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February 1, 2024

Delivered Electronically

Mr. Brian Rockensuess
Commissioner
Indiana Department of Environmental Management
100 N. Senate Avenue
Mail Code 50-01
Indianapolis, IN 46204-2251

**Re: Indiana-Kentucky Electric Corporation
Clifty Creek Station
Notification of CCR Rule Information Posting
Annual Certified CCR Dam and Dike (Surface Impoundment)
Inspection Report Posting**

Dear Mr. Rockensuess:

As required by 40 CFR 257.106(g), the Indiana-Kentucky Electric Corporation (IKEC) is providing notification to the Commissioner (State Director) of the Indiana Department of Environmental Management that a qualified professional engineer has completed the Annual CCR Dam and Dike (Surface Impoundment) Inspection for the 2023 operating year in accordance with 40 CFR 257.83(b) for IKEC's Clifty Creek Station. The inspection report has been placed in the facility's Operating Record as well as on the company's publicly accessible internet site.

This information can be viewed on IKEC's publicly accessible internet site at:
<http://www.ovec.com/CCRCompliance.php>

If you have any questions, or require any additional information, please call me at (740) 289-7259.

Sincerely,

A handwritten signature in black ink that reads "Jeremy Galloway". The signature is fluid and cursive, with the first name "Jeremy" and last name "Galloway" clearly distinguishable.

Jeremy Galloway
Environmental Specialist

JDG:tlf



**2023 CCR Rule – Surface Impoundments
Clifty Creek Dam/Dike Inspections**



Clifty Creek Generating Station
Madison, Indiana
Jefferson County

January 19, 2024

Prepared for:

Indiana-Kentucky Electric Corporation
Piketon, Ohio

Prepared by:

Stantec Consulting Services Inc.
Cincinnati, Ohio

Sign-off Sheet

This document entitled 2023 CCR Rule – Surface Impoundments, Clifty Creek Dam/Dike Inspections was prepared by Stantec Consulting Services Inc. ("Stantec") for the account of Indiana-Kentucky Electric Corporation (IKEC) (the "Client"). Any reliance on this document by any third party is strictly prohibited. The material in it reflects Stantec's professional judgment in light of the scope, schedule, and other limitations stated in the document and in the contract between Stantec and the Client. The opinions in the document are based on conditions and information existing at the time the document was published and do not take into account any subsequent changes. In preparing the document, Stantec did not verify information supplied to it by others. Any use that a third party makes of this document is the responsibility of such third party. Such third party agrees that Stantec shall not be responsible for costs or damages of any kind, if any, suffered by it or any other third party as a result of decisions made or actions taken based on this document.

Pleiman, Darren

Digitally signed by Pleiman,

Darren

Date: 2024.01.19 16:14:52 -05'00'

Prepared by _____

(signature)

Darren Pleiman, P.E.

Reviewed by Jacqueline S. Harmon

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Jacqueline S. Harmon, P.E.

Reviewed by Paul Sridhar

(signature)

Paul Sridhar, P.E.



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2023 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

Overview

January 19, 2024

1.0 OVERVIEW

Stantec Consulting Services Inc. (Stantec) performed an annual inspection of the existing coal combustion residuals (CCR) surface impoundments at the Clifty Creek Generating Station in Madison, Indiana on November 1, 2023.

This annual dam and dike inspection is intended to fulfill the requirements of 40 CFR 257.83(b) for the *Disposal of Coal Combustion Residuals from Electric Utilities* rule (CCR Rule) signed by the U.S. Environmental Protection Agency (EPA) Administrator on December 19, 2014 and published in the Federal Register on April 17, 2015, as well as the Indiana Department of Natural Resources (IDNR), Division of Water, Dam Safety Program.

This report provides an existing conditions assessment, with observations, photographs, maintenance recommendations, and conclusions. The weather conditions at the time of inspection consisted of clear sunny skies with temperatures ranging from the low to mid 40s to the low to mid 60s (Fahrenheit). Based on regional records, up to about 1.9 inches of precipitation fell within the week prior to the inspection.

