch: 396766

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Antimony	<0.00500	^+	0.0100	0.00500	mg/L		08/16/23 09:30	09/15/23 20:53	5
Arsenic	<0.00420		0.0100	0.00420	mg/L		08/16/23 09:30	09/15/23 20:53	5
Barium	<0.0150		0.0500	0.0150	mg/L		08/16/23 09:30	09/15/23 20:53	5
Beryllium	<0.00170		0.00500	0.00170	mg/L		08/16/23 09:30	09/15/23 20:53	5
Boron	<0.380		1.00	0.380	mg/L		08/16/23 09:30	09/15/23 20:53	5
Cadmium	<0.000500		0.00250	0.000500	mg/L		08/16/23 09:30	09/15/23 20:53	5
Chromium	<0.00850		0.0250	0.00850	mg/L		08/16/23 09:30	09/15/23 20:53	5
Copper	<0.00900		0.0250	0.00900	mg/L		08/16/23 09:30	09/15/23 20:53	5
Lead	<0.00160		0.00500	0.00160	mg/L		08/16/23 09:30	09/15/23 20:53	5
Cobalt	<0.000850		0.00250	0.000850	mg/L		08/16/23 09:30	09/15/23 20:53	5
Lithium	<0.0160		0.0500	0.0160	mg/L		08/16/23 09:30	09/15/23 20:53	5
Calcium	<1.40		2.50	1.40	mg/L		08/16/23 09:30	09/15/23 20:53	5
Molybdenum	<0.00920		0.0250	0.00920	mg/L		08/16/23 09:30	09/15/23 20:53	5
Selenium	<0.00830		0.0250	0.00830	mg/L		08/16/23 09:30	09/15/23 20:53	5
Thallium	<0.00130		0.00500	0.00130	mg/L		08/16/23 09:30	09/15/23 20:53	5

Lab Sample ID: LCS 310-396679/2-B ^20
Client Sample ID: Lab Control Sample
Matrix: Solid
Prep Type: SPLP West
Analysis Batch: 399799
Prep Batch: 396766

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	4.00	4.498		mg/L		112	80 - 120
Barium	2.00	2.304		mg/L		115	80 - 120
Beryllium	2.00	2.195		mg/L		110	80 - 120
Boron	4.00	4.487		mg/L		112	80 - 120
Cadmium	2.00	2.211		mg/L		111	80 - 120
Chromium	2.00	2.262		mg/L		113	80 - 120
Lead	4.00	4.486		mg/L		112	80 - 120
Cobalt	2.00	2.163		mg/L		108	80 - 120
Lithium	4.00	4.408		mg/L		110	80 - 120
Calcium	40.0	41.39		mg/L		103	80 - 120
Molybdenum	4.00	4.358		mg/L		109	80 - 120
Selenium	8.00	8.794		mg/L		110	80 - 120
Thallium	4.00	3.250		mg/L		81	80 - 120

Method: 6020B - Metals (ICP/MS) (Continued)

Lab Sample ID: LCS 310-396679/2-B ^20
Matrix: Solid
Analysis Batch: 400008

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 396766

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Copper	4.00	4.094		mg/L		102	80 - 120

Lab Sample ID: LCS 310-396679/2-B ^20
Matrix: Solid
Analysis Batch: 400141

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 396766

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	4.00	4.780		mg/L		120	80 - 120

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 399799

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: SPLP West
Prep Batch: 396766

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Arsenic	0.00464	J F1	4.00	5.060	F1	mg/L		126	75 - 125
Barium	0.0688	F1	2.00	2.632	F1	mg/L		128	75 - 125
Beryllium	<0.00170	F1	2.00	2.514	F1	mg/L		126	75 - 125
Boron	<0.380	F1	4.00	5.035	F1	mg/L		126	75 - 125
Cadmium	<0.000500		2.00	2.486		mg/L		124	75 - 125
Chromium	0.0145	J F1	2.00	2.562	F1	mg/L		127	75 - 125
Copper	0.0109	J *+ F1	4.00	5.560	F1	mg/L		139	75 - 125
Lead	0.00573	F1	4.00	5.067	F1	mg/L		127	75 - 125
Cobalt	0.00191	J	2.00	2.456		mg/L		123	75 - 125
Lithium	<0.0160	F1	4.00	5.045	F1	mg/L		126	75 - 125
Calcium	5.22		40.0	51.43		mg/L		116	75 - 125
Molybdenum	<0.00920		4.00	4.894		mg/L		122	75 - 125
Selenium	<0.00830		8.00	9.932	E	mg/L		124	75 - 125
Thallium	0.00153	J	4.00	3.519		mg/L		88	75 - 125

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 400008

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: SPLP West
Prep Batch: 396766

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Copper	0.0104	J B	4.00	4.023		mg/L		100	75 - 125

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 400141

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: SPLP West
Prep Batch: 396766

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Antimony	<0.00500	^3+ F1	4.00	5.093	F1	mg/L		127	75 - 125

Method: 7470A - Mercury (CVAA)

Lab Sample ID: LB 310-396682/1-C
Matrix: Solid
Analysis Batch: 397002

Client Sample ID: Method Blank
Prep Type: TCLP
Prep Batch: 396800

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		08/16/23 11:18	08/17/23 12:33	1

Lab Sample ID: LCS 310-396682/2-C
Matrix: Solid
Analysis Batch: 397002

Client Sample ID: Lab Control Sample
Prep Type: TCLP
Prep Batch: 396800

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0167	0.01545		mg/L		93	80 - 120

Lab Sample ID: LB 310-396679/1-C
Matrix: Solid
Analysis Batch: 397002

Client Sample ID: Method Blank
Prep Type: SPLP West
Prep Batch: 396801

Analyte	LB Result	LB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00150		0.00200	0.00150	mg/L		08/16/23 11:20	08/17/23 13:11	1

Lab Sample ID: LCS 310-396679/2-C
Matrix: Solid
Analysis Batch: 397002

Client Sample ID: Lab Control Sample
Prep Type: SPLP West
Prep Batch: 396801

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.0167	0.01485		mg/L		89	80 - 120

Lab Sample ID: 310-262448-5 MS
Matrix: Solid
Analysis Batch: 397002

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: SPLP West
Prep Batch: 396801

Analyte	Sample Result	Sample Qualifier	Spike Added	MS Result	MS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	<0.00150		0.0167	0.01740		mg/L		104	80 - 120

Method: 7471B - Mercury (CVAA)

Lab Sample ID: MB 310-399148/1-A
Matrix: Solid
Analysis Batch: 399338

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 399148

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Mercury	<0.00770		0.0188	0.00770	mg/Kg		09/11/23 10:40	09/12/23 14:24	1

Lab Sample ID: LCS 310-399148/2-A
Matrix: Solid
Analysis Batch: 399338

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 399148

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Mercury	0.159	0.1616		mg/Kg		101	80 - 120

Method: 7196A - Chromium, Hexavalent

Lab Sample ID: MB 500-729175/1-A
Matrix: Solid
Analysis Batch: 729752

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 729175

Analyte	MB Result	MB Qualifier	RL	MDL	Unit	D	Prepared	Analyzed	Dil Fac
Chromium, hexavalent	<0.388		1.00	0.388	mg/Kg		08/24/23 08:00	08/28/23 15:58	1

Lab Sample ID: LCS 500-729175/2-A
Matrix: Solid
Analysis Batch: 729752

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 729175

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium, hexavalent	20.0	17.78		mg/Kg		89	80 - 120

Lab Sample ID: LCS 500-729175/3-A
Matrix: Solid
Analysis Batch: 729752

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 729175

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
Chromium, hexavalent	1220	1008		mg/Kg		82	80 - 120

Method: 9045D - pH

Lab Sample ID: LCS 310-396727/1
Matrix: Solid
Analysis Batch: 396727

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

Analyte	Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec	%Rec Limits
pH	7.00	7.0		SU		100	98 - 102

Lab Sample ID: 310-262448-5 DU
Matrix: Solid
Analysis Batch: 396727

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: Soluble

Analyte	Sample Result	Sample Qualifier	DU Result	DU Qualifier	Unit	D	RPD	RPD Limit
pH	8.7	HF	8.8		SU		1	20

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS)

Lab Sample ID: MB 160-624743/1-A
Matrix: Solid
Analysis Batch: 627770

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 624743

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.418	U	0.0906	0.0908	1.00	0.418	pCi/g	08/18/23 13:33	09/12/23 14:05	1
Radium-228	<0.369	U	0.191	0.191		0.369	pCi/g	08/18/23 13:33	09/12/23 14:05	1

Lab Sample ID: LCS 160-624743/2-A
Matrix: Solid
Analysis Batch: 627775

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 624743

Analyte	Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits
Americium-241	96.0	99.68		10.4		0.951	pCi/g	104	75 - 125

Method: 901.1 - Radium-226 & Other Gamma Emitters (GS) (Continued)

Lab Sample ID: LCS 160-624743/2-A
Matrix: Solid
Analysis Batch: 627775

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 624743

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Cesium-137			25.1	24.45		2.60		0.156	pCi/g	97	75 - 125		
Cobalt-60			6.60	6.463		0.732		0.0815	pCi/g	98	75 - 125		

Lab Sample ID: 310-262448-5 DU
Matrix: Solid
Analysis Batch: 627771

Client Sample ID: LAN USACE Sand 230808-lab composite
Prep Type: Total/NA
Prep Batch: 624743

Analyte	Sample Result	Sample Qual		DU Result	DU Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit			RER	RER Limit
Radium-226	0.282			0.4610		0.116	1.00	0.0453	pCi/g			0.76	1
Radium-228	<0.275	U		0.2447		0.159		0.172	pCi/g			0.36	1

Method: 9315 - Radium-226 (GFPC)

Lab Sample ID: MB 160-624741/1-A
Matrix: Solid
Analysis Batch: 627474

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 624741

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-226	<0.106	U	0.0540	0.0540	1.00	0.106	pCi/L	08/18/23 13:11	09/11/23 09:03	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.5*		*30 - 110*	*08/18/23 13:11*	*09/11/23 09:03*	*1*

Lab Sample ID: LCS 160-624741/2-A
Matrix: Solid
Analysis Batch: 627474

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 624741

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-226			11.3	11.83		1.25	1.00	0.106	pCi/L	104	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*89.0*		*30 - 110*

Lab Sample ID: LCSD 160-624741/3-A
Matrix: Solid
Analysis Batch: 627474

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 624741

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-226			11.3	9.901		1.08	1.00	0.132	pCi/L	87	75 - 125	0.83	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*85.5*		*30 - 110*

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Method: 9320 - Radium-228 (GFPC)

Lab Sample ID: MB 160-624742/1-A
Matrix: Solid
Analysis Batch: 626551

Client Sample ID: Method Blank
Prep Type: Total/NA
Prep Batch: 624742

Analyte	MB Result	MB Qualifier	Count Uncert. (2σ+/-)	Total Uncert. (2σ+/-)	RL	MDC	Unit	Prepared	Analyzed	Dil Fac
Radium-228	<0.574	U	0.298	0.298	1.00	0.574	pCi/L	08/18/23 13:16	09/05/23 12:43	1

Carrier	*MB %Yield*	*MB Qualifier*	*Limits*	*Prepared*	*Analyzed*	*Dil Fac*
Ba Carrier	*88.5*		*30 - 110*	*08/18/23 13:16*	*09/05/23 12:43*	*1*
Y Carrier	*83.7*		*30 - 110*	*08/18/23 13:16*	*09/05/23 12:43*	*1*

Lab Sample ID: LCS 160-624742/2-A
Matrix: Solid
Analysis Batch: 626551

Client Sample ID: Lab Control Sample
Prep Type: Total/NA
Prep Batch: 624742

Analyte			Spike Added	LCS Result	LCS Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits		
Radium-228			7.90	7.252		1.25	1.00	0.732	pCi/L	92	75 - 125		

Carrier	*LCS %Yield*	*LCS Qualifier*	*Limits*
Ba Carrier	*89.0*		*30 - 110*
Y Carrier	*62.4*		*30 - 110*

Lab Sample ID: LCSD 160-624742/3-A
Matrix: Solid
Analysis Batch: 626551

Client Sample ID: Lab Control Sample Dup
Prep Type: Total/NA
Prep Batch: 624742

Analyte			Spike Added	LCSD Result	LCSD Qual	Total Uncert. (2σ+/-)	RL	MDC	Unit	%Rec	%Rec Limits	RER	RER Limit
Radium-228			7.90	8.149		1.25	1.00	0.638	pCi/L	103	75 - 125	0.36	1

Carrier	*LCSD %Yield*	*LCSD Qualifier*	*Limits*
Ba Carrier	*85.5*		*30 - 110*
Y Carrier	*78.5*		*30 - 110*

GC/MS VOA

Leach Batch: 396953

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	1311	
LB 310-396953/1-A	Method Blank	TCLP	Solid	1311	
LCS 310-396953/2-A	Lab Control Sample	TCLP	Solid	1311	

Analysis Batch: 397535

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	8260D	396953
LB 310-396953/1-A	Method Blank	TCLP	Solid	8260D	396953
LCS 310-396953/2-A	Lab Control Sample	TCLP	Solid	8260D	396953

GC/MS Semi VOA

Leach Batch: 396683

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	1311	
LB 310-396683/1-B	Method Blank	TCLP	Solid	1311	

Prep Batch: 396755

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	3510C	396683
LB 310-396683/1-B	Method Blank	TCLP	Solid	3510C	396683
LCS 310-396755/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 310-396755/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

Analysis Batch: 396885

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	8270E	396755
LB 310-396683/1-B	Method Blank	TCLP	Solid	8270E	396755
LCS 310-396755/2-A	Lab Control Sample	Total/NA	Solid	8270E	396755
LCSD 310-396755/3-A	Lab Control Sample Dup	Total/NA	Solid	8270E	396755

GC Semi VOA

Leach Batch: 396683

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	1311	
LB 310-396683/1-C	Method Blank	TCLP	Solid	1311	

Prep Batch: 396756

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	3510C	396683
LB 310-396683/1-C	Method Blank	TCLP	Solid	3510C	396683
LCS 310-396756/2-A	Lab Control Sample	Total/NA	Solid	3510C	
LCSD 310-396756/3-A	Lab Control Sample Dup	Total/NA	Solid	3510C	

Analysis Batch: 397059

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	8081B	396756
LB 310-396683/1-C	Method Blank	TCLP	Solid	8081B	396756
LCS 310-396756/2-A	Lab Control Sample	Total/NA	Solid	8081B	396756
LCSD 310-396756/3-A	Lab Control Sample Dup	Total/NA	Solid	8081B	396756

GC Semi VOA

Leach Batch: 728441

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	1311	
LB 500-728441/1-B	Method Blank	TCLP	Solid	1311	
310-262448-5 MS	LAN USACE Sand 230808-lab composite	TCLP	Solid	1311	

Prep Batch: 728652

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	8151A	728441
LB 500-728441/1-B	Method Blank	TCLP	Solid	8151A	728441
MB 500-728652/1-A	Method Blank	Total/NA	Solid	8151A	
LCS 500-728652/2-A	Lab Control Sample	Total/NA	Solid	8151A	
LCSD 500-728652/3-A	Lab Control Sample Dup	Total/NA	Solid	8151A	
310-262448-5 MS	LAN USACE Sand 230808-lab composite	TCLP	Solid	8151A	728441

Analysis Batch: 729215

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	8151A	728652
LB 500-728441/1-B	Method Blank	TCLP	Solid	8151A	728652
MB 500-728652/1-A	Method Blank	Total/NA	Solid	8151A	728652
LCS 500-728652/2-A	Lab Control Sample	Total/NA	Solid	8151A	728652
LCSD 500-728652/3-A	Lab Control Sample Dup	Total/NA	Solid	8151A	728652
310-262448-5 MS	LAN USACE Sand 230808-lab composite	TCLP	Solid	8151A	728652

HPLC/IC

Leach Batch: 396680

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP	Solid	1312	
LB 310-396680/1-A	Method Blank	SPLP	Solid	1312	
LCS 310-396680/2-A	Lab Control Sample	SPLP	Solid	1312	
310-262448-5 MS	LAN USACE Sand 230808-lab composite	SPLP	Solid	1312	
310-262448-5 MSD	LAN USACE Sand 230808-lab composite	SPLP	Solid	1312	

Leach Batch: 396990

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Soluble	Solid	DI Leach	
MB 310-396990/1-A	Method Blank	Soluble	Solid	DI Leach	
LCS 310-396990/2-A	Lab Control Sample	Soluble	Solid	DI Leach	

Analysis Batch: 397430

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Soluble	Solid	9056A	396990
MB 310-396990/1-A	Method Blank	Soluble	Solid	9056A	396990
LCS 310-396990/2-A	Lab Control Sample	Soluble	Solid	9056A	396990

Analysis Batch: 398143

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP	Solid	9056A	396680
LB 310-396680/1-A	Method Blank	SPLP	Solid	9056A	396680
LCS 310-396680/2-A	Lab Control Sample	SPLP	Solid	9056A	396680
310-262448-5 MS	LAN USACE Sand 230808-lab composite	SPLP	Solid	9056A	396680
310-262448-5 MSD	LAN USACE Sand 230808-lab composite	SPLP	Solid	9056A	396680

Metals

Leach Batch: 396679

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	1312	
LB 310-396679/1-B ^5	Method Blank	SPLP West	Solid	1312	
LB 310-396679/1-C	Method Blank	SPLP West	Solid	1312	
LCS 310-396679/2-B ^20	Lab Control Sample	SPLP West	Solid	1312	
LCS 310-396679/2-C	Lab Control Sample	SPLP West	Solid	1312	
310-262448-5 MS	LAN USACE Sand 230808-lab composite	SPLP West	Solid	1312	

Leach Batch: 396682

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	1311	
LB 310-396682/1-B	Method Blank	TCLP	Solid	1311	
LB 310-396682/1-C	Method Blank	TCLP	Solid	1311	
LCS 310-396682/2-B	Lab Control Sample	TCLP	Solid	1311	
LCS 310-396682/2-C	Lab Control Sample	TCLP	Solid	1311	

Prep Batch: 396765

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	3010A	396682
LB 310-396682/1-B	Method Blank	TCLP	Solid	3010A	396682
LCS 310-396682/2-B	Lab Control Sample	TCLP	Solid	3010A	396682

Prep Batch: 396766

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	3010A	396679
LB 310-396679/1-B ^5	Method Blank	SPLP West	Solid	3010A	396679
LCS 310-396679/2-B ^20	Lab Control Sample	SPLP West	Solid	3010A	396679
310-262448-5 MS	LAN USACE Sand 230808-lab composite	SPLP West	Solid	3010A	396679

Prep Batch: 396800

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	7470A	396682
LB 310-396682/1-C	Method Blank	TCLP	Solid	7470A	396682
LCS 310-396682/2-C	Lab Control Sample	TCLP	Solid	7470A	396682

Prep Batch: 396801

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	7470A	396679
LB 310-396679/1-C	Method Blank	SPLP West	Solid	7470A	396679
LCS 310-396679/2-C	Lab Control Sample	SPLP West	Solid	7470A	396679
310-262448-5 MS	LAN USACE Sand 230808-lab composite	SPLP West	Solid	7470A	396679

Prep Batch: 396811

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	3050B	
MB 310-396811/1-A ^5	Method Blank	Total/NA	Solid	3050B	
LCS 310-396811/2-A ^20	Lab Control Sample	Total/NA	Solid	3050B	
LCS 310-396811/2-A ^5	Lab Control Sample	Total/NA	Solid	3050B	
310-262448-5 MS	LAN USACE Sand 230808-lab composite	Total/NA	Solid	3050B	
310-262448-5 MSD	LAN USACE Sand 230808-lab composite	Total/NA	Solid	3050B	

Metals

Analysis Batch: 397002

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	7470A	396801
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	7470A	396800
LB 310-396679/1-C	Method Blank	SPLP West	Solid	7470A	396801
LB 310-396682/1-C	Method Blank	TCLP	Solid	7470A	396800
LCS 310-396679/2-C	Lab Control Sample	SPLP West	Solid	7470A	396801
LCS 310-396682/2-C	Lab Control Sample	TCLP	Solid	7470A	396800
310-262448-5 MS	LAN USACE Sand 230808-lab composite	SPLP West	Solid	7470A	396801

Analysis Batch: 397006

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	TCLP	Solid	6010D	396765
LB 310-396682/1-B	Method Blank	TCLP	Solid	6010D	396765
LCS 310-396682/2-B	Lab Control Sample	TCLP	Solid	6010D	396765

Analysis Batch: 397621

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	6020B	396811
MB 310-396811/1-A ^5	Method Blank	Total/NA	Solid	6020B	396811
LCS 310-396811/2-A ^5	Lab Control Sample	Total/NA	Solid	6020B	396811
310-262448-5 MS	LAN USACE Sand 230808-lab composite	Total/NA	Solid	6020B	396811
310-262448-5 MSD	LAN USACE Sand 230808-lab composite	Total/NA	Solid	6020B	396811

Analysis Batch: 397697

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	6020B	396811
MB 310-396811/1-A ^5	Method Blank	Total/NA	Solid	6020B	396811
LCS 310-396811/2-A ^20	Lab Control Sample	Total/NA	Solid	6020B	396811
310-262448-5 MS	LAN USACE Sand 230808-lab composite	Total/NA	Solid	6020B	396811
310-262448-5 MSD	LAN USACE Sand 230808-lab composite	Total/NA	Solid	6020B	396811

Analysis Batch: 397908

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	6020B	396811
MB 310-396811/1-A ^5	Method Blank	Total/NA	Solid	6020B	396811
LCS 310-396811/2-A ^20	Lab Control Sample	Total/NA	Solid	6020B	396811
310-262448-5 MS	LAN USACE Sand 230808-lab composite	Total/NA	Solid	6020B	396811
310-262448-5 MSD	LAN USACE Sand 230808-lab composite	Total/NA	Solid	6020B	396811

Prep Batch: 399148

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	7471B	
MB 310-399148/1-A	Method Blank	Total/NA	Solid	7471B	
LCS 310-399148/2-A	Lab Control Sample	Total/NA	Solid	7471B	

Analysis Batch: 399338

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	7471B	399148
MB 310-399148/1-A	Method Blank	Total/NA	Solid	7471B	399148
LCS 310-399148/2-A	Lab Control Sample	Total/NA	Solid	7471B	399148

Metals

Analysis Batch: 399799

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	6020B	396766
LB 310-396679/1-B ^5	Method Blank	SPLP West	Solid	6020B	396766
LCS 310-396679/2-B ^20	Lab Control Sample	SPLP West	Solid	6020B	396766
310-262448-5 MS	LAN USACE Sand 230808-lab composite	SPLP West	Solid	6020B	396766

Analysis Batch: 400008

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	6020B	396766
LCS 310-396679/2-B ^20	Lab Control Sample	SPLP West	Solid	6020B	396766
310-262448-5 MS	LAN USACE Sand 230808-lab composite	SPLP West	Solid	6020B	396766

Analysis Batch: 400141

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	6020B	396766
LCS 310-396679/2-B ^20	Lab Control Sample	SPLP West	Solid	6020B	396766
310-262448-5 MS	LAN USACE Sand 230808-lab composite	SPLP West	Solid	6020B	396766

General Chemistry

Analysis Batch: 396525

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	Moisture	

Leach Batch: 396725

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Soluble	Solid	DI Leach	
310-262448-5 DU	LAN USACE Sand 230808-lab composite	Soluble	Solid	DI Leach	

Analysis Batch: 396727

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Soluble	Solid	9045D	396725
LCS 310-396727/1	Lab Control Sample	Total/NA	Solid	9045D	
310-262448-5 DU	LAN USACE Sand 230808-lab composite	Soluble	Solid	9045D	396725

Prep Batch: 729175

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	3060A	
MB 500-729175/1-A	Method Blank	Total/NA	Solid	3060A	
LCS 500-729175/2-A	Lab Control Sample	Total/NA	Solid	3060A	
LCS 500-729175/3-A	Lab Control Sample	Total/NA	Solid	3060A	

Analysis Batch: 729752

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	7196A	729175
MB 500-729175/1-A	Method Blank	Total/NA	Solid	7196A	729175
LCS 500-729175/2-A	Lab Control Sample	Total/NA	Solid	7196A	729175
LCS 500-729175/3-A	Lab Control Sample	Total/NA	Solid	7196A	729175

Analysis Batch: 730827

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	7196A	

Rad

Leach Batch: 624459

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	Dry and Grind	
310-262448-5 DU	LAN USACE Sand 230808-lab composite	Total/NA	Solid	Dry and Grind	

Leach Batch: 624623

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	1312	

Prep Batch: 624741

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	PrecSep-21	624623
MB 160-624741/1-A	Method Blank	Total/NA	Solid	PrecSep-21	
LCS 160-624741/2-A	Lab Control Sample	Total/NA	Solid	PrecSep-21	
LCSD 160-624741/3-A	Lab Control Sample Dup	Total/NA	Solid	PrecSep-21	

Prep Batch: 624742

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	SPLP West	Solid	PrecSep_0	624623
MB 160-624742/1-A	Method Blank	Total/NA	Solid	PrecSep_0	
LCS 160-624742/2-A	Lab Control Sample	Total/NA	Solid	PrecSep_0	
LCSD 160-624742/3-A	Lab Control Sample Dup	Total/NA	Solid	PrecSep_0	

Prep Batch: 624743

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-5	LAN USACE Sand 230808-lab composite	Total/NA	Solid	Fill_Geo-21	624459
MB 160-624743/1-A	Method Blank	Total/NA	Solid	Fill_Geo-21	
LCS 160-624743/2-A	Lab Control Sample	Total/NA	Solid	Fill_Geo-21	
310-262448-5 DU	LAN USACE Sand 230808-lab composite	Total/NA	Solid	Fill_Geo-21	624459

Organic Prep

Analysis Batch: 397120

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
310-262448-1	LAN USACE Sand 230808-A	Total/NA	Solid	Composite	
310-262448-2	LAN USACE Sand 230808-B	Total/NA	Solid	Composite	
310-262448-3	LAN USACE Sand 230808-C	Total/NA	Solid	Composite	
310-262448-4	LAN USACE Sand 230808-D	Total/NA	Solid	Composite	

Lab Chronicle

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE Sand 230808-A
Lab Sample ID: 310-262448-1
Date Collected: 08/08/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Composite		1	397120	FK4Z	EET CF	08/18/23 10:25

Client Sample ID: LAN USACE Sand 230808-B
Lab Sample ID: 310-262448-2
Date Collected: 08/08/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Composite		1	397120	FK4Z	EET CF	08/18/23 10:25

Client Sample ID: LAN USACE Sand 230808-C
Lab Sample ID: 310-262448-3
Date Collected: 08/08/23 12:00
Matrix: Solid
Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Composite		1	397120	FK4Z	EET CF	08/18/23 10:25

Client Sample ID: LAN USACE Sand 230808-D
Lab Sample ID: 310-262448-4
Date Collected: 08/08/23 12:00
Matrix: Solid
Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Analysis	Composite		1	397120	FK4Z	EET CF	08/18/23 10:25

Client Sample ID: LAN USACE Sand 230808-lab composite
Lab Sample ID: 310-262448-5
Date Collected: 08/10/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
TCLP	Leach	1311			396953	FK4Z	EET CF	08/17/23 14:00 - 08/18/23 06:00 [1]
TCLP	Analysis	8260D		20	397535	WSE8	EET CF	08/24/23 07:36
TCLP	Leach	1311			396683	FK4Z	EET CF	08/15/23 14:00 - 08/16/23 06:00 [1]
TCLP	Prep	3510C			396755	Y6AF	EET CF	08/16/23 08:22
TCLP	Analysis	8270E		1	396885	L0FS	EET CF	08/17/23 20:51
TCLP	Leach	1311			396683	FK4Z	EET CF	08/15/23 14:00 - 08/16/23 06:00 [1]
TCLP	Prep	3510C			396756	Y6AF	EET CF	08/16/23 08:25
TCLP	Analysis	8081B		1	397059	BW2O	EET CF	08/18/23 13:16
TCLP	Leach	1311			728441	DAK	EET CHI	08/15/23 14:00 - 08/16/23 06:00 [1]
TCLP	Prep	8151A			728652	DAK	EET CHI	08/21/23 08:50
TCLP	Analysis	8151A		1	729215	SB	EET CHI	08/24/23 10:16
SPLP	Leach	1312			396680	FK4Z	EET CF	08/15/23 14:00 - 08/16/23 06:00 [1]
SPLP	Analysis	9056A		1	398143	QTZ5	EET CF	08/29/23 21:30
TCLP	Leach	1311			396682	FK4Z	EET CF	08/15/23 14:00 - 08/16/23 06:00 [1]
TCLP	Prep	3010A			396765	KCK5	EET CF	08/16/23 09:30
TCLP	Analysis	6010D		1	397006	ZRI4	EET CF	08/17/23 10:49

Client Sample ID: LAN USACE Sand 230808-lab composite
Lab Sample ID: 310-262448-5

Date Collected: 08/10/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
SPLP West	Leach	1312			396679	FK4Z	EET CF	08/15/23 14:00 - 08/16/23 06:00 [1]
SPLP West	Prep	3010A			396766	KCK5	EET CF	08/16/23 09:30
SPLP West	Analysis	6020B		5	399799	A6US	EET CF	09/15/23 21:00
SPLP West	Leach	1312			396679	FK4Z	EET CF	08/15/23 14:00 - 08/16/23 06:00 [1]
SPLP West	Prep	3010A			396766	KCK5	EET CF	08/16/23 09:30
SPLP West	Analysis	6020B		5	400008	DHM5	EET CF	09/19/23 08:18
SPLP West	Leach	1312			396679	FK4Z	EET CF	08/15/23 14:00 - 08/16/23 06:00 [1]
SPLP West	Prep	3010A			396766	KCK5	EET CF	08/16/23 09:30
SPLP West	Analysis	6020B		5	400141	A6US	EET CF	09/20/23 12:51
SPLP West	Leach	1312			396679	FK4Z	EET CF	08/15/23 14:00 - 08/16/23 06:00 [1]
SPLP West	Prep	7470A			396801	NFT2	EET CF	08/16/23 11:20
SPLP West	Analysis	7470A		1	397002	NFT2	EET CF	08/17/23 13:15
TCLP	Leach	1311			396682	FK4Z	EET CF	08/15/23 14:00 - 08/16/23 06:00 [1]
TCLP	Prep	7470A			396800	NFT2	EET CF	08/16/23 11:18
TCLP	Analysis	7470A		1	397002	NFT2	EET CF	08/17/23 13:09
Soluble	Leach	DI Leach			396725	D7CP	EET CF	08/15/23 17:24
Soluble	Analysis	9045D		1	396727	D7CP	EET CF	08/15/23 19:05
Total/NA	Analysis	Moisture		1	396525	T8GC	EET CF	08/14/23 10:56
Total/NA	Leach	Dry and Grind			624459	SRE	EET SL	08/16/23 14:05
Total/NA	Prep	Fill_Geo-21			624743	SAC	EET SL	08/18/23 13:33
Total/NA	Analysis	901.1		1	627770	EMH	EET SL	09/12/23 12:53
SPLP West	Leach	1312			624623	SRE	EET SL	08/15/23 14:00 - 08/16/23 06:00 [1]
SPLP West	Prep	PrecSep-21			624741	KAC	EET SL	08/18/23 13:11
SPLP West	Analysis	9315		1	627474	SCB	EET SL	09/11/23 09:03
SPLP West	Leach	1312			624623	SRE	EET SL	08/15/23 14:00 - 08/16/23 06:00 [1]
SPLP West	Prep	PrecSep_0			624742	KAC	EET SL	08/18/23 13:16
SPLP West	Analysis	9320		1	626551	FLC	EET SL	09/05/23 12:43

Client Sample ID: LAN USACE Sand 230808-lab composite
Lab Sample ID: 310-262448-5

Date Collected: 08/10/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40
Percent Solids: 93.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Soluble	Leach	DI Leach			396990	QTZ5	EET CF	08/21/23 13:32
Soluble	Analysis	9056A		10	397430	QTZ5	EET CF	08/22/23 01:08
Total/NA	Prep	3050B			396811	KCK5	EET CF	08/23/23 08:52
Total/NA	Analysis	6020B		5	397621	A6US	EET CF	08/23/23 23:43
Total/NA	Prep	3050B			396811	KCK5	EET CF	08/23/23 08:52
Total/NA	Analysis	6020B		5	397697	A6US	EET CF	08/24/23 13:25
Total/NA	Prep	3050B			396811	KCK5	EET CF	08/23/23 08:52
Total/NA	Analysis	6020B		5	397908	DHM5	EET CF	08/26/23 00:02
Total/NA	Prep	7471B			399148	NFT2	EET CF	09/11/23 10:40
Total/NA	Analysis	7471B		1	399338	NFT2	EET CF	09/12/23 14:33
Total/NA	Analysis	7196A		1	730827	NC	EET CHI	09/05/23 11:48

Lab Chronicle

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Client Sample ID: LAN USACE Sand 230808-lab composite
Lab Sample ID: 310-262448-5

Date Collected: 08/10/23 00:00
Matrix: Solid
Date Received: 08/11/23 09:40
Percent Solids: 93.2

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Analyst	Lab	Prepared or Analyzed
Total/NA	Prep	3060A			729175	PFK	EET CHI	08/24/23 08:00 - 08/24/23 09:00 [1]
Total/NA	Analysis	7196A		1	729752	PFK	EET CHI	08/28/23 16:11

[1] This procedure uses a method stipulated length of time for the process. Both start and end times are displayed.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

Accreditation/Certification Summary

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Laboratory: Eurofins Cedar Falls

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	007	12-01-23

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
6020B	3010A	Solid	Lithium
6020B	3050B	Solid	Lithium
8270E	3510C	Solid	Pyridine
8270E	3510C	Solid	Total Cresols
Composite		Solid	Composited
Moisture		Solid	Percent Moisture
Moisture		Solid	Percent Solids

Laboratory: Eurofins Chicago

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	082	05-01-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
7196A		Solid	Chromium, trivalent

Laboratory: Eurofins St. Louis

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	Identification Number	Expiration Date
Iowa	State	373	12-01-24

The following analytes are included in this report, but the laboratory is not certified by the governing authority. This list may include analytes for which the agency does not offer certification.

