Emery Pond

Closure Plan

Marion Power Plant
Southern Illinois Power Cooperative
Marion, Williamson County, Illinois

March 29, 2019
revised April 15, 2021

HANSON
Engineering | Planning | Allied Services

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Abbreviations

BGS – below ground surface
CCR – Coal Combustion Residuals
CFR – Code of Federal Regulations
FGD – Flue-Gas Desulphurization
IAC – Illinois Administrative Code
SWPPP – Storm Water Pollution Prevention Plan

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1. Introduction

The pond at issue, Emery Pond, is located near the northwestern shore of Lake of Egypt on the site of Southern Illinois Power Cooperative's (SIPC) power plant near Marion, Illinois (Site). SIPC has owned and operated a coal-fired power plant at the Site since 1963.

The Emery Pond is a less-than-1-acre detention pond located on the south side of the main stack at the power plant facility. The pond has received coal combustion residuals (CCR) and other non-CCR material in waste streams and in runoff that flows by gravity to the pond, particularly air heater wash, and other miscellaneous boiler and precipitator wastes. The pond is occasionally dredged due to the ongoing sediment carried into the pond via various plant and natural effluent streams. The pond is incised on the north, west and south sides, with a wide berm separating the pond from nearby Lake of Egypt to the east. This berm is approximately 140 feet in width at the crest, with a height of approximately 10 feet. The pond has a maximum volume of approximately 6.6 acre-feet. The pond is unlined and, therefore, does not meet the liner design criteria of the federal CCR Rule, 40 CFR 257.71.

Emery Pond is a significant hazard potential classification CCR surface impoundment, according to 40 CFR 257.73. The pond is exempt from the structural stability assessment and safety factor assessment requirements of 40 CFR 257.73 due to an impoundment height of less than 20 feet and impoundment volume of less than 20 acre-feet.

The original pond footprint was reduced around 2009 when a Flue-Gas Desulphurization (FGD) gypsum belt dewatering loadout facility was built on the western end of the existing pond. Direct push borings collected at the site indicate that the previous footprint beneath the FGD Loadout Area contains approximately 7,200 cubic yards of bed ash material. Direct push boring logs and a map of the boring locations are included in Appendix E.

In the fall of 2020, SIPC plans to commence closure of the pond and adjacent FGD Loadout Area by removal of existing CCR. A new pond, designated as Storm Water Basin, will replace Emery Pond within the existing footprint. Construction activities are summarized as follows:

- The area currently occupied by Emery Pond will be closed to meet current Federal and State of Illinois regulations, and at Illinois EPA's request this plan, and related plans have been prepared to align with the state CCR surface impoundment rule as currently proposed. For instance, Section 3.8 below addresses CCR transportation and management during closure activities in a manner consistent with the proposed state CCR rule. CCR materials currently contained in the pond will be removed and disposed of off-site. This closure plan will be implemented in connection with ongoing discussions between SIPC and Illinois EPA regarding resolution of claims that Emery Pond has caused exceedances of state groundwater standards. In that regard, it is expected that the closure activities described herein will decontaminate the source of such alleged exceedances, and thus contribute toward achieving relevant groundwater standards. See also the Corrective Action and Selected Remedy Plan submitted contemporaneously herewith.
- A new Storm Water Basin will be constructed within the existing footprint of Emery Pond to collect local drainage. Though it has been designed to meet the requirements of 40 CFR 257, the new basin will not meet the definition of a regulated CCR unit because it will no longer receive CCR. Nonetheless, the basin will be designed to meet the liner criteria for new CCR surface impoundments of 40 CFR 257.72 and the structural integrity criteria of 40 CFR 257.74. The basin will be constructed with a composite liner system meeting the federal requirements of

40 CFR 257.71. The Storm Water Basin will be permitted and operated as a water treatment device under 35 IAC 309, Subpart B.

- The FGD Loadout Area will be closed by removing surface FGD material and bed ash deposits. The area will be filled with compacted clean soil material and surfaced with crushed aggregate. This area, if closed in place, would have require approximately 5,900 square yards of final cover.
- The installation of a permanent dewatering system around the base of the basin liner system will provide protection from hydraulic pressures to the liner system and will collect groundwater in the vicinity of the new basin.
- Although SIPC maintains that an NPDES permit modification and construction permit are not needed with respect to the closure of Emery Pond and installation of the new Storm Water Basin, SIPC has submitted an NPDES permit modification application and a construction permit application to Illinois EPA per Illinois EPA request.

2. Definitions

Closed means placement of CCR in a CCR unit has ceased, and the owner or operator has completed closure of the CCR unit in accordance with applicable state and/or federal regulation and has initiated post-closure care.

Coal combustion residuals (CCR) means fly ash, bottom ash, boiler slag, and flue gas desulfurization materials generated from burning coal for the purpose of generating electricity by electric utilities and independent power producers.

CCR surface impoundment or impoundment means a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR.

CCR unit means any CCR landfill, CCR surface impoundment, or lateral expansion of a CCR unit, or a combination of more than one of these units, based on the context of the paragraph(s) in which it is used. This term includes both new and existing units, unless otherwise specified.

Dewatering means removal of freely drained pore water from CCR sediments or soil.

Operator means the person(s) responsible for the overall operation of a CCR unit.

Qualified person means a person or persons trained to recognize specific appearances of structural weakness and other conditions which are disrupting or have the potential to disrupt the operation or safety of the CCR unit by visual observation and, if applicable, to monitor instrumentation. Qualified professional engineer means an individual who is licensed by a state as a Professional Engineer to practice one or more disciplines of engineering and who is qualified by education, technical knowledge, and experience to make the specific technical certifications required under this subpart. Professional engineers making these certifications must be currently licensed in the state where the CCR unit(s) is located.

Recognized and generally accepted good engineering practices means engineering maintenance or operation activities based on established codes, widely accepted standards, published technical reports, or a practice widely recommended throughout the industry. Such practices generally detail approved ways to perform specific engineering, inspection, or mechanical integrity activities.

Unwatering means removal of surface (free) water from a site.

3. CCR Removal Activities

Major removal activities include dewatering, contaminated riprap removal, CCR sediment removal, and minor re-grading. CCR removal will be performed in accordance with the construction quality assurance procedures described in Appendix A and documented by an Illinois-licensed professional engineer. Figures showing the Emery Pond Closure and Storm Water Basin design are included in Appendix B and an estimated construction schedule is included in Appendix C.

3.1 CCR Removal

Completion of the activities described below will result in closure of the Emery Pond through removal of CCR sediment. This closure plan includes construction quality assurance (CQA) procedures consistent with the construction requirements for permitted CCR units in Illinois.

In addition to CCR material contained within Emery Pond, FGD material on the ground surface and bed ash and other deposits buried beneath the FGD Loadout Area and within Emery Pond will be excavated and transported to one or more of the following permitted disposal facilities:

- Perry Ridge Landfill, Inc.
- Southern Illinois Regional Landfill, Inc.
- West End Disposal Facility

3.2 Erosion and Sediment Control Measures

Best management practices (BMPs) consisting of interim and permanent stabilization and structural features will be implemented at the site for erosion and sediment control. Perimeter control measures such as silt filter fences and/or storm drain inlet protection will be installed prior to excavation activities. Permanent stabilization practices include gravel surfacing of perimeter roadways. Permanent stabilization practices will be initiated as soon as practicable in portions of the site where construction activities have permanently ceased, or within seven days in portions of the site where construction activities have temporarily ceased (unless construction activity on those portions of the site will resume within 14 days). The gravel surfacing mixture described in Section 3.11 will be used for permanent stabilization.

Structural features include floating suction strainers (for dewatering pumps), silt filter fences, storm drain inlet protection, rock outlet protection, and rolled excelsior, straw bales, or aggregate ditch checks.

BMPs will be implemented and maintained until construction activities are completed and the site is stabilized. SIPC's Storm Water Pollution Prevention Plan (SWPPP) has been included in Appendix D**Error! Reference source not found.**. Note that the construction contractor will need to prepare and file their own SWPPP.

3.3 Emery Pond Unwatering

Emery Pond must be unwatered for CCR sediment removal to be accomplished using conventional earthmoving equipment. Unwatering will be done using an existing pump station at the east end of the pond. This pump station transfers water from Emery Pond to the South Fly Ash Pond for discharge through NPDES Outfall 002.

Once the pond is substantially unwatered, additional methods may be required to dewater the remaining sediment deposits. These options include various combinations of temporary sump pits and/or drainage trenches. The option selected must result in sufficient dewatering in a manner that minimizes re-entrainment of solids and erosion at the discharge location(s). All dewatering activities must be conducted using appropriate best management practices (BMPs) for, and in compliance with the conditions of the Construction Permit. Installation of a permanent dewatering system is described in Section 3.9.

Unwatering of the Emery Pond is estimated to be completed within two (2) days. This is based on a total pumping volume and rate of 195 thousand gallons (at a pond operating water surface elevation of 509.0) and 120 thousand gallons per day, respectively.

3.4 CCR Sediment Dewatering

Dewatering of excavated CCR will be performed by laying out the wet material on perched drying pads within the pond and FGD storage area. Free water that drains out of the material will be directed to drain back into the pond for collection and pumping. The estimated dewatering volume is 587,000 gallons, assuming a free water volume of 25% within the CCR material. The CCR material will be hauled for disposal once sufficient free liquids have discharged to meets the Paint Filter Liquids Test criteria outlined in Section 3.5.

3.5 CCR Sediment Sampling

CCR sediment from the Emery Pond will be transported to a permitted facility for disposal. The sediment will be sampled and tested as necessary to satisfy disposal prequalification requirements. Sampling activities will be conducted in accordance with the construction quality assurance procedures in Section 4.4 of this Plan. Dewatering of sediment must be conducted such that the transported materials do not contain “free liquids” as defined by the Paint Filter Liquids Test (as referenced in 35 IAC 811.107(m)(3)(A)), prior to placement or transport.

3.6 Riprap Excavation

Stone riprap was placed in the Emery Pond to protect the side slopes from wave action and minimize erosion near the inlets and outlet. A total of approximately 600 cubic yards of riprap is present around the perimeter of the Emery Pond. It is visually apparent that CCR sediment has settled in, and adhered to, the portions of the riprap in contact with the pond water.

The riprap will be excavated and transported to a permitted facility for disposal.

3.7 CCR Sediment Excavation

Based on sampling activities, the CCR sediment material is a brown to gray color, loose to very loose consistency, non-cohesive silt to sand size ash and/or FGD material that is often cemented to various degrees. The underlying pond subgrade material is bedrock consisting of weathered shale or weathered sandstone. Bedrock depths measured at the Emery Pond site are found in Appendix E.

The CCR sediment is to be excavated using conventional earthmoving equipment such as a tracked excavator or loader. An estimated 3,500 cubic yards of sediment must be removed to reach the underlying subgrade surface. Sediment excavation will be conducted in accordance with the construction quality assurance procedures as directed by the site CQA Officer or his designee. Upon completion, removal will be certified as described in Section 5.3.

3.8 CCR Management During Closure and Transportation

CCR removed from the Site will be responsibly handled and transported in accordance with draft rule 35 IAC 845.740 as follows:

1) When transporting CCR by motor vehicle, manifests must be carried as specified in 35 IAC 809.
2) The Contractor transporting CCR off-site shall develop, and submit a CCR transportation plan for Owner approval, which shall include:
   a) the frequency, time of day, and routes of CCR transportation;
   b) measures to minimize noise, traffic, and safety concerns caused by the transportation of the CCR;
   c) measures to limit fugitive dust from any transportation of CCR;
   d) installation and use of a vehicle washing station;
   e) a means of covering the CCR for any mode of CCR transportation, including conveyor belts; and
   f) a requirement that, for transport by motor vehicle, the CCR is transported by a permitted special waste hauler pursuant to 35 IAC 809.201.
3) The Contractor must develop and implement on site dust controls, which must include:
   a) A water spray or other commercial dust suppressant to suppress dust in CCR handling areas and haul roads; and
   b) CCR must be handled to minimize airborne particulates and offsite particulate movement during any weather event or condition.
4) The Contractor must provide the following public notices:
   a) signage must be posted at the property entrance warning of the hazards of CCR dust inhalation; and
   b) when CCR is transported off-site, a written notice explaining the hazards of CCR dust inhalation, the transportation plan and tentative transportation schedule must be provided to units of local government through which the CCR will be transported.
5) The Contractor must take measures to prevent contamination of surface water, groundwater, soil, and sediments from the removal of CCR, including but not limited to the following:
   a) CCR removed from the surface impoundment must be stored in a CCR storage pile.
   b) CCR storage piles shall:
      i) be tarped or constructed with wind barriers to suppress dust and to limit stormwater contact with storage piles;
      ii) be periodically wetted or have periodic application of dust suppressants;
      iii) have an impervious storage pad or geomembrane liner that is properly sloped to allow appropriate drainage;
      iv) be tarped over the edge of the storage pad where possible;
      v) be constructed with fixed and mobile berms where appropriate to reduce run-on and run-off of stormwater to and from the storage pile and minimize stormwater-CCR contact.
   c) The Contractor shall incorporate general housekeeping procedures such as daily cleanup of CCR, tarping of trucks, maintaining the pad and equipment, and good practices during unloading and loading.
   d) The Contractor must minimize the amount of time the CCR is exposed to precipitation and wind.

3.9 Permanent Dewatering System

Once the CCR Sediment Excavation is complete, earthwork to establish the base grade may commence. A permanent dewatering system (also referred to as the perimeter toe drain) will be installed around the perimeter of the excavated area to control groundwater levels prior to and during construction of the Storm Water Basin base grade (see Sheets C303, C304, and C305 in Appendix B for details and materials). The lowered groundwater elevation will facilitate construction by eliminating seeps and reducing hydraulic pressure during structural fill placement and soil liner construction. The dewatering system will be composed of a gravel-filled trench with a perforated pipe all wrapped with a geotextile filter. The piping system will drain to collection riser pipes placed at low points in the system, as dictated by bedrock elevations. Water will be pumped from the collection riser pipes to an existing pond discharge structure, where it will then be pumped to the South Fly Ash Pond for discharge through NPDES Outfall 002.

The permanent dewatering system will remain in operation for the life of the new Storm Water Basin to prevent soil liner uplift.

3.10 FGD Loadout Area

CCR material will be excavated and removed from the FGD Loadout Area and removal will be deemed complete upon visual inspection/certification by the CQAO. The excavation will be backfilled with compacted clean soil material. The surface will receive a layer of crushed limestone for the plant to utilize for non-CCR related purposes. The entire FGD Loadout Area will be sloped to drain toward the proposed Storm Water Basin to prevent surface water run-off.

3.11 Permanent Stabilization of Disturbed Areas

The perimeter roadway currently surrounding Emery Pond will be permanently stabilized with gravel surfacing. Gravel surfacing material will be crushed limestone coarse aggregate placed on disturbed areas to minimize wind and water erosion. The coarse aggregate mixture will be Illinois Department of Transportation (IDOT) Gradation CA-6. The perimeter roadway will be graded to drain toward the pond at a slope between 2 and 4 percent.

4. Construction Activities

Major construction activities include establishing the base grade, installation of a composite liner system and structural modifications to the pond discharge structure. Construction activities will be performed in accordance with the construction quality assurance procedures described in a subsequent section of this plan and documented by an Illinois-licensed professional engineer.

Figures showing the proposed Storm Water Basin design are included in Appendix B. In accordance with Appendix C, construction activities are scheduled to conclude in November.

4.1 Description

The new Storm Water Basin pond will not be used for CCR treatment, storage, or disposal. In that regard, SIPC and Illinois EPA have agreed that the expected waste streams to the new basin, as described in connection with the application for a construction permit under 35 IAC 309, Subpart B (water treatment device), are not regulated CCR waste streams. Nonetheless, as a compromise and as part of the resolution of the asserted groundwater claims, the new basin will be designed to meet the

CCR impoundment requirements of 40 CFR 257.100. The proposed Storm Water Basin will be constructed by re-grading the pond base and side slopes and installing a composite liner system.

4.2 Base Grading

The base grade for the Storm Water Basin will be constructed using the following design criteria. The bottom surface of the pond will be established by removal of the upper 2 feet of weathered bedrock material to create a stable base. The interior slopes of the pond will be constructed using compacted earth fill materials to create uniform side slopes with a maximum slope of 2.5H:1V.

4.3 Composite Liner System

After completion of the base grade, a composite liner system will be installed. The composite liner will consist of two components; an upper component consisting of, at a minimum, a 60-mil high density polyethylene (HDPE) geomembrane liner (GM), and a lower component consisting of at least a two-foot layer of compacted soil with a hydraulic conductivity of no more than 1×10^{-7} centimeters per second (cm/sec). The GM or upper liner component will be installed in direct and uniform contact with the compacted soil or lower liner component. Construction of the composite liner system is expected to take two weeks.

Existing drainage piping that discharge into Emery Pond will be inspected for integrity and repaired and/or extended as necessary to match the proposed basin geometry. The pipes will be sealed where they intersect the liner system using generally accepted engineering practices.

4.4 Discharge Structure Rehabilitation

The existing sump discharge structure that currently pumps water from Emery Pond to the South Fly Ash Pond will remain in place. The structure will be inspected after CCR sediment excavation is complete. Any structural deficiencies noted during the inspection will be repaired and the existing wing-walls will be modified to conform with the proposed pond geometry. An intake extension will be installed into the structure to facilitate free drainage and stable pond side slopes. The extension will be constructed of precast box culvert sections which will be integrated to the existing open face of the pump station structure. The composite liner system will be mechanically connected to the discharge structure using batten strips to attach the HDPE geomembrane.

4.5 Operation and Maintenance

The Storm Water Basin will not operate as a CCR surface impoundment. Soil sediment, though, may accumulate within the new pond over time. Cleanout of the new pond using mechanical equipment could compromise that composite liner system, therefore the pond will be periodically cleaned using suction dredging or other non-damaging means.

5. Construction Quality Assurance Procedures

Closure of Emery Pond and construction of the Storm Water Basin will be monitored and documented in accordance with the requirements of the construction quality assurance (CQA) procedures described in the following sections. Performance of CQA activities will confirm that the construction activities are conducted in accordance with the plan through documenting that specified procedures are followed.

5.1 Personnel

Prior to initiation of construction activities, SIPC will designate an independent third-party CQA Officer (CQAO). The CQAO will be a professional engineer registered in the State of Illinois, who is a person other than the contractor or an employee of SIPC, and who will supervise and be responsible for all inspection, testing, and other activities required to be implemented as part of the CQA procedures. The CQAO will also be responsible for, and will provide direct supervision to, other engineers and/or engineering technicians (inspectors) who will perform the inspections, sampling, and testing required by the CQA program. The CQAO will assume responsibility for the performance of the inspections, sampling, and testing, as described more specifically below. The CQAO or his designated representative will be on-site full-time for all the activities specified herein.

5.2 Construction Management Activities

The General Contractor may, after exercising due diligence to locate required information, request from the Construction Manager, clarification, or interpretation of the contract documents. The General Contractor will make specific reference to the contract document in question and include estimates of any schedule or cost impacts that could possibly be associated with the request for information (RFI).

The General Contractor will initiate the RFI in a timely manner using Form CQAP1 - Request for Information. The Construction Manager will, with reasonable promptness, respond to the RFI on the same form and return a copy of the completed form to the party making the request as final disposition of the matter.

5.3 Inspection Activities

The CQAO or his designated representative will be present to observe and document the following activities:

- CCR Sediment Excavation
- Base Grade Earthwork
- Composite Liner System Installation
- Booted liner penetrations of the composite liner system
- Discharge Structure Modifications

As part of these inspection activities, the CQAO will certify that the CCR sediment excavation has been completed using the following language:

> *I hereby certify, as a Professional Engineer in the State of Illinois that to the best of my knowledge the removal of CCR was completed at the existing CCR surface impoundment known as Emery Pond, in general accordance with applicable state and/or federal regulations. The removal and final inspection were complete as of Month Day, 202x.*

5.4 Sampling and Analysis/Testing

Representative CCR sediment material will be sampled and analyzed for the criteria on the Illinois EPA Bureau of Land Special Waste Preacceptance Form (LPC 680). This activity must be completed prior to transportation of the material to a permitted facility. Additional samples will be analyzed if the CQAO or the landfill operator identify or suspect any significant change in material. An independent laboratory will be responsible for the analyses.