Stantec's team that performed the fieldwork included:

- Jacqueline Harmon, P.E., Principal, Project Manager
28 years of experience in geotechnical engineering, including pump stations, levees, and CCR storage facility design, closure, and operation.
- Darren Pleiman, P.E., Senior Project Engineer/Geotechnical Engineer
26 years of experience in geotechnical engineering, including supervision of geotechnical field explorations, design of dams, and landslide remediation.

Fieldwork was coordinated with Daniel Hunt, Clifty Creek Station's landfill environmental manager. Mr. Hunt tracks the maintenance needs and activities through the weekly and monthly inspections. Jeremy Galloway and Zachary Hammond of Ohio Valley Electric Corporation's (OVEC) Environmental Affairs group accompanied Stantec's personnel during the inspection. Observations were briefly discussed with onsite personnel during and after completion of the field activities.

2.0 DESCRIPTION OF CLIFTY CREEK IMPOUNDMENTS

The Clifty Creek Generating Station is a coal-combustion generating station located in Madison, Jefferson County, Indiana. It is owned and operated by Indiana-Kentucky Electric Corporation (IKEC), a wholly owned subsidiary of OVEC. The Clifty Creek Station began operating in 1955. It has six generating units with a total capacity of 1,304 megawatts.

The annual assessment included two CCR surface impoundments: the West Boiler Slag Pond (WBSP) and the Landfill Runoff Collection Pond (LRCP).

2023 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

Description of Clifty Creek Impoundments
January 19, 2024

2.1 WEST BOILER SLAG POND

The WBSP is located about 1,500 feet west/southwest of the power plant on the west side of Big Clifty Creek. It has historically served as a settling facility for sluiced bottom ash produced at the plant and as stormwater run-on management for approximately 510 acres west of the station. Recent facility improvements have altered inflows into the WBSP. The impoundment now receives limited stormwater from rainfall directly into the impoundment or immediately adjacent to it. CCR flows are no longer sluiced to the WBSP. A station overview is included in Appendix A.

The WBSP is formed by natural grade to the north, east, and west. The CCR landfill haul road is to the north. A wide berm area along the east side supports several transmission towers, separating the impoundment from Big Clifty Creek. The Devils Backbone borders the west side. An embankment dam/dike extends along the south side, separating the WBSP from upland new field habitat and mixed early successional/second growth riparian forest adjacent to the Ohio River's ordinary high-water mark (Stantec 2022). The embankment dam/dike is approximately 2,500 feet long with a maximum height of about 41 feet. The crest of the dike is at about elevation 475.0 feet. On the southeast side of the pond, construction of a gypsum loading station for barge traffic has recently been completed. On the southwest side, CCR was removed and the area recently repurposed as lined settling basins.

The WBSP consists of three primary areas: the eastern portion where CCR was historically sluiced and dredged/mined for recovery, the central portion that consists of a wide vegetated delta area, and the lined settling basins. Discharge from the settling basins occurs through an outlet structure extending under the southern dam located at the far western end of the pond. Flow passes through an NPDES-permitted outfall and into the Ohio River. The eastern and central portions of the WBSP areas are hydraulically disconnected from the lined basins. Water levels within the remaining WBSP are managed by pumping. Additional reference drawings are provided in Appendix B.

2.2 LANDFILL RUNOFF COLLECTION POND

The LRCP is located about 1.9 miles southwest of the station near the north bank of the Ohio River. It is formed by natural grades to the north, east, and west and a dam to the south, separating it from the upland mixed early successional/second growth riparian forest habitat along the Ohio River's ordinary high-water mark (Stantec 2022). The CCR landfill lies to the northeast. A station overview is included in Appendix A.

The LRCP has historically served as a runoff collection pond for the CCR landfill and run-on stormwater management for approximately 475 acres of the surrounding hillsides. A portion of the CCR landfill leachate flowed to the impoundment as landfill construction progressed westward. Recent construction completed lined ponds southwest of the CCR landfill to manage leachate and stormwater runoff. A lined diversion channel and modification of the existing dam allowed routing of approximately 350 acres of run-on stormwater around the LRCP to the permitted NPDES outfall. Stormwater flows into the LRCP were reduced to approximately 126 acres, 35 acres for the LRCP footprint and 91 acres of run-on from the adjacent hillsides. Additional reference drawings are provided in Appendix B.