Analysis Method	Prep Method	Matrix	Analyte
901.1	Fill_Geo-21	Solid	Radium-226
901.1	Fill_Geo-21	Solid	Radium-228
9315	PrecSep-21	Solid	Radium-226
9320	PrecSep_0	Solid	Radium-228

Method Summary

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Method	Method Description	Protocol	Laboratory
8260D	Volatile Organic Compounds by GC/MS	SW846	EET CF
8270E	Semivolatile Organic Compounds (GC/MS)	SW846	EET CF
8081B	Organochlorine Pesticides (GC)	SW846	EET CF
8151A	Herbicides (GC)	SW846	EET CHI
9056A	Anions, Ion Chromatography	SW846	EET CF
6010D	Metals (ICP)	SW846	EET CF
6020B	Metals (ICP/MS)	SW846	EET CF
7470A	Mercury (CVAA)	SW846	EET CF
7471B	Mercury (CVAA)	SW846	EET CF
7196A	Chromium, Hexavalent	SW846	EET CHI
7196A	Chromium, Trivalent (Colorimetric)	SW846	EET CHI
9045D	pH	SW846	EET CF
Moisture	Percent Moisture	EPA	EET CF
901.1	Radium-226 & Other Gamma Emitters (GS)	EPA	EET SL
9315	Radium-226 (GFPC)	SW846	EET SL
9320	Radium-228 (GFPC)	SW846	EET SL
Composite	Composite	None	EET CF
1311	TCLP Extraction	SW846	EET CF
1311	TCLP Zero Headspace Extraction	SW846	EET CF
1311	TCLP Extraction	SW846	EET CHI
1312	SPLP Extraction	SW846	EET CF
1312	SPLP Extraction	SW846	EET SL
3010A	Preparation, Total Metals	SW846	EET CF
3050B	Preparation, Metals	SW846	EET CF
3060A	Alkaline Digestion (Chromium, Hexavalent)	SW846	EET CHI
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	EET CF
5030B	Purge and Trap	SW846	EET CF
7470A	Preparation, Mercury	SW846	EET CF
7471B	Preparation, Mercury	SW846	EET CF
8151A	Extraction (Herbicides)	SW846	EET CHI
DI Leach	Deionized Water Leaching Procedure	ASTM	EET CF
Dry and Grind	Preparation, Dry and Grind	None	EET SL
Fill_Geo-21	Fill Geometry, 21-Day In-Growth	None	EET SL
PrecSep_0	Preparation, Precipitate Separation	None	EET SL
PrecSep-21	Preparation, Precipitate Separation (21-Day In-Growth)	None	EET SL

Protocol References:

ASTM = ASTM International

EPA = US Environmental Protection Agency

None = None

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

EET CF = Eurofins Cedar Falls, 3019 Venture Way, Cedar Falls, IA 50613, TEL (319)277-2401

EET CHI = Eurofins Chicago, 2417 Bond Street, University Park, IL 60484, TEL (708)534-5200

EET SL = Eurofins St. Louis, 13715 Rider Trail North, Earth City, MO 63045, TEL (314)298-8566

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310-262448 Chain of Custody

Cooler/Sample Receipt and Temperature Log Form

Client Information

Client: SCS Engineers

City/State. CITY Madison STATE WI Project:

Receipt Information

Date/Time Received: DATE 8/11/23 TIME 0940 Received By:

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 # _____ of _____

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: T Correction Factor (°C): 0

• **Temp Blank Temperature** – If no temp blank, or temp blank temperature above criteria, proceed to Sample Container Temperature

Uncorrected Temp (°C): Corrected Temp (°C):

• **Sample Container Temperature**

	CONTAINER 1	CONTAINER 2
Container(s) used:	Soil jar 1602	
Uncorrected Temp (°C):	1.5	
Corrected Temp (°C):	1.5	

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

Eurofins TestAmerica, Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone (319) 277-2401 Phone (319) 277-2425

Chain of Custody Record

eurofins Environment Testing America

Client Information	Sampler: Bill Johnson	Lab PM:	Carrier Tracking No(s): 1730 1481 7476	COC No: 1
Client Contact: Rachael Huempfner	Phone: 417-259-1102	E-Mail:	State of Origin: IA	Page: Page 1 of 1
Company: SCS Engineers	PWSID:			Job #:

Address: 2830 Dairy Drive	Due Date Requested:	
City: Madison	TAT Requested (days):	
State, Zip: WI, 53718	Compliance Project: Δ Yes Δ No	
Phone: 608-866-0831	PO #: 25222159 00	
Email: rhuempfner@scsengineers.com	WO #:	
Project Name: Lansing Generating Station 25222159 00	Project #:	
Site: Lansing, IA	SSOW#:	

Analysis Requested

Preservation Codes:

A - HCL	M - Hexane
B - NaOH	N - None
C - Zn Acetate	O - AsNaO2
D - Nitric Acid	P - Na2O4S
E - NaHSO4	Q - Na2SO3
F - MeOH	R - Na2S2O3
G - Amchlor	S - H2SO4
H - Ascorbic Acid	T - TSP Dodecahydrate
I - Ice	U - Acetone
J - DI Water	V - MCAA
K - EDTA	W - pH 4-5
L - EDA	Z - other (specify)

Other

Sample Identification	Sample Date	Sample Time	Sample Type (C=comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	See Attached Table	Total Number of containers	Special Instructions/Note:
			Preservation Code:				I		
LAN USACE Sand 230808-A	8-8-23	AM	G	S			X		Composite these grab samples and run the composite sample for attached parameter list. Identify composite sample as LAN USACE SAND 230808
LAN USACE SAND 230808-B	8-8-23	AM	G	S			X		
LAN USACE SAND 230808-C	8-8-23	PM	G	S			X		
LAN USACE SAND 230808-D	8-8-23	PM	G	S			X		

Possible Hazard Identification
☐ Non-Hazard ☐ Flammable ☐ Skin Irritant ☐ Poison B ☐ Unknown ☐ Radiological

Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
☐ Return To Client ☒ Disposal By Lab ☐ Archive For _____ Months

Deliverable Requested I, II, III, IV, Other (specify)

Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by: Rachael Huempfner	Date/Time: 8-10-2023 14:42	Company: SCS	Received by:	Date/Time: 8/11/23 0940	Company	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company	

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.	Cooler Temperature(s) °C and Other Remarks:

Ver: 01/16/2019

USACE Dredge Stockpile Sampling - Parameter List

Collected 4 samples - Laboratory to composite to a single sample for analysis

	Total	SPLP	TCLP
VOCs			
Benzene			X
Carbon tetrachloride			X
Chlorobenzene			X
Chloroform			X
1,2-Dichloroethane			X
1,1-Dichloroethylene			X
Methyl ethyl ketone			X
Tetrachloroethylene			X
Trichloroethylene			X
Vinyl chloride			X
Pesticides			
Chlordane			X
Endrin			X
Heptachlor (and its epoxide)			X
Lindane			X
Methoxychlor			X
Toxaphene			X
Herbicides			
2,4-D			X
2,4,5-TP (Silvex)			X
SVOCs			
o-Cresol			X
m-Cresol			X
p-Cresol			X
Cresol			X
1,4-Dichlorobenzene			X
2.4-Dinitrotoluene			X
Hexachlorobenzene			X
Hexachloroebutadiene			X
Hexachloroethane			X
Nitrobenzene			X
Pentachlorophenol			X
Pyridine			X
2,4,5-Trichlorophenol			X
2,4,6-Trichlorophenol			X
Metals			
Antimony	X	X	
Arsenic	X	X	X
Barium	X	X	X
Beryllium	X	X	
Boron	X	X	

Cadmium	X	X	X
Calcium	X	X	
Chromium - total	X	X	X
Chromium - hexavalent	X		
Chromium - trivalent	X		
Cobalt	X	X	
Copper	X	X	
Lead	X	X	X
Lithium	X	X	
Manganese	X		
Mercury	X	X	X
Molybdenum	X	X	
Nickel	X		
Selenium	X	X	X
Silver	X		X
Thallium	X	X	
Vanadium	X		
Zinc	X		
pH	X		
Anions			
Chloride	X	X	
Fluoride	X	X	
Sulfate	X	X	
Radium			
Radium 226 + 228	X	X	

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

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Client Information (Sub Contract Lab)	Sampler:	Lab PM: Liechti, Meredith L	Carrier Tracking No(s):	COC No: 310-64267.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: meredith.liechti@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State - Iowa; State Program - Iowa		Job #: 310-262448-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 9/12/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Lansing Soil Characterization, 25220100	Project #: 31014222			
Site:	SSOW#:			

Analysis Requested

Preservation Codes:

A - HCL, B - NaOH, C - Zn Acetate, D - Nitric Acid, E - NaHSO4, F - MeOH, G - Amchlor, H - Ascorbic Acid, I - Ice, J - DI Water, K - EDTA, L - EDA, M - Hexane, N - None, O - AsNaO2, P - Na2O4S, Q - Na2SO3, R - Na2S2O3, S - H2SO4, T - TSP Dodecahydrate, U - Acetone, V - MCAA, W - pH 4-5, Y - Trizma, Z - other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Dry_Grind Radium-226/228	9320_Ra228/1312_W Standard Target List	9315_Ra226/1312_W Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:								
LAN USACE Sand 230808-lab composite (310-262448-5)	8/10/23	Central		Solid			X	X	X	1	, CF to Leach send Ext to STL

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	*Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*
Unconfirmed	☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by	Date/Time	Company	Received by	Date/Time	Company
[signature]	8/11/23 1500		FED EX		
Relinquished by: FED EX	Date/Time	Company	Received by: M. Pinette	Date/Time: AUG 14 2023 0850	Company
Relinquished by	Date/Time	Company	Received by	Date/Time	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks

Ver: 06/08/2021

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls, IA 50613
Phone: 319-277-2401 Fax: 319-277-2425

Chain of Custody Record

eurofins | Environment Testing

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Liechti, Meredith L	Carrier Tracking No(s):	COC No: 310-64396.1
Client Contact: Shipping/Receiving	Phone:	E-Mail: meredith.liechti@et.eurofinsus.com	State of Origin: Iowa	Page: Page 1 of 1
Company: TestAmerica Laboratories, Inc.		Accreditations Required (See note): State - Iowa; State Program - Iowa		Job #: 310-262448-1
Address: 13715 Rider Trail North, ,	Due Date Requested: 9/12/2023			
City: Earth City	TAT Requested (days):			
State, Zip: MO, 63045				
Phone: 314-298-8566(Tel) 314-298-8757(Fax)	PO #:			
Email:	WO #:			
Project Name: Lansing Soil Characterization, 25220100	Project #: 31014222			
Site:	SSOW#:			

Analysis Requested

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water, S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	901.1_Ra/Dry_Grind Radium-226/228	901.1_Ra/Fill_Geo_21 Radium-226/228	9320_Ra228/1312_W Standard Target List	9320_Ra228/PrecSep_0 Standard Target List	9315_Ra226/1312_W Standard Target List	9315_Ra226/PrecSep_21 Standard Target List	Total Number of containers	Special Instructions/Note:
			Preservation Code:											
LAN USACE Sand 230808-lab composite (310-262448-5)	8/10/23	Central		Solid			X	X	X	X	X	X	2	, CF to Leach send Ext to STL

Preservation Codes:

A - HCL
B - NaOH
C - Zn Acetate
D - Nitric Acid
E - NaHSO4
F - MeOH
G - Amchlor
H - Ascorbic Acid
I - Ice
J - DI Water
K - EDTA
L - EDA
M - Hexane
N - None
O - AsNaO2
P - Na2O4S
Q - Na2SO3
R - Na2S2O3
S - H2SO4
T - TSP Dodecahydrate
U - Acetone
V - MCAA
W - pH 4-5
Y - Trizma
Z - other (specify)
Other:

Note: Since laboratory accreditations are subject to change, Eurofins Environment Testing North Central, LLC places the ownership of method, analyte & accreditation compliance upon our subcontract laboratories. This sample shipment is forwarded under chain-of-custody. If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central, LLC laboratory or other instructions will be provided. Any changes to accreditation status should be brought to Eurofins Environment Testing North Central, LLC attention immediately. If all requested accreditations are current to date, return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central, LLC.

Possible Hazard Identification	Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)
Unconfirmed	☐ Return To Client ☐ Disposal By Lab ☐ Archive For _____ Months
Deliverable Requested: I, II, III, IV, Other (specify) Primary Deliverable Rank: 2	Special Instructions/QC Requirements:

Empty Kit Relinquished by:	Date:	Time:	Method of Shipment:

Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company
T Sutton	81623 1415		FED EX		
Relinquished by: FED EX	Date/Time:	Company	Received by: M. Pinette	Date/Time: AUG 17 2023 0850	Company
Relinquished by:	Date/Time:	Company	Received by:	Date/Time:	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No.:	Cooler Temperature(s) °C and Other Remarks:

Ver: 06/08/2021

Acetic Acid #:
NaOH #: N/A
Start Date: 8-15-23
pH of TCLP Fluid #1: N/A 4.93 ± 0.05
pH of TCLP Fluid #2: N/A 2.88 ± 0.05

X

TCLP/SPLP Extraction Fluid Record

Analyst: PD
Batch: 396674 SPLP

Temperature Range:
Acceptance Range 21 to 25 °C: 22.1 - 24.7

pH of SPLP Fluid #1: N/A 4.20 ± 0.05 (East)
pH of SPLP Fluid #2: 5.04 5.00 ± 0.05 (West)
pH of SPLP Fluid #3: N/A Neutral (ZHE/Wet Chem)

Rotator 1: X
Rotator 2:
Rotator 3:

Balance ID: B-11
Filter Lot#: 400216-3193

Lab ID	TCLP EXTRACTION FLUID DETERMINATION: pH1 - (5 g sample + 96.5 mL DI water, Stir 10 min); pH2 - (if pH1 >5, add 3.5 mL 1N HCL, heat to 50°C, hold 10 min, cool)					Circle Extraction Fluid Used (Note: If ZHE, or pH1 <5 - TCLP Fluid #1; If pH1 >5 & pH2 <5 - TCLP Fluid #1; If pH1 >5 & pH2 >5 - TCLP Fluid #2)	Dry Wt. of Original Sample Extracted (in g)	Vol. of Extration Fluid (in mLs) (20 X % Solids X Wt. of Sample)	ZHE ID	Date/Time Started	Date/Time Completed	Final pH	ZHE Positive Pressure (If NO, the sample must be re-extracted)	Comments
	Dry Solid (Y/N)	% Solids	Wt. of Sample Used (g)	pH 1	pH 2									
Blank	Y	100	—	—	—	(1) 2 3	—	2000	—			—	—	
C448-S						1 2 3	100.68							
C448-S (2)						1 2 3	100.80							Extra sample for Rads only
Blank (2)						1 2 3	—							Extra Blank for Rads only
						1 2 3								
						1 2 3								
						1 2 3								
						1 2 3								
						1 2 3								
						1 2 3								
						1 2 3								

Document ID: CED-T-ORG-LP-FRM55054
Version: 2
Effective: 18 May 2023
9/21/2023

Eurofins Cedar Falls
3019 Venture Way
Cedar Falls IA 50613
Phone 319-277-2401 Fax 319-277-2425

Chain of Custody Record

eurofins

Client Information (Sub Contract Lab)	Sampler:	Lab PM: Liechti Meredith L	310-262448 COC o(s)	COC No.: 310-64268 1
Client Contact: Shipping/Receiving	Phone:	E-Mail: meredith liechti@et.eurofinsus com	State of Origin: Iowa	Page: Page 1 of 1
Company: Eurofins Environment Testing North Centr		Accreditations Required (See note): State - Iowa State Program - Iowa		Job #: 310-262448-1
Address: 2417 Bond Street	Due Date Requested: 9/12/2023			
City: University Park	TAT Requested (days):			
State Zip: IL 60484				
Phone: 708-534-5200(Tel) 708-534-5211(Fax)	PO #:			
Email:	WO #:			
Project Name: Lansing Soil Characterization, 25220100	Project #: 31014222			
Site:	SSOW#:			

Analysis Requested

Preservation Codes

A HCL, B NaOH, C Zn Acetate, D Nitric Acid, E NaHSO4, F MeOH, G Amchlor, H Ascorbic Acid, I Ice, J DI Water, K EDTA, L EDA, M Hexane, N None, O AsNaO2, P Na2O4S, Q Na2SO3, R Na2S2O3, S H2SO4, T TSP Dodecahydrate, U Acetone, V MCAA, W pH 4-5, Y Trizma, Z other (specify)

Other:

Sample Identification - Client ID (Lab ID)	Sample Date	Sample Time	Sample Type (C=Comp, G=grab)	Matrix (W=water S=solid, O=waste/oil, BT=Tissue, A=Air)	Field Filtered Sample (Yes or No)	Perform MS/MSD (Yes or No)	7196A/3060A	7196A_CR3/ (MOD) Local Method	8151A/1311_T TCLP	TCLP Leachate will come next week	Total Number of containers	Special Instructions/Note
			Preservation Code.									
LAN USACE Sand 230808-lab composite (310-262448-5)	8/10/23	Central		Solid			X	X	X		1	CF to Leach send TCLP Leachate to CHI

Note Since laboratory accreditations are subject to change Eurofins Environment Testing North Central LLC places the ownership of method analyte & accreditation compliance upon our subcontract laboratories This sample shipment is forwarded under chain-of-custody If the laboratory does not currently maintain accreditation in the State of Origin listed above for analysis/tests/matrix being analyzed, the samples must be shipped back to the Eurofins Environment Testing North Central LLC laboratory or other instructions will be provided Any changes to accreditation status should be brought to Eurofins Environment Testing North Central LLC attention immediately If all requested accreditations are current to date return the signed Chain of Custody attesting to said compliance to Eurofins Environment Testing North Central LLC

Possible Hazard Identification *Unconfirmed*	***Sample Disposal (A fee may be assessed if samples are retained longer than 1 month)*** ☐ *Return To Client* ☐ *Disposal By Lab* ☐ *Archive For* _____ *Months*
Deliverable Requested I II III IV Other (specify) Primary Deliverable Rank 2	Special Instructions/QC Requirements

Empty Kit Relinquished by:	Date	Time	Method of Shipment

Relinquished by:	Date/Time: 8/10/23 1530	Company	Received by: Stephanie Hernandez	Date/Time: 8/11/23 0925	Company: EETA
Relinquished by	Date/Time	Company	Received by	Date/Time	Company
Relinquished by:	Date/Time	Company	Received by	Date/T me	Company

Custody Seals Intact: Δ Yes Δ No	Custody Seal No	Cooler Temperature(s) °C and Other Remarks: 1.5+1.2

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-262448-1

Login Number: 262448

List Source: Eurofins Cedar Falls

List Number: 1

Creator: Tucker, Sarah L

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	N/A	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	N/A	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Login Sample Receipt Checklist

Client: SCS Engineers

Job Number: 310-262448-1

Login Number: 262448
List Number: 2
Creator: Hernandez, Stephanie

List Source: Eurofins Chicago
List Creation: 08/12/23 01:07 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	True	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	1.2,1.6
COC is present.	False	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	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: 310-262448-1

Login Number: 262448
List Number: 3
Creator: Pinette, Meadow L

List Source: Eurofins St. Louis
List Creation: 08/14/23 01:01 PM

Question	Answer	Comment
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True	
The cooler's custody seal, if present, is intact.	True	
Sample custody seals, if present, are intact.	True	
The cooler or samples do not appear to have been compromised or tampered with.	True	
Samples were received on ice.	N/A	
Cooler Temperature is acceptable.	True	
Cooler Temperature is recorded.	True	
COC is present.	True	
COC is filled out in ink and legible.	True	
COC is filled out with all pertinent information.	True	
Is the Field Sampler's name present on COC?	True	
There are no discrepancies between the containers received and the COC.	True	
Samples are received within Holding Time (excluding tests with immediate HTs)	True	
Sample containers have legible labels.	True	
Containers are not broken or leaking.	True	
Sample collection date/times are provided.	True	
Appropriate sample containers are used.	True	
Sample bottles are completely filled.	True	
Sample Preservation Verified.	True	
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True	
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True	
Multiphasic samples are not present.	True	
Samples do not require splitting or compositing.	True	
Residual Chlorine Checked.	N/A	

Tracer/Carrier Summary

Client: SCS Engineers
Job ID: 310-262448-1
Project/Site: Lansing Soil Characterization, 25220100

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
LCS 160-624741/2-A	Lab Control Sample	89.0
LCSD 160-624741/3-A	Lab Control Sample Dup	85.5
MB 160-624741/1-A	Method Blank	88.5

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9315 - Radium-226 (GFPC)

Matrix: Solid **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)
		Ba
Lab Sample ID	Client Sample ID	(30-110)
310-262448-5	LAN USACE Sand 230808-lab comp	77.4

Tracer/Carrier Legend

Ba = Ba Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid **Prep Type: Total/NA**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
LCS 160-624742/2-A	Lab Control Sample	89.0	62.4
LCSD 160-624742/3-A	Lab Control Sample Dup	85.5	78.5
MB 160-624742/1-A	Method Blank	88.5	83.7

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

Method: 9320 - Radium-228 (GFPC)

Matrix: Solid **Prep Type: SPLP West**

		Percent Yield (Acceptance Limits)	
		Ba	Y
Lab Sample ID	Client Sample ID	(30-110)	(30-110)
310-262448-5	LAN USACE Sand 230808-lab comp	77.4	78.5

Tracer/Carrier Legend

Ba = Ba Carrier

Y = Y Carrier

Appendix E

Topsoil


2500 Lafayette Ridge Drive, Lansing, Iowa, 52151
Farm field General Fill Location
Lafayette Ridge Dr
Google Earth
N
700 ft


1723 Columbus Road, Lansing, IA, 52151
Village Creek
Columbus Rd
Columbus Rd
Topsoil Borrow Location
Village Creek
Columbus Rd
Columbus Rd
Google Earth
N
1000 ft


Gronna Drive, Waterville, IA, 52170
Gronna Dr
Gronna Dr
Gronna Dr
Roese Rd
Roese Rd
Roese Rd
Topsoil Borrow Location
Google Earth
N
1000 ft


1310 Lansing Harpers Road, Harpers Ferry, Iowa, 52146
Lansing Harpers Rd
X42
Topsoil Borrow Location
Google Earth
N
1000 ft

P.O. Box 729 · Rice Lake, WI 54868 · 608.372.2458 · 800.247.3679 · info@allied.coop · www.allied.coop

August 3, 2023

Good afternoon Ryan,

See below the fertilizer rate for new seeding, per our agronomist recommendation.

17-17-17 (N-P-K) Fertilizer rate on new turf seeding is 100# per acre.

17 – 17 - 17

Guaranteed Analysis

Total Nitrogen (N) 17%
Available Phosphate (P2O5) 17%
Soluble Potash (K2O) 17%
Net Weight: 50 pounds (22.68kg)

Thank you,

Darla Gardner
711 Fair Street
Tomah, WI 54660

608 372-2458
dgardner@allied.coop

ROCK RIVER LABORATORY, INC.
AGRICULTURAL ANALYSIS

Lawn and Garden Soil Test Report

Account No. 418
Allied Cooperative - Tomah
10533 Estate Road
Tomah, WI 54660

Report for:
TEC
PO Box 605
Tomah, WI 54660
ryan@tectomah.com

Lab No: 273415 **Received:** 7/27/2023

Laboratory Analysis - Lansing Iowa Pond

Soil pH	O.M. %	P ppm	K ppm	Ca ppm	Mg ppm	B ppm	Mn ppm	Zn ppm	S ppm	Na ppm	Sol Salt mmhos /cm	Cu ppm	Fe ppm	CEC	NO3 ppm	Al ppm
7.3	1.8	23	64	2192	484		42	3.8						15		

Test Interpretations - Lansing Iowa Pond

	pH		P			K		
	Opt	High	Low	Opt	High	Low	Opt	High
Turf - Low Traffic								

Laboratory Analysis - Lansing Iowa Yard

Soil pH	O.M. %	P ppm	K ppm	Ca ppm	Mg ppm	B ppm	Mn ppm	Zn ppm	S ppm	Na ppm	Sol Salt mmhos /cm	Cu ppm	Fe ppm	CEC	NO3 ppm	Al ppm
6.5	3.0	29	130	2164	394		22	3.9						16		

Test Interpretations - Lansing Iowa Yard

	pH		P			K		
	Opt	High	Low	Opt	High	Low	Opt	High
Turf - Low Traffic								

- Use only fertilizers manufactured specifically for application on turfgrass
- Follow the instructions on the fertilizer bag for the proper fertilizer spreader setting.
- Unless instructed otherwise, the best times for fertilizer application are May 1 to 15, July 1 to 15, September 1 to 15, and after October 15 (after the last mowing for the year). Skip the September application if you mulch mow.
- Sweep up any fertilizer accidentally applied to paved surfaces.
- Unless there is rain the day of application, water the turf for at least 30 minutes after the fertilizer is applied.
- Re-test your soil every 2 to 3 years
- For established turf, apply any standard turf fertilizer.
- For established turf, apply a fertilzer that contains no phosphate, if available.
- For established turf, no lime application is required at this time.

Appendix F

Aggregate, Granular Material Certifications, and Geotextile Cut Sheets

SKAPS Industries (Nonwoven Division)
335, Athena Drive
Athens, GA 30601 (U.S.A.)
Phone (706) 354-3700 Fax (706) 354-3737
E-mail: contact@skaps.com

January 19, 2023
Construction Fabrics & Material
2525 Peiper Rd.
Cottage Grove, WI, 53527
PO :
BOL :

Dear Sir/Madam:

This is to certify that SKAPS GT170 is a high quality needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, randomly networked to form a high strength dimensionally stable fabric. SKAPS GT170 resists ultraviolet deterioration, rotting, biological degradation. The fabric is inert to commonly encountered soil chemicals. Polypropylene is stable within a pH range of 2 to 13. SKAPS GT170 conforms to the property values listed below:

PROPERTY	TEST METHOD	UNITS	M.A.R.V. Minimum Average Roll Value
Grab Tensile	ASTM D 4632	lbs (kN)	180 (0.80)
Grab Elongation	ASTM D 4632	%	50
Trapezoidal Tear	ASTM D 4533	lbs (kN)	75 (0.33)
CBR Puncture	ASTM D 6241	lbs (kN)	475 (2.11)
Permittivity*	ASTM D 4491	sec^{-1}	1.40
Water Flow*	ASTM D 4491	$gpm/ft^2(l/min/m^2)$	105 (4278)
AOS*	ASTM D 4751	US Sieve (mm)	70 (0.21)
UV Resistance	ASTM D 4355	%/hrs	70/500

Notes:
* At the time of manufacturing. Handling may change these properties.

KOUROSH SABZEVARI
QUALITY CONTROL MANAGER

www.skaps.com

WINFAB®

REINFORCING SUCCESS

PRODUCT DATA SHEET
WINFAB® 700N

EROSION PROTECTION | FILTRATION | DRAINAGE | SEPARATION

WINFAB® 700N needle-punched nonwoven geotextile is manufactured using polypropylene fibers that are formed into a dimensionally stable network, which allows the fibers to maintain their relative position.

WINFAB® 700N needle-punched nonwoven geotextile resists ultraviolet deterioration, rotting, and biological degradation and is inert to commonly encountered soil chemicals.

PROPERTY	TEST METHOD	MARV ENGLISH	MARV METRIC
Tensile Strength (Grab)	ASTM D4632	180 x 180 lbs	800 x 800 N
Elongation (Grab)	ASTM D4632	50% x 50%	50% x 50%
Trapezoidal Tear Strength	ASTM D4533	75 x 75 lbs	333 x 333 N
CBR Puncture	ASTM D6241	460 lbs	2,047 N
UV Resistance (500 hrs)	ASTM D4355	70%	70%
Apparent Opening Size*	ASTM D4751	70 US Std. Sieve	0.212 mm
Permittivity	ASTM D4491	1.4 sec^{-1}	1.4 sec^{-1}
Water Flow Rate	ASTM D4491	100 gpm/ft^2	4,074 lpm/m^2

***Maximum Average Roll Value**

PROPERTY	TEST METHOD	TYPICAL ENGLISH	TYPICAL METRIC
Roll Dimensions	Measured	12.5 ft x 360 ft 15 ft x 300 ft	3.81 x 109.8 m 4.6 x 91.5 m
Roll Area	Measured	500 yd^2	418 m^2

Disclaimer: WINFAB assumes no liability for the completeness or accuracy of this information or the ultimate use of this information. WINFAB disclaims any and all implied, expressed, or statutory standards, guarantees, or warranties. This includes without limitation any implied warranty as to merchantability or fitness for a particular purpose or arising from a course of dealing or usage of trade as to equipment, materials, or information furnished herewith. This document should not be construed as engineering advice. Always consult the project engineer for project specific requirements. The end user assumes sole responsibility for the use of this information and product. The property values listed above are subject to change without notice.

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WINFAB | www.winfabusa.com
1 Nashville Mills Rd. Nashville GA 31639
Ph: (912) 534-5757 • Fax: (912) 534-5533

GMA Geosynthetic Materials Association

GAI-LAP
Initials: GK # : 87
Date: 2016

Form 6201Rev

Lab. No.:	2
Material:	BY
Co. & Proj.#:	Allamakee
Producer:	Rock Stream
Contractor:	Stream Quarry
Sampled By:	Lance Mielke
Sample Loc.:	Stream Pile

Grad. No.: 11

Date: 6/10/23

Original Dry Weight:	2685.6	Total Minus No. 4 (W1):	
Dry Weight Washed:	2538.3	Reduced Minus No. 4 (W2)	
Washing Loss:	147.3	Conversion Factor: W1 ÷ W2	
		Calculated Weight (A)=Conversion Factor x (B)	

Sieve Size	Reduced Minus No. 4	Total or Calc. Weight Retd.	% Retained	% Passing	Specs.
1½"					
1"				100	100
¾"		84.5	3.1	96.9	80-100
½"		575.4	21.4	75.5	
⅜"		340.9	12.7	62.8	60-80
No.4		571.3	21.3	41.5	30-45
No. 8	(B)	315.9 (A)	11.8	29.7	10-30
No.16	(B)	165.0 (A)	6.1	23.6	
No. 30	(B)	80.2 (A)	3.0	20.6	
No. 50	(B)	51.1 (A)	1.9	18.7	
No. 100	(B)	83.4 (A)	2.4	16.3	
No. 200	(B)	145.4 (A)	5.4	10.9	2-12
Washing Loss		147.3 → 291.9	10.9		
Pan	(B)	144.6 (A)			
Total		2685.0	100		
Accuracy Check		999			

Wash Sample

Original Dry Weight:	
Dry Weight Washed:	
Washing Loss:	

Sieve Size	Weight Retd.	% Retd.	% Passing	Specs.
No. 200				
Washing Loss				
Pan				

Date Reported:	Cert No.: WF 877
Tested By:	Lance Mielke

NOTE: No more than 200 grams should be retained on the 8" sieves. No more than 850 grams should be retained on the 12" No. 4 sieve, and a maximum of 450 grams on the No. 8 and smaller sieves.

Comments: _____

147

Form 821278

Iowa Department of Transportation

CERTIFIED GRADATION TEST REPORT

County:
Project:
Contractor:
Contract #: NA
Design #: NA
Date: 07/14/23 Report No.: NA

X Certified Sample
Monitor Sample
Verification Sample

Source Name: Wexford Quarry **T-203 No:** A03002 **Source Location:** NE **Sec.:** 36 **Twp.** 98N **Range:** 03W **County:** Allamakee
Material: Class A **Class:** NA **Gradation No.:** 11 **Beds:** Full Face
Mat'l Producer BRUENING ROCK PRODUCTS **Destination:** STOCKPILE **Sampled At:** QUARRY- BELT

Date Sampled	Sample ID	Sampled By	Tested By	-IN	1"	3/4	1/2	3/8	4	8	16	30	50	100	200	Comp	Tons
	*PRODUCTION LIMITS			Max:		100	90		55	40					16		
				Min:	100	95	70		30	15					6		
06/27/23		Jake	Jake		100.0	97.1	69.4	59.4	39.4	28.4	22.0	18.8	16.6	14.2	9.4	Y	3000T
06/25/23		Jake	Jake		100.0	98.3	78.6	67.9	47.4	35.3	28.4	25.0	22.6	19.4	12.3	Y	3000T
06/29/23		Jake	Jake		100.0	98.1	73.8	55.9	39.6	27.9	22.0	20.0	16.6	15.1	10.6	Y	3000T
07/06/23		Jake	Jake		100.0	97.3	80.0	69.9	50.9	39.8	32.9	29.3	26.6	22.7	15.0	Y	3000T
07/07/23		Jake	Jake		100.0	97.9	79.6	68.0	47.9	36.8	30.2	26.8	24.4	20.6	13.7	Y	3000T
Average of all gradations.				####	**100.0**	**97.7**	**76.3**	**64.2**	**45.0**	**33.6**	**27.1**	**24.0**	**21.4**	**18.4**	**12.2**		

Comments:
IA. D.O.T.
BRUENING ROCK
LAB

Estimated Quantity 15000
Total Prev. Cert. 0
Total cert. to date 15,000
Certification No. 221002
Reported by Dawson Holkesvik
Representing BRUENING ROCK PRODUCTS, INC.

*AGREED by the contractor/producer

Form 821278

Iowa Department of Transportation

CERTIFIED GRADATION TEST REPORT

County:
Project:
Contractor:
Contract #: NA
Design #: NA
Date: 06/23/23 Report No.: NA

X Certified Sample
Monitor Sample
Verification Sample

Source Name: McCabe Quarry **T-203 No:** A03008 **Source Location:** NE **Sec.:** 6 **Twp.** 97N **Range:** 05W **County:** Allamakee
Material: Class A **Class:** NA **Gradation No.:** 11 **Beds:** Full Face
Mat'l Producer BRUENING ROCK PRODUCTS **Destination:** STOCKPILE **Sampled At:** QUARRY- BELT

Date Sampled	Sample ID	Sampled By	Tested By	-IN	1"	3/4	1/2	3/8	4	8	16	30	50	100	200	Comp	Tons
	*PRODUCTION LIMITS			Max:		100	90		55	40					16		
				Min:	100	95	70		30	15					6		
06/02/23		Jake	Jake		100.0	97.1	71.4	59.7	38.7	27.0	20.3	16.5	14.1	12.3	9.7	Y	3000T
06/05/23		Jake	Jake		100.0	98.6	75.2	63.2	42.6	31.0	23.4	19.1	15.9	13.8	10.9	Y	3000T
06/05/23		Jake	Jake		100.0	97.8	74.0	61.7	41.1	29.6	22.2	18.0	14.9	12.7	9.9	Y	3000T
06/06/23		Jake	Jake		100.0	97.5	71.4	59.6	41.0	29.2	22.3	18.4	15.2	12.8	9.8	Y	3000T
06/06/23		Jake	Jake		100.0	97.1	73.3	61.6	40.8	29.1	22.2	18.5	15.7	13.7	11.3	Y	3000T
06/07/23		Jake	Jake		100.0	97.5	78.2	64.8	39.9	27.4	20.2	16.6	13.9	12.0	9.5	Y	3000T
Average of all gradations.				####	**100.0**	**97.6**	**73.9**	**61.8**	**40.7**	**28.9**	**21.8**	**17.9**	**15.0**	**12.9**	**10.2**		

Comments:
IA. D.O.T.
BRUENING ROCK
LAB

Estimated Quantity 18000
Total Prev. Cert. 4000
Total cert. to date 22,000
Certification No. 221002
Reported by Dawson Holkesvik
Representing BRUENING ROCK PRODUCTS, INC.