Custody of samples and transfer from the sampling location to the independent laboratory will be established and documented using Form CQAP2 - Chain of Custody Record. The sampling party will enter sample descriptions (including proposed use), sampling dates and times, and types/quantities of samples on the form, including methods or types of testing to be carried out, and relinquish custody of the samples to the laboratory by signing and dating the form at the bottom. The samples will be shipped or delivered to the laboratory with a copy of the form. The sampling party will retain a copy for its records.

The independent laboratory will document receipt of the samples by signing and dating the form at the bottom and retaining a copy for its records. The laboratory will return a copy of the form to the sampling party and the CQAO with the submittal of test results.

The General Contractor will be responsible for the Paint Filter Liquids Testing prior to transport of the sediment to a permitted facility in accordance with IAC requirements. This testing can be completed in the field and will be observed and documented by the CQAO or designee. The CQAO or his designee will select the specific locations for sampling and testing exercising professional judgment to ensure that sampling and testing fairly represent the material. The results of the sampling and testing will be documented by the CQAO or his designated representative on Form CQAP3 - Daily Summary Report.

5.5 CCR Sediment Excavation

The CQAO or his designee will make observations necessary to identify areas requiring sediment removal. Those areas will be determined solely on these observations based on the previously described physical properties of the sediment and foundation materials. The CQAO will inform the General Contractor of areas requiring sediment removal. Upon removal of the sediment, the CQAO or his designee will attach appropriate documentation for the work to Form CQAP3 - Daily Summary Report.

5.6 Base Grade Construction

The CQAO or his designee will observe earth excavation and fill activities during the establishment of the Storm Water Basin base grade. Compaction of fill materials will be conducted to verify moisture and density.

Following base grade earthwork, the CQAO or the Construction Manager will direct a surveyor to record the grades. Elevations will be surveyed on a 100-foot grid pattern for the base grade. The points surveyed for side slopes will be at the top and toe. In addition, all breaks in grade will be surveyed. The points will be documented on record drawings furnished to the CQAO by the surveyor.

5.7 Composite Liner System Installation

The CQAO or his designee will observe placement of the compacted soil liner. Testing of fill materials will be conducted to verify moisture and density. Additional samples (thin wall tubes) will be obtained for verification of in place hydraulic conductivity.

The placement of the geomembrane and field testing of the welds will be observed by the CQAO. Destructive testing of geomembrane samples well be review for compliance with manufacturer's specifications.

Following the compacted soil liner construction, the CQAO or the Construction Manager will direct a surveyor to verify that the actual grades are in accordance with the design. Elevations will be surveyed on a 100-foot grid pattern for the top of the compacted soil liner to verify thickness. The points

surveyed for side slopes will be at the top, midpoint, and toe. In addition, all breaks in grade will be surveyed. The points will be documented on record drawings furnished to the CQAO by the surveyor.

6. Documentation

SIPC's Project Manager and the CQAO will document that closure of the Emery Pond and construction of the Storm Water Basin are performed in accordance with the design. Documentation drawings depicting as-built conditions will accompany the documentation. All activities will be documented in accordance with the construction quality assurance procedures. CQA documentation will be retained by SIPC as part of the Storm Water Basin operating record. This operating record will be available for inspection by Illinois EPA upon request. The CQA documentation may also be submitted directly to Illinois EPA pursuant to regulation or permit requirements.

6.1 General

The CQAO will be responsible for the overall administration and control of the project CQA documents.

The CQAO will verify that a filing system is implemented that will include:

- Date,
- Copy of the Closure Plan, updated as necessary,
- Photographic documentation,
- Survey measurements,
- Field and laboratory testing results,
- Daily summary reports including appropriate documentation, and
- Deficiency, nonconformity, and corrective action information.

Files will be updated with new data as such data become available. Documentation will be transmitted by the CQAO to SIPC and to any other parties designated by SIPC.

6.2 Daily Summary Reports

Each day of activity will be documented by a daily summary report. The report will be prepared by the CQAO or his designated representative and contain the following information:

- Date,
- Summary of weather conditions,
- Summary of locations where activity is occurring,
- Equipment and personnel on the project,
- Summary of any meetings held and attendees, and
- Description of all materials used and references or results of inspections, sampling, and testing, and documentation.

6.3 Photographic Documentation

Construction documentation may be supported with photographs, as appropriate. Photographs may be utilized to document activities, project progress, and acceptability. Any photographs will be maintained by the CQAO. CQA personnel will note the location, date, time, and description of the activity for record photographs.

6.4 Acceptance Report

An acceptance report will be prepared. The acceptance report will provide written evidence that the CQA procedures were implemented as described and that the project proceeded in accordance with the design, plans, and specifications.

The following information will be included in the acceptance report:

- Documentation by the CQAO that the construction has been implemented in general accordance with the engineering design,
- Documentation drawings, and
- All daily summary reports.

The acceptance report will be prepared under the direction of the CQAO and will be forwarded to SIPC for distribution as SIPC deems appropriate.

6.5 Corrective Action Completion Report

Upon completing the closure activities described in 35 IAC 845.760 a Closure Completion Report and Certification, meeting the requirements of 35 IAC 845.760(e) will be prepared and submitted to Illinois EPA.

7. Licensed Professional Signature/Seal

As a qualified professional engineer as defined by 40 CFR 257 Subpart D, I have personally examined and am familiar with this closure plan. Based on my inquiry of those individuals immediately responsible for obtaining the information contained therein, I believe that the information is true, accurate and complete. I certify that The Closure Plan for Marion Power Station Emery Pond meets the requirements set forth in the applicable state and/or federal regulation.

David B. Hoots, P.E.
Hanson Professional Services Inc.
1525 South Sixth Street
Springfield, IL 62703-2886
(217) 788-2450
Registration No. 062-055737

Seal:

Expires 11/30/2021

Signature: David B. Hoots

Date: 29 October 2020

8. References

US EPA, 2015. "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities; Final Rule – 40 CFR Parts 257 and 261", Environmental Protection Agency in Federal Register, April 17, 2015, Vol. 80, No. 74. US Government Printing Office, Washington, D.C., 201 pp.

US EPA, 2018. "Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Amendments to the National Minimum Criteria (Phase One, Part One – 40 CFR Part 257", Environmental Protection Agency in Federal Register, July 30, 2018, Vol. 83, No. 146. US Government Printing Office, Washington, D.C., 22 pp.

Appendix A

Construction Quality Assurance Program Forms

REQUEST FOR INFORMATION
(Form CQAP1 - Revision 1)

RFI #: C-_____-_____

DATE: _____

FROM: _____
COMPANY: _____
PHONE: _____
FAX: _____

TO: _____, CQA Officer
PHONE: _____
FAX: _____

RE: _____

CHECK CATEGORY:

☐ Information not shown on contract documents:
Contract Drawing Reference: _____
Shop Drawing Reference: _____
Specification Reference: _____

☐ Interpretation Requirements
☐ Conflict in Requirements
Possible Cost Impact: _____
☐ Coordination Problem
Possible Time Impact: _____
☐ Other Category
Describe: _____

DESCRIPTION (Use Attached Sheets as Necessary)

_____

CC: RFI File
_____
_____
_____
_____

ATTACHMENTS: ☐ Yes ☐ No

RESPONSE
(Use Attached Sheets as Necessary)

_____

DATE: _____

RESPONSE BY: _____

Chain of Custody Record

(Form CQAP2 - Revision 1)

Emery Pond Closure & Storm Water Basin Construction Plans
SIPC Marion Power Plant, Williamson Co., Illinois

Client	**Southern Illinois Power Company**				Analysis and/or Method Requested						Remarks or Observations
Address	**11543 Lake of Egypt Road**			Analysis and/or Method Requested							
City, State Zip Code	**Marion, IL 62959**										
Phone / Facsimile No.	**(618) 964-1448 / (618) 964-1867**										
Client Project											
Location											
Sampler(s) / Phone	/										
Turnaround Time	Standard [ ] Rush [ ] Date Required:										
P.O. # or Invoice To											
Contact Person											

Sample Description	Sampling		Sample Type[1]	# of Containers								
	Date	Time										

(1) Sample Type: S = Soil; GM = Geomembrane; GT = Geotextile; GCL = Geosynthetic Clay Liner; DM = Drainage Media; O = Other

Relinquished By	Date	Time	Received By	Date	Time	Method of Shipment

Special Instructions:

Page ____ of ____

Copies (circle one): Sampler - Testing Firm - CQA Officer

DAILY SUMMARY REPORT
(Form CQAP3 - Revision 1)

1. SUMMARY OF WEATHER CONDITIONS:

Date: _____

AM Conditions: _____

AM Temperature: _____

PM Conditions: _____

PM Temperature: _____

2. LOCATIONS WHERE CONSTRUCTION IS OCCURRING:

Location 1: East _____ North _____ **Location 2:** East _____ North _____

Location 3: East _____ North _____ **Location 4:** East _____ North _____

Other Description: _____

3. EQUIPMENT & PERSONNEL ON SITE:

Equipment: _____

Personnel: _____

Visitors: _____

4. SUMMARY OF MEETINGS HELD/ATTENDEES:

☐ **None** ☐ **See Sheet 2 of 2** ☐ **See Attached Meeting Minutes**

5. MATERIALS USED & TESTING OR OBSERVATION RESULTS:

Materials Used: ☐ Culvert Pipe ☐ Foundation Fill ☐ Stockpiled Soil ☐ Subgrade Soil ☐ Riprap ☐ Other: _____

Testing and/or Observation Results: ☐ None ☐ See Attached

Calibration Records for Equipment: ☐ None ☐ See Attached

Prepared By: _____

_____
(Signature of CQA Officer or Designated Representative)

_____

_____
(Signature)

Original Report/Attachments To: Document Controller

Copies to: _____

DAILY SUMMARY REPORT

ADDITIONAL NOTES: **Date:** _____

_____

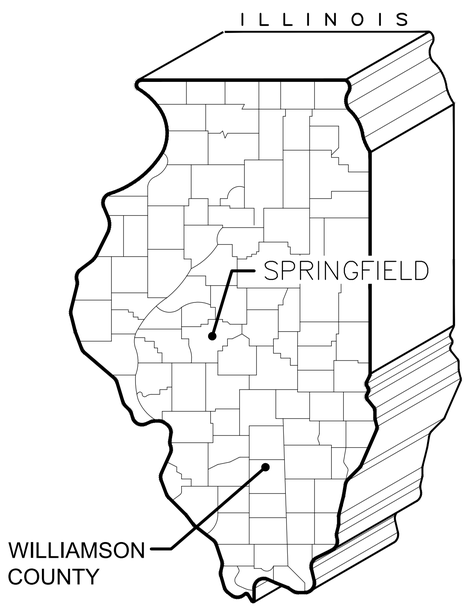
Appendix B

Closure Plan Figures

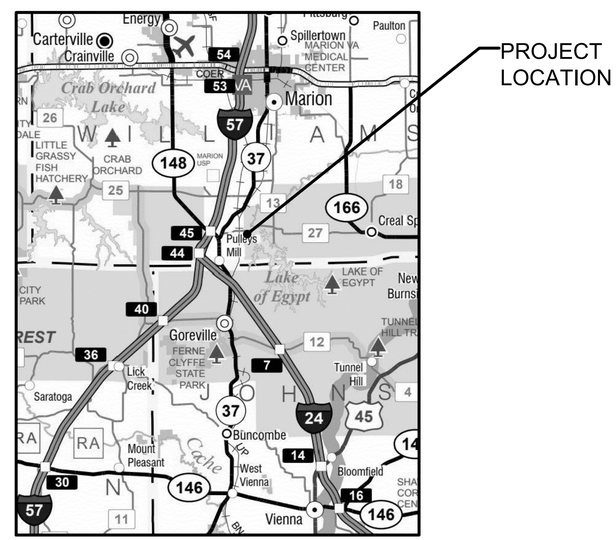
EMERY POND CLOSURE & STORM WATER BASIN CONSTRUCTION PLANS

MARION POWER PLANT
WILLIAMSON COUNTY, ILLINOIS

ISSUED FOR REVIEW - 07/14/2020



STATE MAP



NORTH

VICINITY MAP

INDEX OF SHEETS

GENERAL
G001 COVER SHEET & INDEX OF SHEETS

CIVIL
C001 GENERAL CIVIL NOTES
C101 EMERY POND CLOSURE PLAN
C102 STORM WATER BASIN PLAN
C103 STORM WATER BASIN GRADING & LAYOUT PLAN
C104 FGD AREA GRADING & LAYOUT PLAN
C105 GRADING CONTROL POINTS
C301 EXCAVATION CROSS SECTIONS
C302 EXCAVATION CROSS SECTIONS
C303 GRADING CROSS SECTIONS
C304 GRADING CROSS SECTIONS
C305 TYPICAL SECTIONS & DETAILS
C306 PUMP STATION INTAKE EXTENSION

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EMERY POND CLOSURE & STORM WATER CONSTRUCTION PLANS

SOUTHERN ILLINOIS POWER COOPERATIVE SIPC

ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

MARION POWER PLANT
WILLIAMSON CO.
ILLINOIS

MARK	DATE	DESCRIPTION		
		DES	DRN	REV

ISSUE:	07-14-2020
PROJECT NO:	18E0022A
CAD FILE:	
DESIGN BY:	DBH
DRAWN BY:	SKB
REVIEWED BY:	JMH

SHEET TITLE

TITLE & INDEX OF SHEETS

G001

JUL 14, 2020 10:43 AM H00TS01267
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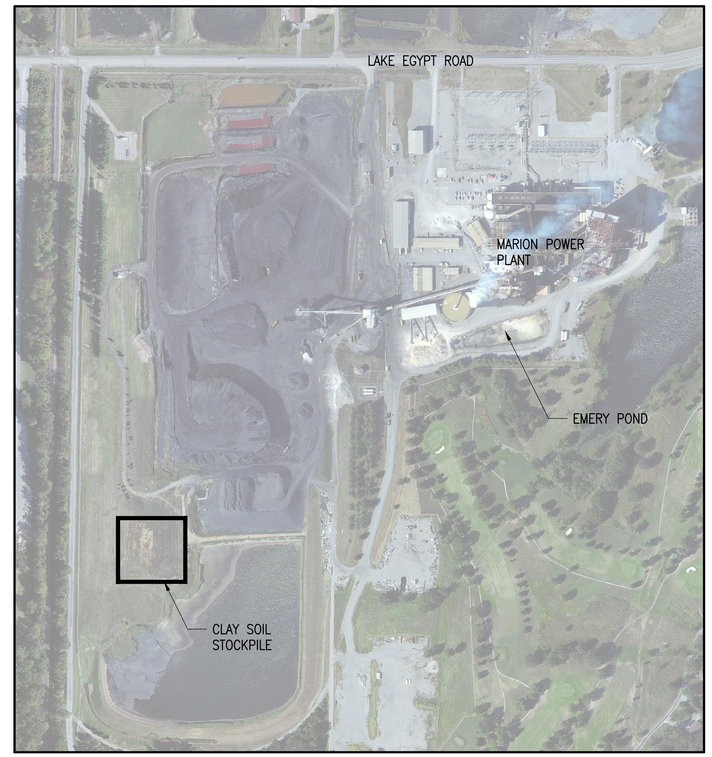
GENERAL NOTES

1. "IDOT STANDARD SPECIFICATIONS", WHERE REFERENCED IN THE PLANS OR TECHNICAL SPECIFICATIONS, REFERS TO THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" ADOPTED APRIL 1, 2016, PUBLISHED BY THE ILLINOIS DEPARTMENT OF TRANSPORTATION (IDOT).
2. ALL REINFORCEMENT BARS SHALL CONFORM TO ASTM A615, GRADE 60.
3. ALL SECTIONS, DETAILS, AND NOTES SHOWN ON THE DRAWINGS ARE INTENDED TO BE TYPICAL AND SHALL APPLY TO SIMILAR SITUATIONS ELSEWHERE, UNLESS OTHERWISE SHOWN.
4. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS BEFORE STARTING WORK. IF CONDITIONS VARY FROM THOSE INDICATED ON THE DRAWINGS, THE OWNER SHALL BE NOTIFIED AND NO WORK SHALL BE DONE IN THE AREA WITHOUT HIS APPROVAL.
5. SCALE FOR THE DRAWINGS IS FOR GENERAL INFORMATION ONLY. LOCATIONS AND DIMENSIONS SHALL BE TAKEN AS SHOWN AND NOT SCALED.
6. WHERE SPECIFIED, IDOT SPECIFICATIONS ARE SPECIFIED, THE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION", ADOPTED APRIL 1, 2016 SHALL APPLY.
7. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN EXISTING FIELD CONDITIONS BEFORE BIDDING ON THIS PROJECT, ORDERING MATERIALS, OR BEGINNING CONSTRUCTION.
8. CONTRACTOR'S WORK ACTIVITIES SHALL BE RESTRICTED TO AREAS WITHIN THE LIMITS OF CONSTRUCTION. CONTRACTOR'S ACTIVITIES AND VEHICLES SHALL NOT BE ALLOWED OUTSIDE OF THESE LIMITS UNLESS APPROVED BY THE OWNER.
9. ALL ROCK AND DEBRIS SHALL BE DISPOSED OF OUT OF THE EMERY POND AREA IN A LOCATION DESIGNATED ON THE PLANS.
10. DISTURBED EARTH SURFACES SHALL BE SEEDED PER THE PROJECT SPECIFICATIONS.
11. CONTRACTOR IS RESPONSIBLE FOR THE SITE RESTORATION WITHIN THE LIMITS OF CONSTRUCTION.
12. ALL HDPE GEOMEMBRANE SHALL BE TEXTURED.
13. CUSHION GEOTEXTILES SHALL MEET THE REQUIREMENTS OF GEOSYNTHETIC RESEARCH INSTITUTE (GRI) SPECIFICATION GRI-GT12(a) "TEST METHODS AND PROPERTIES FOR NONWOVEN GEOTEXTILES USED AS PROTECTION (OR CUSHIONING) MATERIALS FOR THE MASS/UNIT AREA SPECIFIED.ON THE PLANS. THE MINIMUM OVERLAP BETWEEN ADJACENT PANELS SHALL BE 24 INCHES.
14. TEMPORARY EROSION CONTROL SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH IDOT STANDARD DRAWING 280001-07 TEMPORARY EROSION CONTROL SYSTEMS. AND ARTICLE 280 OF THE IDOT STANDARD SPECIFICATIONS.
15. PRECAST BOX CULVERTS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM C1577-SPECIFICATION FOR PRECAST REINFORCED CONCRETE MONOLITHIC BOX SECTIONS FOR CULVERTS, STORM DRAINS, AND SEWERS DESIGNED ACCORDING TO AASHTO LRFD. PRECAST BOX CULVERT SECTIONS SHALL HAVE PREFORMED RUBBER JOINTS IN ACCORDANCE WITH ASTM C 1677-11A STANDARD SPECIFICATION FOR JOINTS FOR CONCRETE BOX, USING RUBBER GASKETS.
16. PRECAST BOX CULVERTS SHALL BE INSTALLED IN ACCORDANCE WITH ARTICLE 540 OF THE IDOT STANDARD SPECIFICATIONS, ALL SECTIONS SHALL BE MECHANICALLY TIED TOGETHER USING IDOT STANDARD 540-22 - MECHANICAL JOINTS FOR CONCRETE PIPE AND BOX CULVERTS. ALL BOX CULVERT SECTIONS SHALL BE EXTERNALLY WATERPROOFED WITH SEALING BANDS PER ASTM C 877-SPECIFICATION FOR EXTERNAL SEALING BANDS FOR CONCRETE PIPE, MANHOLES AND PRECAST BOX SECTIONS.
17. ALL OPEN EXCAVATION WORK SHALL BE PERFORMED IN ACCORDANCE WITH OSHA 29 CFR 1926, SUBPART P- "EXCAVATIONS". THE SUBCONTRACTOR SHALL DESIGNATE A QUALIFIED "COMPETENT PERSON" AS DEFINED IN OSHA SECTION 1926.650(b) PRIOR TO THE COMMENCEMENT OF ANY EXCAVATION ACTIVITIES.