2023 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

Observations
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The LRCP dam is a cross valley dam approximately 1,025 feet long with a maximum height of about 75 feet. It is registered with the Indiana Department of Natural Resources (IDNR) as Panther Creek Dam, a significant hazard structure identified as No. 39-12. Due to recent construction activity at the dam, the crest elevation ranges from approximately 493 to 505 feet to facilitate construction of a new outfall for the lined diversion channel, box culvert, and phased pond closure. The primary spillway from the LRCP was not modified by recent construction.

3.0 OBSERVATIONS

Dam and embankment inspections were conducted in general accordance with 257.83(b) to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection at a minimum included:

1. A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., CCR unit design and construction information required by 40 CFR 257.73(c)(1) and 257.74(c)(1), previous periodic structural stability assessments required under 40 CFR 257.73(d) and 257.74(d), the results of inspections by a qualified person, and results of previous annual inspections),
2. A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit and appurtenant structures, and
3. A visual inspection of any hydraulic structures underlying the base of the CCR unit or passing through the dike of the CCR unit for structural integrity and continued safe and reliable operation.

3.1 WEST BOILER SLAG POND

3.1.1 Changes in Geometry Since Last Inspection (257.83(b)(2)(i))

A low-volume wastewater treatment system (LVWTS) has been installed in the southwest corner of the WBSP. This included construction of a lined primary basin, a lined secondary basin, and modifications to the existing outlet structure. Wastewater has been redirected around the northern and western sides of the WBSP to outlet into the LVWTS primary basin. Reference drawings are provided in Appendix B (Burns & McDonnell 2023). Process flows into the historic WBSP have ceased.

Stormwater diversion modifications north and northwest of the WBSP have rerouted run-on stormwater around the WBSP to a permitted NPDES outfall on Big Clifty Creek. Flow into the impoundment is limited to direct rainfall and a small contribution of stormwater runoff from the northwest.

3.1.2 Instrumentation (257.83(b)(2)(ii))

Applied Geology and Environmental Science, Inc. (AGES) of Clinton, Pennsylvania manages the groundwater monitoring network at the Clifty Creek Station for IKEC. Piezometer data for the station was provided AGES.

**2023 CCR RULE – SURFACE IMPOUNDMENTS
CLIFTY CREEK DAM/DIKE INSPECTIONS**

Observations
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Nineteen piezometers/monitoring wells are associated with the WBSP. Locations of the instruments are shown on excerpts from the respective reports in Appendix C. The maximum recorded readings for each location within the past year are shown in Table 1.

Table 1. WBSP Maximum Piezometer Readings within the Past Year

Instrument⁴	Installation Date	Maximum Reading (ft)	Date of Reading
PZ-1 (B-1) ¹	11/4/2009	--	--
PZ-3 (B-3) ²	11/5/2009	--	--
PZ-4 (B-4) ³	11/11/2009	438.75	2/7/2023
PZ-5 (B-5) ³	11/10/2009	433.20	2/7/2023
WBSP-15-01	11/30/2015	453.73	3/13/2023
WBSP-15-02	11/11/2015	468.14	5/23/2023
WBSP-15-03	12/4/2015	476.99	1/12/2023
WBSP-15-04a	11/12/2015	421.55	1/11/2023
WBSP-15-05a	11/17/2015	442.00	4/18/2023
WBSP-15-06a	11/19/2015	424.32	1/11/2023
WBSP-15-07	11/23/2015	432.02	6/13/2023
WBSP-15-08	11/25/2015	434.10	6/13/2023
WBSP-15-09	1/6/2016	432.93	6/13/2023
WBSP-15-10	1/5/2016	432.87	6/13/2023
CF-15-04	12/3/2015	442.67	3/13/2023
CF-15-05	12/1/2015	437.83	3/13/2023
CF-15-06	11/30/2015	428.62	3/13/2023
WBSP-23-01	7/26/2023	429.20	8/10/2023
WBSP-23-02	7/25/2023	432.98	8/10/2023
WBSP-23-03	7/25/2023	428.88	8/10/2023
WBSP-23-04	7/26/2023	426.24	9/11/2023

Notes:

1. Piezometer PZ-1 could not be located during construction activities in 2023.
2. Piezometer PZ-3 was damaged during construction activities in 2023. It was closed on 7/19/2023.
3. Piezometers PZ-4 and PZ-5 were closed due to construction activities on 7/19/2023 and 7/20/2023, respectively.
4. Wells CF-15-04, CF-15-05, CF-15-06, WBSP-15-01 and WBSP-15-02 are part of both the LRCP and WBSP CCR networks.