*AGREED by the contractor/producer

SKAPS Industries (Nonwoven Division)
335, Athena Drive
Athens, GA 30601 (U.S.A.)
Phone (706) 354-3700 Fax (706) 354-3737
E-mail: contact@skaps.com

January 19, 2023
Construction Fabrics & Material
2525 Peiper Rd.
Cottage Grove, WI, 53527
PO :
BOL :

Dear Sir/Madam:

This is to certify that SKAPS GT170 is a high quality needle-punched nonwoven geotextile made of 100% polypropylene staple fibers, randomly networked to form a high strength dimensionally stable fabric. SKAPS GT170 resists ultraviolet deterioration, rotting, biological degradation. The fabric is inert to commonly encountered soil chemicals. Polypropylene is stable within a pH range of 2 to 13. SKAPS GT170 conforms to the property values listed below:

PROPERTY	TEST METHOD	UNITS	M.A.R.V. Minimum Average Roll Value
Grab Tensile	ASTM D 4632	lbs (kN)	180 (0.80)
Grab Elongation	ASTM D 4632	%	50
Trapezoidal Tear	ASTM D 4533	lbs (kN)	75 (0.33)
CBR Puncture	ASTM D 6241	lbs (kN)	475 (2.11)
Permittivity*	ASTM D 4491	sec^{-1}	1.40
Water Flow*	ASTM D 4491	$gpm/ft^2(l/min/m^2)$	105 (4278)
AOS*	ASTM D 4751	US Sieve (mm)	70 (0.21)
UV Resistance	ASTM D 4355	%/hrs	70/500

Notes:
* At the time of manufacturing. Handling may change these properties.

KOUROSH SABZEVARI
QUALITY CONTROL MANAGER

www.skaps.com

WINFAB®

REINFORCING SUCCESS

PRODUCT DATA SHEET
WINFAB® 700N

EROSION PROTECTION | FILTRATION | DRAINAGE | SEPARATION

WINFAB® 700N needle-punched nonwoven geotextile is manufactured using polypropylene fibers that are formed into a dimensionally stable network, which allows the fibers to maintain their relative position.

WINFAB® 700N needle-punched nonwoven geotextile resists ultraviolet deterioration, rotting, and biological degradation and is inert to commonly encountered soil chemicals.

PROPERTY	TEST METHOD	MARV ENGLISH	MARV METRIC
Tensile Strength (Grab)	ASTM D4632	180 x 180 lbs	800 x 800 N
Elongation (Grab)	ASTM D4632	50% x 50%	50% x 50%
Trapezoidal Tear Strength	ASTM D4533	75 x 75 lbs	333 x 333 N
CBR Puncture	ASTM D6241	460 lbs	2,047 N
UV Resistance (500 hrs)	ASTM D4355	70%	70%
Apparent Opening Size*	ASTM D4751	70 US Std. Sieve	0.212 mm
Permittivity	ASTM D4491	1.4 sec^{-1}	1.4 sec^{-1}
Water Flow Rate	ASTM D4491	100 gpm/ft^2	4,074 lpm/m^2

***Maximum Average Roll Value**

PROPERTY	TEST METHOD	TYPICAL ENGLISH	TYPICAL METRIC
Roll Dimensions	Measured	12.5 ft x 360 ft 15 ft x 300 ft	3.81 x 109.8 m 4.6 x 91.5 m
Roll Area	Measured	500 yd^2	418 m^2

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WINFAB | www.winfabusa.com
1 Nashville Mills Rd. Nashville GA 31639
Ph: (912) 534-5757 • Fax: (912) 534-5533

GMA Geosynthetic Materials Association

GAI-LAP
Initials: GK # : 87
Date: 2016

Form 821278

Iowa Department of Transportation

CERTIFIED GRADATION TEST REPORT

County:
Project:
Contractor:
Contract #: NA
Design #: NA
Date: 09/06/23 Report No.: 1

X Certified Sample
Monitor Sample
Verification Sample

Source Name: Waukon/Mccabe Quarry **T-203 No:** A03008 **Source Location:** NE **Sec.:** 6 **Twp.** 97N **Range:** 05W **County:** Allamakee
Material EROSION STONE **Class:** N.A. **Gradation No.:** NA **Beds:Full Face**
Mat'l Produce BRUENING ROCK PRODUCTS **Destination:** Project **Sampled At:** QUARRY-VISUAL

Date Sampled	Sample ID	Sampled By	Tested By	-IN	1"	3/4	1/2	3/8	4	8	16	30	50	100	200	Comp	Tons
	*PRODUCTION LIMITS		Max.														
			Min.														

NOMINAL 6" SIZE
100% PASSING THE 9" SCREEN
100% RETAINED ON THE 3" SCREEN

VISUAL INSPECTION

09/06/23		JAKE	JAKE													OK	1,000T

Average of all gradations. #DIV/0! #DIV/0! #### #### #### #### #### #### #### #### ### #DIV/0!

Comments:
IA. D.O.T. DECORAH Jason Ryan
BRUENING ROCK
LAB

***AGREED by the contractor/producer**

Estimated Quantity 1,000T
Total Prev. Cert. 0
Total cert. to date 1,000T
Certification No. NE938
Reported by Jacob Axmear
Representing BRUENING ROCK PRODUCTS, INC.

Appendix G

Culverts and Outfall Structures

AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(1 EA.) CULVERT ENDWALL INLET

NOTES:

CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED

REBAR – ASTM A–615 GRADE 60

WEIGHTS: APPROX. 5,053 LBS. – ENDWALL
APPROX. 1,880 LBS. – CUT–OFF WALL

DRAWINGS SUBMITTED FOR APPROVAL

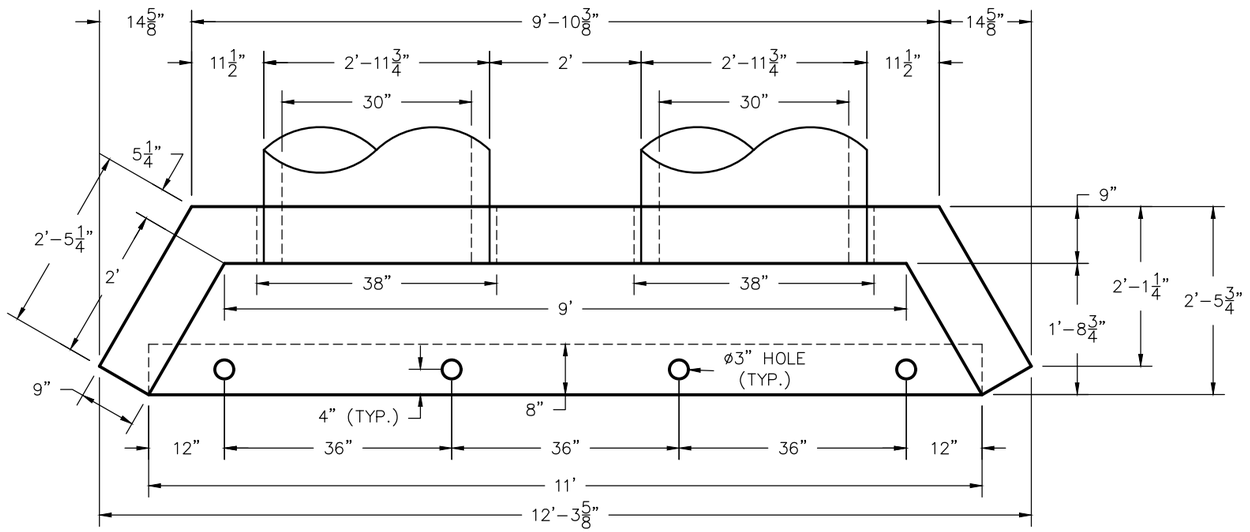
APPROVED BY: _____

APPROVAL DATE: _____

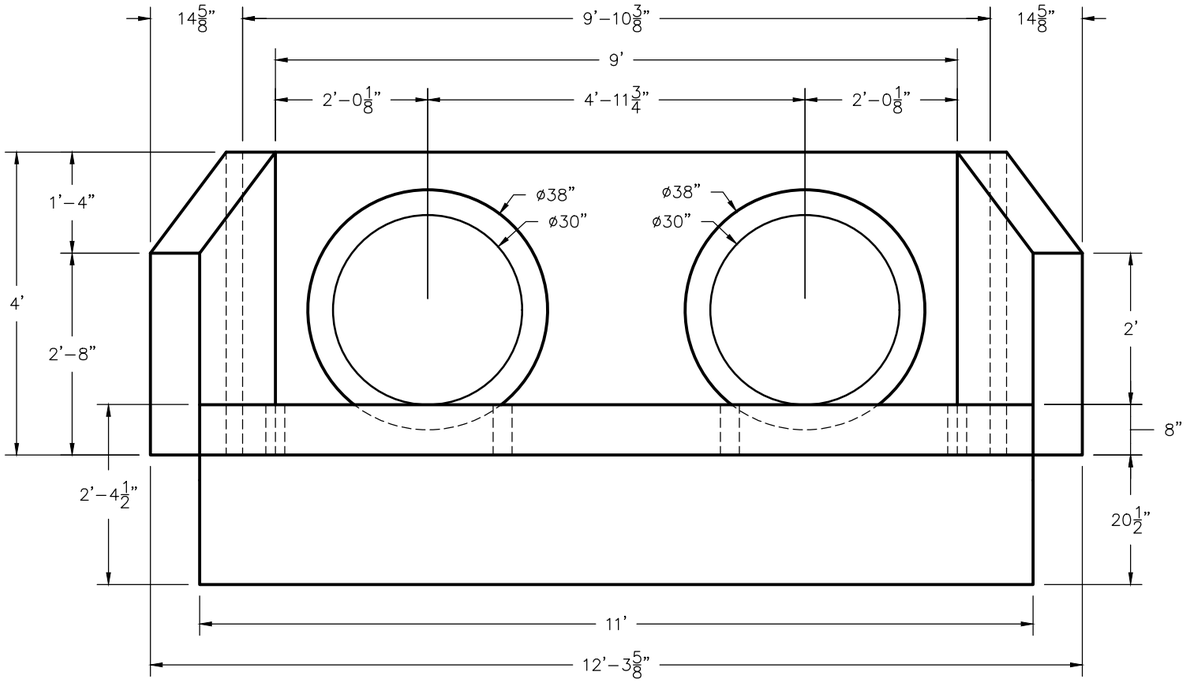
PRODUCTS NEEDED BY: _____

REVIEWED BY _____

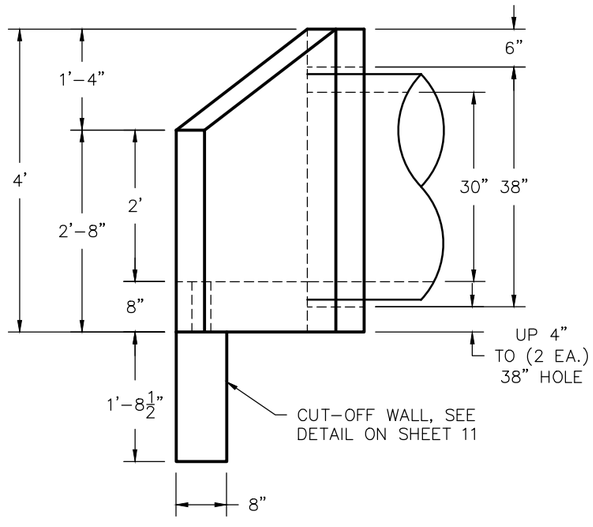
REVIEW DATE _____



TOP VIEW



END VIEW



SIDE VIEW

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1/2" = 1'–0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames – lansing generating station – lansing, ia – energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800–362–7220

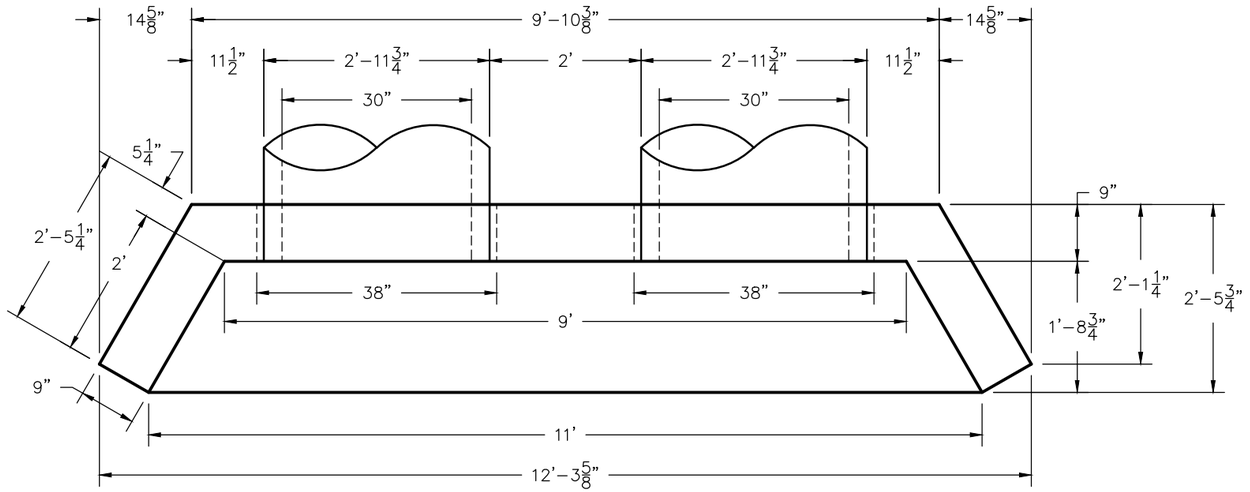
AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23–141U

PRE POUR

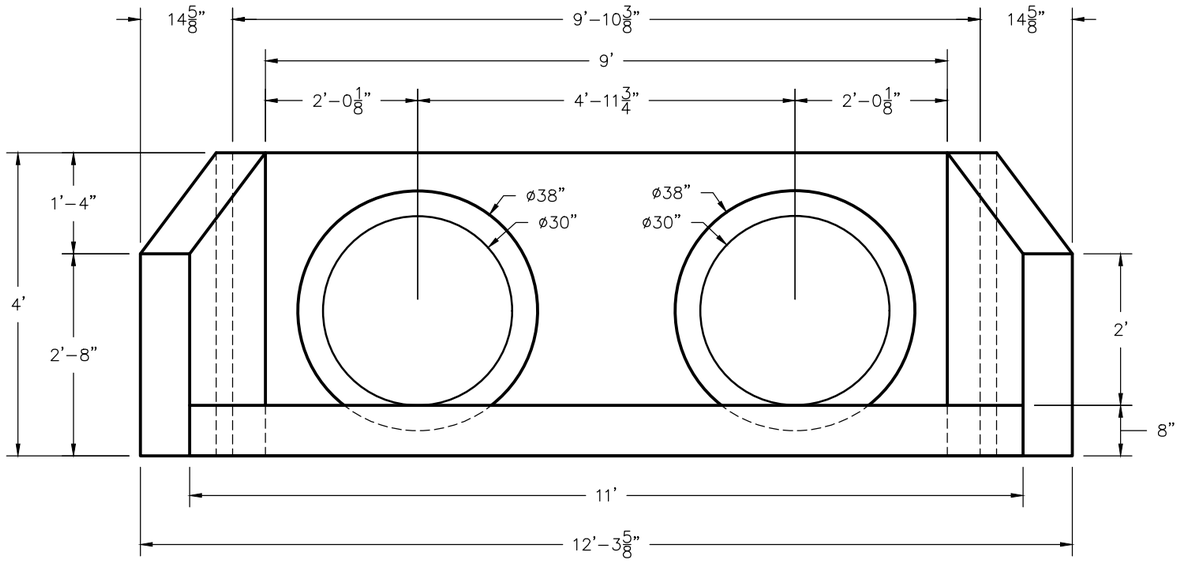
POST POUR

SHEET NO. 9 OF 12

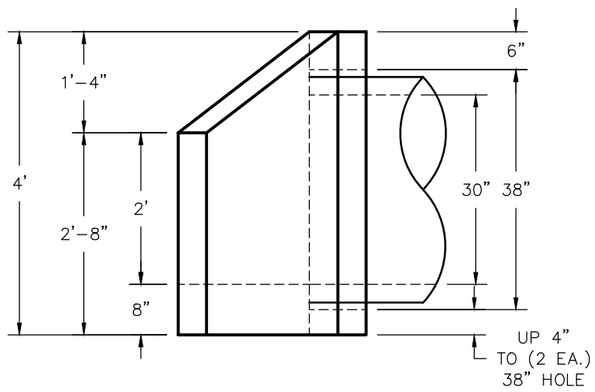
AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(1 EA.) CULVERT ENDWALL OUTLET



TOP VIEW



END VIEW



SIDE VIEW

NOTES:

CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED

REBAR – ASTM A-615 GRADE 60

WEIGHT: APPROX. 5,053 LBS. TOTAL

DRAWINGS SUBMITTED FOR APPROVAL

APPROVED BY: _____

APPROVAL DATE: _____

PRODUCTS NEEDED BY: _____

REVIEWED BY _____

REVIEW DATE _____

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1/2" = 1'-0"

DRAWN BY: BDK

DATE: 05/31/2023

FILE: i:\auto cad\custom boxes\custom boxes 2023\ames - lansing generating station - lansing, ia - energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800-362-7220

AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23-141U

PRE POUR

POST POUR

DRAWINGS SUBMITTED FOR APPROVAL

APPROVED BY: _____

APPROVAL DATE: _____

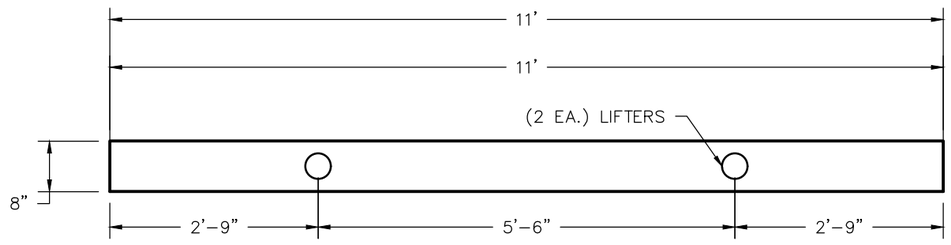
PRODUCTS NEEDED BY: _____

REVIEWED BY _____

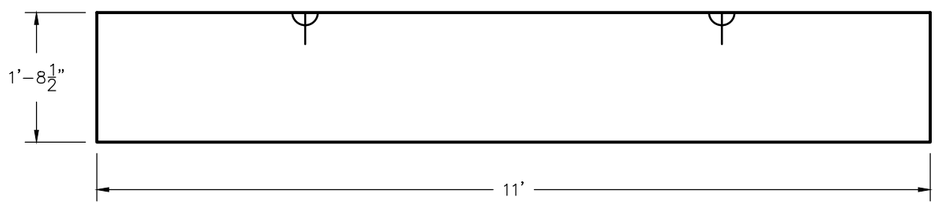
REVIEW DATE _____

AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA

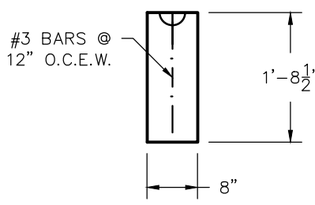
(1 EA.) INLET CUT–OFF WALL



TOP VIEW



SIDE VIEW



END VIEW

NOTES:

- CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED
- REINFORCING PER – ASTM C–1577
- WEIGHT – APPROX. 1,880 LBS. EACH

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1/2" = 1'–0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames – lansing generating station – lansing, ia – energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800–362–7220

AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23–141U

PRE POUR

POST POUR

SHEET NO. 11 OF 12

DRAWINGS SUBMITTED FOR APPROVAL

APPROVED BY: _____

APPROVAL DATE: _____

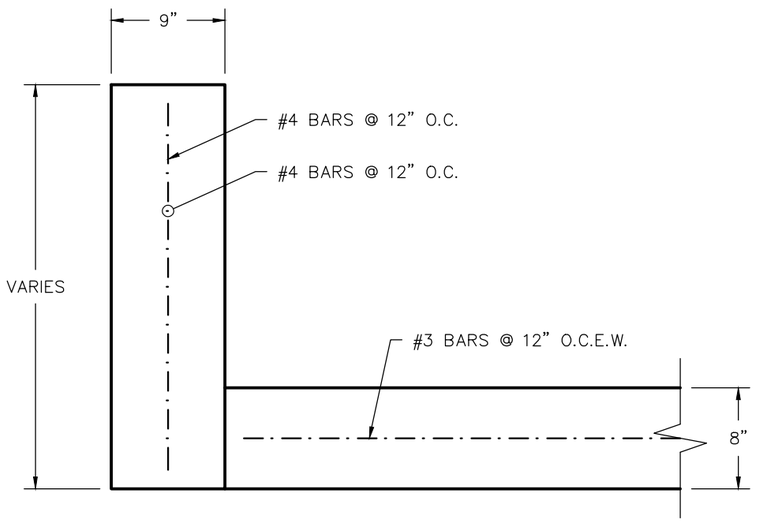
PRODUCTS NEEDED BY: _____

REVIEWED BY _____

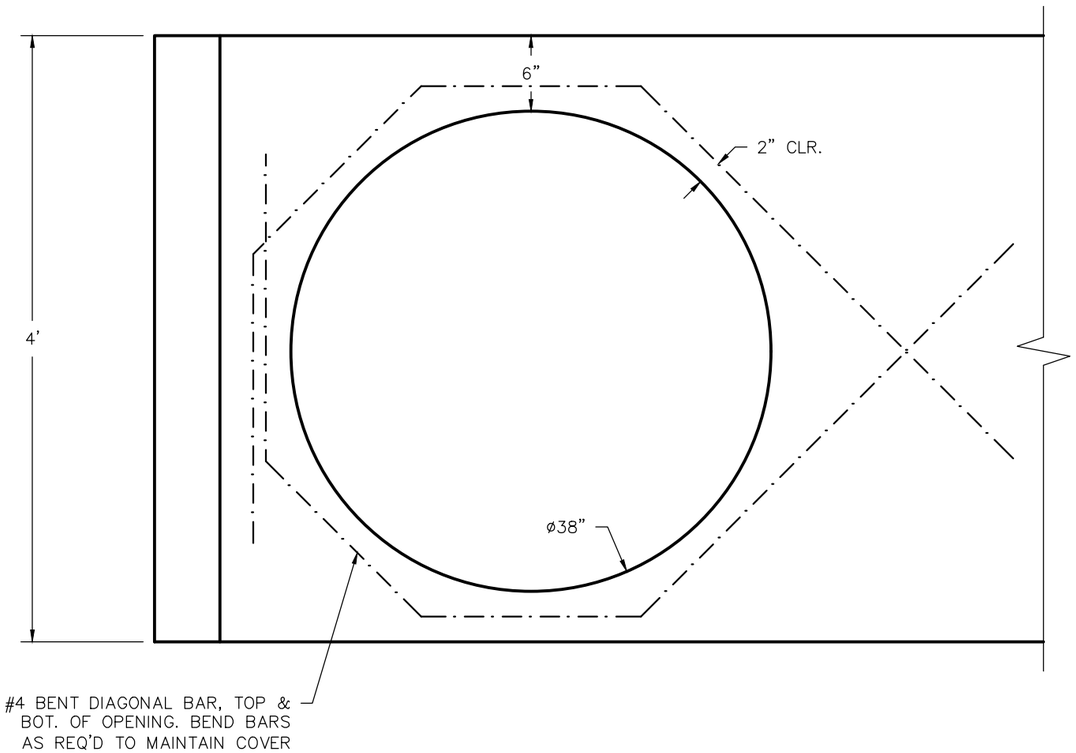
REVIEW DATE _____

AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA

CULVERT ENDWALL REINFORCING SUMMARY



SECTION VIEW
APRON ENDWALL REINFORCEMENT



SECTION VIEW
ENDWALL OPENING REINFORCEMENT

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1" = 1'-0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames - lansing generating station - lansing, ia - energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800-362-7220

AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23-141U

PRE POUR

POST POUR

AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(1 EA.) FLUME 4 ENERGY DISSIPATOR

NOTES:
CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED
REBAR – ASTM A-615 GRADE 60
WEIGHTS: DISSIPATOR BOX W/ BAFFLE WALL – 33,025 LBS
END WALL – 2,341 LBS

DRAWINGS SUBMITTED FOR APPROVAL

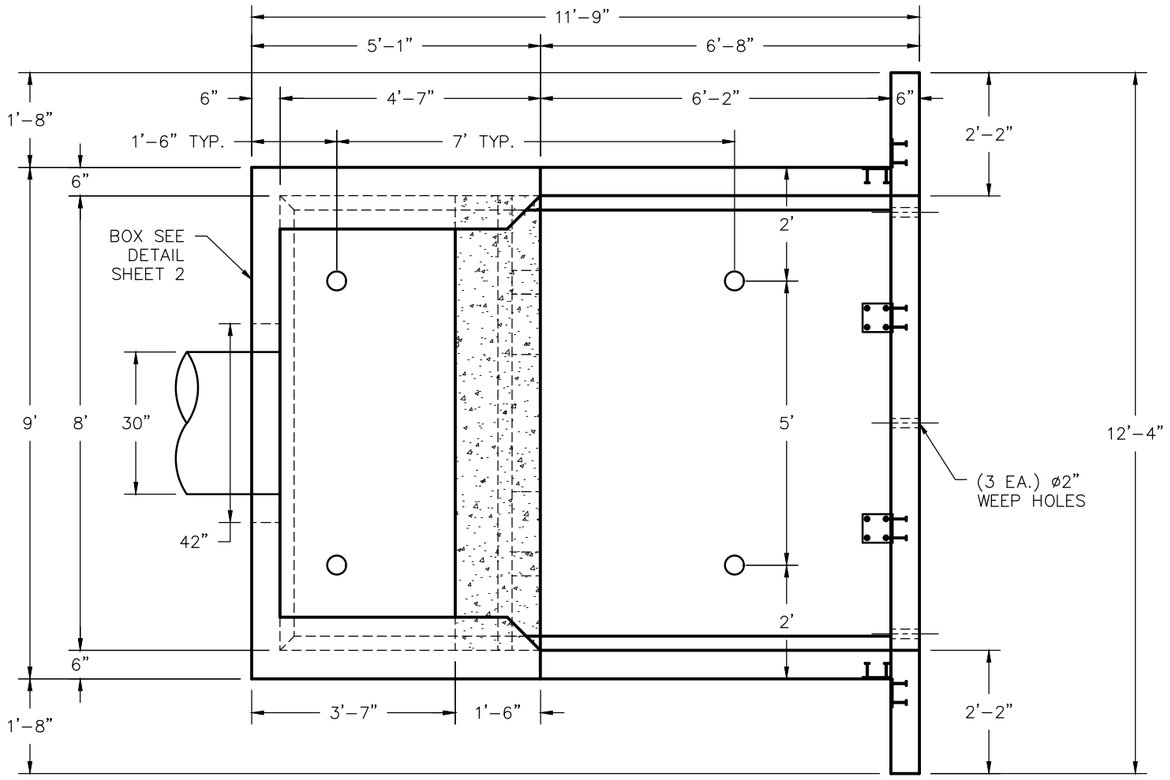
APPROVED BY: _____

APPROVAL DATE: _____

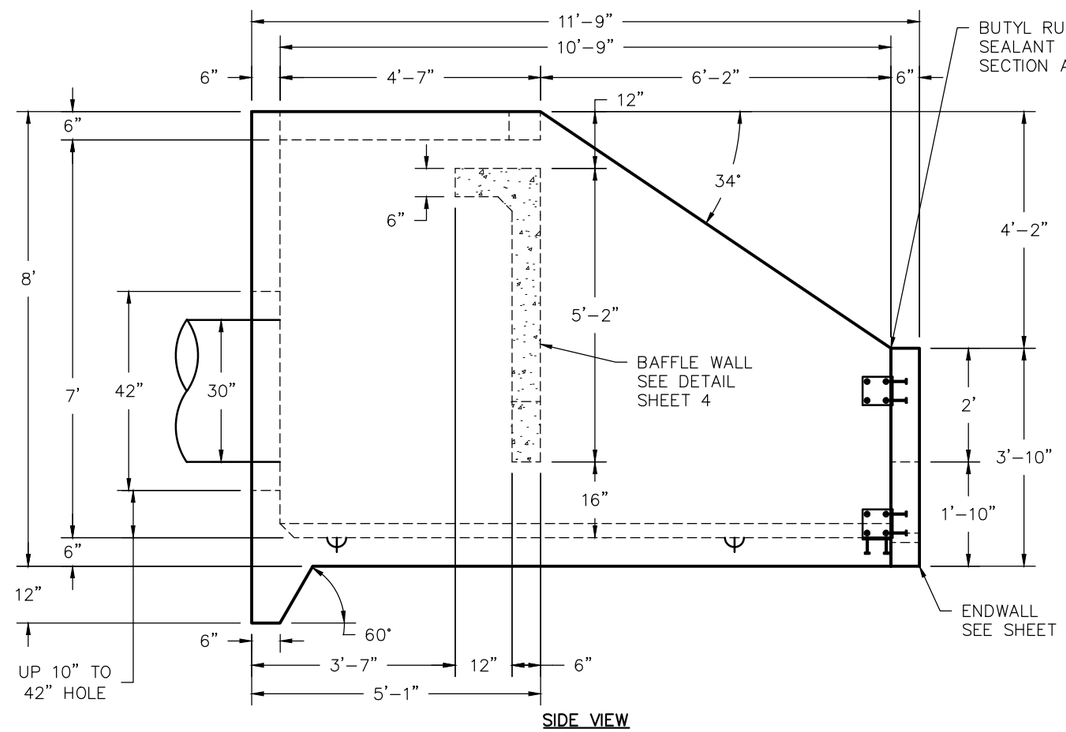
PRODUCTS NEEDED BY: _____

REVIEWED BY _____

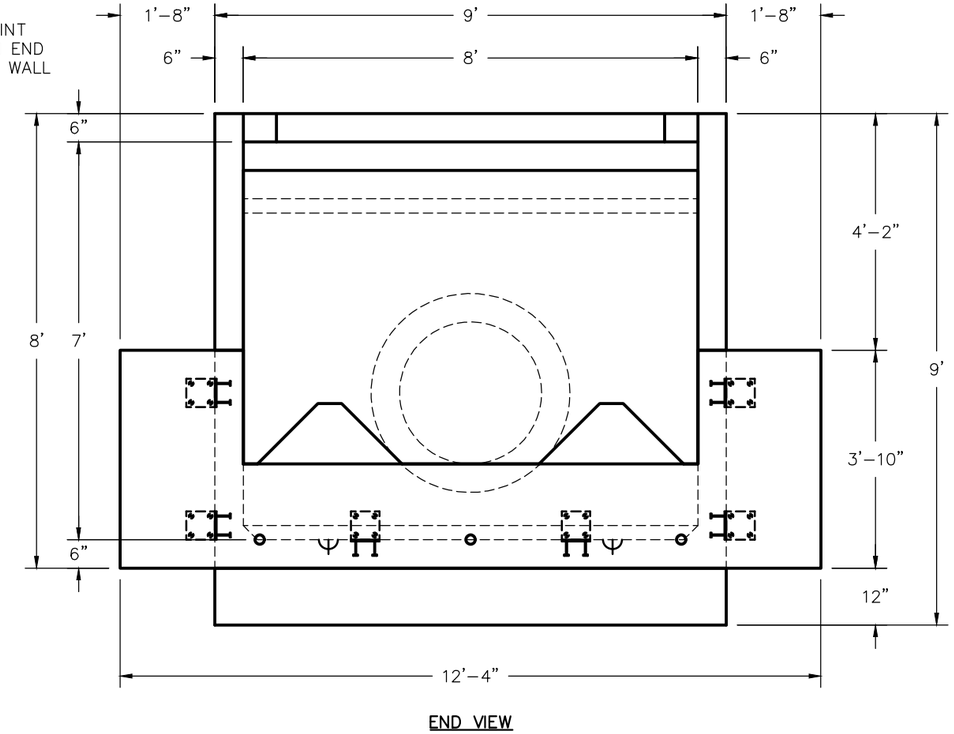
REVIEW DATE _____



TOP VIEW



SIDE VIEW



END VIEW

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1/2" = 1'–0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames - lansing generating station - lansing, ia - energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800–362–7220

AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23–141U

PRE POUR

POST POUR

SHEET NO. 1 OF 12

AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(1 EA.) FLUME 4 ENERGY DISSIPATOR BOX

NOTES:
CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED
REBAR – ASTM A-615 GRADE 60
WEIGHT: DISSIPATOR BOX – 29,522 LBS

DRAWINGS SUBMITTED FOR APPROVAL

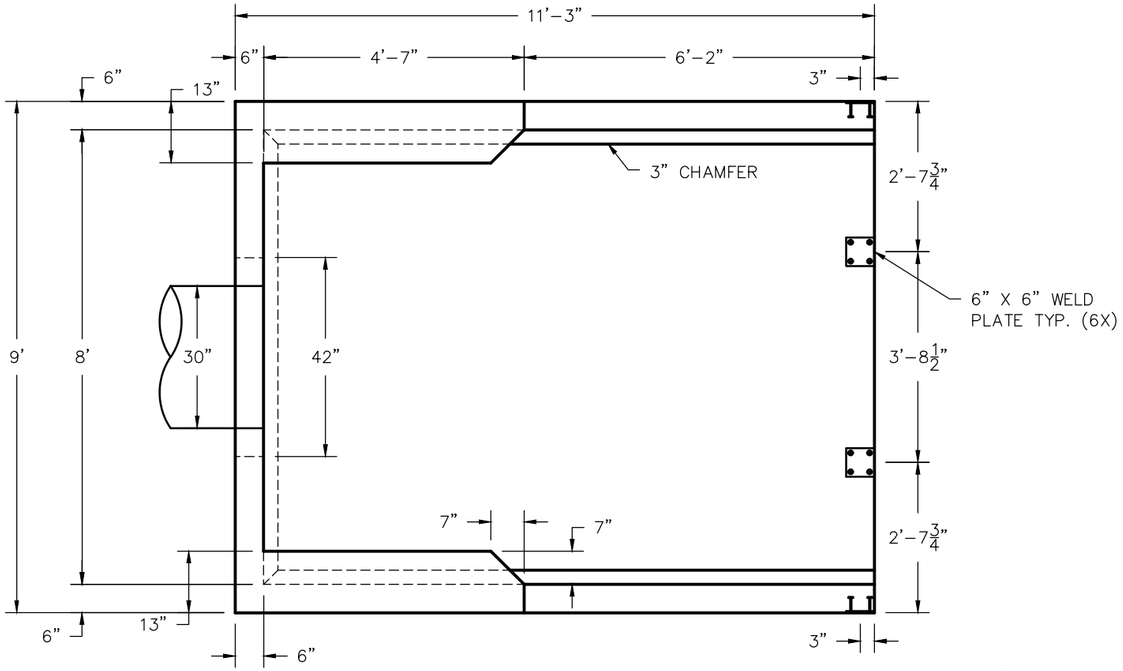
APPROVED BY: _____

APPROVAL DATE: _____

PRODUCTS NEEDED BY: _____

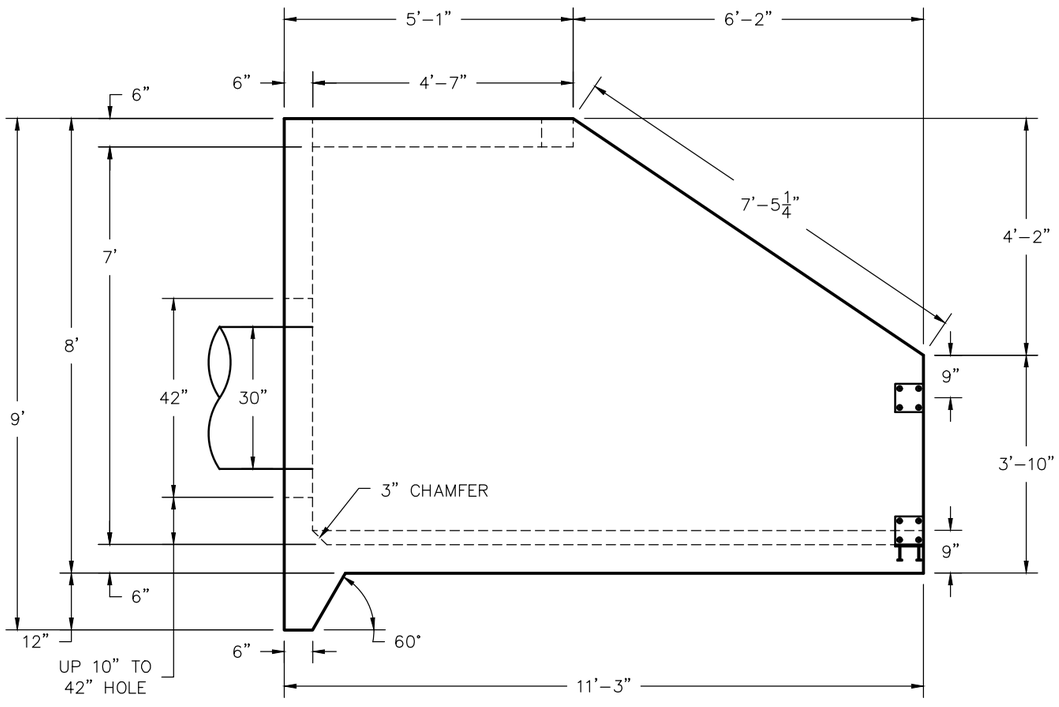
REVIEWED BY _____

REVIEW DATE _____

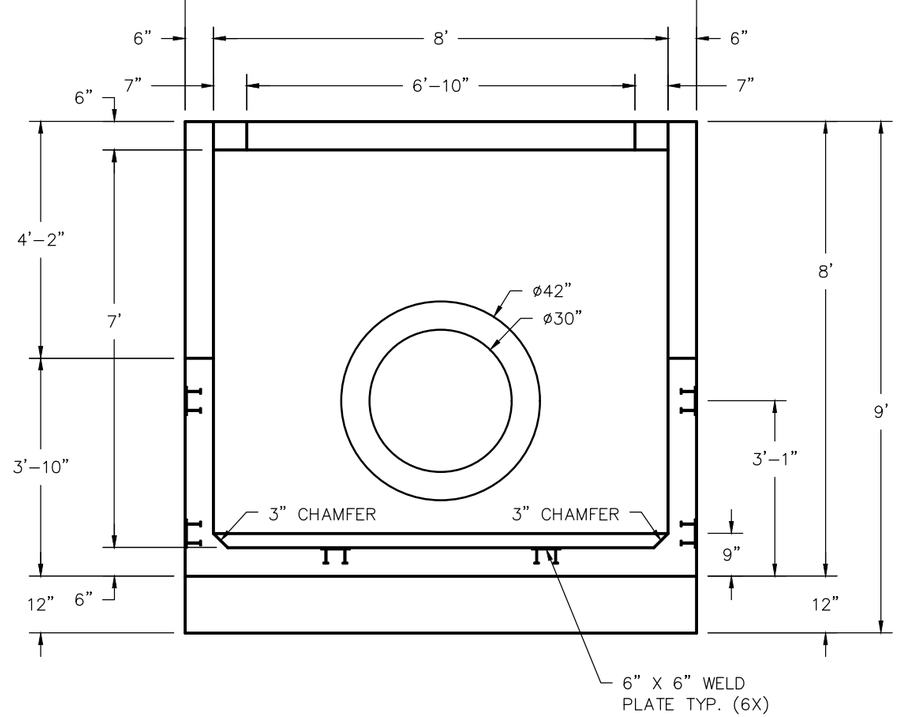


TOP VIEW

NOTE:
BAFFLE WALL NOT
SHOWN FOR CLARITY.