SURVEY AND LAYOUT

1. THE DESIGN PLANS INCLUDED WERE BASED UPON A HORIZONTAL COORDINATE SYSTEM BASED ON THE NORTH AMERICAN DATUM OF 1983 (NAD83), ILLINOIS STATE PLANE EAST ZONE AND VERTICAL ELEVATIONS BASED ON NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88).
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RE-ESTABLISHING ANY PROPERTY MONUMENTS THAT BECOME DAMAGED OR DESTROYED DURING CONSTRUCTION ACTIVITIES.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROPER ALIGNMENT (VERTICAL AND HORIZONTAL) AT ALL INTERFACES BETWEEN NEW AND EXISTING WORK TO ASSURE PROPER INSTALLATION AND USAGE.



NORTH

1 SITE LOCATION MAP
SCALE: 1" = 300'
0 300' 600'

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EMERY POND CLOSURE & STORM WATER CONSTRUCTION PLANS

SOUTHERN ILLINOIS POWER COOPERATIVE SIPC

ISSUED FOR REVIEW
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MARION POWER PLANT
WILLIAMSON CO.
ILLINOIS

MARK	DATE	DESCRIPTION		
		DES	DRN	REV

ISSUE:	07-14-2020
PROJECT NO:	18E0022A
CAD FILE:	
DESIGN BY:	DBH
DRAWN BY:	SKB
REVIEWED BY:	JMH

SHEET TITLE

GENERAL CIVIL NOTES

C001

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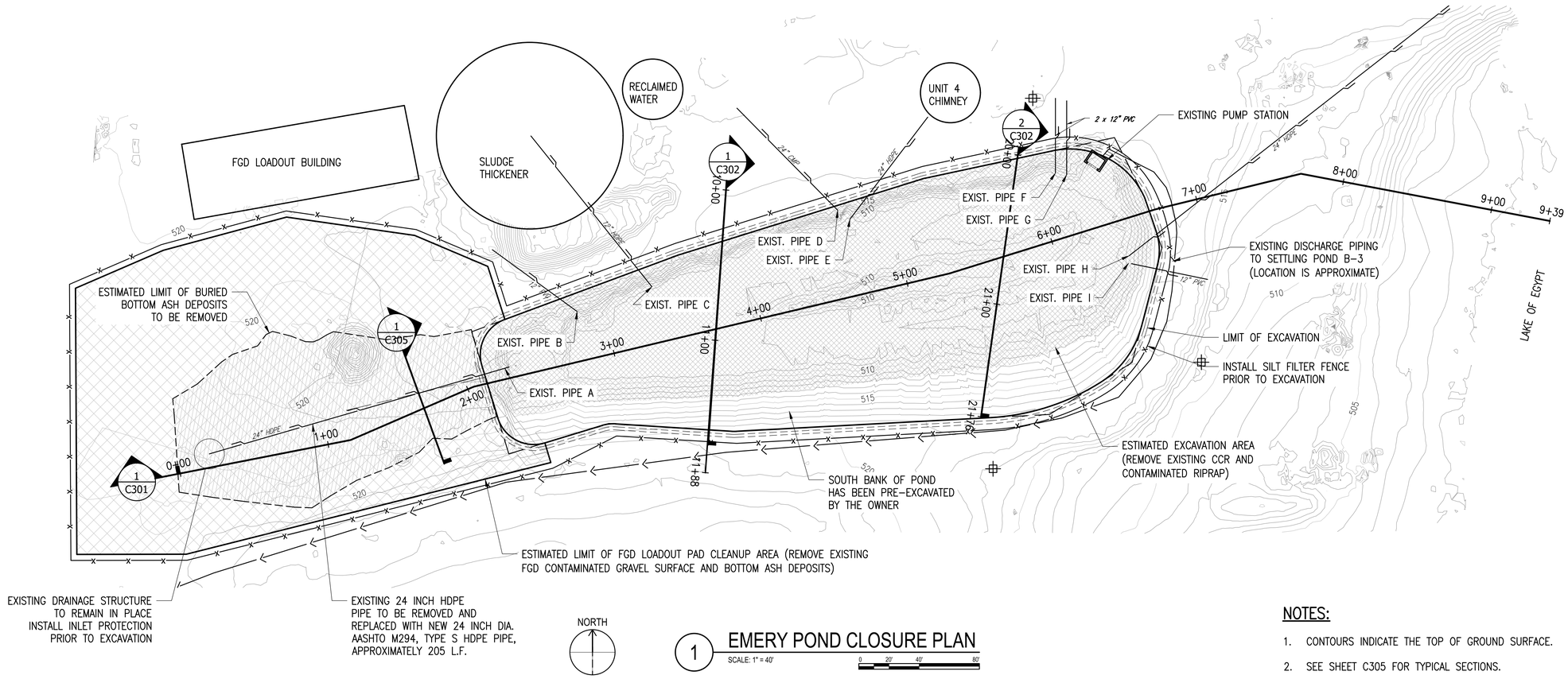
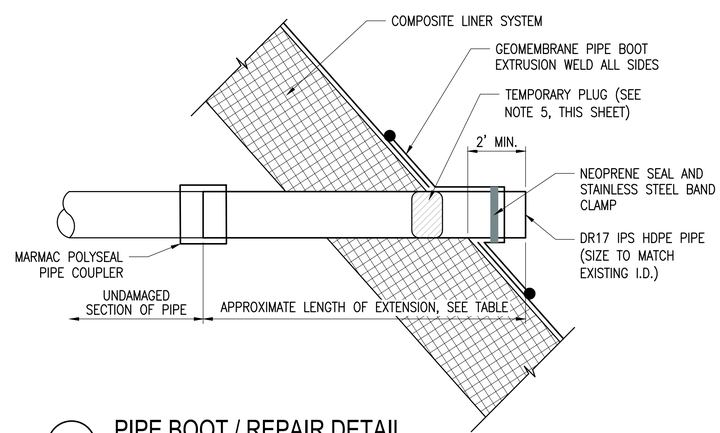


1 EMERY POND CLOSURE PLAN

SCALE: 1" = 40'

PIPE BOOT REPAIR DATA

PIPE ID	DIAMETER	MATERIAL	EXTENSION LENGTH
A	24"	HDPE	5.52 FT
B	12"	PVC	12.92 Ft
C	12"	HDPE	7.87 Ft
D	24"	CMP	20.02 FT
E	24"	HDPE	11.82 FT
F	12"	PVC	5.17 FT
G	12"	PVC	4.35 FT
H	24"	HDPE	9.90 FT
I	12"	PVC	5.92 FT



2 PIPE BOOT / REPAIR DETAIL

NO SCALE

NOTES:

1. CONTOURS INDICATE THE TOP OF GROUND SURFACE.
2. SEE SHEET C305 FOR TYPICAL SECTIONS.
3. EXISTING INFLOW PIPES SHALL BE REPAIRED AND EXTENDED THROUGH THE PROPOSED COMPOSITE LINER PER DETAIL 2 OF THIS SHEET. DAMAGED PIPING THAT IS REMOVED SHALL BE DISPOSED OF IN A LEGAL MANNER AS CONTAMINATED CCR MATERIALS.
4. PROPOSED PIPES TO BE REPLACED AND PIPE EXTENSIONS SHALL MATCH THE GRADE OF THE EXISTING PIPING.
5. CONTRACTOR SHALL INSTALL TEMPORARY PLUGS INSIDE OF ALL INCOMING PIPES TO PREVENT DISCHARGE DURING CONSTRUCTION. CONTRACTOR SHALL MAINTAIN OPERATION OF THE PLUGS DURING THE DURATION OF THE PROJECT. THE TEMPORARY PLUGS SHALL BE REMOVED UPON COMPLETION OF THE PROJECT.
6. CCR MATERIAL EXCAVATED FROM EMERY POND MAY BE PILED ON THE EXISTING FGD STOCKPILE AREA FOR FINAL DEWATERING. ALL SURFACE WATER THAT COMES INTO CONTACT WITH THIS CCR MATERIAL SHALL BE DIRECTED BACK INTO EMERY POND DURING DEWATERING. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONSTRUCTION OF ANY TEMPORARY BERMS AND/OR GRADING REQUIRED TO MAINTAIN SURFACE WATER FLOW INTO EMERY POND.
7. THE PLANT MAY ELECT TO PARTIALLY EXCAVATE CCR MATERIAL PRIOR TO CONTRACTOR MOBILIZATION. CCR EXCAVATION AND DISPOSAL PERFORMED BY THE CONTRACTOR WILL BE DONE BASED ON A TIME AND MATERIALS BASIS.

LEGEND

- MONITORING WELL LOCATION
- EXISTING DRAINAGE OR PROCESS WATER PIPING
- EXISTING PUMP STATION DISCHARGE PIPING

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WILLIAMSON CO.
ILLINOIS

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REVIEWED BY:	JMH

SHEET TITLE

EMERY POND CLOSURE PLAN

C101

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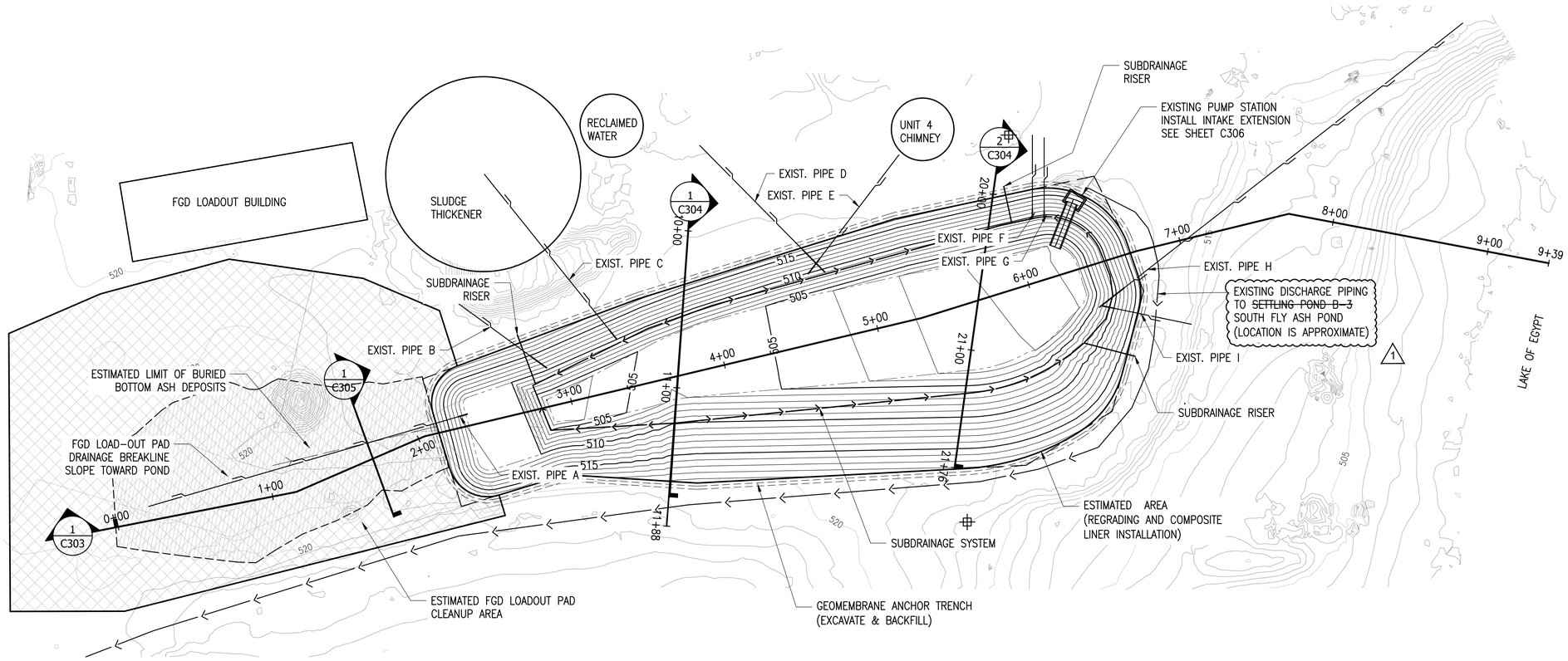

NORTH

1 STORM WATER BASIN PLAN

SCALE: 1" = 40'

0 20' 40' 80'

NOTES:

1. LIGHT CONTOURS INDICATE THE TOP OF GROUND SURFACE.
2. HEAVY CONTOURS INDICATE TOP OF BASE GRADE.
3. SEE SHEET C305 FOR TYPICAL SECTIONS.
4. SEE SHEET C103 AND C104 FOR GRADING CONTROL POINTS.

LEGEND

- MONITORING WELL LOCATION
- EXISTING DRAINAGE OR PROCESS WATER PIPING
- EXISTING PUMP STATION DISCHARGE PIPING
- TOE OF SLOPE
- SUBDRAINAGE SYSTEM PIPING

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DRAWN BY:	SKB
REVIEWED BY:	JMH

SHEET TITLE

STORM WATER BASIN PLAN

C102

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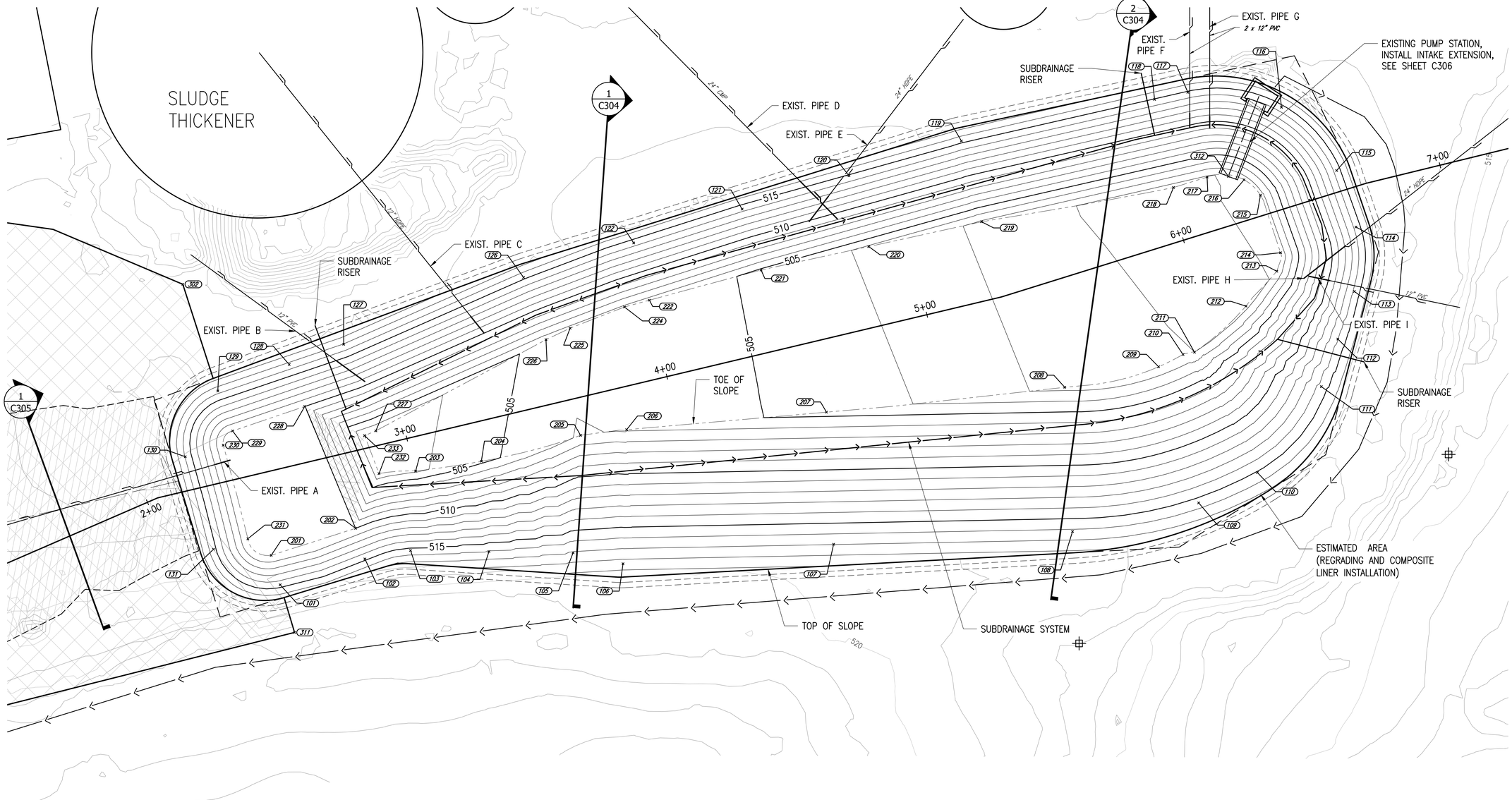

NORTH

1 STORM WATER BASIN GRADING & LAYOUT PLAN

SCALE: 1" = 20'

0 20 40

NOTES:

1. LIGHT CONTOURS INDICATE THE TOP OF GROUND SURFACE.
2. HEAVY CONTOURS INDICATE TOP OF BASE GRADE.
3. SEE SHEET C305 FOR TYPICAL SECTIONS.
4. SEE SHEET C105 FOR GRADING CONTROL POINT TABLES.

LEGEND

- MONITORING WELL LOCATION
- EXISTING DRAINAGE OR PROCESS WATER PIPING
- EXISTING PUMP STATION DISCHARGE PIPING
- TOE OF SLOPE
- SUBDRAINAGE SYSTEM PIPING

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STORM WATER BASIN GRADING & LAYOUT PLAN

C103

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NORTH

1 FGD AREA GRADING & LAYOUT PLAN

SCALE: 1" = 20'

0 20 40

NOTES:

1. LIGHT CONTOURS INDICATE THE TOP OF GROUND SURFACE.
2. HEAVY CONTOURS INDICATE TOP OF BASE GRADE.
3. SEE SHEET C305 FOR TYPICAL SECTIONS.
4. SEE SHEET C105 FOR GRADING CONTROL POINT TABLES.