SIDE VIEW



END VIEW

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 3/8" = 1'-0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames - lansing generating station - lansing, ia - energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800-362-7220

AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23-141U

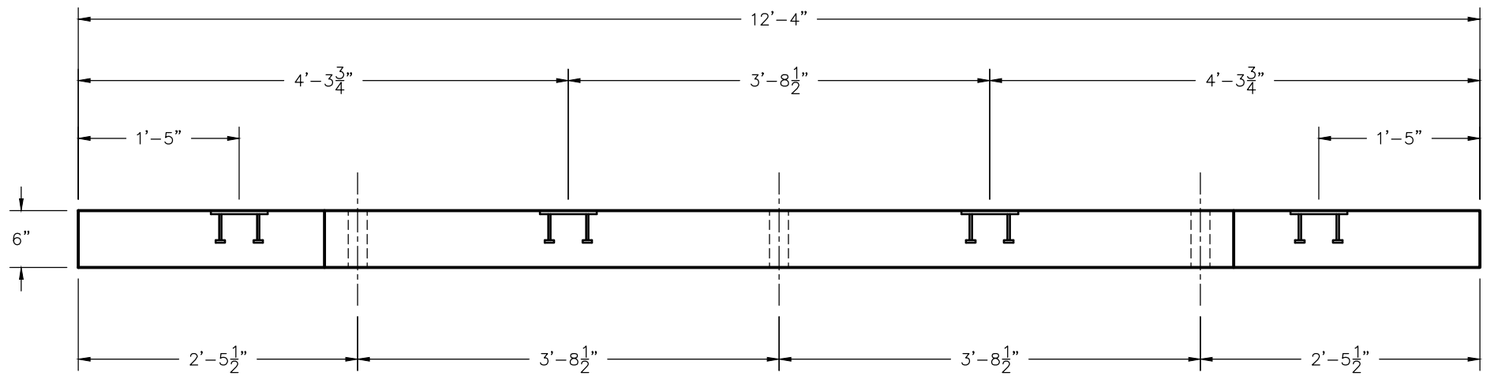
PRE POUR

POST POUR

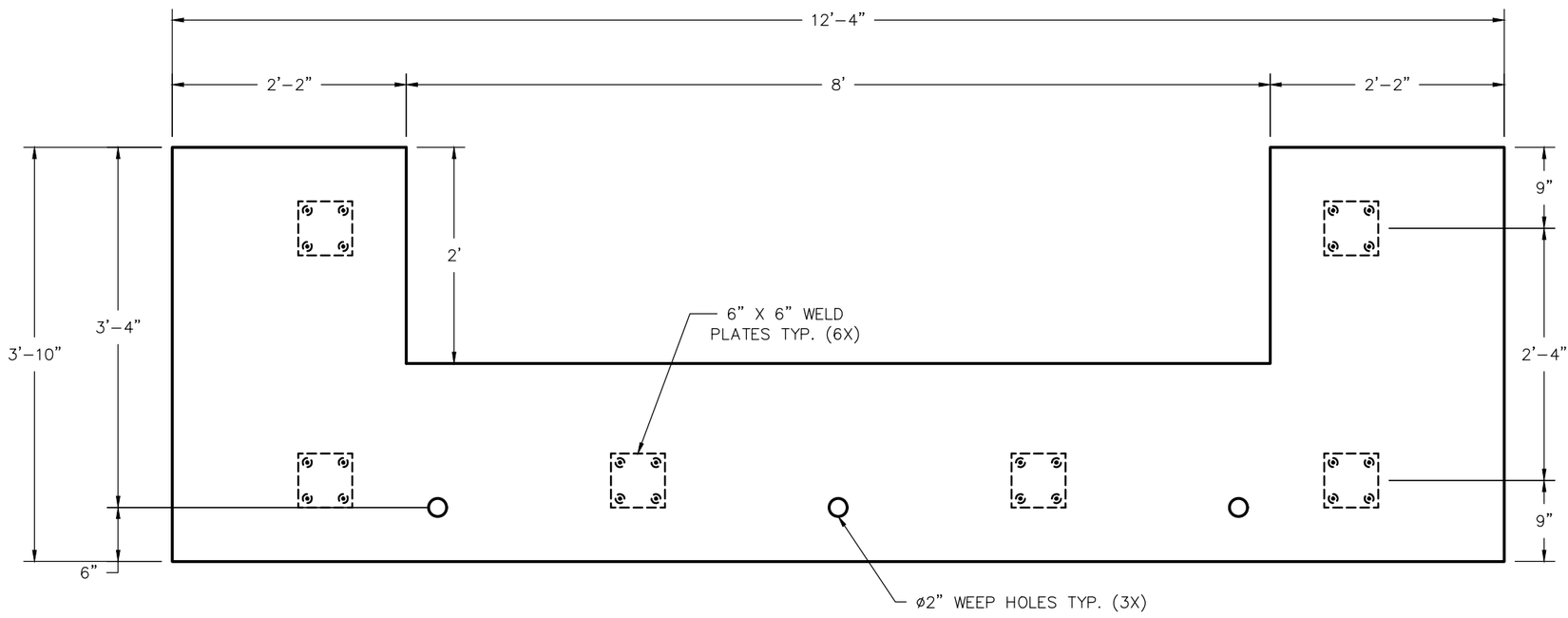
SHEET NO.
2 OF 12

AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(1 EA.) FLUME 4 END WALL

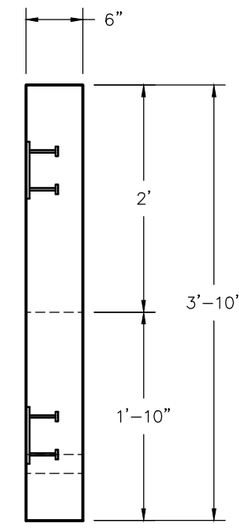
NOTES:
CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED
REBAR – ASTM A-615 GRADE 60
WEIGHT: END WALL – 2,341 LBS



TOP VIEW



SIDE VIEW



END VIEW

DRAWINGS SUBMITTED FOR APPROVAL

APPROVED BY: _____

APPROVAL DATE: _____

PRODUCTS NEEDED BY: _____

REVIEWED BY _____

REVIEW DATE _____

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 3/4" = 1'-0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames - lansing generating station - lansing, ia - energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800-362-7220

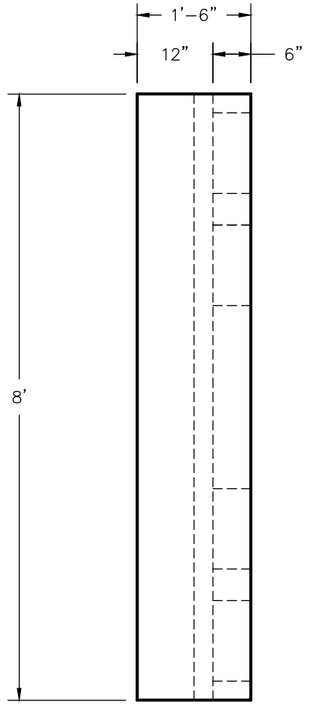
AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23-141U

PRE POUR

POST POUR

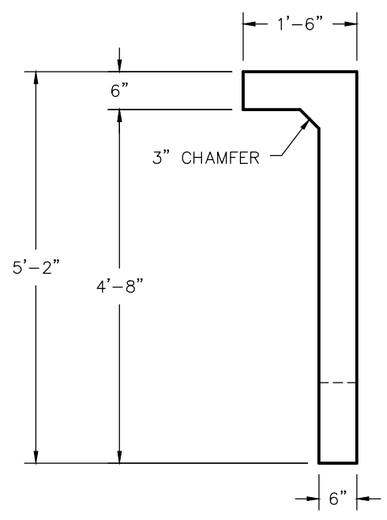
AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(1 EA.) FLUME 4 BAFFLE WALL

NOTES:
CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED
REBAR – ASTM A-615 GRADE 60
WEIGHT: BAFFLE WALL – 3,503 LBS

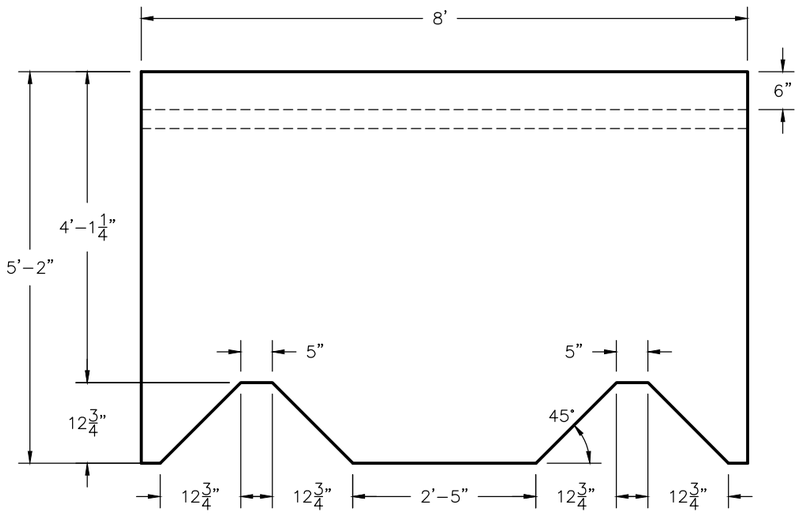


TOP VIEW

NOTE:
DISSIPATOR BOX NOT
SHOWN FOR CLARITY.



SIDE VIEW



END VIEW

DRAWINGS SUBMITTED
FOR APPROVAL
APPROVED BY: _____
APPROVAL DATE: _____
PRODUCTS NEEDED BY: _____

REVIEWED BY _____
REVIEW DATE _____

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1/2" = 1'-0"
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DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames - lansing generating station - lansing, ia - energy dissipator, headwall

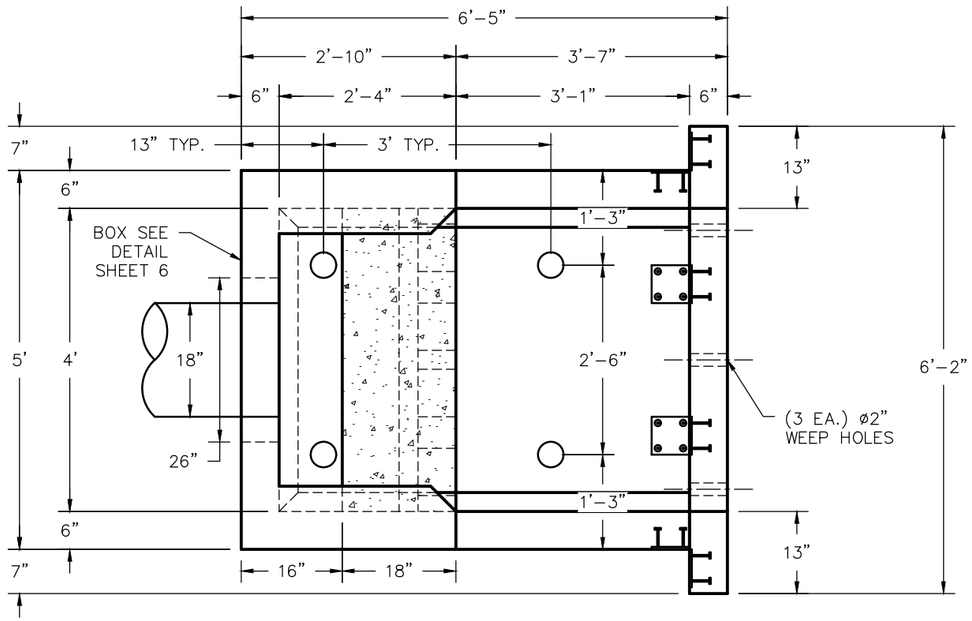
WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800-362-7220

AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23-141U

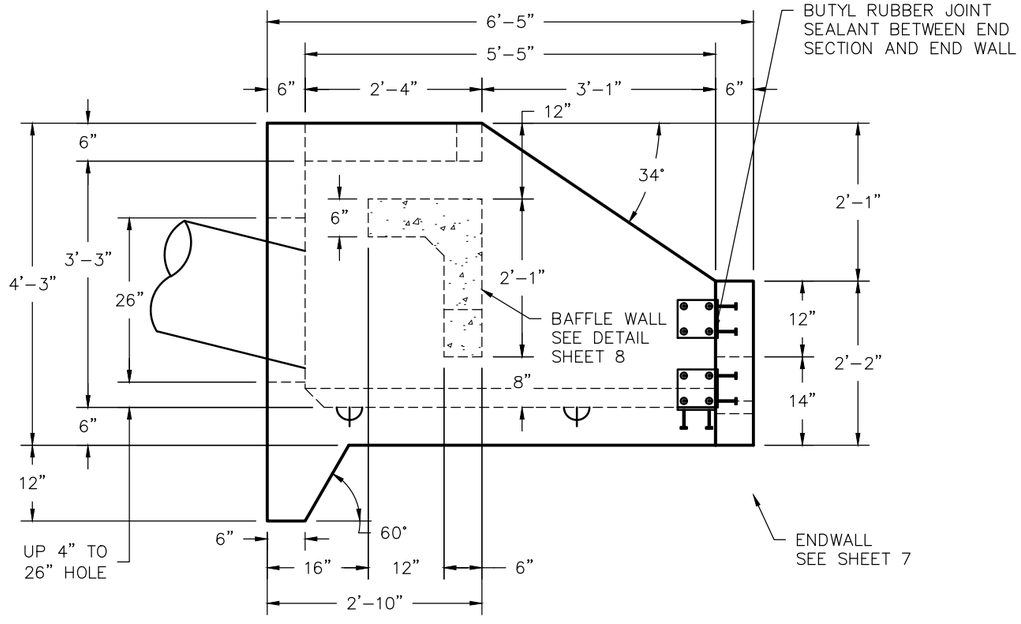
PRE POUR

POST POUR

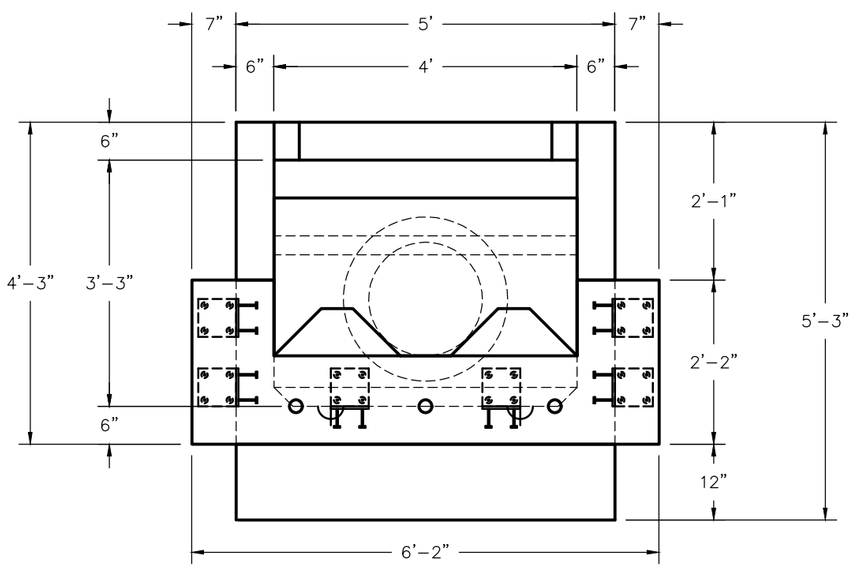
AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(3 EA.) FLUME 1, 2 & 3
ENERGY DISSIPATOR



TOP VIEW



SIDE VIEW



END VIEW

NOTES:
CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED
REBAR – ASTM A-615 GRADE 60
WEIGHTS: DISSIPATOR BOX W/ BAFFLE WALL – 8,443 LBS
END WALL – 698 LBS

DRAWINGS SUBMITTED FOR APPROVAL

APPROVED BY: _____

APPROVAL DATE: _____

PRODUCTS NEEDED BY: _____

REVIEWED BY _____

REVIEW DATE _____

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1/2" = 1'-0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames - lansing generating station - lansing, ia - energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800-362-7220

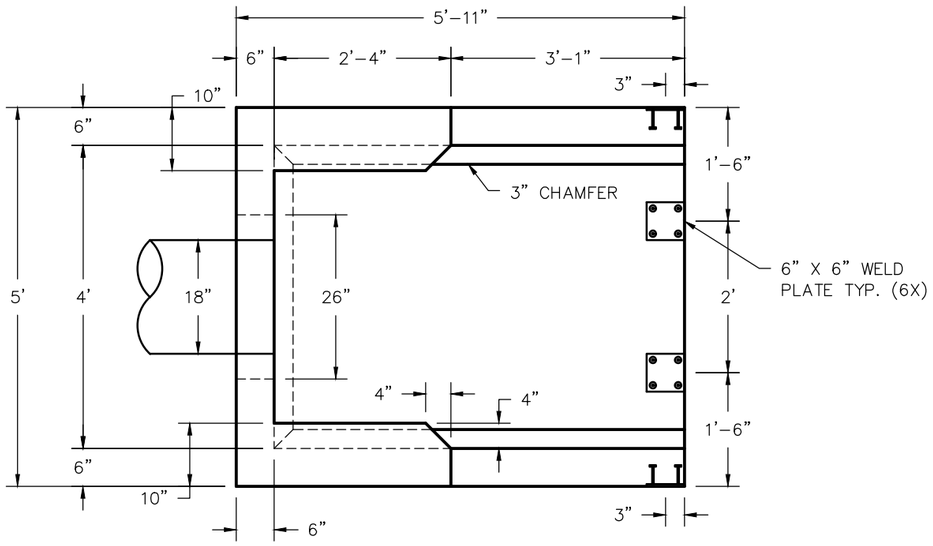
AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23-141U

PRE POUR

POST POUR

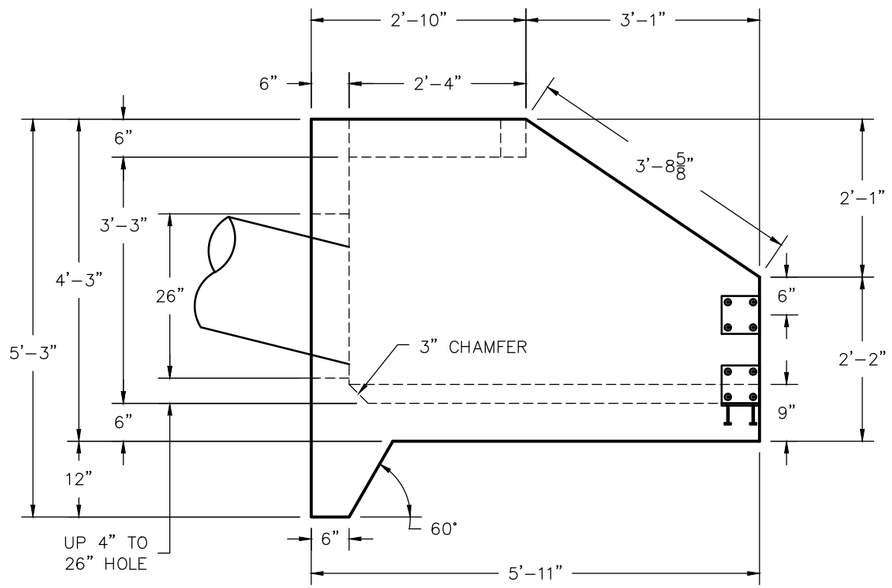
SHEET NO. 5 OF 12

AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(3 EA.) FLUME 1, 2 & 3
ENERGY DISSIPATOR BOX

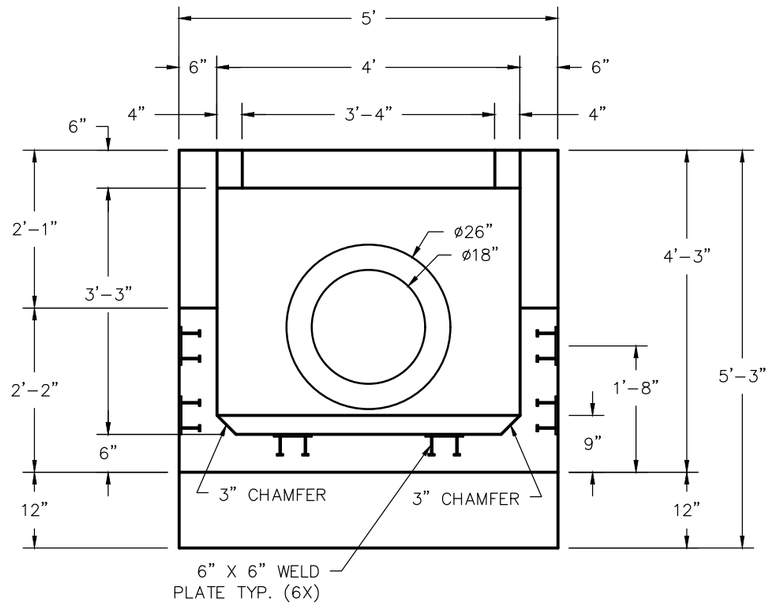


TOP VIEW

NOTE:
BAFFLE WALL NOT
SHOWN FOR CLARITY.



SIDE VIEW



END VIEW

NOTES:
CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED
REBAR – ASTM A-615 GRADE 60
WEIGHT: DISSIPATOR BOX – 7,596 LBS

DRAWINGS SUBMITTED FOR APPROVAL

APPROVED BY: _____
APPROVAL DATE: _____
PRODUCTS NEEDED BY: _____

REVIEWED BY _____
REVIEW DATE _____

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1/2" = 1'-0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames - lansing generating station - lansing, ia - energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
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AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23-141U

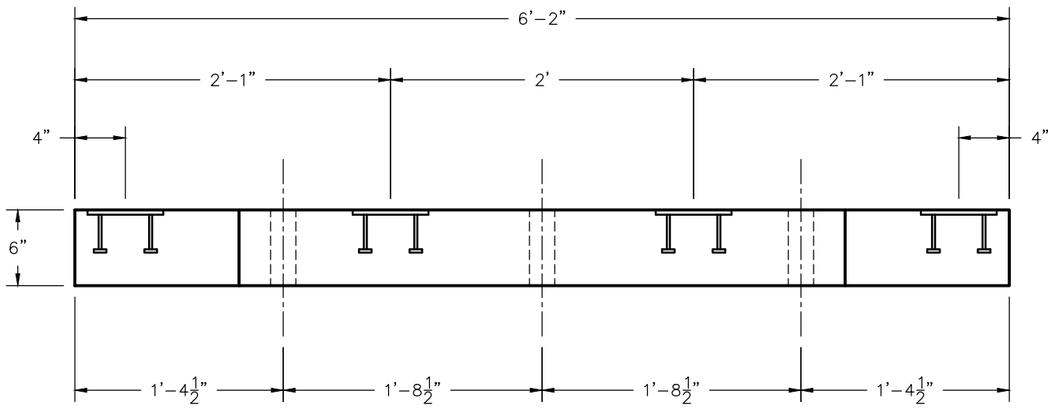
PRE POUR

POST POUR

SHEET NO.
6 OF 12

AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(3 EA.) FLUME 1, 2 & 3 END WALL

NOTES:
CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED
REBAR – ASTM A-615 GRADE 60
WEIGHT: END WALL – 698 LBS



TOP VIEW

DRAWINGS SUBMITTED FOR APPROVAL

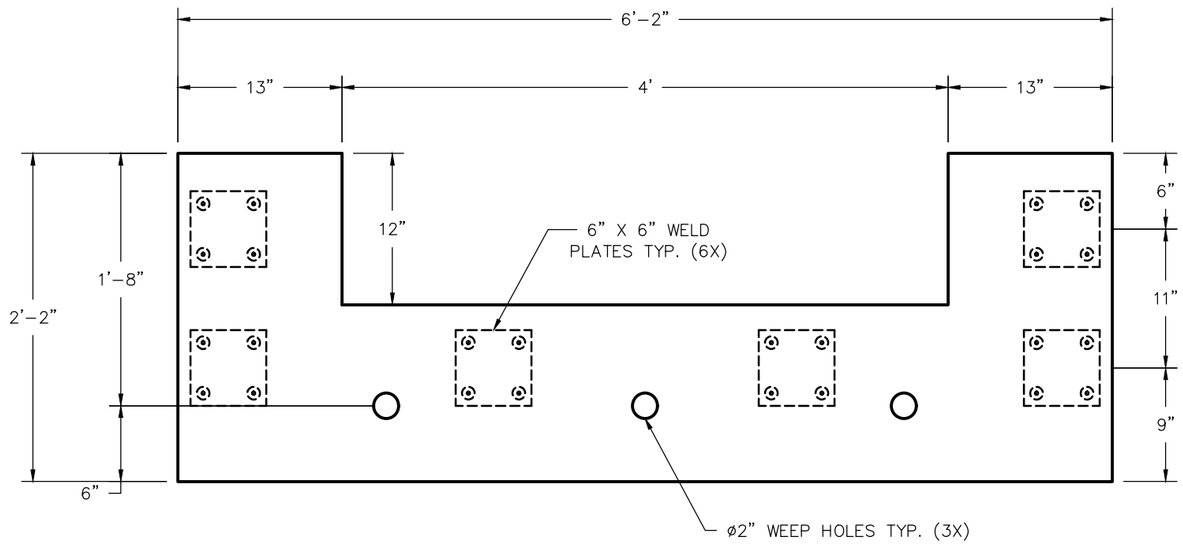
APPROVED BY: _____

APPROVAL DATE: _____

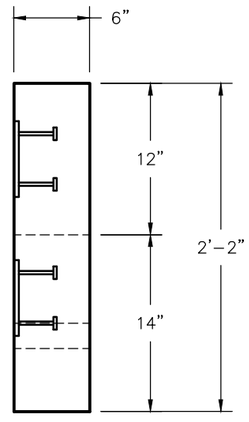
PRODUCTS NEEDED BY: _____

REVIEWED BY _____

REVIEW DATE _____



SIDE VIEW



END VIEW

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1" = 1'-0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames - lansing generating station - lansing, ia - energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800-362-7220

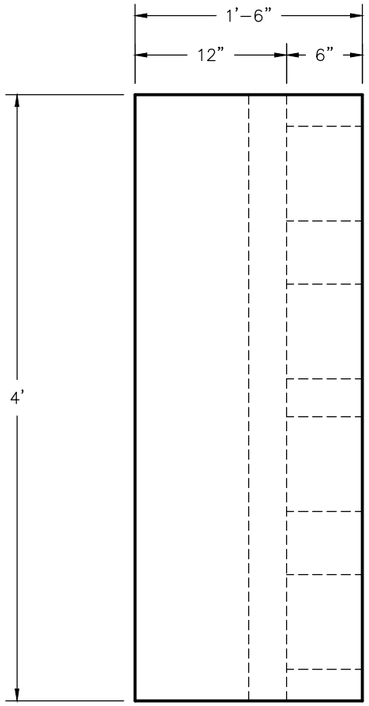
AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23-141U

PRE POUR

POST POUR

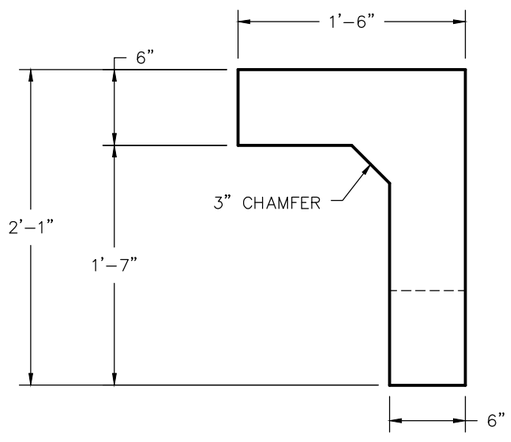
AMES CONSTRUCITON
LANSING GENRATING STATION
LANSING, IA
(3 EA.) FLUME 1, 2 & 3 BAFFLE WALL

NOTES:
CONCRETE – 28 DAY COMPRESSIVE F'C=5000 PSI., AIR ENTRAINED
REBAR – ASTM A–615 GRADE 60
WEIGHT: BAFFLE WALL – 847 LBS

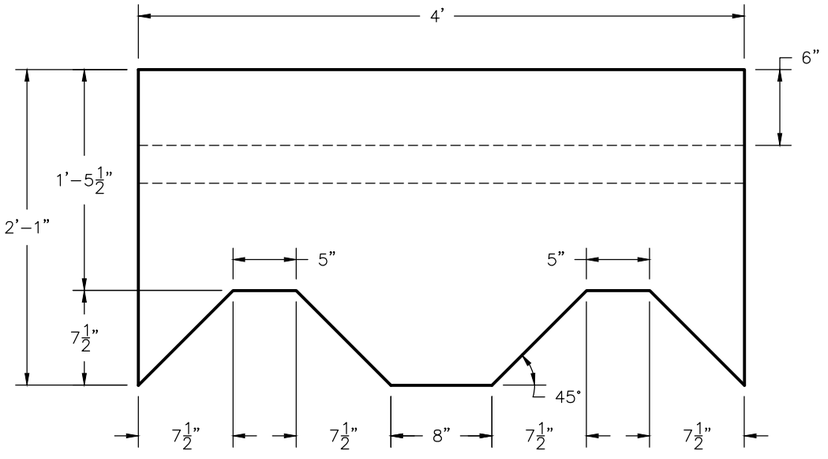


TOP VIEW

NOTE:
DISSIPATOR BOX NOT
SHOWN FOR CLARITY.



SIDE VIEW



END VIEW

DRAWINGS SUBMITTED
FOR APPROVAL

APPROVED BY: _____

APPROVAL DATE: _____

PRODUCTS NEEDED BY: _____

REVIEWED BY _____

REVIEW DATE _____

REV NO.	DATE:
NO. 1	06/09/2023

SCALE: 1" = 1'–0"
DRAWN BY: BDK
DATE: 05/31/2023
FILE: i:\auto cad\custom boxes\custom boxes 2023\ames – lansing generating station – lansing, ia – energy dissipator, headwall

WIESER CONCRETE
2815 RILEY ROAD PORTAGE, WI 53901
800–362–7220

AMES CONSTRUCTION
LANSING GENERATING STATION
ENERGY DISSIPATOR
LANSING, IA
WIESER JOB# 23–141U

PRE POUR

POST POUR

GOLDFLO WT®

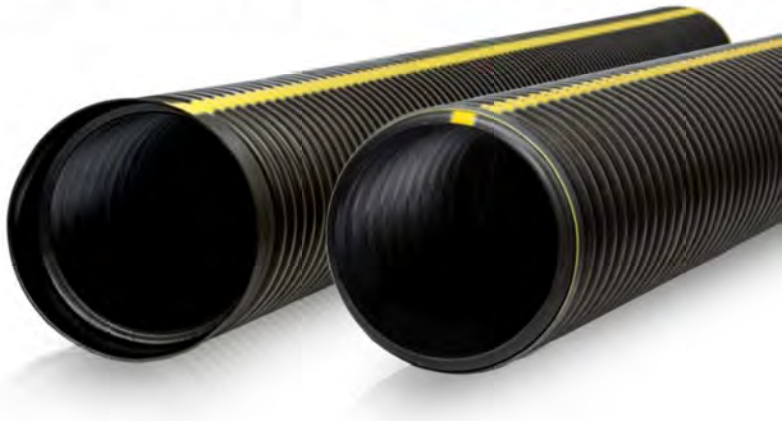


STORMWATER SOLUTIONS / COLLECTION & CONVEYANCE / DUAL-WALL

GOLDFLO WT®

GOLDFLO WT® provides unsurpassed performance for watertight stormwater conveyance and management. It is designed and manufactured with state-of-the-art methods ensuring maximum material performance and maximum structural performance.

GOLDFLO WT® is manufactured to the most stringent requirements of AASHTO M294 or ASTM F2306, along with the ASTM D3212 watertight laboratory test requirements, making it ideal for projects where low cost, high installation efficiency, high product quality, and maximum watertight performance are critical.



Performance

GOLDFLO WT® pipe meets the following:

- **ASTM F2306:** Standard Specification for 12" - 60" (300 - 1500 mm) Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications
- **AASHTO M252:** Standard Specification for Corrugated Polyethylene Drainage Pipe
- **AASHTO M294:** Standard Specification for Corrugated Polyethylene Pipe, 300 - 1500 mm Diameter
- **ASTM F477:** Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
- **ASTM D3212:** Standard Specification for Joints for Drain and Sewer Plastic Pipes using Flexible Elastomeric Seals

Available Sizes

Diameter (in.)	Number	Nominal Length
4"	04WT20NP	20'
6"	06WT20NP	20'
8"	08WT20NP	20'
10"	10WT20NP	20'
12"	12WT10NP/12WT20NP	10'/20'
15"	15WT10NP/15WT20NP	10'/20'
18"	18WT11NP/18WT20NP	11'/20'
24"	24WT11NP/24WT20NP	11'/20'
30"	30WT11NP/30WT20NP	11'/20'
36"	36WT11NP/36WT20NP	11'/20'
42"	42WT11NP/42WT20NP	11'/20'
48"	48WT11NP/48WT20NP	11'/20'
60"	60WT11NP/60WT20NP	11'/20'

(Pipe is available perforated.)

Applications

- Storm Sewers
- Commercial Sites
- Parking Lot Drainage
- Stormwater Detention Systems
- Industrial Applications
- Ditch Enclosures

** Contact your Prinsco representative regarding application suitability questions.*









Green Fact: The carbon footprint of HDPE is considerably smaller than concrete because it requires less energy to manufacture, transport and install.

MOBILE RESOURCES



More about GOLDFLO WT

Installation Videos
Installation Documents
Specifications
Technical Notes

Prinsco.com/GOLDFLOWT-Resources

ENGINEERED WITH INTEGRITY

Prinsco products are fully supported by our engineering team and are designed, manufactured and tested to meet/exceed the high performance needs of the construction market. Prinsco's engineering, quality control and production teams are committed to a continuous process of innovation, product development and quality improvement. We are focused on current and future market needs centered around environmental sustainability, water quality, stormwater management and performance advancement.

COLLECTION & CONVEYANCE



GOLDFLO WT®
AASHTO Dual-Wall Pipe

ECOFLO® 100
High Performance
Recycled Dual-Wall Pipe

TREATMENT



STORMWATER QUALITY
Water Treatment

STORAGE



HYDROSTOR™
High Performance
Arched Chambers

UNDERGROUND DETENTION
Customized High Performance
Pipe Systems

PRINSCO
ENGINEERED WITH INTEGRITY

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Your Resources. One Stop. Any Device.

800.992.1725

GOLDFLO WT® DUAL WALL SPECIFICATION

Scope
This specification designates the requirements for 4- through 60- inch I.D. Prinsco GOLDFLO WT® pipe for use in gravity-flow drainage applications.

Pipe Requirements
Prinsco GOLDFLO WT pipe shall have annular exterior corrugations with a smooth interior allowing for a Manning's "n" design value of 0.012 and shall meet the following standards:

- 4- though 10- inch shall meet AASHTO M252, Type S
- 12- through 60- inch shall meet ASTM F2306 or AASHTO M294, Type S

Materials
GOLDFLO WT pipe and fabricated fittings shall be manufactured using High Density Polyethylene (HDPE) meeting the minimum requirements of cell classification of 424420C for 4- through 10- inch diameters and 435400C for 12- through 60- inch diameters, as defined and described in ASTM D3350 except the carbon black content shall be 2 – 4%.

The HDPE pipe material for 12- through 60- inch diameters shall be tested for slow crack growth resistance using the notched constant ligament-stress (NCLS) test as specified in sections 9.4 and 5.1 of AASHTO M294 and ASTM F2306, respectively. Average failure time of the five test specimens shall not be less than 24 hours.

Joint Performance
GOLDFLO WT pipe shall be joined using watertight bell and spigot type joints meeting AASHTO M252, M294 or ASTM F2306. The integral joints shall be watertight according to ASTM D3212. Gaskets shall meet the requirements of ASTM F477 and shall be installed by the manufacturer. An approved joint lubricant, available from the manufacturer, shall be applied to the bell and gasket during installation. GOLDFLO WT joints shall be assembled in accordance with the manufacturer's requirements to ensure installed watertight performance.

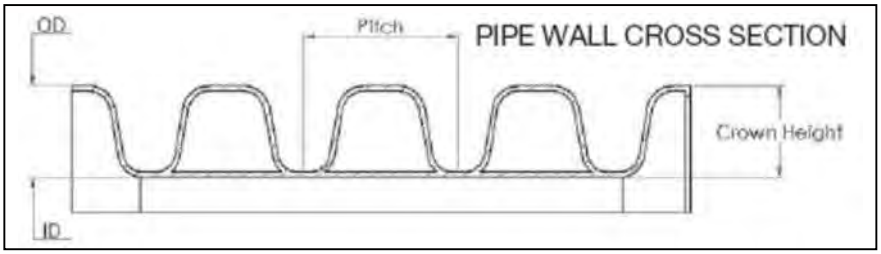
Fittings
Fittings shall meet the requirements of AASHTO M252, M294 or ASTM F2306. Standard fittings are available as listed on Prinsco's website www.prinsco.com and custom fittings may be fabricated to customer specific requirements.

Physical Pipe Dimensions

Nominal ID (in)	Approximate OD (in)	Length (ft)	Corrugation Pitch (in)	Approximate Weight/foot (lb)	Min. Pipe Stiffness @ 5% Deflection (psi)
4"	4.8	20	.67	0.5	50
6"	7.1	20	.80	1.0	50
8"	9.5	20	1.00	1.7	50
10"	11.9	20	1.30	2.3	50
12"	14.4	10, 20	2.00	3.1	50
15"	17.6	10, 20	2.67	4.5	42
18"	21.5	11, 20	3.00	6.5	40
24"	28.2	11, 20	4.00	11.0	34
30"	34.7	11, 20	4.00	14.6	29
36"	40.6	11, 20	4.70/ 3.90*	19.0	22.5
42"	47.5	11, 20	6.00	25	21
48"	54.1	11, 20	6.00	30	20
60"	66.8	12, 20	5.90	40	15

*Contact your Prinsco sales representative to determine actual corrugation pitch.

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Installation

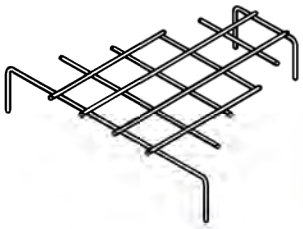
Pipe and fittings shall be installed in accordance with ASTM D2321 and Prinsco's published installation guidelines. Minimum cover heights for AASHTO H-25 loads shall be 12" for 4- through 48-inch diameter pipe and 18" for 60-inch pipe. The minimum cover shall be measured from the top of the pipe to the bottom of flexible pavement or to the top of rigid pavement. Contact your local Prinsco representative or visit www.prinsco.com for the latest installation guidelines.

Reference Specifications

This specification references the latest edition and revisions of the following standard specifications:

- AASHTO M294 – *Standard Specification for Corrugated Polyethylene Pipe, 300- to 1500-mm (12- to 60-in.) Diameter*
- AASHTO M 252 – *Standard Specification for Corrugated Polyethylene Drainage Pipe*
- ASTM F2306 – *Standard Specification for 12 to 60-in. (300 to 1500 mm) Annular Corrugated Profile-Wall Polyethylene (PE) Pipe and Fittings for Gravity-Flow Storm Sewer and Subsurface Drainage Applications*
- ASTM D3350 – *Standard Specification for Polyethylene Plastics Pipe and Fittings Materials*
- ASTM D477 – *Standard Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe*
- ASTM D3212 – *Standard Specification for Joints for Drain and Sewer Plastic Pipes Using Flexible Elastomeric Seals*
- ASTM D2321 – *Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications*
- ASTM F2487 – *Standard Practice for Underground Infiltration and Exfiltration Acceptance Testing of Installed Corrugated High Density Polyethylene Pipelines*

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TRASH GUARD

Used on flared end sections with 3:1 slopes to help keep debris out and prevent clogging.

Size	Number	Unit
8"	TGS08	Each
10"	TGS10	Each
12"	TGS12	Each
15"	TGS15	Each
18"	TGS18P1215	Each
24"	TGS24P18	Each
30"	TGS30P24	Each
36"	TGS36P3036	Each
42"	TGS42	Each
48"	TGS48	Each
60"	TGS60	Each

GALVANIZED TRASH GUARD

Used on flared end sections with 3:1 slopes to help keep debris out and prevent clogging.

Size	Number	Unit
12"	GTG12	Each
15"	GTG15	Each
18"	GTG18	Each
24"	GTG24	Each
30"	GTG30	Each
36"	GTG36	Each

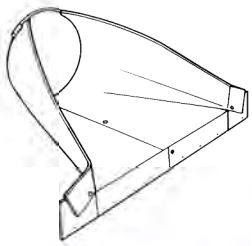
WATERTIGHT BELL COUPLER GASKETS

Used to connect to Prinsco PVC Catch Basins or Fabricated Fittings

4"	GFGSK04	Each
6"	GFGSK06	Each
8"	GFGSK08	Each
10"	GFGSK10	Each
12"	GFGSK12	Each
15"	GFGSK15	Each
18"	GFGSK18MW	Each
18"	GFGSK18WC	Each
24"	GFGSK24MW	Each
24"	GFGSK24WC	Each
30"	GFGSK30MW	Each

GOLDFLO WATER STOP GASKET

Size	Number	Unit
12"	GFWSG12	Each
15"	GFWSG15	Each
18"	GFWSG18	Each
24"	GFWSG24	Each
30"	GFWSG30	Each
36"	GFWSG36	Each
42"	GFWSG42	Each
48"	GFWSG48	Each
60"	GFWSG60	Each

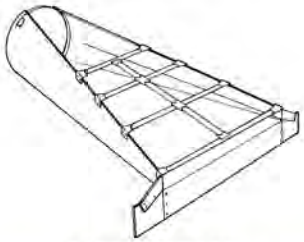


STEEL APRONS

Used on projects where 2.5:1 slope is specified. Fits contour and assists water flow through the culvert.

Size	Number	Unit
6"	ES06	Each*
8"	ES08	Each
10"	ES10	Each
12"	ES12	Each
15"	ES15	Each
18"	ES18	Each
24"	ES24	Each
30"	ES30	Each
36"	ES36	Each
42"	ES42	Each
48"	ES48	Each
60"	ES60	Each

*special order item



SAFETY APRONS

Used where 6:1 slopes are required. Available with or without safety grate.

Size	Number	Unit
12"	SA0012	Each
15"	SA0015	Each
18"	SA0018	Each
24"	SA0024	Each

Safety aprons are all special-order items.

PLASTIC APRONS

High density polyethylene aprons designed for GOLDLINE and GOLDFLO/ ECOFLO applications

Size	Number	Unit
12"	PLAP12	Each
15"	PLAP15	Each
18"	PLAP18	Each
24"	PLAP24	Each
30"	PLAP30	Each
36"	PLAP36	Each

EXTERNAL ENDCAPS

Size	Number	Unit
8"	EC08-GF	Each
10"	EC10-GF	Each
12"	EC12-GF	Each
15"	EC15-GF	Each
18"	EC18-GF	Each
24"	EC24-GF	Each
30"	EC30-GF	Each
36"	EC36-GF	Each
42"	EC42-GF	Each
48"	EC48-GF	Each

PIPE ADAPTER

Size	Number	Unit
10"	GFA10	Each
12"	GFA12	Each
15"	GFA15	Each
18"	GFA18	Each
24"	GFA24	Each
30"	GFA30	Each
36"	GFA36	Each

RUBBER FLEXIBLE MANHOLE ADAPTER

Size	Number	Unit
12"	GFAD12MH	Each
15"	GFAD15MH	Each
18"	GFAD18MH	Each
24"	GFAD24MH	Each

GOLDFLO HDPE BELL X SDR35 SPIGOT ADAPTER

Size	Number	Unit
4"	GFAD04MH-PVC35	Each
6"	GFAD06MH-PVC35	Each
8"	GFAD08MH-PVC35	Each
10"	GFAD10MH-PVC35	Each
12"	GFAD12MH-PVC35	Each
15"	GFAD15MH-PVC35	Each
18"	GFAD18MH-PVC35	Each
24"	GFAD24MH-PVC35	Each

GOLDFLO HDPE BELL X SCH40 SPIGOT ADAPTER

Size	Number	Unit
4"	GFAD04MH-PVC40	Each
6"	GFAD06MH-PVC40	Each
8"	GFAD08MH-PVC40	Each
10"	GFAD10MH-PVC40	Each
12"	GFAD12MH-PVC40	Each

TECHNICAL DATA SHEET

HDPE 7000 40 mils Black Textured

PROPERTY(1)	TEST METHOD	FREQUENCY	UNIT Imperial	1000865
SPECIFICATIONS				
Thickness (Nominal ±10%) (11)	ASTM D5994	Every roll	mils	40
Asperity Height (min. avg.) (3)	ASTM D7466	Every roll	mils	16
Resin Density	ASTM D1505	Certified	g/cc	> 0.932
Melt Index - 190/2.16 (max.)	ASTM D1238	Certified	g/10 min	1.0
Sheet Density	ASTM D792	1/Batch	g/cc	≥ 0.940
Carbon Black Content	ASTM D4218	Every 2 rolls	%	2.0 - 3.0
Carbon Black Dispersion	ASTM D5596	Every 10 rolls	Category	Cat. 1 & Cat. 2
OIT - standard (avg.)	ASTM D3895	Per formulation	min	100
Tensile Properties (min. avg) (2)	ASTM D6693	Every 5 rolls		
Strength at Yield			ppi	84
Elongation at Yield			%	12
Strength at Break			ppi	60
Elongation at Break			%	100
Tear Resistance (min. avg.)	ASTM D1004	Every 10 rolls	lbf	28
Puncture Resistance (min. avg.)	ASTM D4833	Every 10 rolls	lbf	60
Dimensional Stability	ASTM D1204	Certified	%	± 2
Stress Crack Resistance (SP-NCTL)	ASTM D5397	1/Batch	hr	500
Oven Aging - % retained after 90 days	ASTM D5721	Per formulation		
HP OIT (min. avg.)	ASTM D5885		%	80
UV Res. - % retained after 1600 hr	ASTM D7238	Per formulation		
HP-OIT (min. avg.)	ASTM D5885		%	50
SUPPLY SPECIFICATIONS(Roll dimensions may vary ±1%)				
Roll Dimension - Width	-		ft	22.3
Roll Dimension - Length	-		ft	780
Area (Surface/Roll)	-		ft^2	17394

NOTES

1. Testing frequency based on standard roll dimensions and one batch is approximately 180,000 lbs (or one railcar).
2. Machine Direction (MD) and Cross Machine Direction (XMD or TD) average values should be on the basis of 5 specimens each direction.
3. Lowest individual and 8 out of 10 readings as per GRI-GM13 / 17, latest version.
11. The minimum average thickness is ±10% of the nominal value.

* All values are nominal test results, except when specified as minimum or maximum.
* The information contained herein is provided for reference purposes only and is not intended as a warranty or guarantee. Final determination of suitability for use contemplated is the sole responsibility of the user. SOLMAX assumes no liability in connection with the use of this information.

Solmax is not a design professional and has not performed any design services to determine if Solmax's goods comply with any project plans or specifications, or with the application or use of Solmax's goods to any particular system, project, purpose, installation or specification.

SOLMAX.COM

Revision date: 02-Mar-2016

4/12/2022
v3.3

Iowa Department Of Transportation
Office Of Materials
PORTLAND CEMENT CONCRETE

Form E820150
E - Units

Mix #: 1

Project No.: _____ **County :** _____

Mix No.: FM-Critical Fluidity **Abs Vol. Cement:** _____ **Type:** IL(10)

Cement (IM 401):	100 %	lbs	**Source:** PC3209-Holcim - ST. Gen-IL(10)	**Sp. Gr.:**	3.12
Fly Ash (IM 491.17):	20 %	400	**Source:** FA001C-Columbia Generating Station #1, #2 or Comb	**Sp. Gr.:**	2.75
Slag (IM 491.14):	%		**Source:**	**Sp. Gr.:**	
CarbonCure:		0	Cement Reduction		

Adjusted lbs. Cement: 100 lbs

Total Cementitious 500 lbs **Total % Replacement =** _____

IM T203	**Fine Aggregate Source:**	A03502-HARPERS FERRY	**Sp. Gr.:**	2.67
IM T203	**Interm. Aggregate Source:**		**Sp. Gr.:**	
IM T203	**Coarse Agregate Source:**		**Sp. Gr.:**	

Basic w/c	_____	**Water**	**lbs/cy**	**= Basic w/c X (Total Cementitious)** =	583.1
Max w/c	_____	**Max. Water**	**lbs/cy**	**= Max w/c X (Total Cementitious)** =	

Absolute Volumes	**Cement**	(lbs/cy) / (Sp. Gr. X 62.4 X 27)	=	
	Fly Ash	(lbs/cy) / (Sp. Gr. X 62.4 X 27)	=	
	Slag	(lbs/cy) / (Sp. Gr. X 62.4 X 27)	=	
	Water	(lbs/cy) / (Sp. Gr. X 62.4 X 27)	=	
	Air			0.060

Subtotal	=	0.060
1.000 - Subtotal	=	0.940
Total	=	1.000

% FA Agg.:	100	**Fine Aggregate (1.000 - Subtotal) X % In Mix**	= 0.000
% In. Agg.:	0	**Interm. Aggregate (1.000 - Subtotal) X % In Mix**	= 0.000
% CA Agg.:		**Coarse Aggregate (1.000 - Subtotal) X % In Mix**	= 0.000
		Aggregate Total	= 0.000

Aggregate Weights	**Fine:**	**Abs Vol. X Sp. Gr. X 62.4 X 27**	=	2600
	Intermediate:	**Abs Vol. X Sp. Gr. X 62.4 X 27**	=	0
	Coarse:	**Abs Vol. X Sp. Gr. X 62.4 X 27**	=	

Summary

Concrete Supplier: Croell, Inc.
Plant Location: Lansing
Certified Mix Designer: Russ Horner
Certification Number: SW208

Cement	100	lbs/cy
Fly Ash	400	lbs/cy
Slag		lbs/cy
Water	583.1	lbs/cy
Fine Agg.	2600	lbs/cy
Interm. Agg.	0	lbs/cy
Coarse Agg.		lbs/cy

Air Entrainment:	ConAir X-Premiere Admix.	**oz/100wt:**	5 oz./yard
Normal Water Reducer:	OptiFlo 700-Premiere Admix	**oz/100wt:**	3
Mid-Range Water Reducer:		**oz/100wt:**	
High-Range Water Reducer:		**oz/100wt:**	
Retarder:		**oz/100wt:**	
Special Performance Admixture:		**oz/100wt:**	
Fibers:		**lb/yd3:**	
Carbon Cure:		**oz/cy:**	

Distribution: ___ DME, ___ Proj. Engr., ___ Contractor

Brand: OneCem
Material: Blended Cement
Type: IL(8)

Material Certification Report

Test Period: 1-Jun-2023 to 30-Jun-2023
Date Issued: 15-Jul-23

Certification

This cement meets the specifications of ASTM C595 and AASHTO M240 for Type IL cement.

General Information

Supplier:	Holcim (US) Inc.	Source Location:	Ste. Genevieve Plant
Address:	8700 West Bryn Mawr Ave Chicago, IL 60631		2942 US Highway 61 Bloomsdale, MO 63627
Contact:		Contact:	Ben Kist / (636) 524-8197

The following is based on average test data during the test period. The data is typical of product shipped from this source; individual shipments may vary.

Test Data on ASTM Standard Requirements

Chemical			Physical		
Item	**Limit [1]**	**Result**	**Item**	**Limit [1]**	**Result**
Sulfate as SO3 (%)	3.0 max[2]	3.19	+45 µm (No. 325) Sieve (%)	-	1.6
Loss on Ignition (%)	10.0 max	5.30	Blaine Fineness (m²/kg)	-	462
$CaCO_3$ in Limestone (%)	70 min	89	Density (g/cm³) (Specific Gravity)	-	3.10
			Autoclave Expansion (%) (C151)	-0.20 to +0.80	0.02
			Initial Vicat (minutes)	45-420	88
			Air Content (%)	12 max	7
			Compressive Strength Mpa (psi)		
			3 day	13.0 (1890) min	32.1 (4660)
			7 day	20.0 (2900) min	37.9 (5490)
			28 day (previous month's data)	25.0 (3620) min	45.2 (6560)
			Mortar Bar Expansion (%) (C1038)	0.02	0.007

Test Data on ASTM Optional Requirements

Chemical			Physical		
Item	**Limit [1]**	**Result**	**Item**	**Limit [1]**	**Result**
Equivalent Alkalies (%)	-	0.53			

Notes (*1-9)

1 - Dashes in the Limit / Result columns mean Not Applicable.
2 - It is permissible to exceed the specification limit provided that ASTM C1038 Mortar Bar Expansion does not exceed 0.020% at 14 days.
This data may have been reported on previous mill certificates.

Benjamin Kist,
Quality Manager

Material Certification Report

Material: Fly Ash
Class: C

Test Period: 7/27/22 to 8/11/22
Date Issued: 16-Sep-22

Certification

This fly ash meets the specifications of ASTM C618 and AASHTO M 295 for Class C Fly Ash.

General Information

Supplier:	Holcim (US) Inc.	Source Location:	**COLUMBIA unit 2**
Address:	8700 West Bryn Mawr Ave Chicago, IL 60631		W8375 Murray Road Pardeeville, WI 53954
		Contact:	Brian Borowski (630) 561-1198

This report is based on test results of a composite sample as defined by ASTM C311. The data are typical of product shipped from this source; individual shipments may vary.

Test Data on ASTM Standard Requirements for Class C Fly Ash

Chemical			Physical		
Item	**Limit[1]**	**Result**	**Item**	**Limit[1]**	**Result**
Silicon Dioxide (SiO_2) (%)	-	36.82	Fineness		
Aluminum Oxide (Al_2O_3) (%)	-	19.09	Amount Retained 45 µm Sieve (%)	34 max	16.7
Iron Oxide (Fe_2O_3) (%)	-	5.61	Variation, % Points from Average	5 max	-1.0
SUM (SiO_2 + Al_2O_3 + Fe2O3) (%)	50.0 min	61.5	Strength Activity Index with Portland Cement[2]		
Calcium Oxide (CaO) (%)	>18.0	26.32	7 day (% of cement control)	75 min	102
Magnesium Oxide (MgO) (%)	-	5.52			
Sulfur Trioxide (SO_3) (%)	5.0 max	1.86	Water Requirement		
Sodium Oxide (Na_2O) (%)	-	1.76	(% of cement control)	105 max	94
Potassium Oxide (K_2O) (%)	-	0.56	Soundness		
Equivalent Alkalies (Na_2O Eq) (%)	-	2.13	Autoclave Expansion or Contraction (%)	0.8 max	0.04
Moisture Content (%)	3.0 max	0.11	Density (g/cm^3) [5]		2.67
Loss on Ignition (%) [3]	6.0 max[4]	0.12	Variation, % from Average	5 max	-3.3

Notes (*1-9)

1 - Dashes in the Limit / Result column means Not Applicable
2 - Holcim Ste. Genevieve Type I/II cement.
3 - Finely divided materials may tend to reduce the entrained air content of concrete. Hence, if a fly ash or natural pozzolan is added to any concrete for which entrainment of air is specified, provision should be made to ensure that the specified air content is maintained by air content tests and by use of additional air-entraining admixture or use of an air-entraining admixture in combination with air-entraining hydraulic cement.
4 - The limit under ASTM C618 is 6.0 max; the limit under AASHTO M 295 is 5.0 max.
5 - Determined according to ASTM C604.

Testing performed at Holcim US MPC, Renwick Lab, 20408 Renwick Road, Lockport, IL 60441.

Brian Borowski
Quality Manager, US MPC

Form 821278

Iowa Department of Transportation

CERTIFIED GRADATION TEST REPORT

County: Allamakee
Project:
Contractor:
Contract #: NA
Design #: NA
Date: 08/10/22 Report No.: NA

Certified Sample
Monitor Sample
XXX Verification Sample

Source Name: Harpers Ferry Sand Pit **T-203 No:** A03502 **Source Location:** SW **Sec.:** 07 **Twp.** 97 **Range:** 02W **County:** Allamakee
Material: Concrete Sand **Class:** NA **Gradation No.:** 1 **Beds:** NA
Mat'l Producer BRUENING ROCK PRODUCTS **Destination:** STOCKPILE **Sampled At:** QUARRY- Probe

Date Sampled	Sample ID	Sampled By	Tested By	-IN	1"	3/4	1/2	3/8	4	8	16	30	50	100	200	Comp	Tons
	*PRODUCTION LIMITS			Max.				100	100	100		60			1.5		
				Min.					90	70		10			0		
07/07/22		Dawson	Dawson					100.0	95.2	81.1	62.2	27.2	6.3	0.4	0.2	Y	1000T
07/08/22		Dawson	Dawson					100.0	95.4	80.4	60.5	20.6	2.9	0.4	0.2	Y	1000T
07/11/22		Jake	Jake					100.0	97.3	87.8	71.9	39.4	4.9	0.7	0.3	Y	1000T
07/12/22		Jake	Jake					100.0	96.2	84.9	68.2	33.4	7.8	0.8	0.2	Y	1000T
07/13/22		Jake	Jake					100.0	95.7	83.6	66.0	29.7	6.2	0.7	0.3	Y	1000T
07/14/22		Jake	Jake					100.0	95.4	79.6	56.4	18.6	3.9	0.6	0.3	Y	1000T
07/14/22		Jake	Jake					100.0	95.8	82.0	60.1	20.4	4.1	0.7	0.3	Y	1000T
07/18/22		Jake	Jake					100.0	96.4	83.9	67.6	30.5	10.1	0.9	0.4	Y	1000T
07/19/22		Chris	Chris					100.0	95.4	83.4	65.1	33.0	9.2	0.9	0.3	Y	1000T
07/20/22		Chris	Chris					100.0	96.2	84.9	67.2	31.1	5.2	0.7	0.4	Y	1000T
07/21/22		Chris	Chris					100.0	95.9	82.6	64.8	26.8	7.0	0.6	0.4	Y	1000T
07/22/22		Chris	Chris					100.0	96.4	85.3	68.1	29.4	4.8	0.5	0.2	Y	1000T
07/27/22		Dawson	Dawson					100.0	95.7	82.3	62.7	28.7	7.3	0.6	0.3	Y	1000T
07/28/22		Dawson	Dawson					100.0	95.8	83.2	62.2	21.7	6.4	0.5	0.2	Y	1000T
07/30/22		Dawson	Dawson					100.0	96.4	84.7	65.4	28.4	4.3	0.6	0.3	Y	1000T
08/01/22		Chris	Chris					100.0	97.4	87.2	70.3	33.9	6.3	0.7	0.4	Y	1000T
08/02/22		Chris	Chris					100.0	97.2	87.5	70.7	33.9	7.8	0.9	0.3	Y	1000T
08/03/22		Chris	Chris					100.0	96.2	82.8	62.7	23.0	4.7	0.4	0.2	Y	1000T
08/04/22		Jake	Jake					100.0	95.8	85.2	71.2	39.4	10.3	0.4	0.2	Y	1000T
08/05/22		Jake	Jake					100.0	96.6	84.7	67.0	30.1	4.0	0.4	0.2	Y	1000T
08/08/22		Jake	Jake					100.0	96.2	84.2	65.7	31.6	4.4	0.6	0.3	Y	1000T
08/09/22		Jake	Jake					100.0	96.3	85.6	65.3	24.2	3.0	0.5	0.3	Y	1000T
08/10/22		Jake	Jake					100.0	97.1	86.1	67.1	28.7	3.5	0.5	0.3	Y	1000T
Average of all gradations.				####	####	####	####	**100.0**	**96.2**	**84.0**	**65.6**	**28.9**	**5.8**	**0.6**	**0.3**		

Comments:
IA. D.O.T. DECORAH
BRUENING ROCK
LAB

Estimated Quantity 20,000T
Total Prev. Cert.
Total cert. to date 20,000T
Certification No. NE009
Reported by Jacob Bruening
Representing BRUENING ROCK PRODUCTS, INC.

***AGREED by the contractor/producer**

Rev 02.2022

ConAir® X

Air Entraining Admixture for Concrete

PRODUCT INFORMATION

PACKAGING

Packaged in 55 gallon drums, 275 gallon totes, and in bulk.

SHELF LIFE

2 years in original unopened container.

STORAGE

ConAir® X should be stored at temperatures above 35°F (2°C) degrees. Although freezing does not harm the performance of **ConAir® X**, precautions should be taken to protect it from freezing. If it should happen to freeze, thaw and reconstitute with mechanical agitation. **Do not use pressurized air for agitation.**

SPECIFICATIONS/COMPLIANCES

ASTM C260
AASHTO M 154

DESCRIPTION

ConAir® X is an aqueous solution formulated for use as an air entraining admixture for concrete. **ConAir® X** is manufactured under strict quality control standards to ensure uniform performance at the job site.

ConAir® X introduces millions of uniformly sized and spaced air voids throughout the concrete mixture. Concrete containing these microscopic air bubbles has been proven to be far more resistant to freezing and thawing than non-air entrained concrete.

PERFORMANCE BENEFITS

- Significantly improves freeze-thaw resistance
- Improves resistance to surface deterioration from de-icing chemicals
- Reduces permeability
- Improves workability
- Improves pumpability
- Reduces bleeding

DOSAGE RATES AND DIRECTIONS FOR USE

ConAir® X dosage will vary with mix materials and proportioning, as well as intended concrete performance requirements.

Typical **ConAir® X** addition rates range from 0.2 to 5.0 oz/cwt of cementitious material. (13 to 325 mL/100kg)

For best results, each admixture must be batched at separate intervals with the initial or final batch water, and should not come in direct contact with any other admixture until they are mixed in the concrete batch. Admixtures should not come in contact with any dry cementitious material.

TECHNICAL NOTES

ConAir® X is compatible with Portland cements, blended cements, class C and F fly ash, slag cements, silica fume, calcium chloride, and fibers. **ConAir® X** can be used in all white, colored, and architectural concrete.

PRECAUTIONS/LIMITATIONS

This product does not contain calcium chloride or chloride containing compounds, and any chloride ions present are in trace amounts resulting from municipal water used during the manufacturing process.

This product is compatible with most other admixtures when added to the mix separately. Always conduct trial batches, prior to job applications, to confirm compatiblity and to verify mix results. Contact your technical sales representative before dosing outside of recommended ranges or for assistance with specialty applications.

In all cases, consult the safety data sheet prior to use.

Premiere Concrete Admixtures (herein PCA) warrants its products to be free from defects in material and manufacture. There are no other warranties by PCA of any nature whatsoever, expressed or implied. This information is based on data and knowledge believed to be true and accurate at time of publication and is offered as a resource for the users of our products. PCA shall not be liable in the use of this information and does not warranty the results obtained for any application. PCA shall not be liable for damages of any sort, the use or results of this product and shall not be responsible for conditions outside its control, including but not limited to, other materials, design, inspection, workmanship and field conditions. No statement, recommendation, or other information is intended to infringe on any patent or copyright held by others.

Rev 01.2022

OptiFlo® 700

Multi-Range Water-Reducing Admixture for Concrete

PRODUCT INFORMATION

PACKAGING

Packaged in 55 gallon drums, 275 gallon totes, and in bulk.

SHELF LIFE

2 years in original unopened container.

STORAGE

OptiFlo® 700 may freeze at temperatures below 35ºF (2ºC). Although freezing does not harm **OptiFlo® 700**, precautions should be taken to protect it from freezing. If it should happen to freeze, thaw and reconstitute with mechanical agitation. **Do not use pressurized air for agitation.**

SPECIFICATIONS/COMPLIANCES

ASTM C494 Type A and F
AASHTO M 194 Type A and F

DESCRIPTION

OptiFlo® 700 is a water-reducing chemical admixture, that is formulated to enhance the quality and performance characteristics of plastic and hardened concrete. Its unique chemistry optimizes hydration of the cementitious materials in the concrete. Powerful finishing aids in **OptiFlo® 700** provide lubricity and improved paste qualities for superior concrete finishability, reducing labor costs and providing a superior finished concrete appearance.

PERFORMANCE BENEFITS

- Reduces w/cm ratio
- Increases compressive/ flexural strengths
- Provides normal setting characteristics
- Provides superior finishability
- Improves surface quality
- Improves workability
- Improves pumpability
- Reduces cracking potential

DOSAGE RATES AND DIRECTIONS FOR USE

Important: Recommended dosage applies when no additional water reducers are included in the mix design. When using water reducing admixtures in combination, the dosage will vary to meet ASTM standards. Consult your local technical sales rep for those combination dosages.

By varying the dosage rate, **OptiFlo® 700** can be used as a low-range, mid-range, or high-range water reducing admixture.

Recommended Dosage OptiFlo® 700		
Low-Range Water Reducer Applications	3 - 5 oz/cwt	195 – 325 mL/100kg
Mid-Range Water Reducer Applications	5 - 12 oz/cwt	325 – 780 mL/100kg
High-Range Water Reducer Applications	12 – 16 oz/cwt	780-1040 mL/100kg
Dosage is per hundred-weight of cementitious material.		

For best results, each admixture must be batched at separate intervals with the initial or final batch water, and should not come in direct contact with any other admixture until they are mixed in the concrete batch. Admixtures should not come in contact with any dry cementitious material.

TECHNICAL NOTES

OptiFlo® 700 is compatible with Portland cements, blended cements, class C and F fly ash, slag cements, silica fume, calcium chloride, and fibers. **OptiFlo® 700** can be used in all white, colored, and architectural concrete.

PRECAUTIONS/LIMITATIONS

This product does not contain calcium chloride or chloride containing compounds, and any chloride ions present are in trace amounts resulting from municipal water used during the manufacturing process.

This product is compatible with most other admixtures when added to the mix separately. Always conduct trial batches, prior to job applications, to confirm compatiblity and to verify mix results. Contact your technical sales representative before dosing outside of recommended ranges or for assistance with specialty applications.

In all cases, consult the safety data sheet prior to use.

Premiere Concrete Admixtures (herein PCA) warrants its products to be free from defects in material and manufacture. There are no other warranties by PCA of any nature whatsoever, expressed or implied. This information is based on data and knowledge believed to be true and accurate at time of publication and is offered as a resource for the users of our products. PCA shall not be liable in the use of this information and does not warranty the results obtained for any application. PCA shall not be liable for damages of any sort, the use or results of this product and shall not be responsible for conditions outside its control, including but not limited to, other materials, design, inspection, workmanship and field conditions. No statement, recommendation, or other information is intended to infringe on any patent or copyright held by others.