LEGEND

- MONITORING WELL LOCATION
- EXISTING DRAINAGE OR PROCESS WATER PIPING
- EXISTING PUMP STATION DISCHARGE PIPING
- TOE OF SLOPE
- SUBDRAINAGE SYSTEM PIPING

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FGD AREA GRADING & LAYOUT PLAN

C104

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GRADING CONTROL POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
101	347064.26	804362.27	514.61	TOP OF SLOPE
102	347073.91	804393.97	514.79	TOP OF SLOPE
103	347077.11	804411.04	515.33	TOP OF SLOPE
104	347076.68	804440.38	516.09	TOP OF SLOPE
105	347076.21	804471.85	517.11	TOP OF SLOPE
106	347072.15	804490.55	518.41	TOP OF SLOPE
107	347079.40	804569.33	516.98	TOP OF SLOPE
108	347084.22	804658.72	516.20	TOP OF SLOPE
109	347094.89	804705.92	515.48	TOP OF SLOPE
110	347106.23	804727.89	515.11	TOP OF SLOPE
111	347138.39	804751.80	514.42	TOP OF SLOPE
112	347156.19	804757.99	513.97	TOP OF SLOPE
113	347174.00	804764.18	514.21	TOP OF SLOPE
114	347198.10	804764.74	514.35	TOP OF SLOPE
115	347219.25	804757.53	514.46	TOP OF SLOPE
116	347242.91	804736.88	514.66	TOP OF SLOPE
117	347248.51	804701.84	514.85	TOP OF SLOPE
118	347245.84	804689.41	514.92	TOP OF SLOPE
119	347230.32	804617.14	515.30	TOP OF SLOPE
120	347217.28	804575.08	514.85	TOP OF SLOPE

GRADING CONTROL POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
121	347204.80	804535.09	514.35	TOP OF SLOPE
122	347192.14	804494.54	514.46	TOP OF SLOPE
126	347179.25	804453.34	515.26	TOP OF SLOPE
127	347154.25	804386.03	516.95	TOP OF SLOPE
128	347146.67	804365.63	516.70	TOP OF SLOPE
129	347136.75	804338.93	516.37	TOP OF SLOPE
130	347112.17	804326.76	515.94	TOP OF SLOPE
131	347077.56	804337.31	515.38	TOP OF SLOPE
201	347075.27	804358.92	510.00	TOE OF SLOPE
202	347085.38	804390.48	510.00	TOE OF SLOPE
203	347106.82	804412.94	503.81	TOE OF SLOPE
204	347110.47	804437.54	504.74	TOE OF SLOPE
205	347120.17	804474.67	506.10	TOE OF SLOPE
206	347122.29	804491.90	505.88	TOE OF SLOPE
207	347128.84	804566.66	504.60	TOE OF SLOPE
208	347138.14	804655.81	502.70	TOE OF SLOPE
209	347145.81	804690.91	502.19	TOE OF SLOPE
210	347150.42	804700.05	502.05	TOE OF SLOPE
211	347151.28	804704.35	502.00	TOE OF SLOPE
212	347168.51	804723.61	501.63	TOE OF SLOPE

GRADING CONTROL POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
213	347181.56	804735.13	502.20	TOE OF SLOPE
214	347188.49	804736.55	502.43	TOE OF SLOPE
215	347210.03	804729.02	502.60	TOE OF SLOPE
216	347215.77	804722.89	502.46	TOE OF SLOPE
217	347216.83	804709.07	501.85	TOE OF SLOPE
218	347212.88	804696.48	501.43	TOE OF SLOPE
219	347200.07	804624.67	502.83	TOE OF SLOPE
220	347190.79	804582.48	503.84	TOE OF SLOPE
221	347182.03	804542.19	504.81	TOE OF SLOPE
222	347170.72	804500.39	505.59	TOE OF SLOPE
224	347168.18	804491.07	505.75	TOE OF SLOPE
225	347160.26	804470.75	505.66	TOE OF SLOPE
226	347155.99	804461.71	505.34	TOE OF SLOPE
227	347121.86	804398.06	503.13	TOE OF SLOPE
228	347130.97	804371.46	510.00	TOE OF SLOPE
229	347121.81	804344.48	510.00	TOE OF SLOPE
230	347116.50	804340.97	510.00	TOE OF SLOPE
231	347081.48	804350.18	510.00	TOE OF SLOPE
232	347105.85	804399.25	503.29	TOE OF SLOPE
233	347120.07	804393.82	503.00	TOE OF SLOPE

GRADING CONTROL POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
302	347176.67	804325.84	518.84	FGD PAD LIMIT
303	347188.06	804245.66	518.76	FGD PAD LIMIT
304	347175.11	804148.95	519.13	FGD PAD LIMIT
305	347162.15	804052.24	519.50	FGD PAD LIMIT
306	347073.80	804052.69	519.86	FGD PAD LIMIT
307	346985.45	804053.14	520.23	FGD PAD LIMIT
308	347081.06	804231.94	519.45	FGD PAD BREAKLINE
309	346985.57	804125.78	520.78	FGD PAD LIMIT
310	347016.00	804246.71	521.29	FGD PAD LIMIT
311	347046.43	804367.65	521.80	FGD PAD LIMIT
312	347217.06	804716.99	505.57	INVERT, 6'W BOX CULVERT

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EMERY POND CLOSURE & STORM WATER CONSTRUCTION PLANS

SOUTHERN ILLINOIS POWER COOPERATIVE SIPC

ISSUED FOR REVIEW
NOT FOR CONSTRUCTION

MARION POWER PLANT
WILLIAMSON CO.
ILLINOIS

MARK	DATE	DESCRIPTION		
		DES	DRN	REV

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PROJECT NO:	18E0022A
CAD FILE:	
DESIGN BY:	DBH
DRAWN BY:	SKB
REVIEWED BY:	JMH

SHEET TITLE

GRADING CONTROL POINTS

C105

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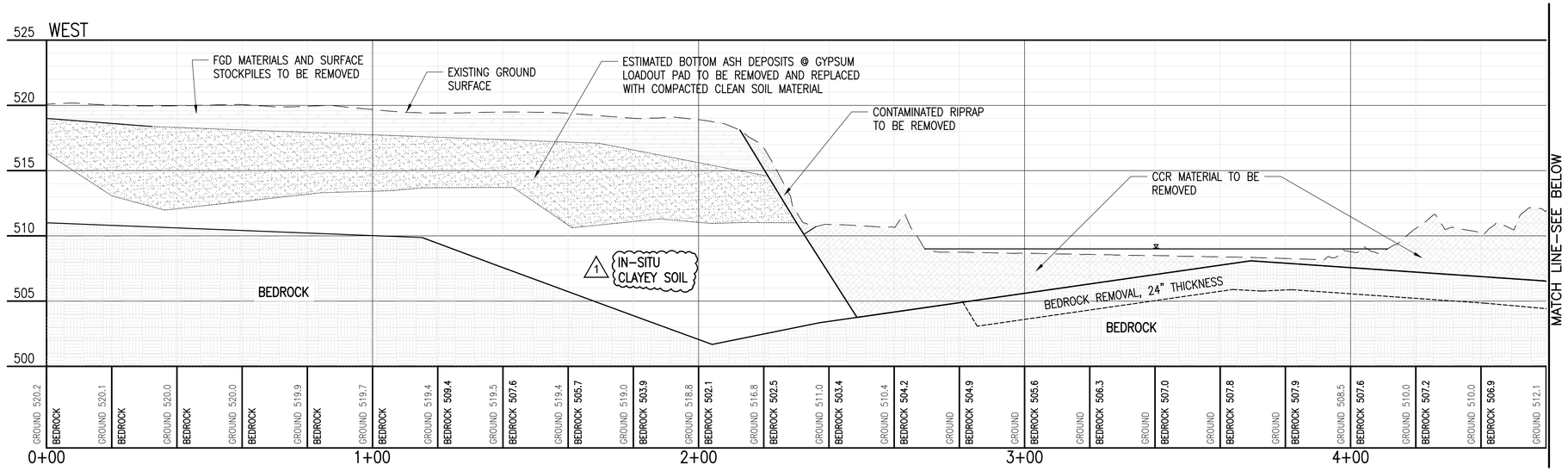

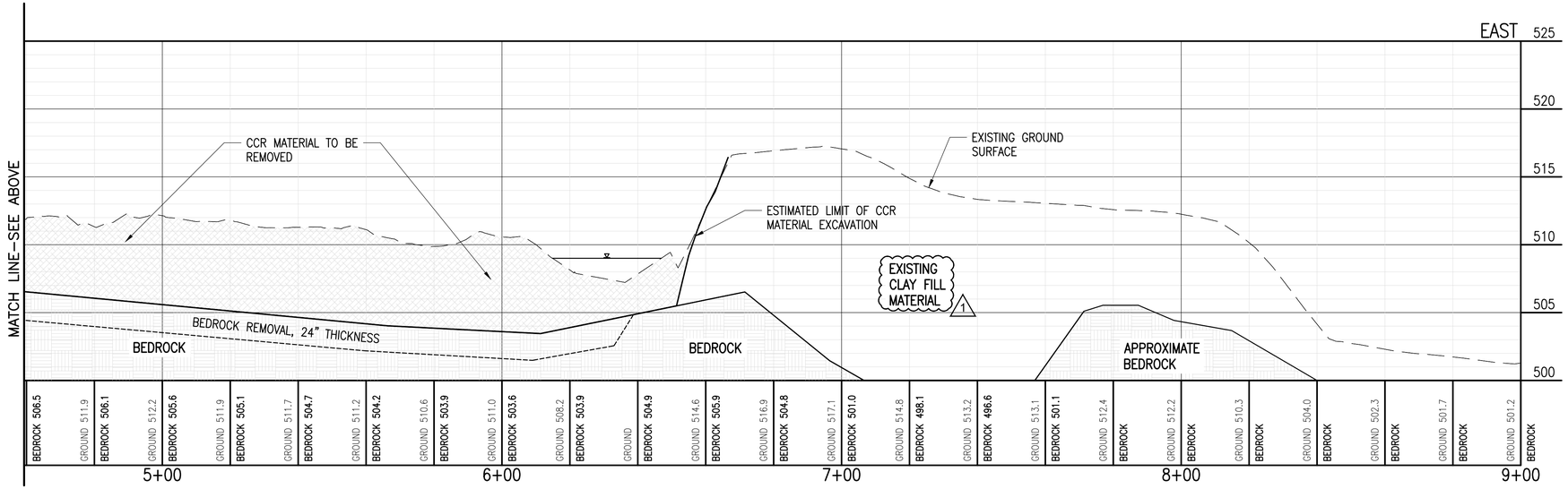

1 EXCAVATION CROSS SECTION

SCALES:

HORIZONTAL: 0 10' 20' 40'

VERTICAL: 0 5 10

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EXCAVATION CROSS SECTIONS

C301

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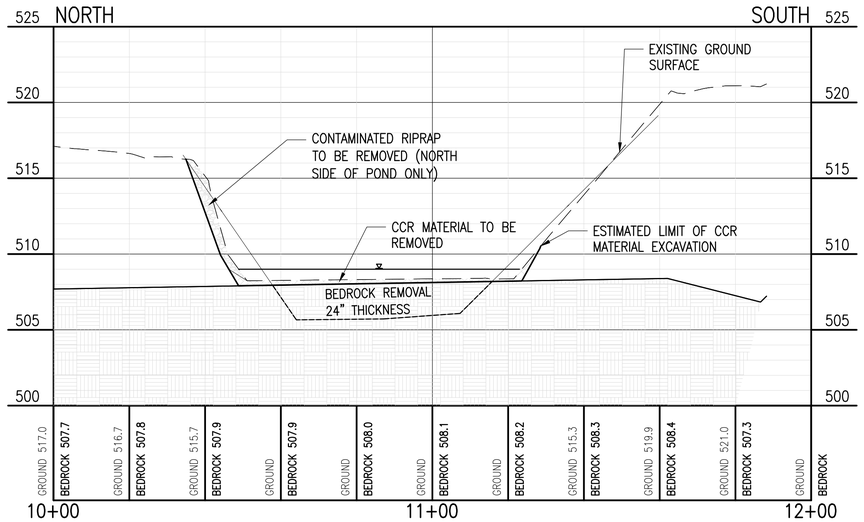

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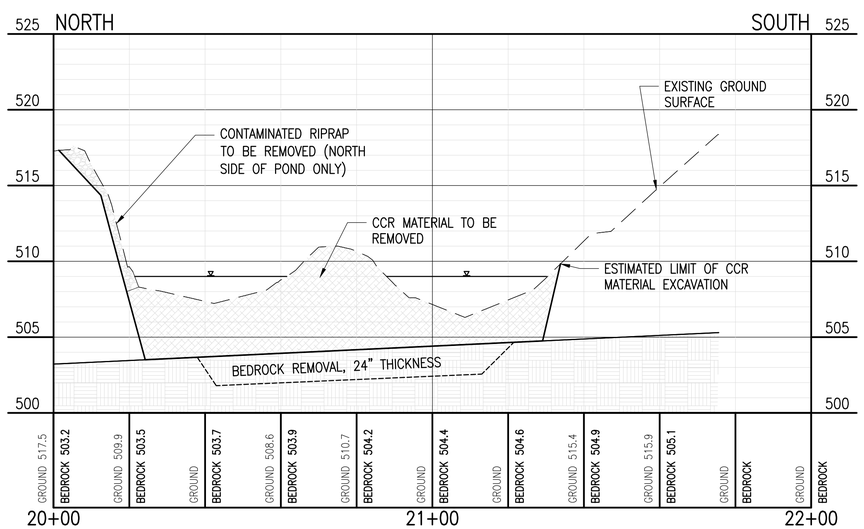

2 EXCAVATION CROSS SECTION

SCALES:

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VERTICAL: 0 5 10

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EXCAVATION CROSS SECTIONS

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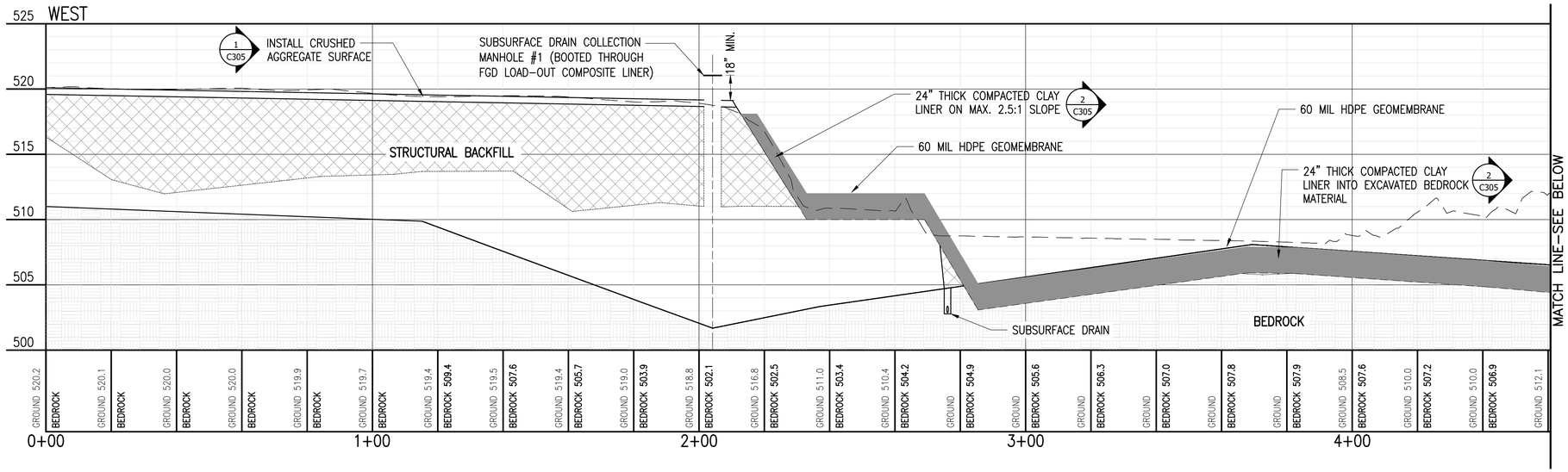

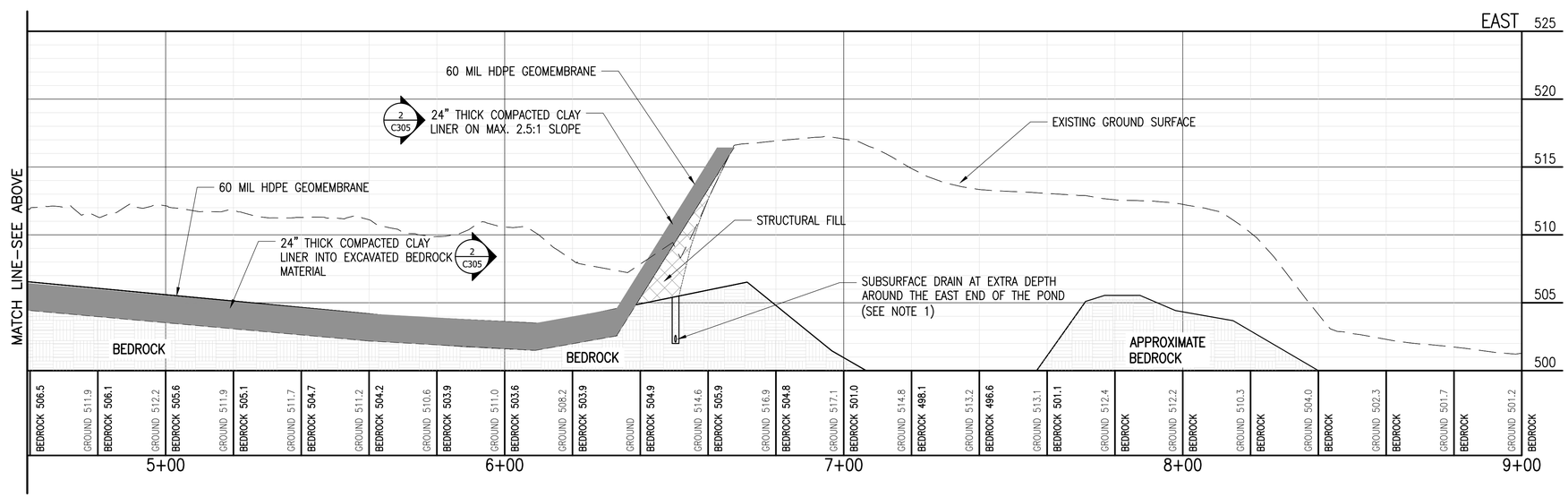

1 CROSS SECTION

SCALES:

HORIZONTAL: 0 10' 20' 40'

VERTICAL: 0 5 10

NOTES:

1. INSTALL SUBSURFACE DRAINS EAST OF STATION 6+12 AT EXTRA DEPTH TO PROVIDE POSITIVE DRAINAGE TOWARD SUBSURFACE DRAINAGE MANHOLE #2.
2. STRUCTURAL FILL SHALL NOT BE COMPOSED OF ANY TYPE OF CCR OR CCB. (1)

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GRADING
CROSS SECTIONS

C303

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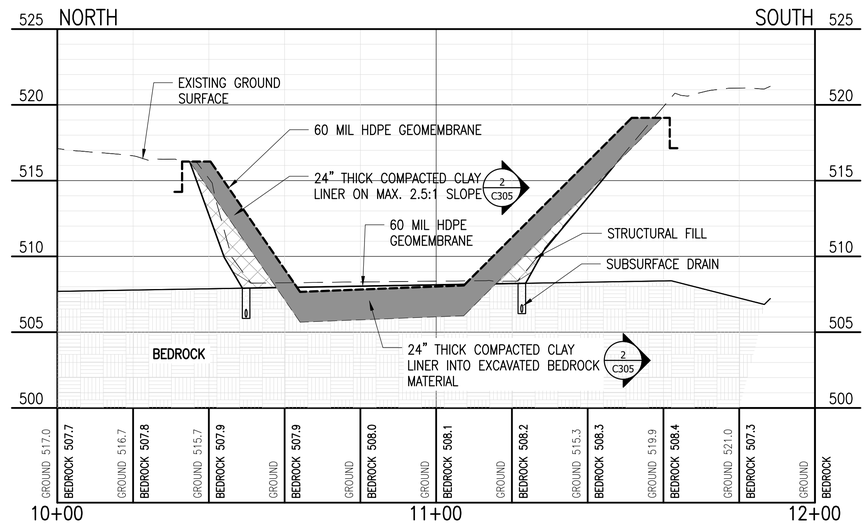

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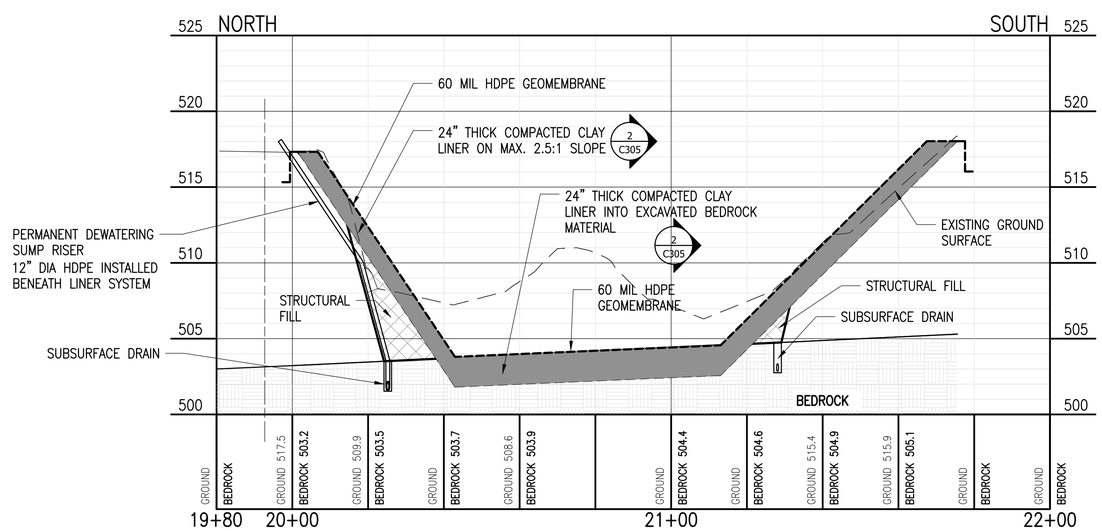

2 CROSS SECTION

SCALES:

HORIZONTAL: 0 10' 20' 40'

VERTICAL: 0 5 10

NOTES:

1. STRUCTURAL FILL SHALL NOT BE COMPOSED OF ANY TYPE OF CCR OR CCB.

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GRADING
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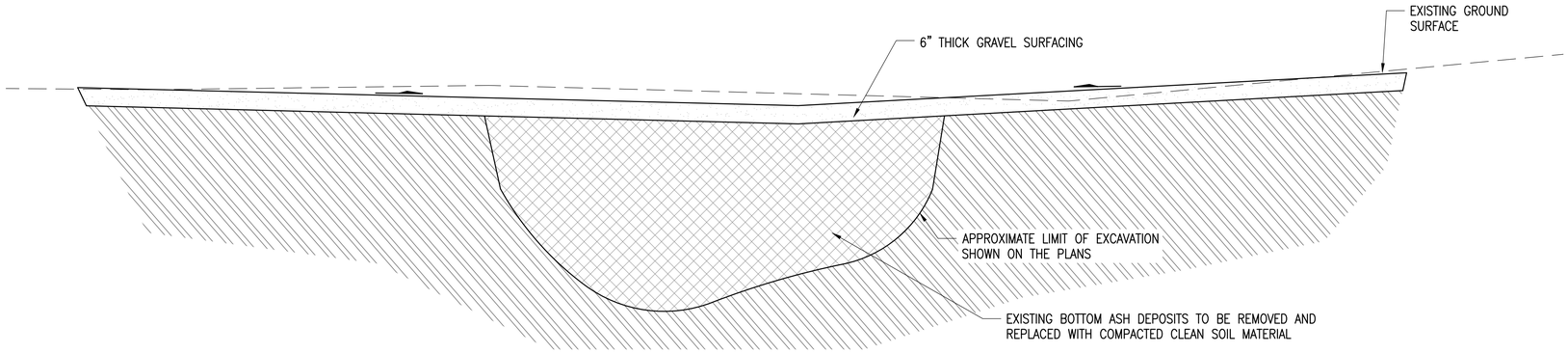
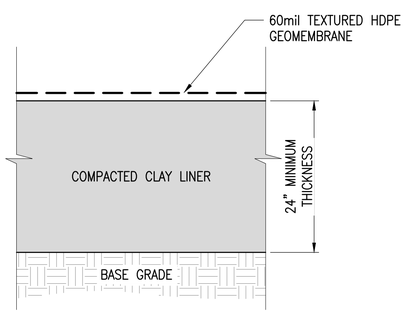


1 FGD LOADOUT AREA CLEANUP
NOT TO SCALE



2 COMPOSITE LINER SYSTEM
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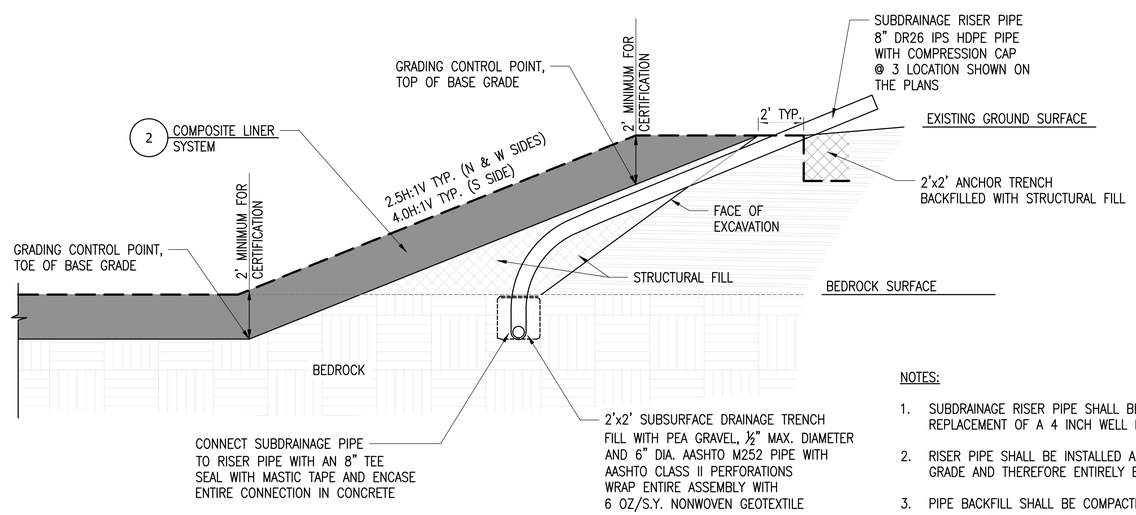

3 TYPICAL SECTION
NOT TO SCALE

NOTES:

1. SUBDRAINAGE RISER PIPE SHALL BE FIELD BENT TO ALLOW INSTALLATION AND REPLACEMENT OF A 4 INCH WELL PUMP, SAFETY CABLE AND WIRING HARNESS.
2. RISER PIPE SHALL BE INSTALLED A MINIMUM OF 8 INCHES BELOW THE BASE GRADE AND THEREFORE ENTIRELY BENEATH THE COMPOSITE LINER SYSTEM,
3. PIPE BACKFILL SHALL BE COMPACTED CLAY LINER MATERIAL.
4. STRUCTURAL FILL SHALL NOT BE COMPOSED OF ANY TYPE OF CCR OR CCB. (1)

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TYPICAL SECTIONS

C305

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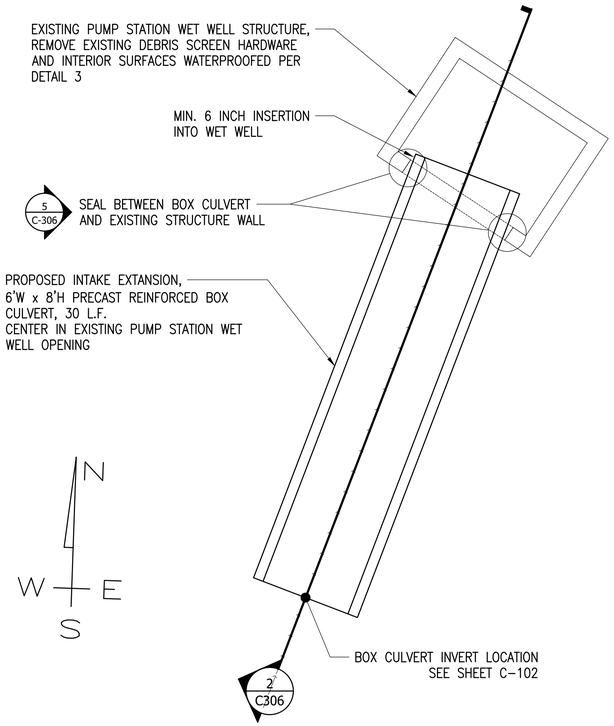
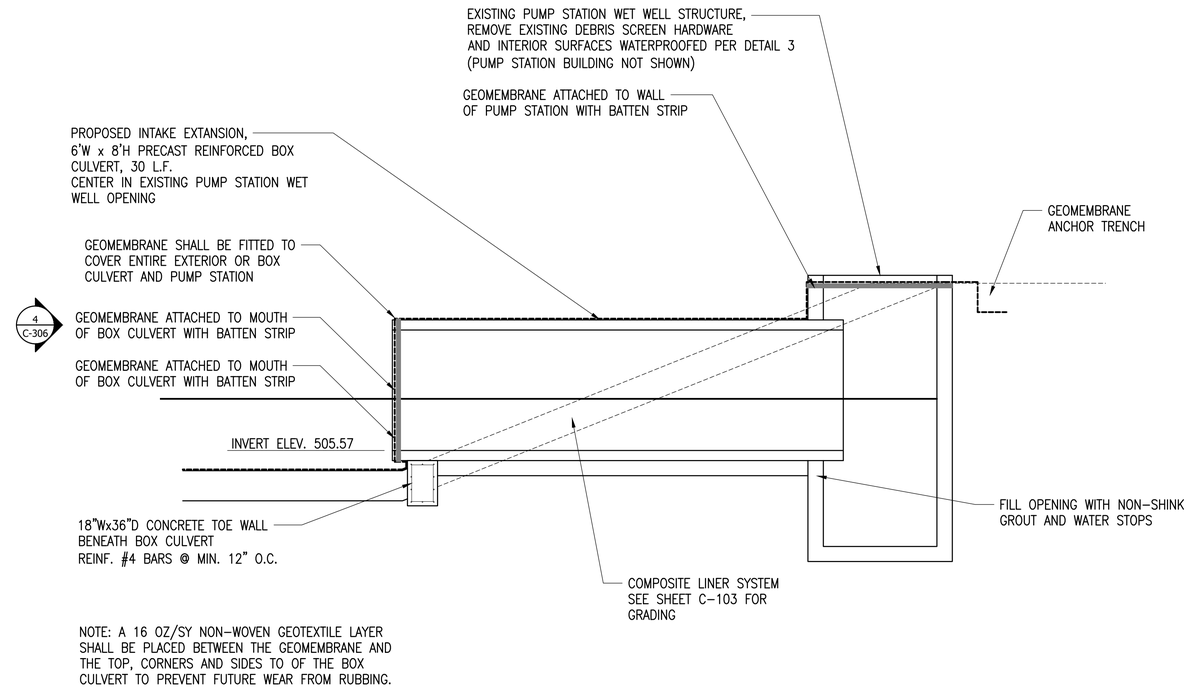


1 PUMP STATION INTAKE EXTENSION

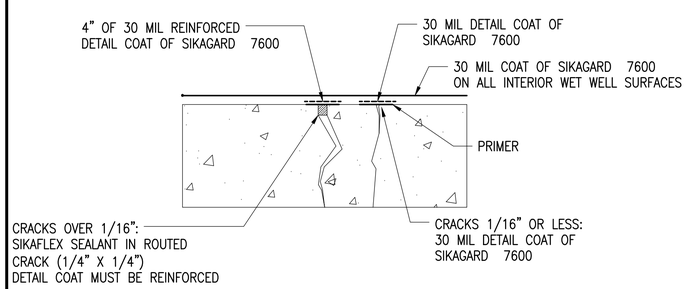
PLAN - NOT TO SCALE



NOTE: A 16 OZ/SY NON-WOVEN GEOTEXTILE LAYER SHALL BE PLACED BETWEEN THE GEOMEMBRANE AND THE TOP, CORNERS AND SIDES TO OF THE BOX CULVERT TO PREVENT FUTURE WEAR FROM RUBBING.

2 PUMP STATION INTAKE EXTENSION

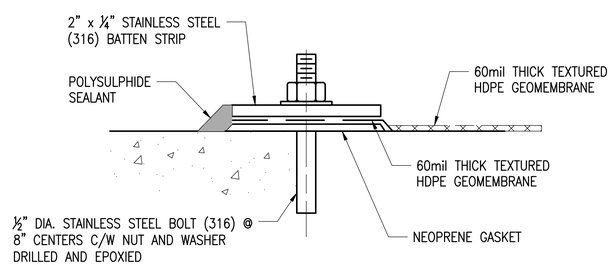
PROFILE - NOT TO SCALE



3 WET WELL WATERPROOFING

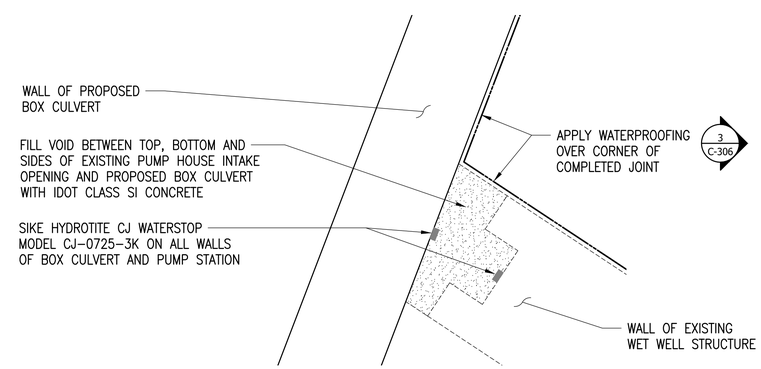
SECTION - NOT TO SCALE

ALL SURFACES OF WET WELL TO BE WATERPROOFED SHALL BE CLEANED AND PREPARED PER SIKAGARD MANUFACTURERS INSTRUCTIONS



4 BATTEN STRIP DETAIL

SECTION - NOT TO SCALE



5 SEAL DETAIL

SECTION - NOT TO SCALE

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PUMP STATION INTAKE EXTENSION

C306

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Appendix C

Construction Schedule

Table C-1. Construction Schedule

Activities		Week															
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Submit notification to the Illinois Environmental Protection Agency	■															
2	Implement and Maintain BMP Erosion and Sediment Control Measures	■	■	■	■	■	■	■	■	■							
3	Unwater Emery Pond	■															
4	Continue unwatering/dewatering as necessary to conduct excavation activities		■	■	■	■	■	■	■	■							
5	Install process water and drainage bypass pumping system		■														
6	Sample CCB sediment			■													
7	Initial Dewatering			■													
8	Excavate riprap			■	■												
9	Excavate CCR sediment, FGD & Bottom Ash				■	■	■	■	■								
10	Install subsurface drainage system								■								
10	Earthwork to establish retrofitted pond base grade									■	■						
11	Install low permeability clay liner											■	■	■			
12	Install HDPE Geomembrane														■		
13	Conduct Construction Quality Assurance			■	■	■	■	■	■	■	■	■	■	■	■		
14	Finalize retrofit documentation															■	■

Appendix D

SIPC Storm Water Pollution Prevention Plan

Southern Illinois Power Cooperative
Storm Water Pollution Plan

Jason McLaurin
Effective: 8/20/2007
Reviewed: 8/17/2018

TABLE OF CONTENTS

General Facility Information

1.0 Overview
- 1.1 General Overview of SIPC
- 1.2 Introduction
- 1.3 Objectives

2.0 Storm Water Pollution Prevention Team

3.0 SIPC Storm Water System

4.0 Potential Sources of Storm Water Pollution
- 4.1 Site Map
- 4.2 Inventory of Exposed Materials
- 4.3 Summary of Sampling Data
- 4.4 Sediment and Erosion Control

5.0 Storm Management Practices
- 5.1 Non-Structural Control Measures
- 5.2 Structural Control Measures

6.0 Record Keeping and Reporting
- 6.1 SWPPP Record Keeping
- 6.2 Annual Report and Inspection
- 6.3 Annual inspection Form

7.0 Certification Statement

GENERAL FACILITY INFORMATION

Name of Facility: Southern Illinois Power Cooperative

Facility Address: 11543 Lake of Egypt Road
Marion, Illinois 62959

Facility Contact:

Name: Jason McLaurin

Title: Environmental Coordinator

Telephone: 618-964-1448

Mailing Address: Same As Facility Address

Owner: Southern Illinois Power Cooperative

NPDES Permit Information:

Designated Name: Southern Illinois Power Cooperative

Permit Number: IL0004316

Effective Date of Coverage: 03-01-07

Number of Storm Water Outfalls: (1 Active)

Receiving Waters: Little Saline Creek
Lake of Egypt

1.0 OVERVIEW

1.1 GENERAL OVER VIEW OF SIPC

Southern Illinois Power Cooperative owns and operates a coal-fired, electric generating station at its Lake of Egypt site south of Marion, Illinois. Coal and Coal

combustion byproducts consisting of bottom ash, flyash, and scrubber sludge are routinely stored on the station's property. In addition, support products such as sulfuric acid, dibasic acid, sodium hydroxide, iron and steel, and petroleum-based products are routinely stored and used in such a manner that allows them to be exposed to rain water.

The amount of land in which SIPC owns in and around the Lake of Egypt Area is approximately 4,554 acres. However the amount of land the power plant uses for day-to-day operation is approximately 225 acres. Of those 225 acres, 2.2 % or 5 acres of them is either covered is some form or another by buildings, or is impervious by things such as concrete or pavement.

1.2 INTRODUCTION

This storm water pollution prevention plan (SWPPP) covers the operations at Southern Illinois Power Cooperative. It has been developed as required under Special Condition 15 of SIPC National Pollutant Discharge Elimination System (NPDES) general permit for storm water discharges and in accordance with good engineering practices. This SWPPP describes this facility and its operations, identifies potential sources of storm water pollution at the facility, recommends appropriate best management practices (BMPs) or pollution control measures to reduce the discharge of pollutants in storm water runoff, and provides for periodic review of this SWPPP.

1.3 OBJECTIVES

The objective of this SWPPP is three-fold:

1. To identify potential sources of pollution at: Southern Illinois Power Cooperative.

2. To describe best management practices (BMPs), which are to be used at Southern Illinois Power Cooperative.

3. To provide other elements such as, but not limited to, a facility inspection program, site compliance evaluation program, and a record keeping and reporting program that will help Southern Illinois Power Cooperative comply with the terms and conditions of their storm water discharge permit

2.0 STORMWATER POLLUTION PREVENTION TEAM

The storm water pollution prevention team is responsible for developing, implementing, maintaining, and revising this SWPPP. The members of the team are familiar with the management and operations of Southern Illinois Power Cooperative.

The member(s) of the team and their primary responsibilities are as follows:

Name & Title	Responsibility
Wendell Watson-Environmental Services Manager	**Assure that SIPC complies with all environmental laws and regulations.**
Jason Mclaurin – Environmental Coordinator	**Oversee the required policies of this plan and SIPC NPDES permit.**
Company Lab technicians	**Retrieving and testing samples from the Power Plants outfalls.**
Coal Handling Department	**Help in the day-to-day maintenance of the stormwater system.**

3.0 SIPC STORM WATER SYSTEM

The storm water treatment system at the Marion station is the series of retention ponds shown on the attached maps. The ponds are used to balance pH, settle out solids, and assure a clean discharge into little Saline Creek. These ponds are used to treat the storm water as well as the process water from the plant. A few, non-industrial areas will discharge rainwater directly to the Lake of Egypt. The runoff from such areas is a sheeting runoff and does not lend itself to be sampled during a rain event. The other small percentage of storm water that leaves the plant boundaries without being captured by the NPDES system is typically sheeting rainfall passing over grassy fields owned by the plant.

4.0 POTENTIAL SOURCES OF POLLUTANTS

4.1 SITE MAP

The attached Maps present a site map of the facility showing the following features (as required by the permit):

- Property boundaries
- Buildings and other permanent structures
- Storage or disposal areas for significant materials
- Areas used for outdoor operations, including activities thet generate significant quantities of dust or particulates.
- Storm water discharge outfalls
- Location of storm water inlets contributing to each outfall
- Outlines of drainage areas contributing to each outfall
- Storm Water conveyance and discharge structures
- Location of NPDES permitted discharges other than storm water
- Structural runoff controls and storm water settling ponds
- Areas of vegetation
- Areas of exposed and/or eroding soils
- Impervious surfaces (roof tops, asphalt, concrete)
- Names and locations of receiving waters
- Locations where the following activities are exposed to storm water:
  - Fixed fueling operations
  - Vehicle and equipment maintenance and/or cleaning areas
  - Loading/unloading areas
  - Waste storage or disposal areas
  - Liquid storage tanks
  - Equipment operating areas
  - Storage areas

4.2 INVENTORY OF EXPOSED MATERIALS

The permit requires a general inventory of significant materials on site. For each significant material on site an evaluation is to be conducted to determine the potential for these materials to be contributed to the runoff being discharged from the facility. Such areas to focus on may include:

- Loading and unloading areas
- Material handling operations (fuel pumps, etc.)
- Outdoor storage areas
- Processes which generate dust or particulate matter
- Yard drains, stacks, and blowers
- Waste generating areas
- Waste disposal areas
- Maintenance and cleaning practices for vehicles and equipment
- Sites of environmental contamination
- Areas where spills of polluting materials have occurred in the past three years
- Any other areas deemed appropriate

Included are the ways in which these materials might be exposed to the storm water runoff. And the identified outfall from which the materials may be discharged if a release should occur.