Earth Contact Products
15612 S Keeler Terrace
Olathe, KS 66062
(800) 327-0007

P2-070
Technical Data Sheet

TERRATHANE™ Polyurethanes

TerraThane™ Polyurethanes by NCFI are uniquely formulated for a variety of geotechnical applications. Each batch goes through stringent testing and quality assurance standards to ensure reliability in the field.

About 24-070

NCFI 24-070 is a two-component, HF0 blown, low GWP, all PMDI based, pour-in-place urethane rigid foam system. 24-070 is a low-exotherm system with slow reactivity for greater flow. The system is ideal for filling large void areas, pipe abandonment, and underground tank abandonment.

24-070 APPLICATIONS

Low to Extreme Void Filling
Pipe Abandonment
Underground Tank Abandonment
Cavity Filling

Reactivity at 110°

Cream Time	12 seconds
Gel Time	150 Seconds
Tack Free Time	250 seconds
Rise Time	340 seconds



Physical Properties

Physical Properties	Test Method	Free Rise
Density	ASTM D1622	2.1 pcf
Compressive Strength	ASTM D1621	30.9 psi
Compressive Modulus	ASTM D1621	744 psi
Tensile Strength	ASTM D1623	52.0 psi
Tensile Modulus	ASTM D1623	86 psi
Water Absorption	ASTM D2842	≤ 0.044 lbs/ft^2
Closed Cell Content		>90%
Max Service Temp		200°
Elongation	ASTM D1623	6.0%
Shear Strength	ASTM C273	30.8 psi
Shear Modulus	ASTM C273	200 psi
Flexural Strength	ASTM D790	30.7 psi
Flexural Modulus	ASTM D790	579 psi

Earth Contact Products
15612 S Keeler Terrace
Olathe, KS 66062
(800) 327-0007

Special Testing/Certifications

Flammability	FMVSS-302	Pass
	FAR 25.853a(iii)	Pass
	UL-94 HBDF	Pass
USGC Title 33, Chapter 1, Part 183		Pass
Initial K-Factor		0.167
Moisture Vapor Transmission		2-3 perm inch
Overall Mold Density		3.2 pcf

Performance

Wet Environments... **Fair**

Lifting Capacity... **Fair**

Chemical Resistance

Solvents... **Excellent**

Mold and Mildew... **Excellent**

Component Properties

Component	B-24-070	A2-000
Appearance	Brown Liquid	Clear Brown Liquid
iscosity @ 20rpm	450 cps at 72°	200 cps at 72°
	1.13	1.24
Weight per Gallon	9.4 lbs	10.3 lbs
Storage Temperature	40° - 90°F	40° - 90°F

Processing Parameters

ISO Temperature	90° - 130°F
Poly Temperature	90° - 130°F
Mixing Pressure	800 psi static, 600 psi dynamic, 1000/800 preferred

Mix Ratio

By weight....100 parts poly : 112 parts iso

By volume...100 parts poly : 100 parts iso

Storage and Handling

Store the poly from 65°F to 85°F. Avoid moisture contamination during storage, handling, and processing. For both components, pad containers and day tanks with either nitrogen or dry air (desiccant cartridge or air dryer @ -40°F dew point). For optimum shelf life, the recommended storage temperature for iso is 50°F to 110°F. **Do not expose iso to lower temperatures – freezing may occur.** Store components at 70°F to 90°F for several days prior to use to minimize components being too viscous at time to take to Shelf life is 6 months for factory sealed containers.

Application Cautions

Careful consideration should be given to selection and application of any NCFI Polyurethane foam system where excessive foam mass build-up can occur. Excessive polyurethane foam lift thickness will result in high internal temperatures within the injected foam, which can result in degraded foam properties, or in extreme cases, or spontaneous combustion. **Any rating contained in this literature is not intended to hazards presented by this or any other material under actual conditions.** Each person, or corporation engaged in the application, installation or use of any polyurethane product should carefully determine whether there is a potential hazard associated with such product in a usage, and utilize all appropriate precautionary and safety measures. Please consult NCFI Polyurethanes for safety considerations, polyurethane system selection and application recommendations.

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24-070
Technical Data Sheet

Version: 3.11.20

Appendix H

Restoration Material Cut Sheets

IA DOT RURAL PERM/ SUDAS 2 MIX

LA CROSSE SEED

CONTENTS:	%	GERM:	ORIGIN:
FAWN TALL FESCUE	51.03%	85%	OR
PERENNIAL RYEGRASS**	38.33%	90%	MN
KENTUCKY BLUEGRASS**	10.14%	85%	WA

**VARIETY NOT STATED

OTHER CROP SEED: 0.01%
WEED SEED: 0.01%
INERT MATTER: 0.48%
NOXIOUS WEED SEED PR/LB: NONE FOUND
AMS# 2352

TEST DATE: JAN, 2023
NET WT. 50 LBS (22.68 KG)

LA CROSSE SEED
2541 COMMERCE STREET
LA CROSSE WI, 54603

LOT: S22-0189

TAG CODE: PRO-213213

PRECISION
Companies, Inc.
Solar Design & Installation
General Contractor

13810 Washington Road
West Burlington, IA 52655
Phone: (319) 208-1775

June 24, 2023

Ames Construction
Attn.: Mr. Trevor Wipf, Project Engineer
2500 County Road 42W
Burnsville, MN 55337
Phone: 952-435-7106
Cell: 612-219-7290
Email: trevorwipf@amesco.com

Re: Seed mix recommendation
Ash Pond Closure Project, Burlington Generating Station

Dear Mr. Wipf,

The following is my recommendation for changing the seed mix for the above mentioned project.

Because of the project completion schedule for the project at BGS, it seems appropriate to change the seed mix from the original warm season prairie grass mixes to a cool season seed mix. By changing the mix to a cool season mix, we will be able to get a better stand this summer, and provide excellent erosion control.

The mix I would recommend is:

100#/acre of Tall Fescue
20#/acre of Kentucky Bluegrass
74#/acre of Perennial Ryegrass

This is the standard Iowa DOT cool season mix, which is extremely durable. It also works well because it is a low fertility mix that requires little to no maintenance. The other advantage is that the previously recommended mix should be burned off every 1-2 years, and that is not the case with this mix.

A. **Type 1 (Permanent Lawn Mixture):** Used for residential and commercial turf site, fertilized, and typically mowed. Use between March 1 and May 31 and between August 10 and September 30.

Table 9010.06: Type 1 Seed Mixture[1]

Common Name	Application Rate lb/acre
Creeping red fescue	25
Turf-type perennial ryegrass[2]	20
Turf-type perennial ryegrass[2]	20
Kentucky bluegrass cultivar[3]	65
Kentucky bluegrass cultivar[3]	65
Kentucky bluegrass cultivar[3]	65

[1] A commercial mixture may be used if it contains a high percentage of similar bluegrasses; it may or may not contain creeping red fescue.
[2] Choose two different cultivars of turf-type perennial ryegrass, at 20 lbs/acre each.
[3] Choose three different cultivars of Kentucky bluegrass, at 65 lbs/acre each.

B. **Type 2 (Permanent Cool Season Mixture for Slopes and Ditches):** Not typically mowed. Reaches a maximum height of 2 to 3 feet, low fertility requirements, grows in the spring and fall, and can go dormant in the summer. Use between March 1 and May 31 and between August 10 and September 30.

Table 9010.07: Type 2 Seed Mixture

Common Name	Application Rate lb/acre
Tall fescue[1]	100
Kentucky bluegrass	20
Ryegrass, perennial[2]	75

[1] Use endophyte free cultivars including Fawn, K-31, or a combination.
[2] Use cultivars including Linn, Amazon, Noriea, or Nui, or a combination.

C. **Type 3 (Permanent Warm-Season Slope and Ditch Mixture):** Not typically mowed. Reaches a height of 5 to 6 feet, stays green throughout summer, and responds well to being burned in spring; no fertilizer. Use between March 1 and June 30.

Table 9010.08: Type 3 Seed Mixture

Common Name	Application Rate lb/acre
Big bluestem*	3 PLS
Grain rye	40
Indiangrass*	4 PLS
Little bluestem*	3 PLS
Oats	16
Sideoats grama*	5 PLS
Switchgrass*	1 PLS

* Furnish seed certified as Source Identified Class (Yellow Tag) Source G0-Iowa.

D. **Type 4 (Urban Temporary Erosion Control Mixture):** Short lived (6 to 8 months) mix for erosion control.

Table 9010.09: Type 4 Seed Mixture

Common Name	Application Rate lb/acre
SPRING - March 1 - May 20	
Annual ryegrass	40

Profile® Wood with Tack
Hydraulic Mulch

Solutions for your Environment®

GREEN DESIGN ENGINEERING™
EARTH-FRIENDLY SOLUTIONS FOR SUSTAINABLE RESULTS™

Description

Profile® Wood with Tack is a fully biodegradable, Hydraulic Mulch (HM) composed of 100% recycled Thermally Refined™ virgin wood fibers and wetting agents (including high-viscosity colloidal polysaccharides). The HM is phytosanitized, free from plastic netting, and upon application forms an intimate bond with the soil surface to create a porous, absorbent and flexible erosion resistant blanket that allows for rapid germination and accelerated plant growth.

Recommended Applications

- Erosion control and revegetation for moderate slopes (≤2H:1V)
- Rough graded slopes
- Enhancement of vegetation establishment

Technical Data

Physical Properties*	Test Method	Units	Tested Value
Mass/Unit Area	ASTM D6566	g/m^2 (oz/yd^2)	≥ 336 (9.9)
Water Holding Capacity	ASTM D7367	%	≥ 1,200
Material Color	Observed	n/a	Green
Performance Properties*	**Test Method**	**Units**	**Tested Value**
Cover Factor[1]	Large Scale[2]	n/a	≤ 0.25
Percent Effectiveness[3]	Large Scale[2]	%	≥ 75
Functional Longevity[4]	ASTM D5338	months	≤ 3
Environmental Properties*	**Test Method**	**Units**	**Tested Value**
Ecotoxicity	EPA 2021.0	%	48-hr LC_{50} > 100%
Biodegradability	ASTM D5338	n/a	Yes
Product Composition			**Typical Value**
Thermally Refined Wood Fibers[5]			97%
Wetting Agent–Including high-viscosity colloidal polysaccharides			3%

* When uniformly applied at a rate of 3000 pounds per acre (3400 kilograms/hectare) under laboratory conditions. 1. Cover Factor is calculated as soil loss ratio of treated surface versus an untreated control surface. 2. Large scale testing conducted at Utah Water Research Laboratory. For specific testing information please contact a Profile technical service representative at 800-508-8681 or +1-847-215-3464. 3. % Effectiveness = One minus Cover Factor multiplied by 100%. 4. Functional Longevity is the estimated time period, based upon ASTM D5338 testing and field observations, that a material can be anticipated to provide erosion control and agronomic benefits as influenced by composition, as well as site-specific conditions, including; but not limited to – temperature, moisture, light conditions, soils, biological activity, vegetative establishment and other environmental factors. 5. Heated within a pressurized vessel to a temperature greater than 380 degrees Fahrenheit (193 degrees Celsius) for 5 minutes at a pressure greater than 50 psi (345 kPa) in order to be Thermally Refined™/Processed and to achieve phyto-sanitization.

Packaging Data

Properties	Test Method	Units	Nominal Value
Bag Weight	Scale	kg (lb)	22.7 (50)
Bags per Pallet	Observed	#	40

UV and weather-resistant plastic bags. Pallets are weather-proof stretch wrapped with UV resistant pallet cover.

Profile Products
750 Lake Cook Road, Ste. 440
Buffalo Grove, IL 60089
800-508-8681 or +1-847-215-3464
www.profileproducts.com

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Profile Products 2020©

ETRS-1 Erosion Control Blanket

ETRS-1 Single Net Straw

A blanket featuring 100% straw fill with a typical functional longevity of 12 months but will differ with soil and climate conditions. This product meets all FHWA FP-03 requirements for a Type 2.A and 2.C erosion control blanket.

Part Numbers	ETRS-1-100	ETRS-1-200	ETRS-1-500	ETRS-1-1000
Blanket Size	8 ft x 112.5 ft	16 ft x 112.5 ft	8 ft x 562.5 ft	16 ft x 562.5 ft
Rolls per Pallet	25	25	4	4
Rolls per Truck Load	600	300	96	48
Netting	Single Net - Green/Photodegradable/Polypropylene			
Opening Size	0.5 in x 0.5 in			
Stitching Thread	White/Photodegradable/Polypropylene			
Stitching Frequency	2 in			
Fill	100% Straw			
Packaging	Each Roll is Individually Stretched Wrapped with a Label			

INDEX TESTING	TEST METHOD	UNIT	ENGLISH
Mass per Unit Area	ASTM D 6475	oz / sq yd	8.95
Thickness	ASTM D 6525	mils	241
Tensile Strength	ASTM D 6818	lb/in	8.5 x 4.8
Ground Cover / Light Penetration	ASTM D 6567	%	90/ 10
Water Absorption	ASTM D 1117	% wt Change	516
BENCH-SCALE TESTING	**TEST METHOD**	**Parameter**	**ENGLISH**
Determination of Unvegetated RECP Ability to Protect Soil from Rain Splash and Associated Runoff Under Bench-Scale Conditions	ASTM D 7101	50 mm (2 in.) / hr for 30 min.	Soil Loss Ratio = 28.23
		100 mm (4 in.) / hr for 30 min.	Soil Loss Ratio = 32.71
		150 mm (6 in.) / hr for 30 min.	Soil Loss Ratio = 27.69
Determination of Unvegetated RECP Ability to Protect Soil from Hydraulically Induced Shear Stresses Under Bench-Scale Conditions	ASTM D 7207	Shear: 1.14 psf for 30 min.	Soil Loss = 116.4 g
		Shear: 1.94 psf for 30 min.	Soil Loss = 433.5 g
		Shear: 2.73 psf for 30 min.	Soil Loss = 640.7 g
		Soil loss curve intercept =	1.85 psf @ ½-in soil loss
Determination of Temporary Degradable RECP Performance in Encouraging Seed Germination and Plant Growth	ASTM D 7322	Topsoil; Fescue (Kentucky 31); 21-day incubation; 27±2° & approximately 45±5% RH	% of Control = 353% (increased biomass)
LARGE-SCALE TESTING	**TEST METHOD**	**UNIT**	**ENGLISH**
Slope Erosion	ASTM D 6459	C Factor	0.048
Channel Erosion	ASTM D 6460	lb/ft^2	2.05

Notes:

1. Soil Loss Ratio = Soil Loss Bare Soil / Soil Loss with RECP = 1 / C-Factor (Note: soil loss is based on regression analysis).
2. Permissible Velocity and Shear Stress have been obtained through large scale test programs featuring specific soil types, vegetation classes, flow conditions, anchor methods, and failure criteria. These conditions may not be relevant to every project nor can they be replicated by other manufacturers. Please contact your Erosion Tech rep for more information.
3. Design Performance Criteria for Vegetated Velocity and Shear Stress are estimated values given the typical industry results for RECP's manufactured to FHWA FP-03 Type 2.A and 2.C standards and with similar physical properties. The Designing Engineer is responsible for determining the suitability of this product on projects.

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American Excelsior Company®
Earth Science Division

Proud Participant in NTPEP and Proud Member of:

PRODUCT DATA SHEET
CURLEX® II

DESCRIPTION

Curlex II erosion control blanket (ECB) consists of a specific cut of naturally seed free Great Lakes Aspen curled wood excelsior with 80% six-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the blanket. The top and bottom of each blanket is covered with degradable polypropylene netting. Curlex II is also available as QuickGRASS® (green pigment). Curlex II shall be manufactured in the U.S.A.

Curlex II has a design soil loss ratio (event-based RUSLE C factor) of .022 and is typically suitable for slopes up to 1.5H:1V. Curlex II is rated for channel flows up to 9.0 ft/s (2.7 m/s) and 2.25 lb/ft^2 (108 Pa) shear stress.

PHYSICAL PROPERTIES

Curlex II measurements at time of manufacturing:

Width	4.0 ft (1.2 m)	8.0 ft (2.4 m)	16.0 ft (4.9 m)
Length	112.5 ft (34.29 m)	112.5 ft (34.29 m)	112.5 ft (34.29 m)
Area	50.0 yd^2 (41.8 m^2)	100.0 yd^2 (83.6 m^2)	200.0 yd^2 (167.2 m^2)
Weight[a]	36.5 lb (16.6 kg)	73.0 lb (33.1 kg)	146.0 lb (66.2 kg)
Fiber Count	≈7,000 per yd^2 (≈8,400 per m^2)	≈7,000 per yd^2 (≈8,400 per m^2)	≈7,000 per yd^2 (≈8,400 per m^2)
Fiber Length (80% min.)	≥6.0 in (≥15.2 cm)	≥6.0 in (≥15.2 cm)	≥6.0 in (≥15.2 cm)
Mass per Unit Area (± 10%)	0.73 lb/yd^2 (0.40 kg/m^2)	0.73 lb/yd^2 (0.40 kg/m^2)	0.73 lb/yd^2 (0.40 kg/m^2)
Net Openings	1.0 in x 2.0 in (25.4 mm x 50.8 mm)	1.0 in x 2.0 in (25.4 mm x 50.8 mm)	1.0 in x 2.0 in (25.4 mm x 50.8 mm)

TYPICAL INDEX VALUES

Index Property	Test Method	Value
Thickness	ASTM D 6525	0.327 in (8.31 mm)
Light Penetration	ASTM D 6567	29.5%
Resiliency	ASTM D 6524	64%
Mass per Unit Area	ASTM D 6475	0.66 lb/yd^2 (0.358 kg/m^2)
MD-Tensile Strength Max.	ASTM D 6818	148.8 lb/ft (2.17 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	39.6 lb/ft (0.58 kN/m)
MD-Elongation	ASTM D 6818	28.3%
TD-Elongation	ASTM D 6818	22.7%
Swell	ECTC Procedure	89%
Water Absorption	ASTM D 1117/ECTC	228%
Bench-Scale Rain Splash	ASTM D 7101	SLR = 9.50 @ 2 in/hr [b,c]
Bench-Scale Rain Splash	ASTM D 7101	SLR = 10.29 @ 4 in/hr [b,c]
Bench-Scale Rain Splash	ASTM D 7101	SLR = 8.45 @ 6 in/hr [b,c]
Bench-Scale Shear	ASTM D 7207	2.86 lb/ft^2 @ 0.5 in soil loss [c]
Germination Improvement	ASTM D 7322	693%

[a] Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

[b] SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO. [c] Bench-scale index values should not be used for design purposes.

MADE IN THE U.S.A.

850 Avenue H E | Arlington, Texas 76011
Phone 1-800-777-SOIL | Fax 817-385-3585 | www.Curlex.com

LANDLOK® TRM

Product Data

LANDLOK® 450

LANDLOK® 450 turf reinforcement mat (TRM) features X3® technology that consists of a dense web of interlocking, multi-lobed polypropylene fibers positioned between two biaxially oriented nets and mechanically bound together by parallel stitching with polypropylene thread. The TRM is designed to accelerate seedling emergence, exhibit high resiliency, and possess strength and elongation properties to limit stretching in a saturated condition. Every component of LANDLOK® 450 is stabilized against chemical and ultraviolet degradation which are normally found in a natural soil environment. Furthermore, the TRM contains no biodegradable components.

LANDLOK® 450 conforms to the property values listed below[1] and is manufactured at a Propex facility having achieved ISO 9001:2008 certification. Propex performs internal Manufacturing Quality Control (MQC) tests that have been accredited by the Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP).

PROPERTY	TEST METHOD	ENGLISH	METRIC
ORIGIN OF MATERIALS			
% U.S. Manufactured		100%	100%
PHYSICAL			
Mass/Unit Area [2]	ASTM D-6566	10.0 oz/yd²	339 g/m²
Thickness [2]	ASTM D-6525	0.50 in	12.7 mm
Light Penetration (% Passing) [2]	ASTM D-6567	20%	20%
Color	Visual	Green or Tan	
MECHANICAL			
Tensile Strength [2]	ASTM D-6818	425 x 350 lbs/ft	6.2 x 5.1 kN/m
Elongation [2]	ASTM D-6818	50%	50%
Resiliency [2]	ASTM D-6524	90%	90%
Flexibility [2]	ASTM D-6575	0.026 in-lb	30,000 mg-cm
ENDURANCE			
UV Resistance % Retained at 1,000 hrs [2]	ASTM D-4355	80%	80%
PERFORMANCE			
Velocity (Vegetated) [2, 3]	Large Scale	18 ft/sec	5.5 m/sec
Shear Stress (Vegetated) [2, 3]	Large Scale	10 lb/ft²	479 Pa
Manning's n (Unvegetated) [2, 4]	Calculated	0.025	0.025
Seedling Emergence [2]	ASTM D-7322	409%	409%
ROLL SIZES		8 ft x 140 ft 16 ft x 140 ft 16 ft x 348.75 ft	2.45 m x 42.7 m 4.88 m x 42.7 m 4.88 m x 106.3 m

NOTES:

1. The property values listed above are effective 01/22/2020 and are subject to change without notice.
2. Values represent testing at time of manufacture and are shown as typical values.
3. Maximum permissible velocity and shear stress has been obtained through vegetated testing programs featuring specific soil types, vegetation classes, flow conditions, and failure criteria. These conditions may not be relevant to every project nor are they replicated by other manufacturers. Please contact Propex for further information.
4. Calculated as typical values from large-scale flexible channel lining test programs with a flow depth of 6 to 12 inches.

Propex® GEOSOLUTIONS

ENGINEERED EARTH SOLUTIONS™

www.propexglobal.com

Propex Operating Company, LLC · 4019 Industry Drive · Chattanooga, TN 37416 · ph 800 621 1273 · ph 423 855 1466

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Plan Sheets

Sheet 1. Title Sheet
Sheet 2. Overall Site Plan
Sheet 3. Pre-Construction Conditions
Sheet 4. Landfill Cover Subgrades
Sheet 5. Landfill Cover Subgrades – Northwest
Sheet 6. Landfill Cover Subgrades – Southeast
Sheet 7. Landfill Top of Select Clay Fill
Sheet 8. Landfill Top of Select Clay Fill – Northwest
Sheet 9. Landfill Top of Select Clay Fill – Southeast
Sheet 10. Landfill Final Grades
Sheet 11. Landfill Final Grades – Northwest
Sheet 12. Landfill Final Grades – Southeast
Sheet 13. Restoration Plan
Sheet 14. Cross Sections
Sheet 15. Details
Sheet 16. Details
Sheet 17. Details

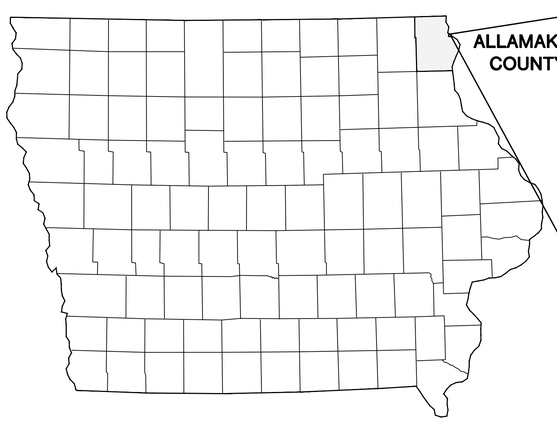
2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION

LANSING GENERATING STATION
LANSING, IOWA

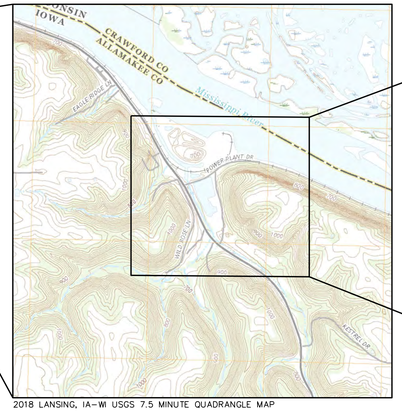
PREPARED FOR: INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IOWA

PREPARED BY: SCS ENGINEERS
MADISON, WISCONSIN

DATE: NOVEMBER 2023



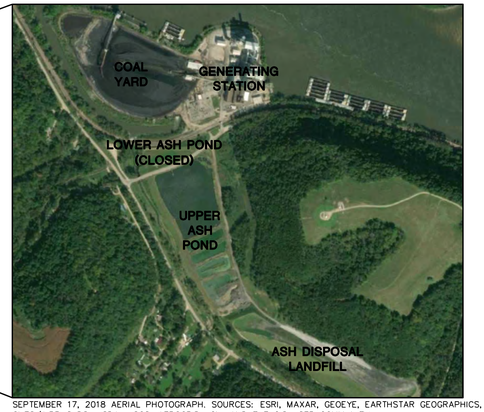
IOWA



2018 LANSING, IA–WI USGS 7.5 MINUTE QUADRANGLE MAP

SITE LOCATOR MAP

APPROXIMATE SCALE: 1" = 2,000'



SEPTEMBER 17, 2018 AERIAL PHOTOGRAPH. SOURCES: ESRI, MAXAR, GEOEYE, EARTHSTAR GEOGRAPHICS, CNES/AIRBUS DS, USDA, USGS, AEROGRID, IGN, AND THE GIS USER COMMUNITY.

SITE AERIAL

SCALE: 1" = 700'

INDEX

SHEET NUMBER	SHEET TITLE
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3	PRE-CONSTRUCTION CONDITIONS
4	LANDFILL COVER SUBGRADES
5	LANDFILL COVER SUBGRADES - NORTHWEST
6	LANDFILL COVER SUBGRADES - SOUTHEAST
7	LANDFILL TOP OF SELECT CLAY FILL
8	LANDFILL TOP OF SELECT CLAY FILL - NORTHWEST
9	LANDFILL TOP OF SELECT CLAY FILL - SOUTHEAST
10	LANDFILL FINAL GRADES
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13	RESTORATION PLAN
14	CROSS SECTIONS
15	DETAILS
16	DETAILS
17	DETAILS

MARK HUBER 15325 IOWA 11/22/2023

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/03/2023

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

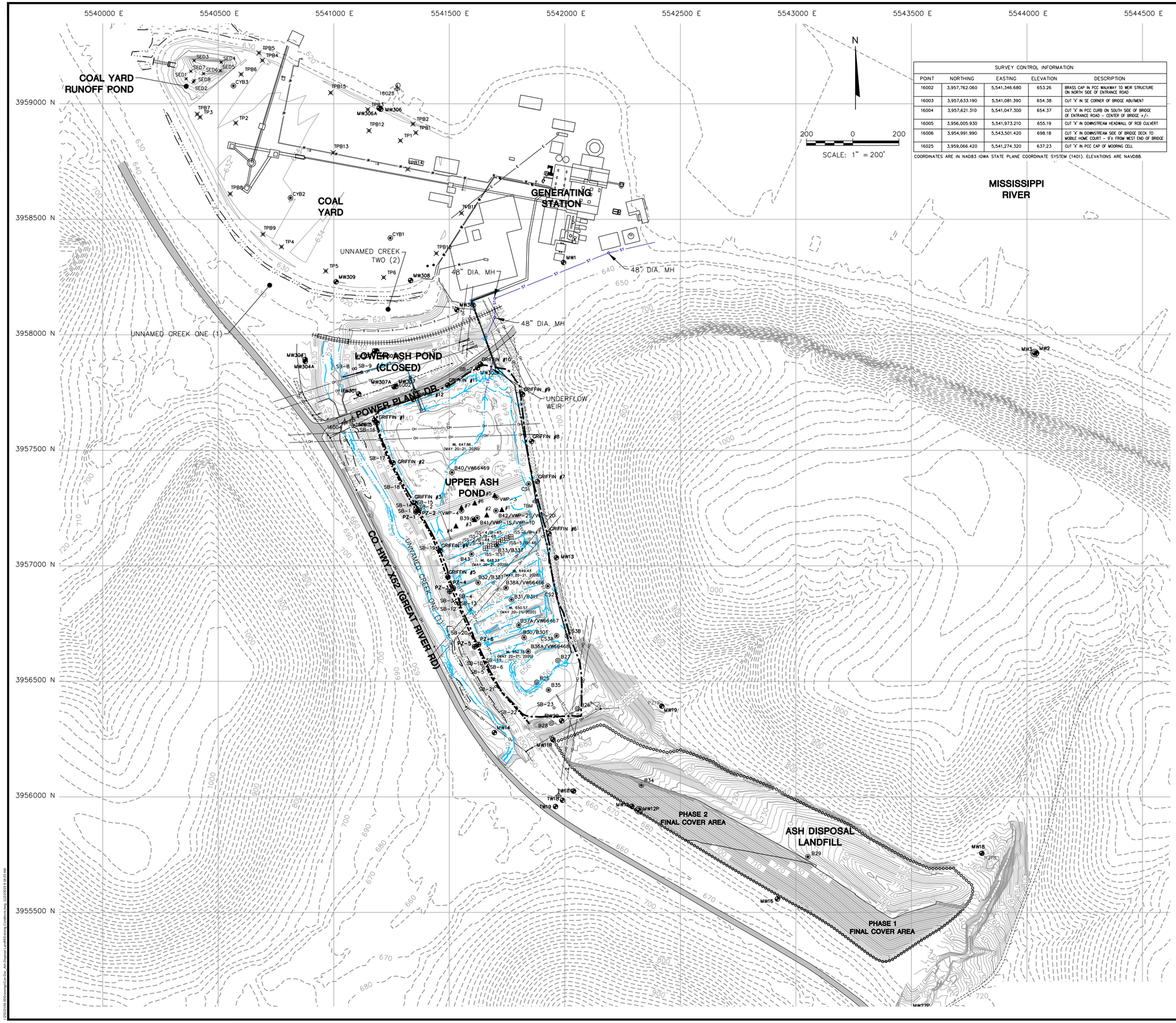
ENGINEER: SCS ENGINEERS
2830 DARY DRIVE MADISON, WI 53718-6751
PHONE: (608) 224-2830

SITE: 2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SHEET: TITLE SHEET

SHEET 1 of 17

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SURVEY CONTROL INFORMATION				
POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
16002	3,957,762.060	5,541,346.680	653.26	BRASS CAP IN PCC WALKWAY TO WEIR STRUCTURE ON NORTH SIDE OF ENTRANCE ROAD
16003	3,957,633.190	5,541,081.390	654.38	CUT 'X' IN SE CORNER OF BRIDGE ABUMENT
16004	3,957,621.310	5,541,047.300	654.37	CUT 'X' IN PCC CURB ON SOUTH SIDE OF BRIDGE OF ENTRANCE ROAD - CENTER OF BRIDGE +/-
16005	3,956,005.930	5,541,973.210	655.19	CUT 'X' IN DOWNSTREAM HEADWALL OF RCB CULVERT
16006	3,954,991.990	5,543,501.420	698.18	CUT 'X' IN DOWNSTREAM SIDE OF BRIDGE DECK TO MOBILE HOME COURT - 9'± FROM WEST END OF BRIDGE
16025	3,959,066.420	5,541,274.320	637.23	CUT 'X' IN PCC CAP OF MOORING CELL

COORDINATES ARE IN NAD83 IOWA STATE PLANE COORDINATE SYSTEM (1401). ELEVATIONS ARE NAVD88.

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (10' CONTOUR)
- 2015/2020/2022 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- FENCE
- RAILROAD TRACKS
- EDGE OF WATER (MAY 2020)
- PROCESS TRANSPORT WATER, PLANT AREA RUNOFF, AND DIRECT RAINFALL FLOW DIRECTION
- UNNAMED CREEK FLOW PATH
- BURIED ELECTRIC
- OVERHEAD UTILITY
- TELEPHONE
- STORM DRAINAGE PIPE
- WATER
- ABANDONED WATER
- PROCESS WATER PIPE
- UPPER ASH POND OUTFALL REROUTE PIPING
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW17 ABANDONED MONITORING WELL
- MW12P PIEZOMETER
- MW12P ABANDONED PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- B40/VW66469 SOIL BORING WITH VWP (JUNE 2020/SEPTEMBER 2021/MARCH 2022)
- CS1 CRANE SETUP INVESTIGATION BORING [APPROX.] (NOVEMBER 2019 BY TERRACON)
- B30/B30T SOIL BORING (MAY 2015/SEPTEMBER 2021)
- B26 SOIL BORING (SEPTEMBER 2014)
- SB-1 SOIL BORING (2015 BY HARD HAT SERVICES)
- SED1 SEDIMENT PROBE
- TP1 TEST PIT
- PZ-1 WEST EMBANKMENT SLURRY WALL PIEZOMETER (2015 BY HARD HAT SERVICES)
- GRIFFIN #1 DEWATERING PUMP TEST WELL (PUMPING WELL/MONITORING WELL)
- #1 SETTLEMENT PLATE
- ISS-1/B-49 IN-SITU STABILIZATION TEST COLUMN AND BORING
- SLURRY WALL (2015 BY HARD HAT SERVICES)
- APPROXIMATE LIMITS OF UPPER ASH POND
- ASH DISPOSAL LANDFILL FINAL COVER AREA
- WETLAND

NOTES:

1. DRAWING COORDINATES IN IOWA STATE PLANE, NORTH ZONE, US FOOT, NAD 83 DATUM. VERTICAL DATUM IS NAVD 88.
2. EXISTING CONTOURS FOR OUTSIDE THE ASH DISPOSAL LANDFILL AND ASH PONDS ARE FROM ALLAMAKEE COUNTY DATED SPRING 2008.
3. EXISTING CONTOURS FOR THE CREEK AREA WEST OF THE ASH PONDS ARE FROM 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
4. EXISTING CONTOURS IN THE LOWER ASH POND AREA BASED ON HARD HAT SERVICES LOWER POND CLOSURE AS-BUILT DRAWINGS DATED JANUARY 2016.
5. EXISTING CONTOURS FOR THE ASH DISPOSAL LANDFILL PHASE 1 FINAL COVER AREA ARE FROM APRIL 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
6. EXISTING CONTOURS FOR THE ASH DISPOSAL LANDFILL PHASE 2 FINAL COVER ARE FROM MARCH 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
7. EXISTING CONTOURS FOR THE OPEN ASH DISPOSAL LANDFILL, SOUTHEAST OF THE ASH DISPOSAL LANDFILL, AND UPPER ASH POND AREAS ARE FROM MAY 2020 TOPOGRAPHIC/BATHYMETRIC SURVEY AND JANUARY 2022 TOPOGRAPHIC/DRONE SURVEY BY MOHN SURVEYING, INC.
8. EXISTING CONTOURS IN THE COAL YARD AND COAL YARD RUNOFF POND ARE BASED ON JANUARY 2020 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC. AND NOVEMBER 2021 SEDIMENT PROBES COMPLETED BY AMES. CONTOURS REPRESENT ANTICIPATED GRADES AFTER COAL PILES HAVE BEEN REMOVED.
9. EDGE OF WATER IN THE UNNAMED CREEK FROM 2015 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC. AND EDGE OF WATER IN THE UPPER ASH POND AREA FROM MAY 20–21, 2020 TOPOGRAPHIC SURVEY BY MOHN SURVEYING, INC.
10. UTILITIES SHOWN FROM 2015 SURVEY BY MOHN SURVEYING, INC. AS SHOWN ON HARD HAT SERVICES LOWER POND CLOSURE AS-BUILT DRAWINGS DATED JANUARY 2016 AND MAY 2020 SURVEY BY MOHN SURVEYING, INC. UTILITIES SHOWN ARE APPROXIMATE AND NOT ALL UTILITIES ARE SHOWN ON THIS DRAWING.
11. STRUCTURES AND UTILITIES IN THE COAL YARD AND GENERATING STATION AREA ARE APPROXIMATE AND BASED ON 2007 LANSING POWER STATION-PLOT PLAN (EIO NO. 92-2686) AND NOVEMBER 5, 2014 COAL YARD FIRE PROTECTION SITE PLAN (DRAWING NO. 17692-LAN-M-001 AND 17692-LAN-M-002) PROVIDED BY IPL.
12. 2015 BORINGS, PIEZOMETERS, AND SLURRY WALL BY HARD HAT SERVICES LOCATIONS BASED ON MAY 2015 SEEPAGE CONTROL CUT-OFF WALL DRAWINGS BY HARD HAT SERVICES.
13. SOIL BORINGS (B41, B42, AND B43) COMPLETED BY AMERICAN ENGINEERING TESTING IN SEPTEMBER 2021. VWPs IN B42 AND B43 INSTALLED BY AMERICAN ENGINEERING TESTING IN SEPTEMBER 2021. VWP-3 AND VWP-4 INSTALLED BY AMERICAN ENGINEERING TESTING IN MARCH 2022. LOCATIONS SURVEYED BY AMES.
14. TEST PITS AND SEDIMENT PROBES WERE INSTALLED BY AMES IN NOVEMBER 2021. LOCATIONS SURVEYED BY AMES.
15. WEIR STRUCTURE INFORMATION IS FROM A COMBINATION OF THE WEIR BOX SECTIONS & DETAILS ASH SETTLING BASIN DESIGN DRAWINGS BY SARGENT & LUNDY DATED FEBRUARY 25, 1975/JANUARY 30, 1976 (DRAWINGS S-213 AND S-214) AND THE LOWER POND CLOSURE AS-BUILT DRAWINGS BY HARD HAT SERVICES DATED JANUARY 2016.
16. APPROXIMATE LIMITS OF UPPER ASH POND BASED ON JUNE 5, 1974 SARGENT & LUNDY SITE DEVELOPMENT DRAWINGS AND MARCH 15, 1993 SARGENT & LUNDY DRAWING (ALLIANT DRAWING NO. 1-0110-4-5-C8002).
17. UPPER ASH POND OUTFALL REROUTE BASED ON UPPER ASH POND OUTFALL REROUTE ISSUED FOR CONSTRUCTION SET BY HARD HAT SERVICES DATED OCTOBER 2020.
18. WETLANDS WERE DELINEATED BY IMPACT 7G, INC. ON APRIL 19, 2021.

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/13/2023

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

CLIENT

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

ENGINEER

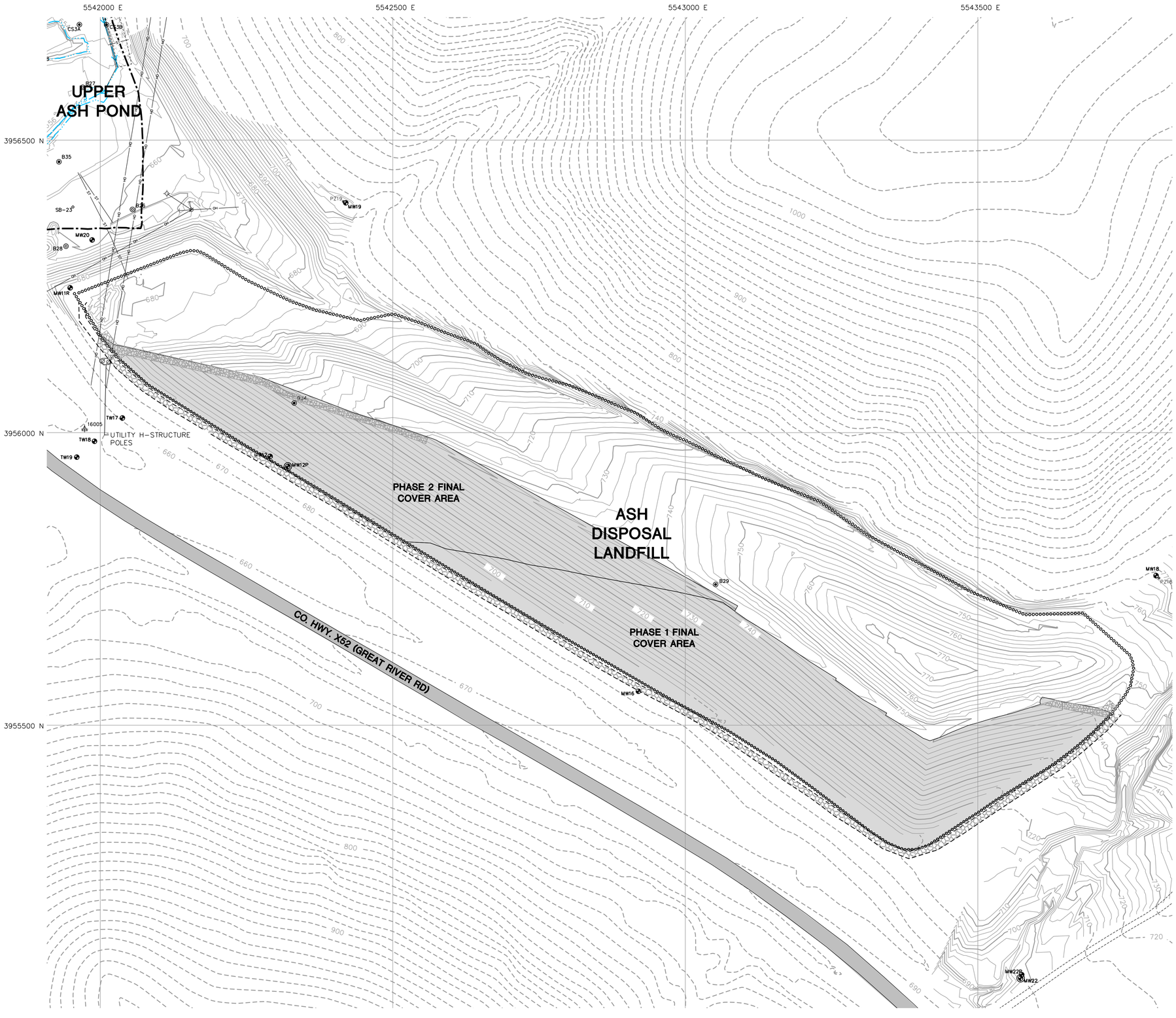
2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
GENERATING PLANT STATION
LANSING, IOWA

SITE

OVERALL SITE PLAN

SHEET
2 of 17

L:\2025\25-159.00\Drawings\Civil\Site Plan\Site Plan.dwg, 11/13/2023 9:19:25 AM



LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL APPROVED LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- OVERHEAD UTILITY
- STORM DRAINAGE PIPE
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW12P PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
- EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
- EXISTING RIPRAP

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.

80 0 80
SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/13/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9735

CLIENT

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

ENGINEER

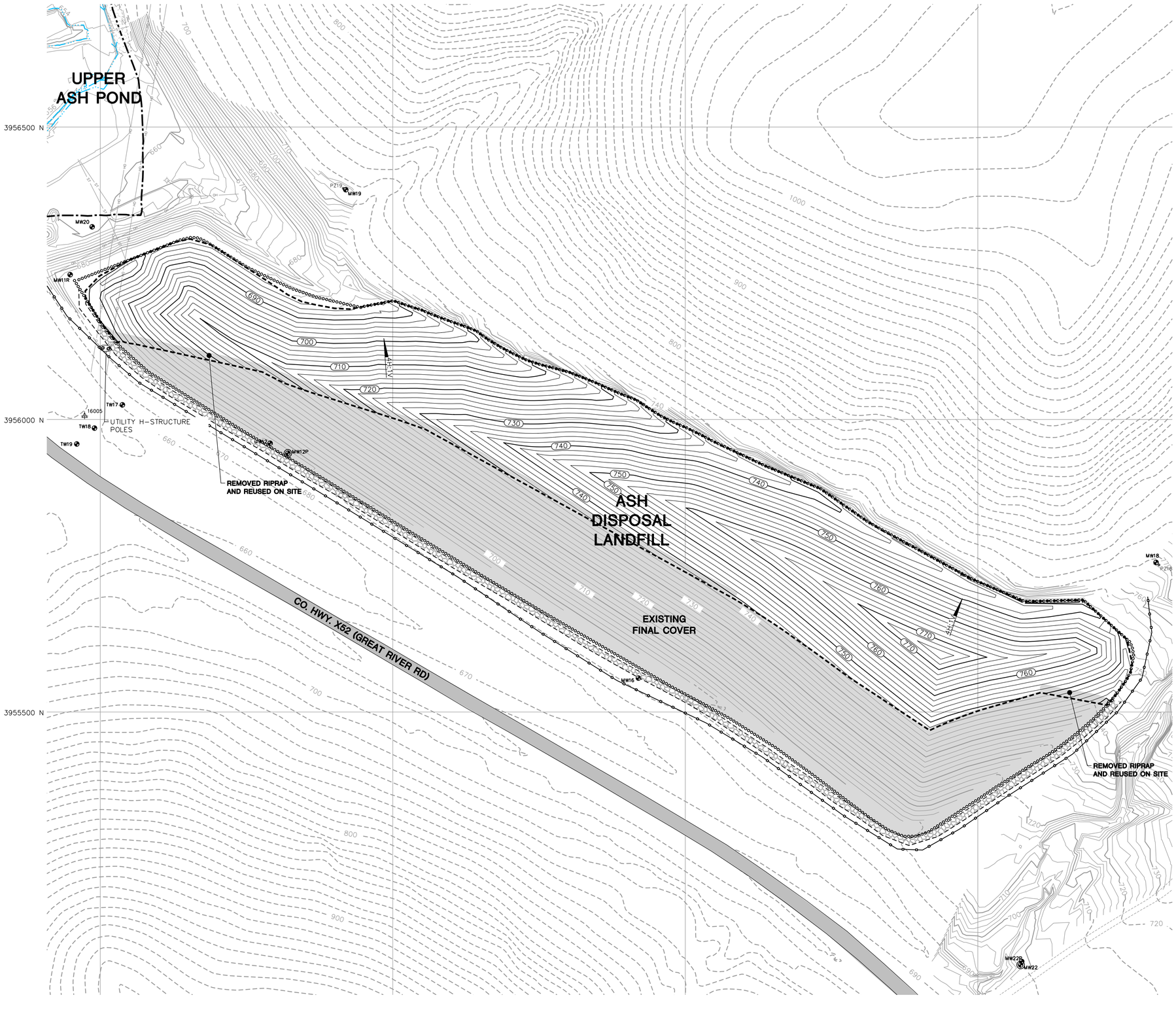
2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

PRE-CONSTRUCTION CONDITIONS

SHEET
3 of 17

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LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL APPROVED LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- OVERHEAD UTILITY
- STORM DRAINAGE PIPE
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW12P PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
- EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- DESIGN FINAL COVER SUBGRADE (10' CONTOUR)
- DESIGN FINAL COVER SUBGRADE (2' CONTOUR)
- SILT FENCE

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER SUBGRADE (TOP OF WASTE).
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

80 0 80
SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
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INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
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ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

LANDFILL COVER SUBGRADES

SHEET
4 of 17

I:\25\22159.00\Drawings\Cur\Fac. Ash Pond\Landfill\Landfill Subgrade.dwg, 11/27/2023 8:19:59 AM

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3956300 N | 3956200 N | 3956100 N | 3956000 N | 3955900 N | 3955800 N

690 | 700 | 710 | 720 | 730 | 740 | 750

LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 — DESIGN FINAL COVER SUBGRADE (10' CONTOUR)
- DESIGN FINAL COVER SUBGRADE (2' CONTOUR)
- POINT NUMBER — 2025 • 649.9' TOP OF WASTE ELEVATION — DOCUMENTATION SURVEY POINT

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER SUBGRADE (TOP OF WASTE).
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

N

30 0 30

SCALE: 1" = 30'

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
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ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
INTERSTATE POWER AND LIGHT COMPANY
LANSING GENERATING STATION
LANSING, IOWA

SITE

LANDFILL COVER SUBGRADES – NORTHWEST

SHEET 5 of 17

L:\25\25222159.00\Drawings\Civil\Dwg_Ash Disposal Landfill\Landfill Subgrades.dwg, 11/27/2023 9:19:54 AM

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3956000 N | 3955900 N | 3955800 N | 3955700 N | 3955600 N | 3955500 N

8155 719.9' | 8157 722.2' | 8163 723.0' | 8149 719.8' | 8164 727.8' | 8150 727.9' | 8158 725.0' | 8165 727.4' | 8175 728.3' | 8176 728.5' | 8177 731.4' | 8151 740.1' | 8159 739.5' | 8166 736.9' | 8178 735.3' | 8182 734.3' | 8183 734.6' | 8190 735.4' | 8191 737.4' | 8197 737.2' | 8152 750.1' | 8160 751.2' | 8167 748.9' | 8179 747.8' | 8184 744.7' | 8192 739.7' | 8198 738.7' | 8204 738.9' | 8212 739.3' | 8153 744.8' | 8170 756.6' | 8174 757.9' | 8211 739.6' | 8213 739.5' | 8154 739.6' | 8161 746.6' | 8168 753.1' | 8185 756.3' | 8193 752.2' | 8199 748.1' | 8205 743.5' | 8214 740.0' | 8173 757.6' | 8220 741.8' | 8156 735.4' | 8186 761.4' | 8223 741.4' | 8162 736.5' | 8169 742.4' | 8180 749.2' | 8187 756.4' | 8194 762.9' | 8200 759.9' | 8206 755.1' | 8215 749.4' | 8224 742.7' | 8222 743.6' | 8230 743.0' | 8171 737.5' | 8236 745.1' | 8239 743.7' | 8172 738.1' | 8181 738.4' | 8188 745.9' | 8195 752.7' | 8201 760.0' | 8207 766.1' | 8216 760.5' | 8225 754.8' | 8231 749.5' | 8238 746.4' | 8249 745.0' | 8189 740.2' | 8250 745.7' | 8257 745.4' | 8259 745.5' | 8196 742.4' | 8202 749.7' | 8208 757.5' | 8217 765.5' | 8226 766.1' | 8232 760.9' | 8240 755.7' | 8251 750.4' | 8256 746.3' | 8260 746.4' | 8265 747.1' | 8272 748.2' | 8271 748.1' | 8274 748.9' | 8280 749.4' | 8287 750.5' | 8291 751.7' | 8203 742.8' | 8209 747.8' | 8218 755.6' | 8227 763.8' | 8233 771.9' | 8241 767.2' | 8252 762.3' | 8261 757.9' | 8266 748.0' | 8270 748.9' | 8275 749.6' | 8281 750.6' | 8286 751.9' | 8267 753.8' | 8276 752.8' | 8282 753.6' | 8292 751.7' | 8294 752.0' | 8299 751.3' | 8298 752.0' | 8304 749.2' | 8306 749.1' | 8308 749.1' | 8210 743.2' | 8283 764.7' | 8285 763.8' | 8288 763.0' | 8289 760.9' | 8305 749.7' | 8310 747.6' | 8219 746.0' | 8228 754.4' | 8234 762.4' | 8242 770.2' | 8253 773.7' | 8262 769.4' | 8268 765.9' | 8277 765.2' | 8295 757.0' | 8307 747.6' | 8221 745.5' | 8309 746.3' | 8311 746.3' | 8229 746.5' | 8235 752.3' | 8243 760.5' | 8247 764.9' | 8254 763.2' | 8263 760.1' | 8269 757.7' | 8278 755.1' | 8284 752.6' | 8293 748.8' | 8300 745.6' | 8273 752.8' | 8301 744.4' | 8303 742.7' | 8279 749.0' | 8302 742.7' | 8264 752.0' | 8290 743.6' | 8237 748.1' | 8246 757.0' | 8258 751.4' | 8296 738.5' | 8297 738.8' | 8244 750.2' | 8245 753.8' | 8255 751.4' | 8248 750.1'

750 | 740 | 760 | 770

LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 DESIGN FINAL COVER SUBGRADE (10' CONTOUR)
- DESIGN FINAL COVER SUBGRADE (2' CONTOUR)
- POINT NUMBER 2894 / TOP OF WASTE ELEVATION 649.9' — DOCUMENTATION SURVEY POINT

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER SUBGRADE (TOP OF WASTE).
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

N

30 0 30

SCALE: 1" = 30'

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PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	11/14/2023
DRAWN BY:	BSS/KP
CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/22/2023

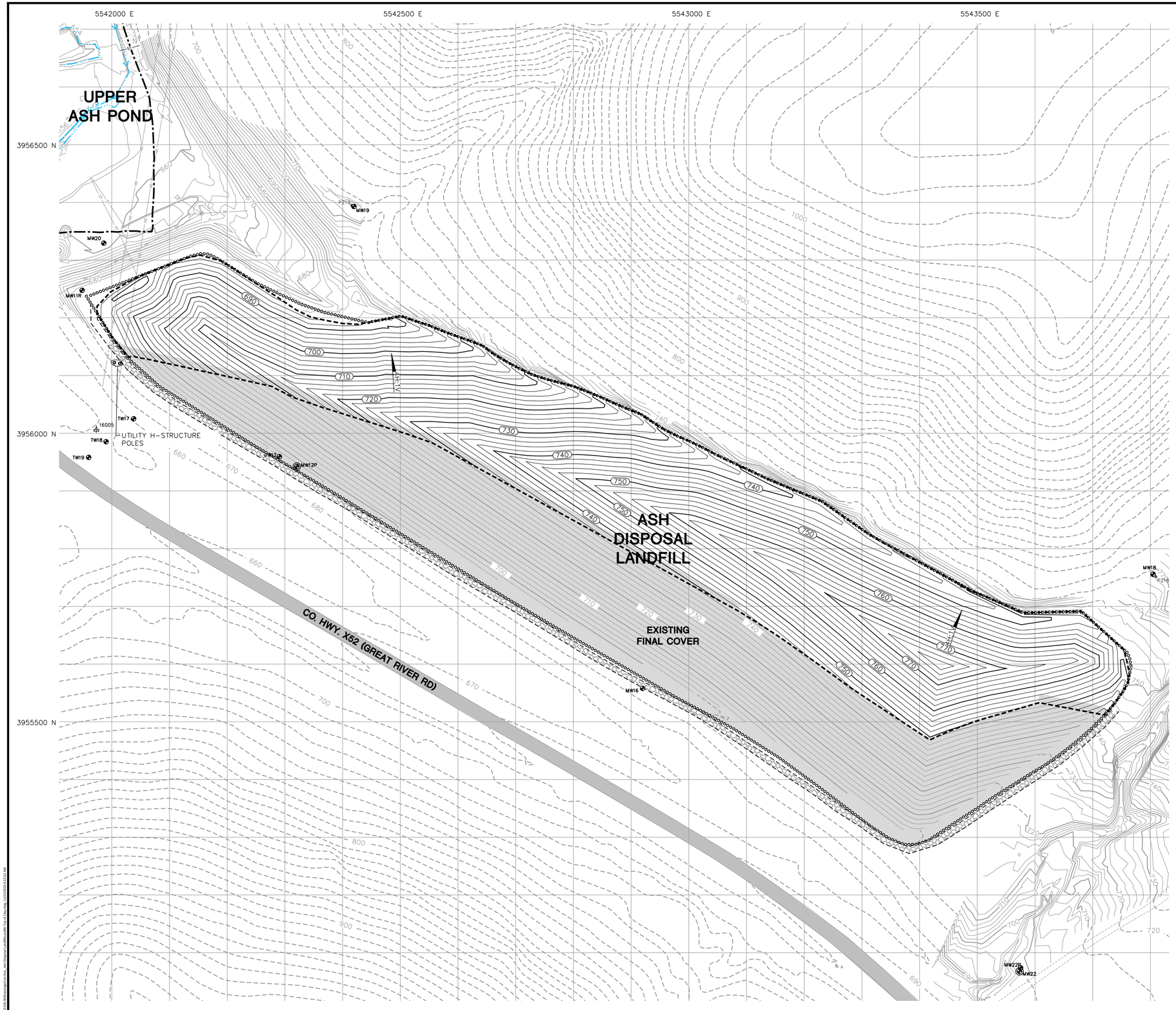
CLIENT
INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

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

SITE
2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
INTERSTATE POWER AND LIGHT COMPANY
LANSING GENERATING STATION
LANSING, IOWA

LANDFILL COVER SUBGRADES – SOUTHEAST

SHEET
6 of 17



LEGEND

- 1000 — 2008 EXISTING GRADE (10' CONTOUR)
- 660 — 2015/2020 EXISTING GRADE (10' CONTOUR)
- 656 — 2015/2020 EXISTING GRADE (2' CONTOUR)
- ASH DISPOSAL LANDFILL APPROVED LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- OH — OVERHEAD UTILITY
- ST — STORM DRAINAGE PIPE
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW12P PIEZOMETER
- PZ18 ABANDONED SHALLOW PIEZOMETER
- EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
- EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 DESIGN TOP OF SELECT CLAY FILL (10' CONTOUR)
- DESIGN TOP OF SELECT CLAY FILL (2' CONTOUR)

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER TOP OF SELECT CLAY FILL LAYER.
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

80 0 80
SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

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

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PHONE: (608) 224-2830

ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

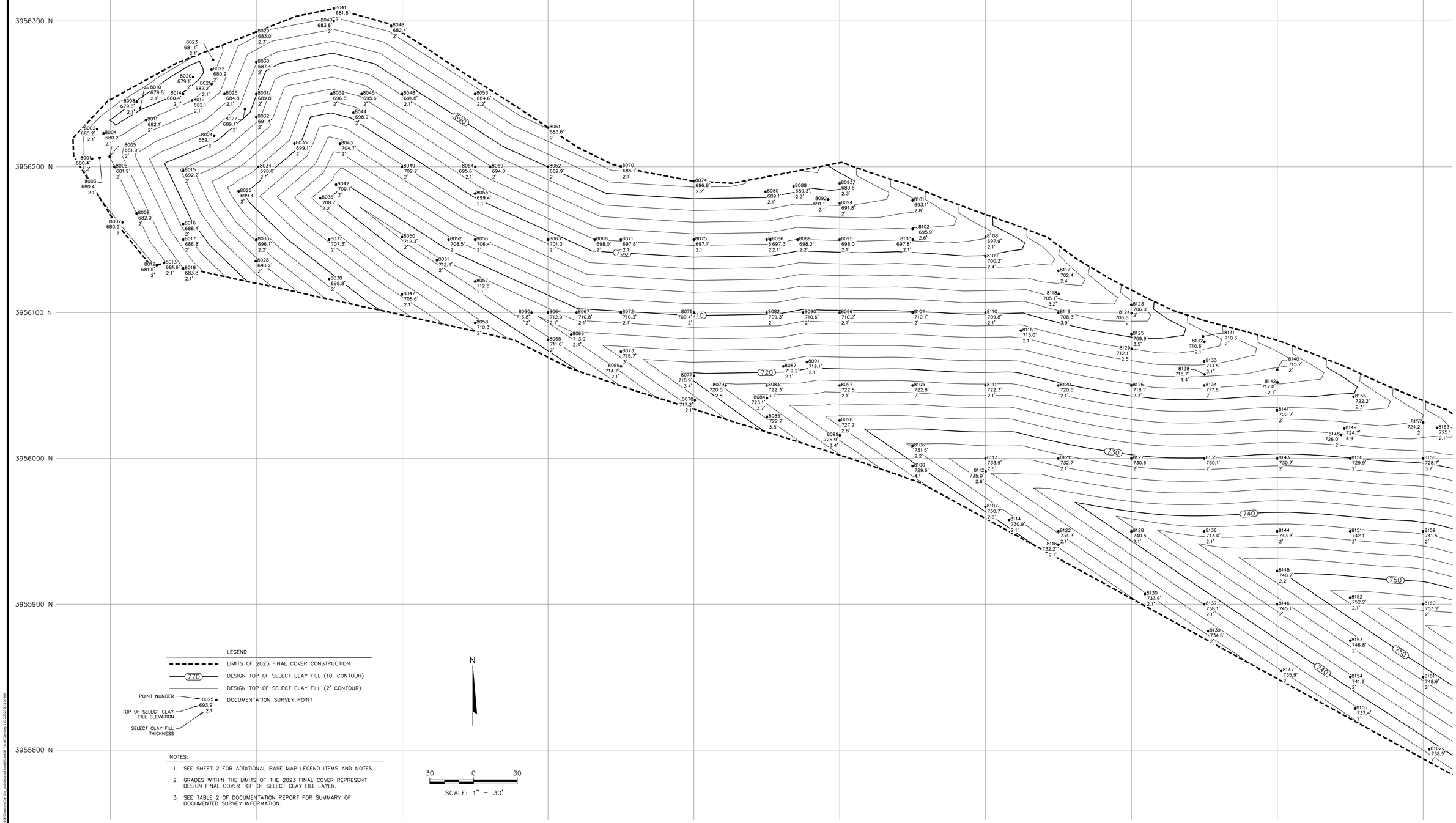
LANDFILL TOP OF SELECT CLAY FILL

SHEET
7 OF 17

L:\2023\25159.00\Drawing\Cur\Cur_Ash Disposal Landfill Layout Plan.dwg, 11/27/2023 8:53:3 AM

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3956300 N | 3956200 N | 3956100 N | 3956000 N | 3955900 N | 3955800 N



LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 — DESIGN TOP OF SELECT CLAY FILL (10' CONTOUR)
- DESIGN TOP OF SELECT CLAY FILL (2' CONTOUR)
- DOCUMENTATION SURVEY POINT

POINT NUMBER → 8025
TOP OF SELECT CLAY FILL ELEVATION → 693.9'
SELECT CLAY FILL THICKNESS → 2.1'

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER TOP OF SELECT CLAY FILL LAYER.
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

N

30 0 30

SCALE: 1" = 30'

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DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 2522159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

INTERSTATE POWER AND LIGHT CO.
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LANSING, IA 52151-9733

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SCS ENGINEERS
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PHONE: (608) 224-2830

ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

LANDFILL TOP OF SELECT CLAY FILL – NORTHWEST

SHEET
8 OF 17

5542900 E | 5543000 E | 5543100 E | 5543200 E | 5543300 E | 5543400 E | 5543500 E | 5543600 E | 5543700 E

3956000 N | 3955900 N | 3955800 N | 3955700 N | 3955600 N | 3955500 N

LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 DESIGN TOP OF SELECT CLAY FILL (10' CONTOUR)
- DESIGN TOP OF SELECT CLAY FILL (2' CONTOUR)
- POINT NUMBER 8025 / TOP OF SELECT CLAY FILL ELEVATION 693.9' / SELECT CLAY FILL THICKNESS 2.1' — DOCUMENTATION SURVEY POINT

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL COVER TOP OF SELECT CLAY FILL LAYER.
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

N

30 0 30

SCALE: 1" = 30'

PROJECT NO.	25222159.00
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DRAWN BY:	BSS/KP
CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/22/2023

CLIENT

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

ENGINEER

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

SITE

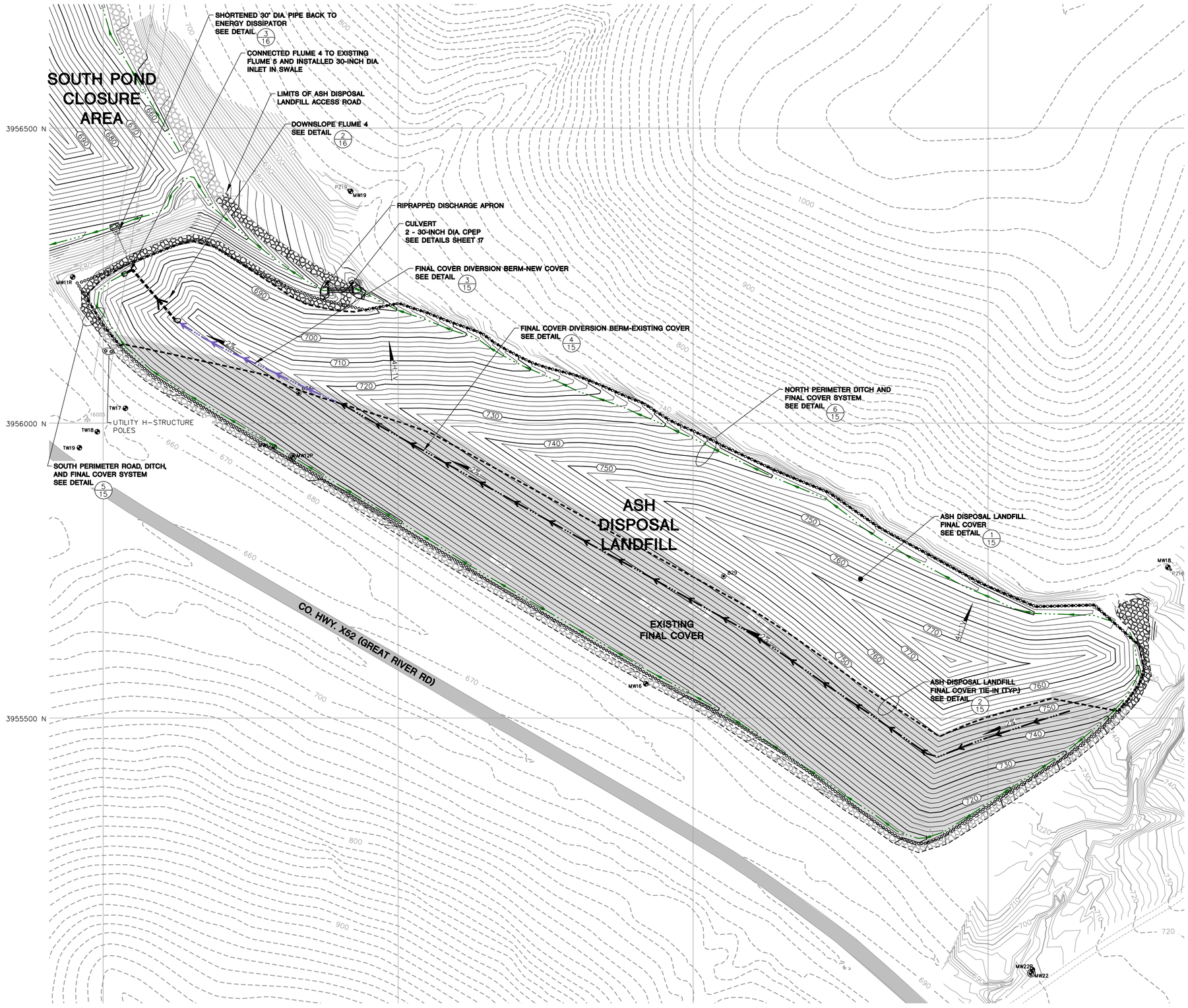
2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SHEET

LANDFILL TOP OF SELECT CLAY FILL - SOUTHEAST

9 of 17

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LEGEND

- 1000 — 2008 EXISTING GRADE (10' CONTOUR)
- 660 — 2015/2020 EXISTING GRADE (10' CONTOUR)
- 656 — 2015/2020 EXISTING GRADE (2' CONTOUR)
- PERMITTED ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- OH — OVERHEAD UTILITY
- ST — STORM DRAINAGE PIPE
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 — MONITORING WELL
- MW12P — PIEZOMETER
- PZ18 — ABANDONED SHALLOW PIEZOMETER
- B40/VW66469 — SOIL BORING WITH VWP (JUNE 2020)
- CS1 — CRANE SETUP INVESTIGATION BORING [APPROX.] (NOVEMBER 2019 BY TERRACON)
- B30/B30T — SOIL BORING (MAY 2015)
- B26 — SOIL BORING (SEPTEMBER 2014)
- SB-1 — SOIL BORING (2015 BY HARD HAT SERVICES)
- EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 — DESIGN FINAL GRADE (10' CONTOUR)
- DESIGN FINAL GRADE (2' CONTOUR)
- EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
- ASH DISPOSAL LANDFILL ACCESS ROAD
- DOWNSLOPE FLUME
- ENERGY DISSIPATOR
- DIVERSION BERM-EXISTING COVER
- DIVERSION BERM-NEW COVER
- DRAINAGE SWALE
- CULVERT
- RIPRAP

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES OUTSIDE THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN PERIMETER FINAL GRADES (TOP OF TOPSOIL OR TOP OF GRAVEL).
3. GRADES WITHIN THE LIMITS OF FINAL COVER REPRESENT DESIGN FINAL GRADES (TOP OF TOPSOIL).
4. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

80 0 80
SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

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

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

2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA
SITE

LANDFILL FINAL GRADES

SHEET
10 of 17

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5542000 E | 5542100 E | 5542200 E | 5542300 E | 5542400 E | 5542500 E | 5542600 E | 5542700 E | 5542800 E | 5542900 E

3956300 N | 3956200 N | 3956100 N | 3956000 N | 3955900 N | 3955800 N

LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 — DESIGN FINAL GRADE (10' CONTOUR)
- DESIGN FINAL GRADE (2' CONTOUR)
- DOCUMENTATION SURVEY POINT

POINT NUMBER: 8025 • 693.9' 0.5/0.5

TOP OF FINAL COVER ELEVATION

ROOTING ZONE THICKNESS/ TOPSOIL THICKNESS (FT)

N

30 0 30

SCALE: 1" = 30'

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL GRADES (TOP OF TOPSOIL).
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

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

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MRS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

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2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

ENGINEER

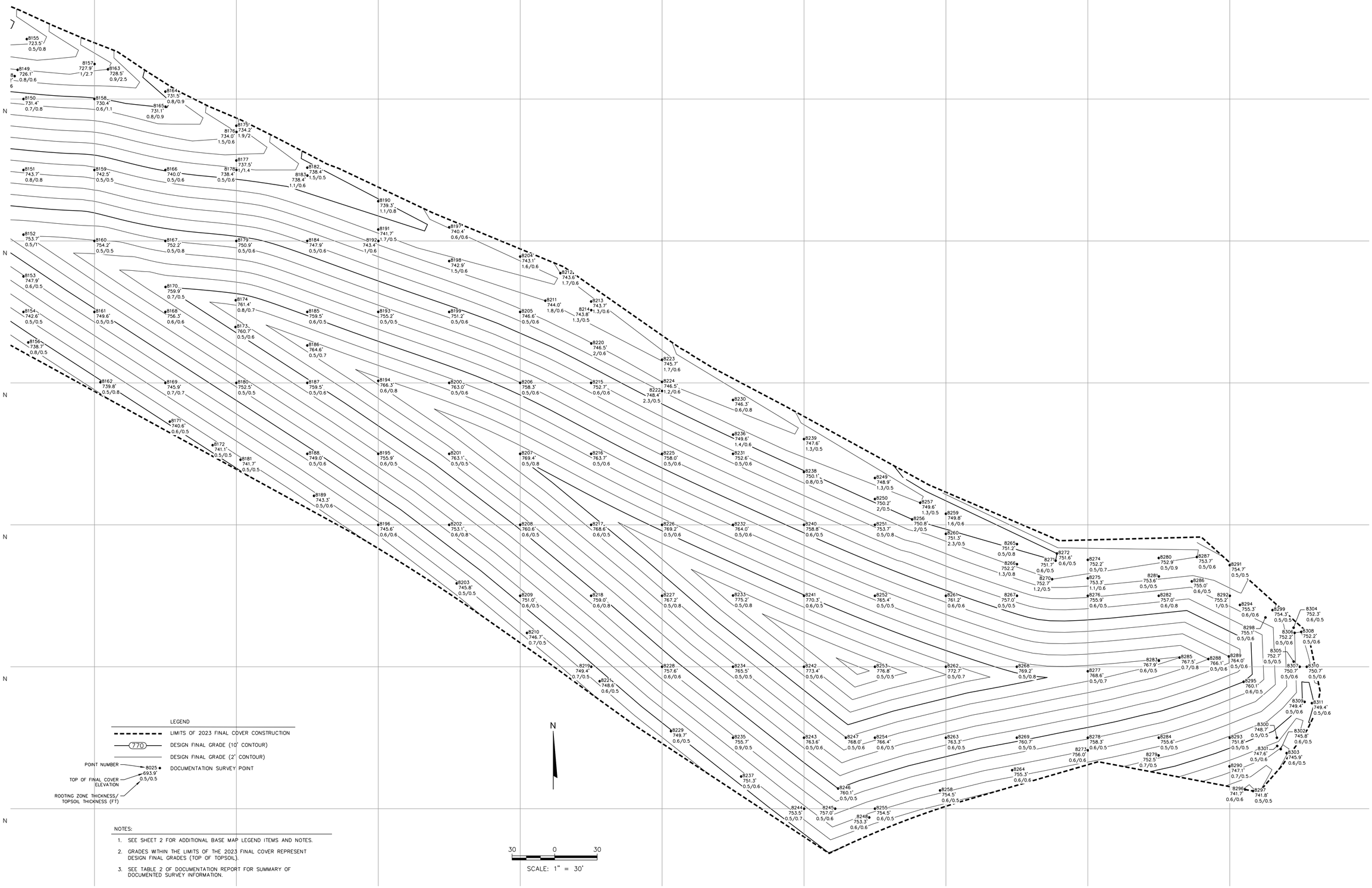
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2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
NORTH CENTER STATION
LANSING, IOWA

SHEET
LANDFILL FINAL GRADES – NORTHWEST
11 of 17

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3956000 N
3955900 N
3955800 N
3955700 N
3955600 N
3955500 N



LEGEND

- LIMITS OF 2023 FINAL COVER CONSTRUCTION
- 770 — DESIGN FINAL GRADE (10' CONTOUR)
- DESIGN FINAL GRADE (2' CONTOUR)
- DOCUMENTATION SURVEY POINT

POINT NUMBER — 8025 693.9' 0.5/0.5 — TOP OF FINAL COVER ELEVATION — ROOTING ZONE THICKNESS/ TOPSOIL THICKNESS (FT)

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. GRADES WITHIN THE LIMITS OF THE 2023 FINAL COVER REPRESENT DESIGN FINAL GRADES (TOP OF TOPSOIL).
3. SEE TABLE 2 OF DOCUMENTATION REPORT FOR SUMMARY OF DOCUMENTED SURVEY INFORMATION.