Area/Process	Material	Method of Exposure	Outfall
Plant Yard Drains	OIL and Grease, metals	Storm water runoff, accidental release, Daily operations	002
Coal Pile Runoff	Metals	Storm water runoff	002
Floor drains and equipment drains	Oil and grease, metals, chemicals, solvents	Storm water runoff, accidental release, Daily operations	002
Process wastewater	Metals, oil and grease	Daily operations	002
Boiler Evaporations and Blowdowns	TSS, TDS	Daily operations	002
Bottom ash slurry	Metals, oil and grease	Storm water runoff	002
Slag storage pile runoff	Metals, oil and grease	Storm water runoff	002

Scrubber sludge disposal area runoff	Metals, oil and grease	Storm water runoff	002
Ammonia from SCR unit Operation	Ammonia	Accidental release	002
Chlorine from the chlorination process at intake screen of the plants circulating (cooling) water.	Chlorine	Accidental release	003
Equipment fueling locations	Diesel fuel	Accidental release	002
Equipment maintenance locations	Used oil, Fuel, Solvents, fuel conditioner, hydraulic oil	Spills, leaks	002
Accidental release from waste and oil contamination areas	Used oil	Accidental release	002
Sodium Formate from the sludge thickener and reclaimed water tank.	Sodium Formate	Accidental release	002

4.3 SUMMARY OF SAMPLING DATA

The following is a summary of the sampling data available for SIPC. The summary gives a list of the possible pollutants and the effected outfall number. For information on the frequency of testing required and concentration limits and parameters please see SIPC NPDES permit No. IL0004316.

Outfall	Analysis	Outfall	Analysis
002	PH-Daily max & min	005	PH-Daily max & min
002	Suspended solids	005	Suspended solids
002	Iron	005	Iron
002	Boron	005	Boron
002	Mercury	005	Mercury
002	Copper	005	Copper
002	Oil & Grease	005	Oil & Grease
002	Dissolved Solids	005	Dissolved Solids
002	Daily Flow	005	Daily Flow
002	Fluoride	005	Zinc
003	Max. Chlorine		
003	Water Temp		
003	Daily Flow		

4.4 SEDIMENT AND EROSION CONTROL

Sediment and erosion issues at SIPC are controlled by a settling pond system. Sedimentation is monitored by plant personnel through preventive maintenance such as cleaning ditches and ponds that handle rainwater. Such actions assure the proper diversion of rainwater to the NPDES settling ponds as outlined in our NPDES permit. Erosion has the potential to be an issue in very few areas at SIPC. The areas most vulnerable to erosion are the slopes and waterways in and around our settling pond area. These areas are inspected by plant personnel for erosion and other problem areas. Planting grass on slopes and the use of rock and riprap in waterways has controlled erosion in these areas. Traffic in these areas is also kept to a minimum to help prevent wear on the grass, ground rutting, and other damage that might alter ground water flow or accelerate ground erosion. Other areas around the plant where erosion could be at issue would include gravel roads within the plant that are used by plant personnel for plant operational issues. Again these roads are also subject to monitoring and preventive maintenance to insure they don't become a problem for our NPDES system. The Marion Station has a track hoe, dozer, and a fleet of end loaders that are used to accomplish these tasks.

5.0 STORM WATER MANAGEMENT PRACTICES

The following are the Storm water management controls, or best management practices (BMPs) that have been implemented or will be implemented to help reduce the amount of pollutants in the storm water discharge from Southern Illinois Power Cooperative.

- The Marion station uses a series of retention/settling ponds to reduce the amount of pollution in its storm water discharge.
- The retention/settling ponds are fed by the conveyance structures and grassy waterways that were built around the facility with the sole purpose of funneling all the rainwater that falls on the Power Stations grounds into the ponds.
- Berms and slopes of the retentions ponds are planted with grass to prevent soil erosion.

5.1 STRUCTURAL CONTROLS

In order to meet the objectives of the SWPPP and help maintain compliance with our NPDES permit SIPC will use structural controls. The structural controls listed will help meet one of three issues: (1) To insure all rainwater that falls on the Power Stations ground is properly funneled to the retention pond system, or (2) Prevent accidental or unnecessary contamination from the potential pollutants which had been identified (3) Decrease the amount of pollutants in the storm water discharge. Such structural controls include:

1. The use of berms and grass waterways to insure that the rainwater that falls onto the plant is conveyed into the retention pond system.

2. The Plant should periodically inspect this conveyance system to insure that it is functioning properly and all stormwater is being diverted as planned.

3. SIPC uses berms and levies to direct potentially polluted stormwater away from water bodies such as the Lake of Egypt.

4. SIPC has constructed berms, levies, or other secondary containment around outside fuel storage facilities to prevent against leaks and spills.

5. Use grading where applicable to divert storm water from high-risk areas.

6. The use of booms and oil absorbing pillows in the ponds to protect against accidental release.

7. Hazardous waste is stored in a proper containment area. The current waste area is located outside of warehouse C and can be located on the attached maps. The

waste that is accumulated is removed in a timely manner. This will prevent possible build up and decrease the potential for accidental contamination.

8. The plant uses covered storage for much of the equipment and materials.

* It should be noted that many of these structural controls are also considered Best Management Practices.

Best Management Practices used by SIPC

9. SIPC installed an oil / water separator at its combustion turbine site when it was constructed.

10. On a daily basis the plant uses a watering truck and a sprinkler system to help keep down dust and air borne particles during dry times of the year.

11. The plant keeps the yard in a clean and orderly fashion.

- **Other Controls**
  There are other control measures that can be used that may not fit into one of the previously mentioned categories. The use of such controls is encouraged. Additional controls that have to been used at the facility include sumps, oil/water separators, rock filters, vegetative filters, basins (collection, retention, detention), reduce, reuse, and recycle materials, etc.

Area	Material	Control Measure
Settling Ponds	50-lb rock filter	Decrease sedimentation to downstream pond
Settling Ponds	Sediment removal	Increase retention time of water in ponds

5.2 NON-STRUCTURAL CONTROLS

The following Non-Structural Controls are being used by SIPC:

- **Annual Inspections**

  The NPDES discharge system will be inspected by the Environmental Coordinator at least once per year. This inspection consists of checking of checking pond levels, checking the operability of all pumps, assuring that water sampling equipment is properly working, assuring that berms and levies are intact and not leaking, noting the coloration of the outfalls, and assuring that the security gates are locked. Berms or levy problems are reported to the grounds caretaker for repair. Eroded areas that are found during the inspection are repaired at the earliest opportunity. Other areas included in these inspections include all waste storage areas, oil storage areas, coal yard, and sludge storage area; all of which could be a site of possible pollution. Through these inspections, SIPC can assure that any problems with the NPDES and settling pond system, which controls the storm water, can be addressed in a timely fashion.

  The Environmental Coordinator will also inspect SIPC's hazardous waste emergency response equipment as it pertains to its SPCC plan. These inspections are to insure SIPC is prepared in case of accidental spill.

- **Good Housekeeping and Preventive Maintenance Practices**
  The following practices have been implemented to be used by SIPC in order to maintain an efficient stormwater discharge system.

Area / Equipment	Frequency
Preventive maintenance of ditches and ponds	As Required
Proper storage of waste and oil in containment areas	Daily
Removal or recycle of all waste and used oil in a timely matter	As Needed

Use of booms and pillows in ponds in case of accidental spill Checking of pumps, oil and water separators, and sampling equipment;	As Needed Weekly
Making sure ditch drains are free of debris and sedimentation	Daily
Covered storage of as much plant equipment as possible	Daily
Proper labeling of all significant materials	Always
Maintaining the plant as clean and orderly as possible	Daily
Training of employees of company policy, hazardous waste handling procedures, proper storage and labeling of hazardous waste, SPCC program, Waste Minimization, Good Housekeeping methods	Annually
Checking the emergency spill kits on-site in accordance with the companies SPCC plan	At Least Annually
Monitor performance of water pumps and sumps during a storm event	During One Rain Event

- **Spill Prevention and Response Procedures (SPCC PLAN)**

This SPCC plan specifies material handling procedures and storage requirements for significant materials. It specifies equipment and procedures necessary for cleaning up spills and preventing the spilled materials from being discharged have also been identified. All employees are trained to follow the procedures outlined in the plan. SIPC's SPCC plan is located in the Environmental Manager's office at the administration building of the SIPC facility. Described in this plan would be the location of emergency spill minimization materials; which happen to be in Warehouse A and D.

Area	Materials Present	Emergency Response Equipment Locations
Turbine Deck	Turbine oil	Warehouse A and D, Concrete curbed, inside building
Oil Storage Area	Lube Oils, Used Oil, Antifreeze	Warehouse A and D, inside building

Maintenance Shop	Used Oil	Warehouse A and D, inside building
Storeroom Area	Chemicals	Warehouse A and D, inside building
Boiler Areas	Lube Oil, Compressor Oil, Boiler Chemicals, Ammonia	Warehouse A and D, inside building, curbed concrete
Ammonia Storage and Handling Areas	Anhydrous Ammonia	Water mist, SCBA's located plant wide
Chlorine Handling & Storage areas	Chlorine	SCBA's located plant wide, Emergency alarms located in the chlorine bldg. alert the plants control room if a leak should occur, Warning light on top of Chlorine Bldg. Is activated once a leak is detected.
Coal Handling Area	Fuel, Oil, Antifreeze, Fuel Conditioners	Warehouse A and D
Used oil Area	Used Oil	Warehouse A and D, Inside Covered Concrete Basin

- **Employee Training**

The following is a description of the employee training programs that are conducted to inform personnel at all levels of their responsibility to carry out the components and goals of the SWPPP.

Topic	Frequency
Hazardous Waste	Yearly
SPCC	Yearly
Good Housekeeping	Yearly
Waste Minimization	Yearly
SWPPP	Yearly

6.0 RECORD KEEPING AND REPORTING

6.1 SWPPP RECORD KEEPING

The SWPPP for SIPC will be maintained on-site at the office of the Environmental Coordinator. The SWPPP will be revised and updated when changes are made at

SIPC that will impact the exposure of significant materials to stormwater or the overall effectiveness of the SWPPP. When an inspection determines that changes to the SWPPP are necessary, or when the SWPPP is ineffective in accomplishing the stated objectives, the Environmental Coordinator will make appropriate revisions to the SWPPP. In addition, the Environmental Coordinator will review the SWPPP at least annually, and the SWPPP will be revised as necessary.

The Environmental Coordinator will maintain a record of the results of site inspections (indicating implementation of BMPs) or identify any incident(s) of non-compliance.

The Environmental Coordinator will maintain a record of incidents of spills or leaks of significant materials that could impact stormwater runoff, along with corrective actions, surface water discharge (if any), and other relevant information. Records of inspection and maintenance activities such as cleaning and repairing stormwater control and treatment facilities will also be maintained.

Accompanying reports and changes to the SWPPP will be retained on-site for at least (3) years.

6.2 ANNUAL REPORT & INSPECTION

NPDES permit number IL 0004316 requires that Southern Illinois Power Cooperative conduct an annual facility inspection to verify that all elements of the plan, including the site map, potential pollutant sources, and structural and non-structural controls to reduce pollutants in industrial storm water discharges are accurate. Observations and the appropriate responses to the observations shall be retained as part of the plan. Records documenting significant observations made during the site inspection shall be submitted to the IL Environmental Protection Agency as required by the reporting requirements of the SIPC NPDES permit. As part of the annual inspection report, the company will document any event (spill, treatment unit malfunction, etc,) that required an inspection, results of the inspection, and any corrective actions that followed.

In addition to the annual inspection, at least once per year, the Environmental Coordinator shall inspect the entire plant boundary during a rain event. During this inspection, the coordinator will look for storm water being discharged to lakes, ponds, streams, other bodies of water that do not flow through the facility's NPDES impoundments. If such water flows are found, the coordinator shall take a sample of the water and have it analyzed for all pertinent pollutants. Results of this analysis will be included in the annual submission to the IEPA.

6.3 Annual Inspection Form

This form will be used to check and document the facilities annual inspection. The form will also used to assign corrective actions if something is found during an inspection that requires a corrective action. This form will be kept on file in the Environmental Coordinator's Office for up to (3) years.

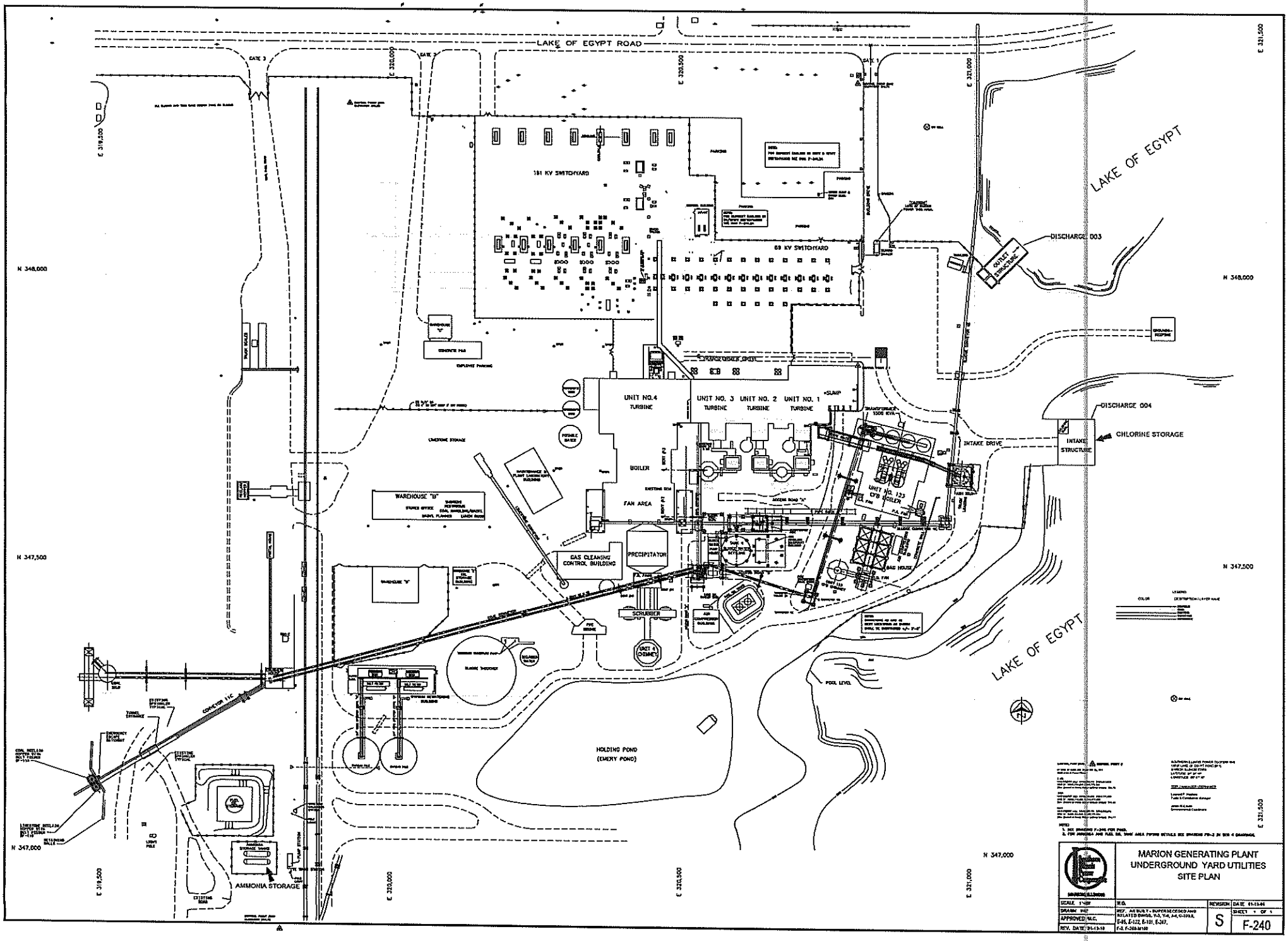
7.0 CERTIFICATION OF THE SWPPP

I certify under penalty of law that this SWPPP has been developed in accordance with good engineering practices. To the best of my knowledge and belief, the information submitted is true, accurate, and complete. In addition, at the time this plan was completed, no unauthorized discharges were present. I am aware that there are significant penalties for submitting false information, including the possibility of fine or imprisonment for knowing violations.

Jason A McL	241-17-2063
(Signature of Certified Operator)	(Certification Number)
JASON A MCLAURIN	8/17/2018
(Printed Name)	(Date)
SAME AS ABOVE	
(Signature of Corporate Officer)	(Date)
(Printed Name)	(Title)