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DRAWN BY:	BSS/KP
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APPROVED BY:	MRS 11/22/2023

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LANSING, IA 52151-9733

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

SITE
2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

LANDFILL FINAL GRADES – SOUTHEAST

SHEET
12 OF 17

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5542000 E

5542500 E

5543000 E

5543500 E

3956500 N

3956000 N

3955500 N

SOUTH POND CLOSURE AREA

SHORTENED 30" DIA PIPE BACK TO ENERGY DISSIPATOR SEE DETAIL 3/16

CONNECTED FLUME 4 TO EXISTING FLUME 5 AND INSTALLED 30-INCH DIA INLET IN SWALE

LIMITS OF ASH DISPOSAL LANDFILL ACCESS ROAD

DOWNSLOPE FLUME 4 SEE DETAIL 2/16

ROCK CHECK DAM (TYP.) SEE DETAIL 5/16

RIPRAPPED DISCHARGE APRON

CULVERT 2 - 30-INCH DIA CPEP SEE DETAILS SHEET 17

FINAL COVER DIVERSION BERM-NEW COVER SEE DETAIL 3/15

FINAL COVER DIVERSION BERM-EXISTING COVER SEE DETAIL 4/15

NORTH PERIMETER DITCH AND FINAL COVER SYSTEM SEE DETAIL 6/15

ASH DISPOSAL LANDFILL FINAL COVER SEE DETAIL 1/15

ASH DISPOSAL LANDFILL FINAL COVER TIE-IN (TYP.) SEE DETAIL 2/15

ROCK CHUTE RC1

SOUTH PERIMETER ROAD, DITCH, AND FINAL COVER SYSTEM SEE DETAIL 5/15

UTILITY H-STRUCTURE POLES

ASH DISPOSAL LANDFILL

EXISTING FINAL COVER

CO. HWY. X52 (GREAT RIVER RD)

MW11R MW16 MW17 MW18 MW19 MW22 MW22P PZ18 TW17 TW18 TW19 B29 B30 B30T B40/VW66469 CS1 SB-1

LEGEND

- 2008 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (10' CONTOUR)
- 2015/2020 EXISTING GRADE (2' CONTOUR)
- PERMITTED ASH DISPOSAL LANDFILL LIMITS OF WASTE
- PAVED ROAD
- GRAVEL ROAD
- OH — OVERHEAD UTILITY
- ST — STORM DRAINAGE PIPE
- UTILITY POLE AND GUY WIRE
- LIGHT POLE
- SURVEY CONTROL POINT
- MW17 MONITORING WELL
- MW12P PIEZOMETER
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- B40/VW66469 SOIL BORING WITH VWP (JUNE 2020)
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- EXISTING ASH DISPOSAL LANDFILL FINAL COVER AREA
- LIMITS OF 2023 FINAL COVER CONSTRUCTION
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- DOCUMENTED FINAL GRADE (2' CONTOUR)
- EXISTING ASH DISPOSAL LANDFILL ACCESS ROAD
- ASH DISPOSAL LANDFILL ACCESS ROAD
- DOWNSLOPE FLUME
- ENERGY DISSIPATOR
- DIVERSION BERM-EXISTING COVER
- DIVERSION BERM-NEW COVER
- DRAINAGE SWALE
- CULVERT
- RIPRAP
- VEGETATED RESTORATION

NOTES:

1. SEE SHEET 2 FOR ADDITIONAL BASE MAP LEGEND ITEMS AND NOTES.
2. CONTOURS WITHIN THE CONSTRUCTION LIMITS BASED ON SEPTEMBER 25, 2023 DRONE SURVEY PERFORMED BY AMES.
3. PLACED NON-CHANNEL EROSION MAT ON RESTORED SLOPES STEEPER OR EQUAL TO 4:1 OR AS NOTED.
4. PLACED CHANNEL EROSION MAT IN DRAINAGE SWALES.

80 0 80

SCALE: 1" = 80'

N

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
APPROVED BY: MWS 11/22/2023

PROJECT NO. 25222159.00
DRAWN: 10/05/2023
REVISED: 11/14/2023

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

CLIENT

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

ENGINEER

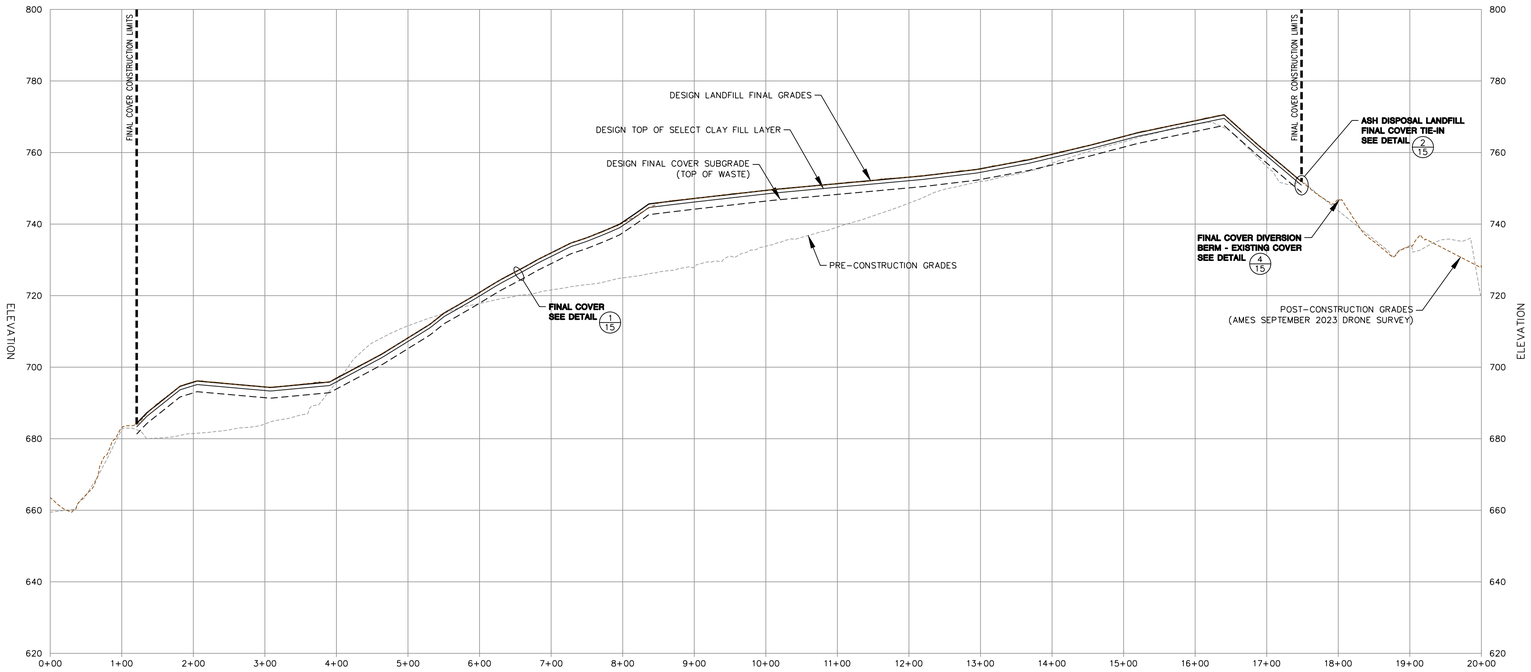
2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

RESTORATION PLAN

SHEET 13 of 17

L:\2025\25159.00\Drawings\Cover Sheet - Aerial Photograph.dwg Plotted: Jack Wiedenmann, Brian Mayo 11/13/2023 9:39:43 AM



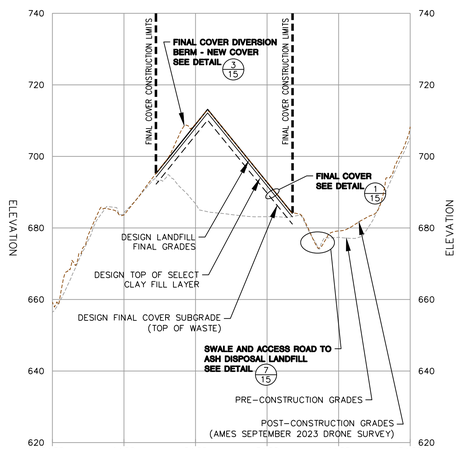
CROSS SECTION A-A'

NOTES:

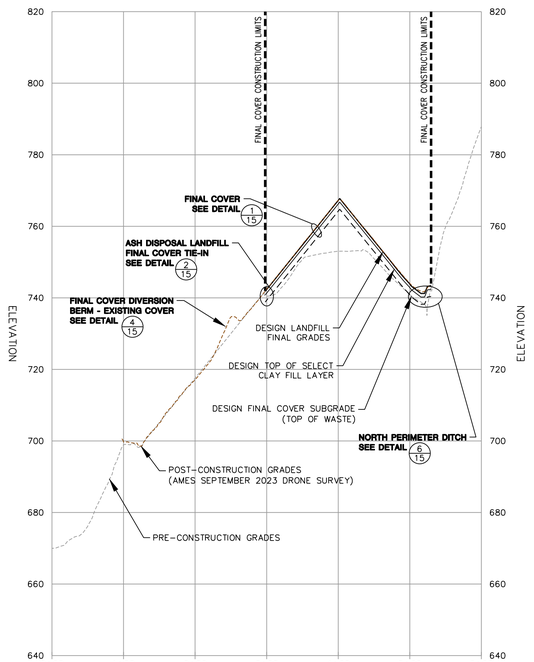
1. SEE SHEET 2 FOR ADDITIONAL BASE MAP NOTES.

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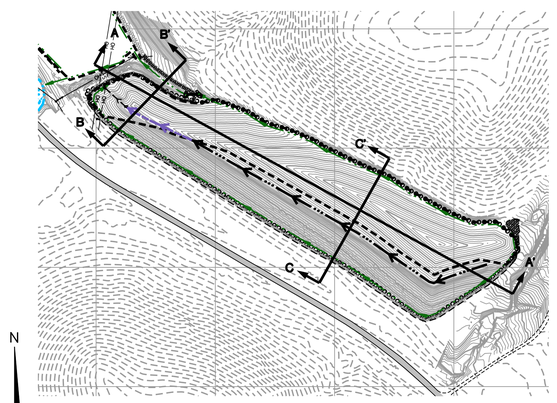
SCALE: 1" = 100'
VERTICAL EXAGGERATION: 5X



CROSS SECTION B-B'



CROSS SECTION C-C'



CROSS SECTION LOCATION MAP

SCALE: 1" = 300'

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

ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
CONSTRUCTION QUALITY ASSURANCE
LANSING ENERGY STATION
LANSING, IOWA

SITE

INTERSTATE POWER AND LIGHT CO.
3320 POWER PLANT DRIVE
LANSING, IA 52151-9733

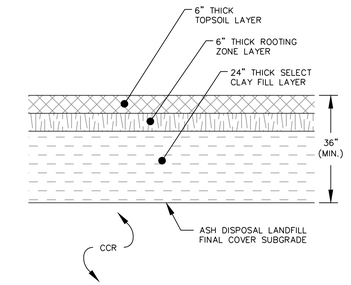
CLIENT

PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	11/03/2023
DRAWN BY:	BSS/KP
CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/22/2023

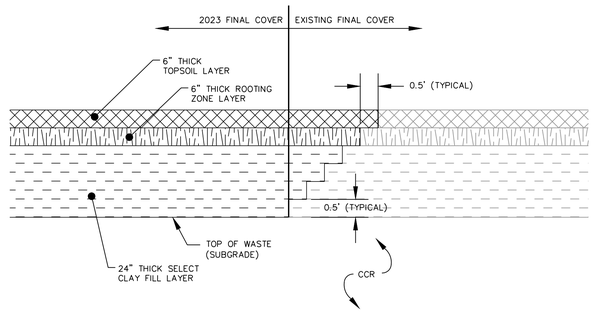
CROSS SECTIONS

SHEET
14 OF 17

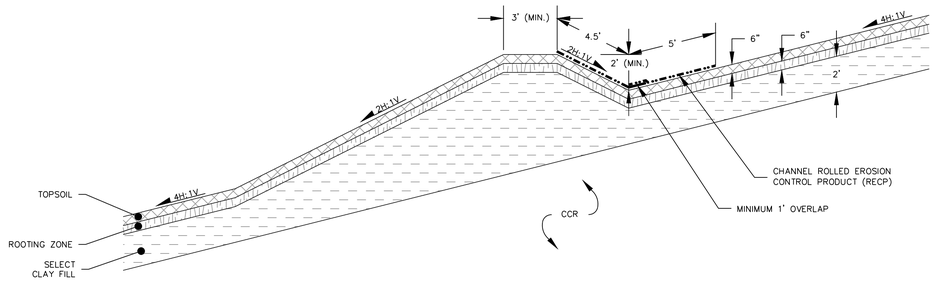
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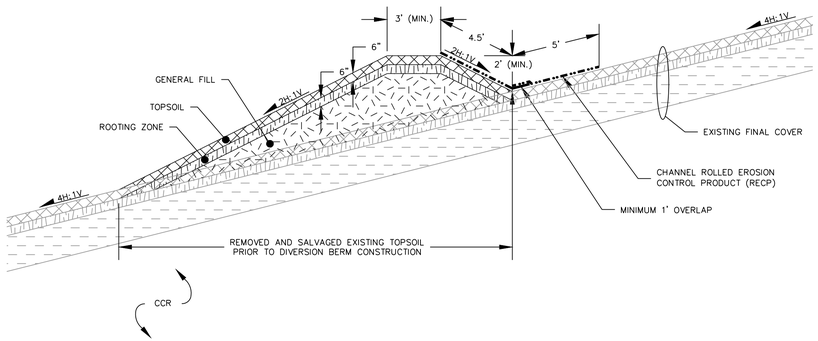
1/15 ASH DISPOSAL LANDFILL FINAL COVER
SCALE: 1" = 2'



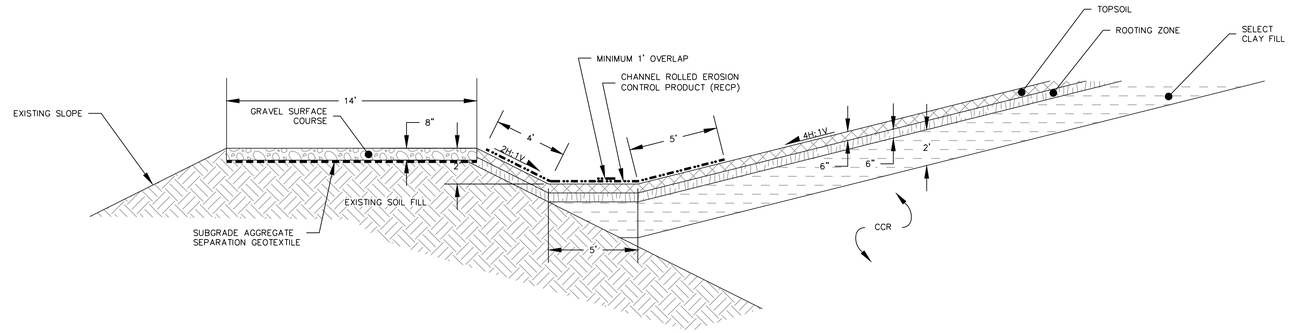
2/15 ASH DISPOSAL LANDFILL FINAL COVER TIE-IN
SCALE: 1" = 2'



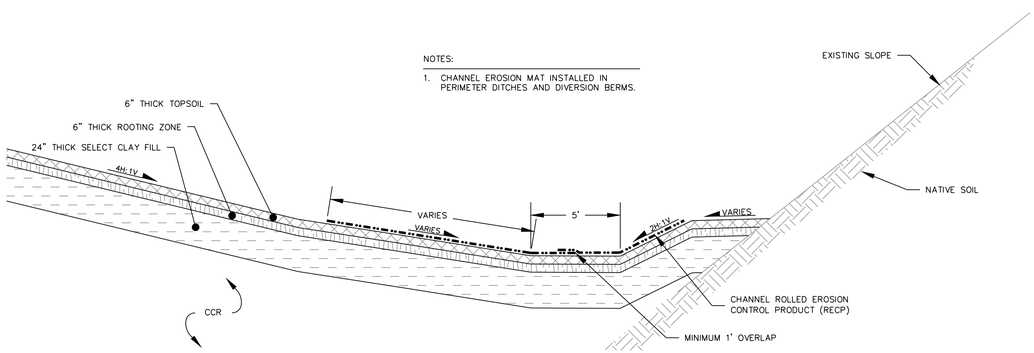
3/15 LANDFILL FINAL COVER DIVERSION BERM - NEW COVER
NOT TO SCALE



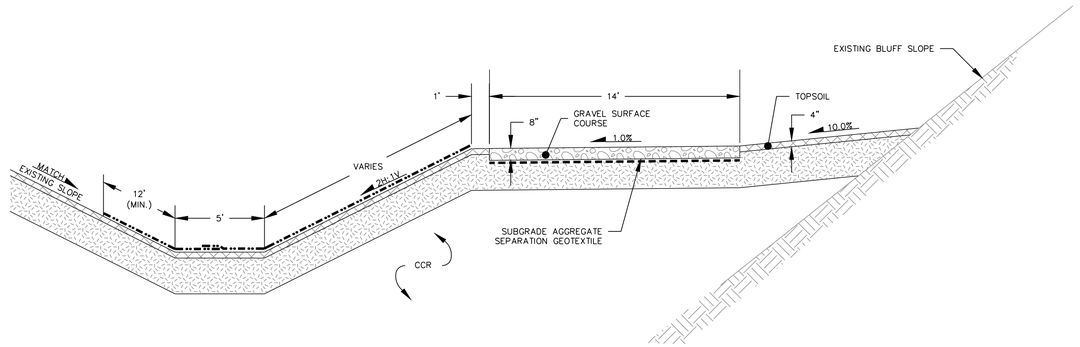
4/15 FINAL COVER DIVERSION BERM - EXISTING COVER
NOT TO SCALE



5/15 SOUTH PERIMETER ROAD AND DITCH
NOT TO SCALE



6/15 NORTH PERIMETER DITCH
NOT TO SCALE



7/15 SWALE AND ACCESS ROAD TO ASH DISPOSAL LANDFILL
NOT TO SCALE

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

DRAWN BY: BSS/KP
CHECKED BY: BSS/MRH
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INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

CLIENT

ENGINEER

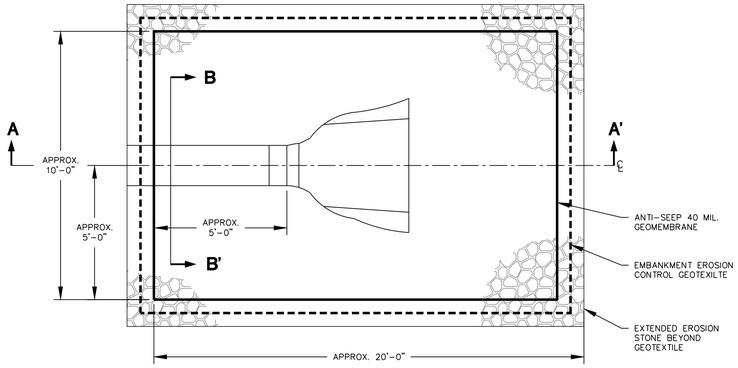
2023 ASH DISPOSAL LANDFILL FINAL COVER
CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

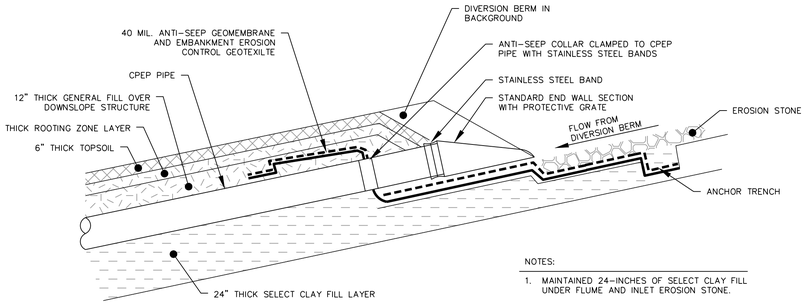
DETAILS

SHEET
15 of 17

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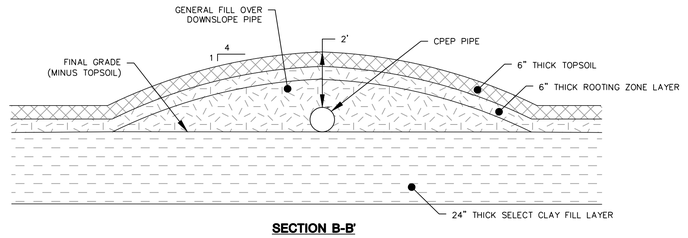
PLAN VIEW



NOTES:

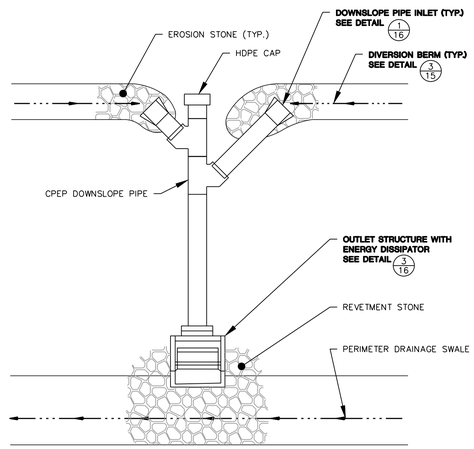
1. MAINTAINED 24-INCHES OF SELECT CLAY FILL UNDER FLUME AND INLET EROSION STONE.

SECTION A-A'

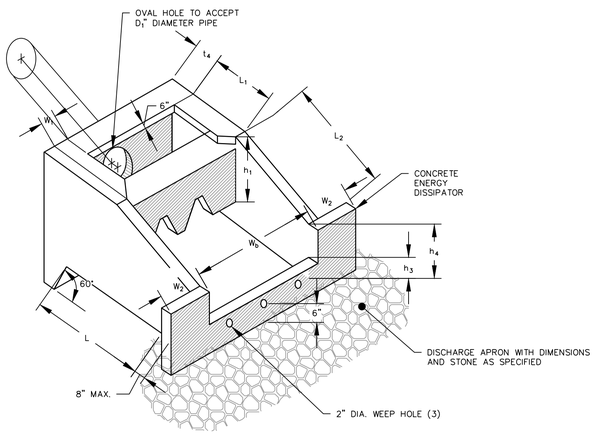


SECTION B-B'

1/16 DOWNSLOPE INLET STRUCTURE
NOT TO SCALE

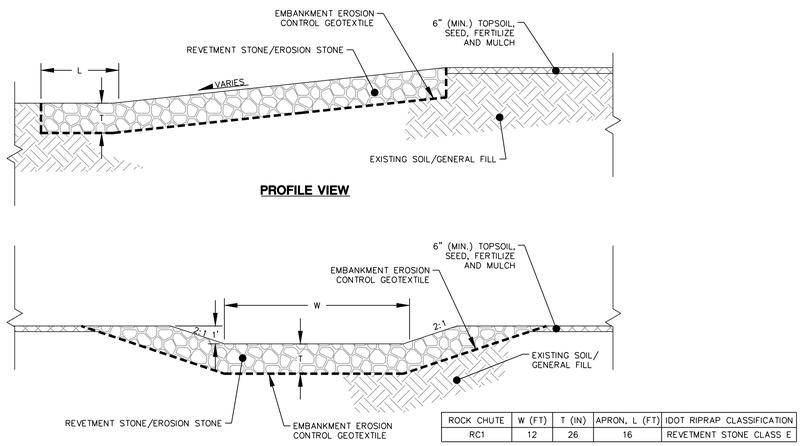


2/16 DOWNSLOPE PIPE
NOT TO SCALE



Flume	D_1 (in.)	Energy Dissipator Dimensions (feet)										Discharge Apron				
		W_b	h_1	h_3	h_4	L	L_1	L_2	W_1	W_2	t_4	Chute Width (ft.)	Apron Width (ft.)	Length (ft.)	Thickness (in.)	Stone Type
Flume 4/ Flume 5	30	8	6.17	1.33	3.33	10.67	4.58	6.17	0.58	2.17	0.5	10	10	12	20	IDOT Revetment Stone Class E

3/16 ENERGY DISSIPATOR
NOT TO SCALE



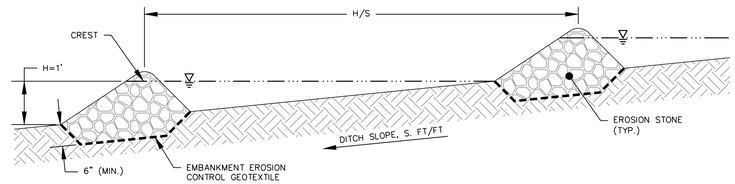
ROCK CHUTE	W (FT)	T (IN)	APRON, L (FT)	IDOT RIPRAP CLASSIFICATION
RC1	12	26	16	REVETMENT STONE CLASS E

NOTES:

1. TOP OF REVETMENT STONE/EROSION STONE FLUSH WITH SURROUNDING GRADES.

SECTION VIEW

4/16 ROCK CHUTE
NOT TO SCALE



5/16 TYPICAL ROCK CHECK DAM
NOT TO SCALE

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

ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
INTERSTATE POWER AND LIGHT CO.
LANSING ENERGY CENTER, LANSING, IOWA

SITE

DETAILS

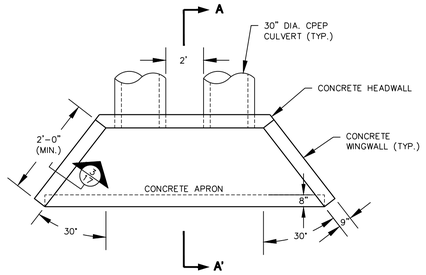
SHEET 16 of 17

PROJECT NO.	25222159.00
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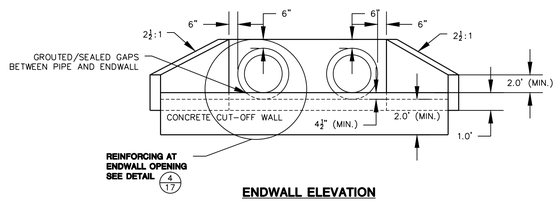
INTERSTATE POWER AND LIGHT CO.
2320 POWER PLANT DRIVE
LANSING, IA 52151-9733

CLIENT

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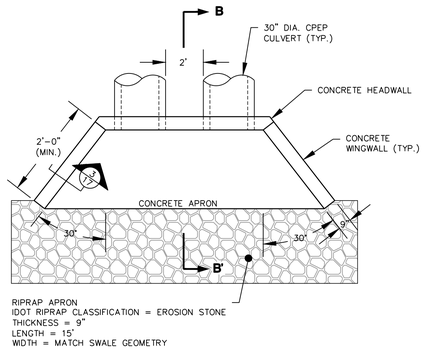


ENDWALL PLAN VIEW

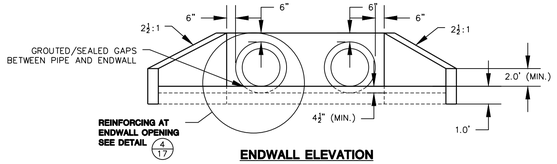


ENDWALL ELEVATION

1/17 CULVERT ENDWALL INLET
NOT TO SCALE

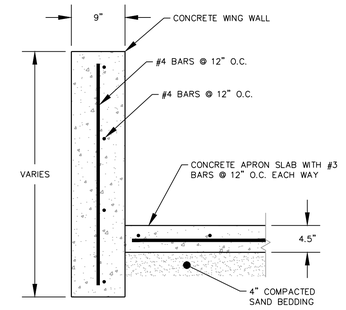


ENDWALL PLAN VIEW

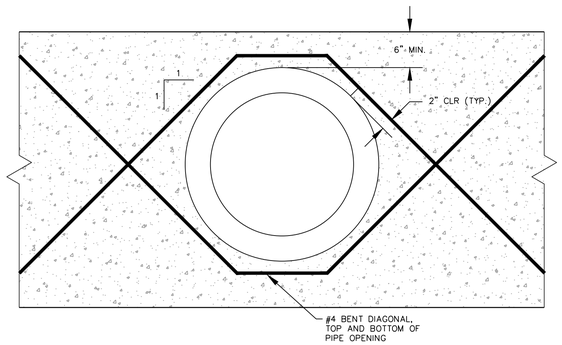


ENDWALL ELEVATION

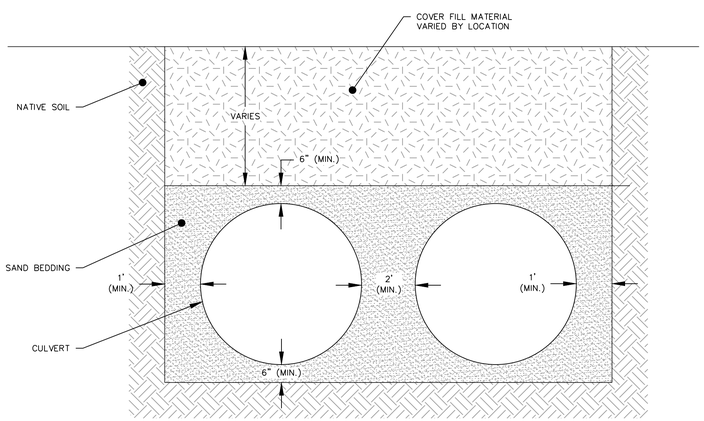
2/17 CULVERT ENDWALL OUTLET
NOT TO SCALE



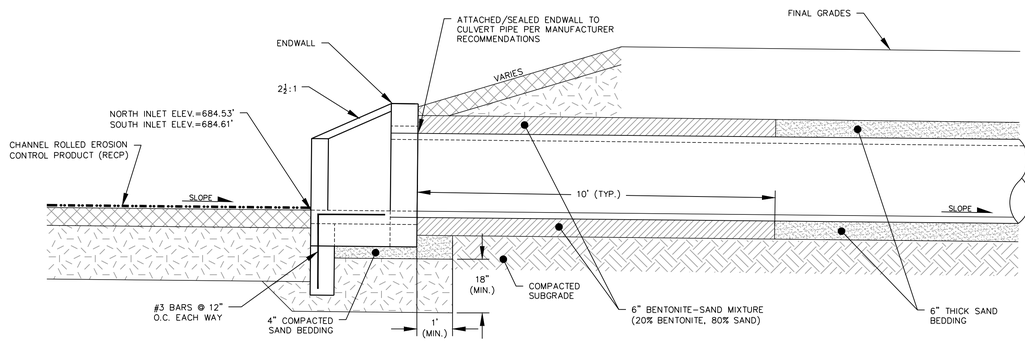
3/17 REINFORCEMENT AT APRON ENDWALL
NOT TO SCALE



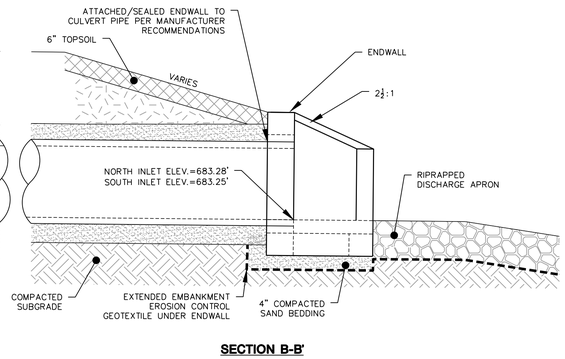
4/17 REINFORCEMENT AT ENDWALL OPENING
NOT TO SCALE



5/17 CULVERT BEDDING
NOT TO SCALE



SECTION A-A'



SECTION B-B'

6/17 CULVERT PROFILE
NOT TO SCALE

SCS ENGINEERS
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DRAWN BY:	BSS/KP
CHECKED BY:	BSS/MRH
APPROVED BY:	MRS 11/22/2023
PROJECT NO.	25222159.00
DRAWN:	10/05/2023
REVISED:	11/03/2023

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

ENGINEER

2023 ASH DISPOSAL LANDFILL FINAL COVER CONSTRUCTION DOCUMENTATION
LANSING GENERATING STATION
LANSING, IOWA

SITE

DETAILS

SHEET
17 of 17

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