This SWPPP becomes effective as of August 20, 2007

Reviewed: August 18, 2018


LAKE OF EGYPT ROAD
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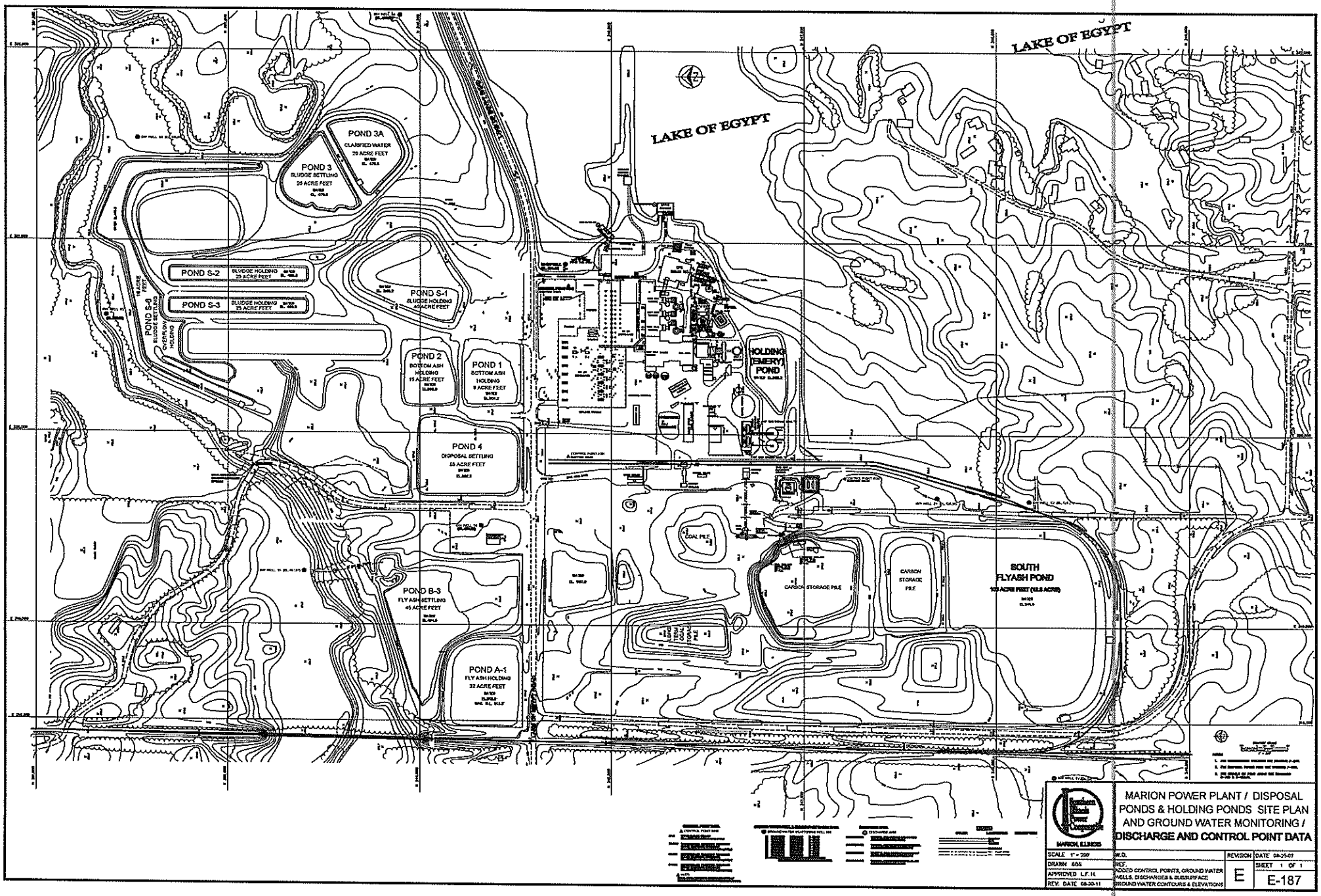
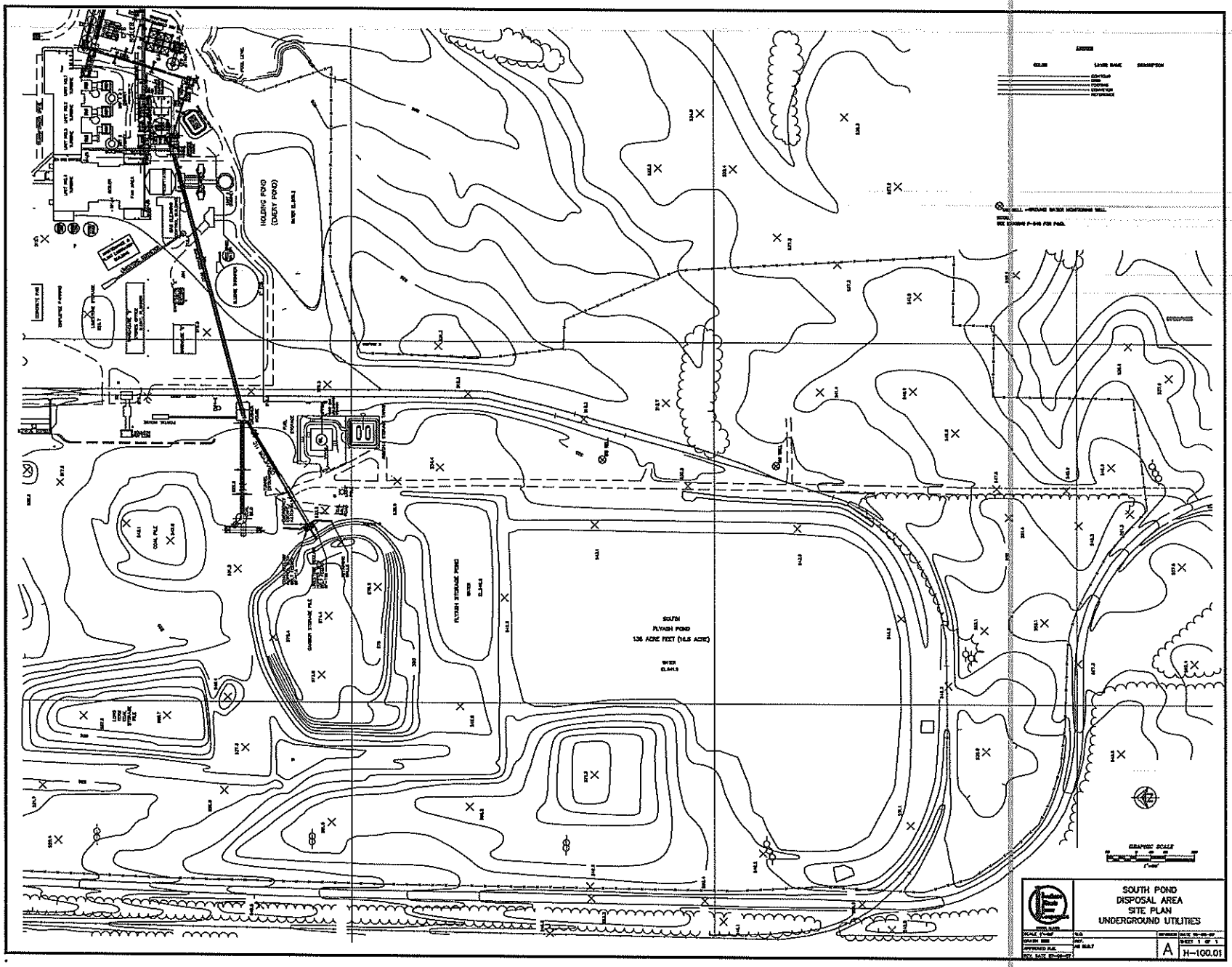
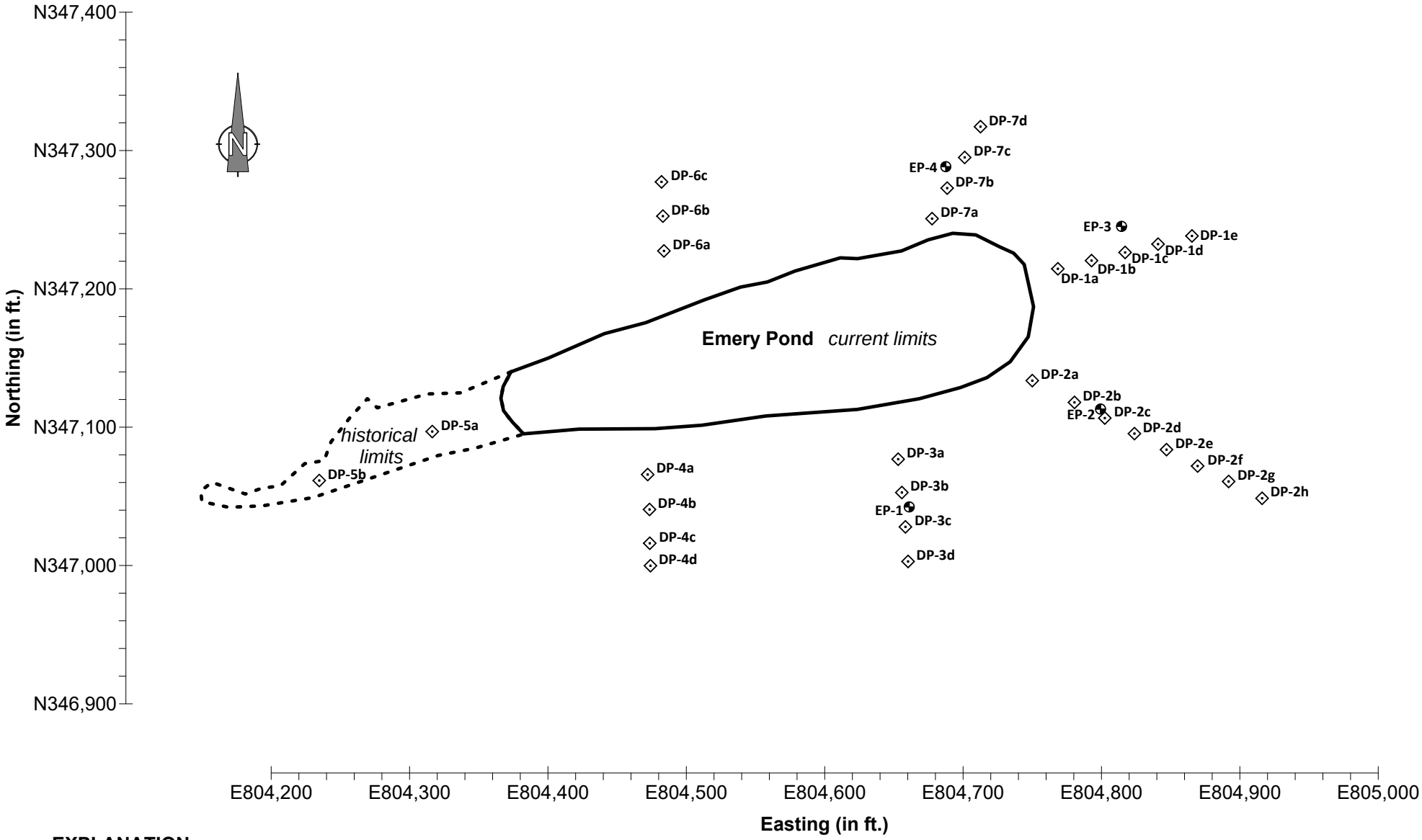
GATE 2
GATE 1
E 319,500
E 320,000
E 320,500
E 321,000
E 321,500
N 348,000
N 347,500
N 347,000
161 KV SWITCHYARD
69 KV SWITCHYARD
PARKING
CONCRETE PAD
WAREHOUSE "B"
WAREHOUSE "A"
LIMESTONE STORAGE
UNIT NO.4 TURBINE
UNIT NO. 3 TURBINE
UNIT NO. 2 TURBINE
UNIT NO. 1 TURBINE
SUMP
TRANSFORMER 1000 KVA
BOILER
FAN AREA
GAS CLEANING CONTROL BUILDING
PRECIPITATOR
SCRUBBER
UNIT 4 (CLOSED)
UNIT NO. 123 CFB BOILER
BAG HOUSE
INTAKE DRIVE
INTAKE STRUCTURE
CHLORINE STORAGE
DISCHARGE 004
DISCHARGE 003
OUTLET STRUCTURE
LAKE OF EGYPT
LAKE OF EGYPT
POOL LEVEL
HOLDING POND (EMERY POND)
CONVEYOR 11C
AMMONIA STORAGE
MARION GENERATING PLANT
UNDERGROUND YARD UTILITIES
SITE PLAN
S
F-240


LAKE OF EGYPT
LAKE OF EGYPT
POND 3A
CLARIFIED WATER
29 ACRE FEET
POND 3
SLUDGE SETTLING
26 ACRE FEET
POND S-2
SLUDGE HOLDING
25 ACRE FEET
POND S-3
SLUDGE HOLDING
25 ACRE FEET
POND S-4
SLUDGE SETTLING
OVERFLOW HOLDING
POND S-1
SLUDGE HOLDING
40 ACRE FEET
POND 2
BOTTOM ASH HOLDING
19 ACRE FEET
POND 1
BOTTOM ASH HOLDING
9 ACRE FEET
HOLDING (EMERY) POND
POND 4
DISPOSAL SETTLING
50 ACRE FEET
COAL PILE
CARBON STORAGE PILE
CARBON STORAGE PILE
SOUTH FLYASH POND
POND B-3
FLY ASH SETTLING
45 ACRE FEET
POND A-1
FLY ASH HOLDING
32 ACRE FEET
MARION, ILLINOIS
MARION POWER PLANT / DISPOSAL PONDS & HOLDING PONDS SITE PLAN AND GROUND WATER MONITORING / DISCHARGE AND CONTROL POINT DATA
SCALE 1" = 200'
DRAWN
APPROVED L.F.H.
REV. DATE 08-30-11
REVISION E
DATE 08-25-07
SHEET 1 OF 1
E-187


HOLDING POND
(DUERY POND)
SOUTH
FLYASH POND
126 ACRE FEET (16.5 ACRE)
COAL PILE
GARDEN STORAGE PILE
FLYASH STORAGE POND
GRAPHIC SCALE
SOUTH POND
DISPOSAL AREA
SITE PLAN
UNDERGROUND UTILITIES
A
H-100.01

Appendix E

Geotechnical Data



EXPLANATION

- Monitoring Well
- Direct Push Boring

Contour Interval = 1 foot

SCALE: 1 inch equals 100 feet

0 ft. 30 ft. 61 ft. 91 ft.

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HANSON

Hanson Professional Services Inc.

Boring Location Map

EMERY POND
MARION POWER PLANT
WILLIAMSON CO., ILLINOIS

HANSON NO. 18E0022A FIGURE E-1

I:\18jobs\18E0022A\Admin\15-Field-Laboratory Data\BoringLocationMap-AppE_20210318.srf

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/28/2019
Finish: 2/28/2019
WEATHER: Rainy, cold (lo 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push

FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-1a
Well ID: DP-1a
Surface Elev: 516.52 ft. MSL
Completion: 17.00 ft. BGS
Station: 347,214.45N
804,768.52E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = Dry - 3/1/2019 @ 8:30
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	44/60 *73%*	DP					2	Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		516	
	28/48 *58%*	DP					4	Black (10YR2/1) RANDOM FILL (clay, silt, gravel, and some bottom ash in 4 to 6 inch lifts).		514	
	32/48 *67%*	DP					6	Dark yellowish brown (10YR4/4), moist, soft, CLAY with some silt and trace sand. (FILL)		512	
	40/48 *83%*	DP					8			510	
							10	Brownish yellow (10YR6/6), weathered SHALE.		508	
							12			506	
							14			504	
							16			502	
										500	

End of Boring = 17.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/28/2019
Finish: 2/28/2019
WEATHER: Rainy, cold (lo 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push

FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-1b
Well ID: DP-1b
Surface Elev: 517.05 ft. MSL
Completion: 17.00 ft. BGS
Station: 347,220.35N
804,792.89E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 15.95 - 3/1/2019 @ 8:25
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								Black (10YR2/1) ASPHALTI. (FILL)			
								Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		516	
	48/60 *80%*	DP					2	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. (FILL)			
										514	
							4	Black (10YR2/1) RANDOM FILL (clay, silt, gravel, and some bottom ash in 4 to 6 inch lifts).			
										512	
							6				
	42/48 *88%*	DP						Yellowish brown (10YR5/6) RANDOM FILL (clay, silt, and gravel in 4 to 6 inch lifts).		510	
							8	Black (10YR2/1) RANDOM FILL (clay, silt, gravel, and some bottom ash in 4 to 6 inch lifts).			
										508	
							10	Gray (10YR5/1) RANDOM FILL (clay, silt, and gravel in 4 to 6 inch lifts).			
	27/48 *56%*	DP								506	
							12				
										504	
							14	Gray (10YR5/1), moist, soft, CLAY with some silt and trace sand.			
	32/48 *67%*	DP								502	
							▼ 16	Yellowish brown (10YR5/8), weathered SHALE.			

End of Boring = 17.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/28/2019
Finish: 2/28/2019
WEATHER: Rainy, cold (lo 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-1c
Well ID: DP-1c
Surface Elev: 514.27 ft. MSL
Completion: 19.00 ft. BGS
Station: 347,226.27N
804,817.11E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 10.37 - 3/1/2019 @ 8:10
▽ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								Dark grayish brown (10YR4/2), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		514	
								Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. (FILL)			
	38/60 63%	DP					2	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt, few bottom ash, and trace sand. (FILL)		512	
								Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. (FILL)			
							4	Light yellowish brown (10YR6/4), moist, hard, weathered SHALE. (FILL)		510	
	38/48 79%	DP					6	Black (10YR2/1) mottled yellowish brown (10YR5/6) RANDOM FILL (clay, silt, gravel, and some bottom ash in 4 to 6 inch lifts).		508	
							8	Dark yellowish brown (10YR4/4) RANDOM FILL (clay, silt, and gravel in 4 to 6 inch lifts).		506	
	40/48 83%	DP					10 ▼	Black (10YR2/1) RANDOM FILL (clay, silt, gravel, and some bottom ash in 4 to 6 inch lifts).		504	
							12			502	
	42/48 88%	DP					14	Yellowish brown (10YR5/8), moist, soft, CLAY with some silt and trace sand.		500	
							16	Yellowish brown (10YR5/8), weathered SANDSTONE.		498	
	24/24 100%	DP					18	Brownish yellow (10YR6/8), weathered SHALE.		496	

End of Boring = 19.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/28/2019
Finish: 2/28/2019
WEATHER: Rainy, cold (lo 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-1d
Well ID: DP-1d
Surface Elev: 513.11 ft. MSL
Completion: 17.00 ft. BGS
Station: 347,232.30N
804,841.00E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 10.60 - 2/28/2019 @ 15.45
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	60/60 *100%*	DP					2	Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		512	
								Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. (FILL)		510	
							4	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.		508	
	48/48 *100%*	DP					6			506	
							8	Black (10YR2/1), moist, medium, CLAY with some silt, little sand, few bottom ash, and trace gravel.		504	
	37/48 *77%*	DP					10 ▼	Yellowish brown (10YR5/8), wet, soft, CLAY with some silt and trace sand.		502	
							12	Black (10YR2/1), wet, soft, CLAY with some silt and trace sand.		500	
	40/48 *83%*	DP					14	Yellowish brown (10YR5/6), moist, soft, CLAY with some silt and trace sand.		498	
							16	Yellowish brown (10YR5/8), SANDSTONE.			

End of Boring = 17.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/28/2019
Finish: 2/28/2019
WEATHER: Rainy, cold (lo 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-1e
Well ID: DP-1e
Surface Elev: 512.80 ft. MSL
Completion: 8.00 ft. BGS
Station: 347,238.19N
804,865.50E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 0.00 - 2/28/2019 @ 15:25
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	60/60 *100%*	DP					2	Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		512	
							4	Dark yellowish brown (10YR4/4), moist, medium, CLAY with some silt and trace sand. (FILL)		510	
	36/36 *100%*	DP					6	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt and trace sand.		508	
							8	Yellowish brown (10YR5/6), SANDSTONE.		506	

End of Boring = 8.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/26/2019
Finish: 2/26/2019
WEATHER: Ptly cloudy, mild (hi 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-2a
Well ID: DP-2a
Surface Elev: 516.53 ft. MSL
Completion: 13.50 ft. BGS
Station: 347,133.62N
804,750.03E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 14.26 - 2/27/2019 @ 8:15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								Black (10YR2/1), moist, loose, medium- to very coarse-grained SAND, with some silt and trace gravel. (FILL)		516	
								Black (10YR2/1), moist, stiff, CLAY with some silt, little sand, and trace gravel.			
							2	Brownish yellow (10YR6/6), moist, stiff, CLAY with some silt and trace sand.			
	60/60 *100%*	DP								514	
							4	Brownish yellow (10YR6/6) with 30% gray (10YR6/1) mottles, moist, medium, CLAY with some silt and trace sand.		512	
							6			510	
	35/48 *73%*	DP						Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.			
							8			508	
							10			506	
	31/48 *65%*	DP						Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.			
							12			504	
								Yellowish brown (10YR5/6), weathered SHALE.			
	6/6 *100%*	DP						Yellowish brown (10YR5/8), SANDSTONE.			

End of Boring = 13.5 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/26/2019
Finish: 2/26/2019
WEATHER: Ptly cloudy, mild (hi 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-2b
Well ID: DP-2b
Surface Elev: 516.65 ft. MSL
Completion: 16.00 ft. BGS
Station: 347,117.86N
804,780.56E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 9.38 - 2/27/2019 @ 8:35
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	31/60 *52%*	DP					0–2	Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		516	
							2–4	Yellowish brown (10YR5/8) with 40% Black (10YR2/1) mottles, moist, medium CLAY with some silt and trace sand. (FILL)		514, 512	
	34/48 *71%*	DP					4–6	Dark gray (10YR4/1), moist, medium, CLAY with some silt and trace sand.		510	
	35/48 *73%*	DP					6–9.38	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt, little sand, and trace gravel.		508, 506	
							9.38–12			504	
	36/36 *100%*	DP					12–14	Yellowish brown (10YR5/6), wet, soft, SILT with few clay and little very fine-grained sand.			
							14–16	Yellowish brown (10YR5/8), weathered SHALE.		502	

End of Boring = 16.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/26/2019
Finish: 2/26/2019
WEATHER: Ptly cloudy, mild (hi 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-2c
Well ID: DP-2c
Surface Elev: 510.46 ft. MSL
Completion: 16.00 ft. BGS
Station: 347,106.55N
804,802.49E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 7.34 - 2/27/2019 @ 8:55
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	40/60 *67%*	DP					0–7.5	Dark gray (10YR4/1) with 30% yellowish brown (10YR5/6) mottles, moist, medium, CLAY with some silt and trace sand.		510	
	43/48 *90%*	DP					7.5–10.5	Yellowish brown (10YR5/6) with 20% gray (10YR5/1) mottles, moist, medium, CLAY with some silt and trace sand.		508, 506, 504	
	41/48 *85%*	DP					10.5–12.5	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.		502, 500	
	36/36 *100%*	DP					12.5–15.5	Yellowish brown (10YR5/8), moist, hard, weathered SHALE		498, 496	
							15.5–16	Yellowish brown (10YR5/8) SANDSTONE.			

End of Boring = 16.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/26/2019
Finish: 2/26/2019
WEATHER: Ptly cloudy, mild (hi 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-2d
Well ID: DP-2d
Surface Elev: 508.64 ft. MSL
Completion: 15.50 ft. BGS
Station: 347,095.26N
804,823.89E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = 13.00 - during drilling
▼ = 1.35 - 2/26/2019 @ 17:10
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	53/60 *88%*	DP						Very dark gray (10YR3/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		508	
	42/48 *88%*	DP					2, 4, 6, 8	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.		506, 504, 502, 500	
	44/48 *92%*	DP					10	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.		498	
	29/30 *97%*	DP					12, 14	Yellowish brown (10YR5/8), weathered SHALE.		496	
								Yellowish brown (10YR5/8) SANDSTONE.		494	

End of Boring = 15.5 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/26/2019
Finish: 2/26/2019
WEATHER: Ptly cloudy, mild (hi 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-2e
Well ID: DP-2e
Surface Elev: 507.37 ft. MSL
Completion: 16.00 ft. BGS
Station: 347,083.66N
804,847.08E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 2.31 - 2/27/2019 @ 9:10
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	60/60 *100%*	DP					2	Very dark gray (10YR3/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		506	
							4	Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and trace sand.		504	
	39/48 *81%*	DP					6			502	
							8	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.		500	
	48/48 *100%*	DP					10			498	
							12			496	
								Yellowish brown (10YR5/6), wet, soft, SILT with few clay and little very fine-grained sand.		494	
	27/36 *75%*	DP					14	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.			
								Yellowish brown (10YR5/8), weathered SHALE.		492	
							16				

End of Boring = 16.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/26/2019
Finish: 2/26/2019
WEATHER: Ptly cloudy, mild (hi 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-2f
Well ID: DP-2f
Surface Elev: 506.32 ft. MSL
Completion: 15.50 ft. BGS
Station: 347,071.83N
804,869.56E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 3.55 - 2/27/2019 @ 9:25
▽ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	60/60 100%	DP					0	Very dark gray (10YR3/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		506	
							2	Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand.		504	
							4			502	
	44/48 92%	DP					6	Yellowish brown (10YR5/6) with 20% gray (10YR5/1) mottles, moist, medium CLAY with some silt and trace sand.		500	
							8	Dark yellowish brown (10YR4/6), wet, medium dense, very fine- to medium-grained SAND with few clay and silt.		498	
	45/48 94%	DP					10	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.		496	
							12			494	
	28/30 93%	DP					14	Light yellowish brown (10YR6/4) SANDSTONE.		492	

End of Boring = 15.5 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/26/2019
Finish: 2/26/2019
WEATHER: Ptly cloudy, mild (hi 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-2g
Well ID: DP-2g
Surface Elev: 505.12 ft. MSL
Completion: 15.40 ft. BGS
Station: 347,060.68N
804,891.97E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = 9.00 - during drilling
▼ = 11.60 - 2/26/2019 @ 17:30
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	46/60 *77%*	DP					2	Gray (10YR5/1), moist, loose, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		504	
								Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand.			
							4	Yellowish brown (10YR5/6), medium CLAY with some silt and trace sand.		502	
							6	Gray (10YR5/1), moist, medium, CLAY with some silt, little sand, and trace gravel.		500	
	34/48 *71%*	DP					8			498	
							10	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt and trace sand.		496	
	35/48 *73%*	DP					12			494	
							14			492	
	29/30 *97%*	DP						Yyellowish brown (10YR5/8) SANDSTONE.		490	

End of Boring = 15.4 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/26/2019
Finish: 2/26/2019
WEATHER: Ptly cloudy, mild (hi 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-2h
Well ID: DP-2h
Surface Elev: 503.54 ft. MSL
Completion: 15.00 ft. BGS
Station: 347,048.55N
804,916.15E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = 7.00 - during drilling
▼ = -0.30 - 2/26/2019 @ 17:40
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	45/60 *75%*	DP						Gray (10YR5/1), moist, loose, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)			
							2			502	
							4	Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand.		500	
							6			498	
	33/48 *69%*	DP									
							8	Gray (10YR6/1) with 20% yellowish brown (10YR5/6) mottles, wet, medium SILT with few clay and little very fine-grained sand.		496	
							10			494	
	42/48 *88%*	DP						Yellowish brown (10YR5/8), moist, stiff, CLAY with some silt and trace sand.		492	
							12				
								Yellowish brown (10YR5/8), moist, stiff, CLAY with some silt, little sand, and trace gravel.		490	
	24/24 *100%*	DP					14	Brownish yellow (10YR6/8) SANDSTONE.			

End of Boring = 15.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-3a
Well ID: DP-3a
Surface Elev: 518.30 ft. MSL
Completion: 17.00 ft. BGS
Station: 347,076.80N
804,653.12E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 11.68 - 2/26/2019 @ 8:55
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		518	
	49/60 *82%*	DP					2			516	
							4	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.		514	
	30/48 *63%*	DP					6			512	
							8			510	
	32/48 *67%*	DP					10	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.		508	
							▼ 12			506	
	36/48 *75%*	DP					14	Yellowish brown (10YR5/8), weathered SHALE.		504	
							16			502	
								Yellowish brown (10YR5/8), SANDSTONE.			

End of Boring = 17.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-3b
Well ID: DP-3b
Surface Elev: 518.15 ft. MSL
Completion: 19.00 ft. BGS
Station: 347,052.67N
804,655.84E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 10.63 - 2/26/2019 @ 9:15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
	60/60 *100%*	DP						Black (10YR2/1), moist, soft, CLAY with some silt and trace sand.	518	
							2	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.	516	
	48/48 *100%*	DP					4	Yellowish brown (10YR5/6), moist, medium, SILT with few clay, and trace very fine-grained sand.	514	
							6		512	
							8		510	
							10		508	
	39/48 *81%*	DP						Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and trace sand.		
							12	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.	506	
							14	Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and trace sand.	504	
	42/48 *88%*	DP						Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.		
							16	Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and few very fine-grained sand.	502	
	23/24 *96%*	DP					18	Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and trace sand.	500	
								Light yellowish brown (10YR6/4) SANDSTONE.		
								Yellowish brown (10YR5/8), weathered SHALE.		

End of Boring = 19.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push

FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-3c
Well ID: DP-3c
Surface Elev: 516.55 ft. MSL
Completion: 16.00 ft. BGS
Station: 347,027.84N
804,658.41E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 6.44 - 2/26/2019 @ 9:30
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	60/60 *100%*	DP					0–6.5	Very dark grayish brown (10YR3/2), moist, soft, CLAY with some silt and trace sand. Yellowish brown (10YR5/6), moist, soft, CLAY with some silt and trace sand.		516–510	
	41/48 *85%*	DP					6.5–10	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt, little sand, and trace gravel.		510–506	
	40/48 *83%*	DP					10–14			506–502	
	38/48 *79%*	DP					14–16	Brownish yellow (10YR6/8), weathered SANDSTONE.		502	

End of Boring = 16.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push

FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP3d
Well ID: DP3d
Surface Elev: 516.62 ft. MSL
Completion: 10.30 ft. BGS
Station: 347,002.83N
804,660.29E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 5.06 - 2/26/2019 @ 9:45
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								Very dark grayish brown (10YR3/2), moist, soft, CLAY with some silt and trace sand.		516	
							2	Yellowish brown (10YR5/6), moist, soft, CLAY with some silt and trace sand.			
	53/60 *88%*	DP								514	
							4	Yellowish brown (10YR5/6), moist, medium, SILT with few clay, and trace very fine-grained sand.		512	
							6	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt, little sand, and trace gravel.		510	
	36/48 *75%*	DP									
							8	Yellowish brown (10YR5/6), weathered SHALE.		508	
	16/18 *89%*	DP					10	Yellowish brown (10YR5/6), weathered SANDSTONE.			

End of Boring = 10.3 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-4a
Well ID: DP-4a
Surface Elev: 520.39 ft. MSL
Completion: 17.00 ft. BGS
Station: 347,065.72N
804,472.12E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 14.26 - 2/27/2019 @ 8:15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	42/60 *70%*	DP						Brown (10YR5/3), moist, medium, CLAY with some silt, little sand, and trace gravel. (FILL)		520	
								Light gray (10YR7/1), moist, dense, medium- to coarse-grained GRAVEL with little sand and few silt. (FILL)			
							2			518	
							4			516	
	48/48 *100%*	DP					6	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt and trace sand.		514	
							8			512	
	48/48 *100%*	DP					10			510	
							12	Yellowish brown (10YR5/8), weathered SANDSTONE.		508	
	48/48 *100%*	DP					▼ 14	Yellowish brown (10YR5/8), weathered SHALE.		506	
							16	Yellowish brown (10YR5/8), weathered SILTSTONE.		504	

End of Boring = 17.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push

FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-4b
Well ID: DP-4b
Surface Elev: 520.64 ft. MSL
Completion: 14.50 ft. BGS
Station: 347,040.46N
804,473.43E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 13.55 - 2/27/2019 @ 8:15
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	60/60 *100%*	DP					2, 4	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt and trace sand.		520, 518, 516	
	46/48 *96%*	DP					6, 8	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.		514, 512	
	37/48 *77%*	DP					10, 12	Yellowish brown (10YR5/8), weathered SHALE.		510, 508	
	18/18 *100%*	DP					▼ 13.55, 14	Brownish yellow (10YR6/6) SANDSTONE.			

End of Boring = 14.5 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-4c
Well ID: DP-4c
Surface Elev: 523.14 ft. MSL
Completion: 17.00 ft. BGS
Station: 347,016.05N
804,473.64E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 13.61 - 2/27/2019 @ 8:15
▽ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	60/60 100%	DP					0–7	Brown (10YR4/3), moist, soft, CLAY with some silt and trace sand.		522	
	46/48 96%	DP					7–10	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.		520, 518, 516	
	35/48 73%	DP					10–13.5	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.		514, 512	
	28/48 58%	DP					13.5–17	Yellowish brown (10YR5/8), weathered SHALE.		510, 508	

End of Boring = 17.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-4d
Well ID: DP-4d
Surface Elev: 524.09 ft. MSL
Completion: 17.00 ft. BGS
Station: 346,999.74N
804,474.16E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 2.10 - 2/26/2019 @ 8:25
▽ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	60/60 100%	DP					2	Dark yellowish brown (10YR4/4), moist, soft, CLAY with some silt, little sand, and trace gravel.		522	
							4	Yellowish brown (10YR5/6), moist, soft, CLAY with some silt and trace sand.		520	
	46/48 96%	DP					6			518	
							8	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt, little sand, and trace gravel.		516	
							10			514	
	37/48 77%	DP						Yellowish brown (10YR5/8), weathered SHALE.			
							12	Yellowish brown (10YR5/8), weathered SANDSTONE.		512	
							14			510	
	28/48 58%	DP						Yellowish brown (10YR5/8), weathered SHALE.			
							16			508	

End of Boring = 17.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-5a
Well ID: DP-5a
Surface Elev: 518.48 ft. MSL
Completion: 17.00 ft. BGS
Station: 347,096.77N
804,316.45E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = 15.00 - during drilling
▼ = 6.62 - 2/26/2019 @ 7:50
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	40/60 *67%*	DP					2, 4, 6	Very dark brown (10YR2/2), moist, dense, bottom ASH. (FILL)		518, 516, 514, 512	
	48/48 *100%*	DP					8			510	
	48/48 *100%*	DP					10			508	
							12	Light brownish gray (10YR6/2), moist, dense, very fine-grained SAND with some silt. (FILL)		506	
							14	Very dark brown (10YR2/2), moist, dense, bottom ASH. (FILL)		504	
	26/48 *54%*	DP					16	Very dark brown (10YR2/2), wet, dense, bottom ASH. (FILL)		502	
								Very pale brown (10YR7/4), weathered SANDSTONE			

End of Boring = 17.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/25/2019
Finish: 2/25/2019
WEATHER: Sunny, cool (hi 30's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-5b
Well ID: DP-5b
Surface Elev: 519.57 ft. MSL
Completion: 9.80 ft. BGS
Station: 347,061.40N
804,234.84E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 7.02 - 2/26/2019 @ 8:05
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	49/60 *82%*	DP					2, 4	Yellow, (10YR7/6) wet, soft, GYPSUM (FILL)		518, 516	
	48/48 *100%*	DP					6, 8	Very dark brown (10YR2/2), moist, dense, bottom ASH. (FILL)		514, 512	
	8/8 *100%*	DP						Yellowish brown (10YR5/8), weathered SANDSTONE		510	

End of Boring = 9.8 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/27/2019
Finish: 2/27/2019
WEATHER: Overcast, cool (lo 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push

FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-6a
Well ID: DP-6a
Surface Elev: 516.69 ft. MSL
Completion: 9.50 ft. BGS
Station: 347,227.38N
804,483.91E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 6.32 - 2/28/2019 @ 9:10
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		516	
	51/60 *85%*	DP					2	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt and trace sand. (FILL)		514	
								Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand. (FILL)			
							4	Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)			
								Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand.		512	
							6 ▼	Gray (10YR5/1), moist, soft, SILT with few clay and little very fine-grained sand.			
	34/48 *71%*	DP						Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand.		510	
							8	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.		508	
	6/6 *100%*	DP						Yellowish brown (10YR5/6), SANDSTONE.			

End of Boring = 9.5 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/27/2019
Finish: 2/27/2019
WEATHER: Overcast, cool (lo 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-6b
Well ID: DP-6b
Surface Elev: 517.23 ft. MSL
Completion: 11.50 ft. BGS
Station: 347,252.51N
804,483.13E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 10.63 - 2/29/2019 @ 7:55
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)			
										516	
							2	Black (10YR2/1), moist, dense, BOTTOM ASH. (FILL)			
	59/60 *98%*	DP									
								Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and trace sand. (FILL)		514	
							4	Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand. (FILL)			
										512	
							6	Yellowish brown (10YR5/6), moist, stiff, CLAY with some silt and trace sand.			
	31/48 *65%*	DP								510	
							8	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.			
										508	
								Dark gray (10YR4/1), moist, soft, SILT with few clay and little very fine-grained sand.			
	28/30 *93%*	DP					10	Yellowish brown (10YR5/8), weathered SHALE.			
								Yellowish brown (10YR5/8), SANDSTONE.		506	

End of Boring = 11.5 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/27/2019
Finish: 2/27/2019
WEATHER: Overcast, cool (lo 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-6c
Well ID: DP-6c
Surface Elev: 516.49 ft. MSL
Completion: 8.00 ft. BGS
Station: 347,277.30N
804,482.16E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = 1.00 - during drilling
▼ = 1.00 - 2/28/2019 @ 9:30
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
								Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		516	
							2	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. (FILL)			
	54/60 *90%*	DP								514	
							4	Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand. (FILL)		512	
							6	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.		510	
	26/36 *72%*	DP									
							8	Yellowish brown (10YR5/8), SANDSTONE.			

End of Boring = 8.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/27/2019
Finish: 2/27/2019
WEATHER: Overcast, cool (lo 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-7a
Well ID: DP-7a
Surface Elev: 517.42 ft. MSL
Completion: 15.00 ft. BGS
Station: 347,250.66N
804,677.61E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = 13.50 - during drilling
▼ = 8.49 - 2/28/2019 @ 8:00
▽ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
								Black (10YR2/1), moist, loose, SILT and very fine- to coarse-grained SAND with few clay and trace gravel. (FILL)		
								Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		
								Black (10YR2/1), wet, soft SILT with few clay and trace very fine-grained sand. (FILL)	516	
	43/60 72%	DP					2			
								Yellowish brown (10YR5/8), moist, medium, CLAY with some silt and trace sand and gravel. (FILL)	514	
							4			
								Gray (10YR5/1), moist, medium, CLAY with some silt and trace sand. (FILL)	512	
							6			
	31/48 65%	DP						Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.	510	
							8 ▼			
									508	
							10			
	38/48 79%	DP						Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.	506	
							12			
							▼		504	
	22/24 92%	DP					14	Black (10YR2/1), wet, medium loose, very fine- to medium-grained SAND with few silt and little clay.		
								Yellowish brown (10YR5/8), SANDSTONE.		

End of Boring = 15.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/27/2019
Finish: 2/27/2019
WEATHER: Overcast, cool (lo 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-7b
Well ID: DP-7b
Surface Elev: 517.56 ft. MSL
Completion: 15.50 ft. BGS
Station: 347,272.79N
804,688.58E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = 13.00 - during drilling
▼ = 7.59 - 2/28/2019 @ 7:50
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	58/60 *97%*	DP					2	Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		516	
	26/48 *54%*	DP					4, 6, 8	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. (FILL)		514, 512, 510	
	31/48 *65%*	DP					10, 12	Yellowish brown (10YR5/8), moist, stiff, CLAY with some silt, little sand, and trace gravel. (FILL)		508, 506	
	30/30 *100%*	DP					12, 14	Light gray (10YR7/1), moist, dense, very fine- to very coarse-grained SAND with few silt and trace gravel. (FILL)			
								Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.			
								Black (10YR2/1), wet, medium dense, weathered SANDSTONE.		504	
								Yellowish brown (10YR5/4), weathered SHALE.			
								Yellowish brown (10YR5/8) SANDSTONE.			

End of Boring = 15.5 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/27/2019
Finish: 2/27/2019
WEATHER: Overcast, cool (lo 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-7c
Well ID: DP-7c
Surface Elev: 516.65 ft. MSL
Completion: 19.00 ft. BGS
Station: 347,294.97N
804,701.22E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = 11.60 - during drilling
▼ = 14.47 - 2/28/2019 @ 14:55
▽ =

SAMPLE Number	Recov / Total (in) *% Recovery*	Type	TESTING *Blows / 6 in* N - Value **RQD**	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) *Qp* (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Borehole Detail	Elevation ft. MSL	Remarks
	46/60 *77%*	DP					2	Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)		516	
	35/48 *73%*	DP					4	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. (FILL)		514	
							6	Light gray (10YR7/1), moist, dense, very fine- to very coarse-grained SAND with few silt and trace gravel. (FILL)		512	
	27/48 *56%*	DP					8	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. (FILL)		510	
							10	Gray (10YR6/1), moist, soft, CLAY with some silt, little sand, and trace gravel. (FILL)		508	
	25/48 *52%*	DP					12	Black (10YR2/1), wet, soft, SILT with few clay and trace very fine-grained sand.		506	
							14	Dark gray (10YR4/1), moist, soft, CLAY with some silt and trace sand.		504	
	20/24 *83%*	DP					16	Light yellowish brown (10YR6/4), moist, medium, CLAY with some silt, little sand, and trace gravel.		502	
							18	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt and trace sand.		500	
								White (10YR8/1), weathered SHALE.		498	

End of Boring = 19.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.

FIELD BORING LOG

HANSON

CLIENT: Southern Illinois Power Cooperative
Site: Emery Pond
Location: SIPC Marion Power Plant
Project: 18E0022A
DATES: Start: 2/27/2019
Finish: 2/27/2019
WEATHER: Overcast, cool (lo 40's)

CONTRACTOR: Bulldog Drilling, Inc.
Rig mfg/model: AMS Power Probe 9500-VTR
Drilling Method: Direct Push
FIELD STAFF: Driller: J Edwards
Helper: S Guy
Eng/Geo: R. Hasenyager

BOREHOLE ID: DP-7d
Well ID: DP-7d
Surface Elev: 516.91 ft. MSL
Completion: 20.00 ft. BGS
Station: 347,317.15N
804,712.63E

TOPOGRAPHIC MAP INFORMATION:
Quadrangle: Goreville
Township: Southern
Section 26, **Tier** 10S.; **Range** 2E.

WATER LEVEL INFORMATION:
▼ = Dry - during drilling
▼ = 10.59 - 2/28/2019 @ 8:45
▽ =

SAMPLE Number	Recov / Total (in) % Recovery	Type	TESTING Blows / 6 in N - Value RQD	Water Content (%)	Dry Density (lb/ft³)	Qu (tsf) Qp (tsf) Failure Type	Depth ft. BGS	Lithologic Description	Elevation ft. MSL	Remarks
	56/60 93%	DP					2	Light gray (10YR7/1), moist, dense, small- to coarse-grained GRAVEL with little sand and few silt. (FILL)	516	
							4	Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand. (FILL)	514	
	30/48 63%	DP					6	Gray (10YR5/1), moist, soft, CLAY with some silt and trace sand. (FILL)	512	
	48/48 100%	DP					8	Yellowish brown (10YR5/6), moist, soft, CLAY with some silt and trace sand. (FILL)	510	
							10 ▼		508	
							12	Gray (10YR5/1), moist, soft, CLAY with some silt and trace sand. (FILL)	506	
								Gray (10YR5/1), moist, soft, SILT with few clay and trace very fine-grained sand. (FILL)	504	
							14	Gray (10YR5/1), moist, dense, very fine- to very coarse-grained SAND with few silt and trace gravel. (FILL)		
	33/48 69%	DP						Yellowish brown (10YR5/6), moist, medium, CLAY with some silt and trace sand.	502	
							16	Yellowish brown (10YR5/8), moist, medium, CLAY with some silt, little sand, and trace gravel.	500	
	29/36 81%	DP					18	Yellowish brown (10YR5/8), weathered SANDSTONE.	498	
							20			

End of Boring = 20.0 ft.

NOTE(S): Borehole sealed after sampling with granular bentonite.