Piezometer PZ-1 could not be located due to grading activities for the LVWTS. Piezometer PZ-3 was bent and damaged. Piezometers PZ-4 and PZ-5 were closed as part of the LVWTS construction. The maximum readings for those two instruments are for the portion of the year they were in service.

2023 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

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Per AGES, the uppermost aquifer below the WBSP is a discontinuous confined aquifer with pressures reflected in the potentiometric surface. Some piezometric levels are higher than the pool within the surface impoundment, suggesting artesian conditions.

3.1.3 Impoundment Characteristics (257.83(b)(2)(iii, iv, v))

Table 2 summarizes the WBSP impoundment characteristics since the previous annual inspection.

Table 2. Summary of WBSP Impoundment Characteristics

Characteristics²	2023 Values¹
Approximate Minimum Depth (Elevation) of impounded water	4 ft (443.0 ft)
Approximate Maximum Depth (Elev.) of impounded water	9 ft (448.0 ft)
Approximate Current Depth (Elev.) of impounded water ²	9 ft (448.0 ft)
Approximate Minimum Depth (Elev.) of CCR	0 ft (433.0 ft) ³
Approximate Maximum Depth (Elev.) of CCR	40 ft (473.0 ft)
Approximate Current Depth (Elev.) of CCR	Ranges from 0 to 40 ft (433 to 473 ft)
Storage Capacity of impounding structure at the time of the inspection ⁴	2,162,500 cy
Approximate volume of impounded water at the time of the inspection ⁵	130,700 cy (WBSP) 14,000 cy (LVWTS) ⁷
Approximate volume of CCR at the time of the inspection ⁶	2,195,000 cy

Notes:

1. All values in feet (ft) or cubic yards (cy). Elevation (Elev.) is shown in feet (NAVD88).
2. Excludes LVWTS basins. Reflects remaining WBSP footprint.
3. Minimum depth located beneath the LVWTS.
4. Assumes water impounded by WBSP embankment dam/dike, including the LVWTS and remaining WBSP footprint.
5. Based on current depth with and estimated pool of 9 acres in the remaining WBSP footprint.
6. Based on a base elevation of 433.0 ft and neglecting LVWTS footprint.
7. Estimates 4,000 cy in primary basin and 10,000 cy in secondary basin with two feet of freeboard.

The storage capacity and volumes of impounded water assume a water elevation of 436 feet within the primary basin, 440 feet within the secondary basin, and with a minimum elevation for the perimeter dike of 458 feet.

3.1.4 Visual Inspection (257.83(b)(2)(vi))

The visual inspection of the WBSP and appurtenant structures was conducted to identify actual or potential structural weaknesses or a condition disrupting or that has potential to disrupt the operation and safety of the impoundment. Specific items observed included upstream and downstream slopes, crest of the embankment dam/dike, and inlet and outlet structures. Appendix A includes a plan view and table with inspection points identified in the field. Appendix D includes a photographic log of the conditions.

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The visual inspection started with observations of current and former inlet structures to the WBSP. On the northwest side of the pond is an existing CON/SPAN (box/arch culvert structure) that carried stormwater inflow from the north side of the station property and eastern side of the CCR landfill. Two lined ponds have been constructed on the east side of the CCR landfill to capture and manage stormwater runoff and landfill leachate. Stormwater run-on from the hillside north of the CCR landfill has been rerouted through a diversion channel north of the WBSP, discharging through an NPDES-permitted outfall into Big Clifty Creek.

The existing culvert appears to be in satisfactory condition with negligible inflow. Flow appears to be limited to the area immediately adjacent to the culvert. The CCR sluice piping in the northeast corner of the WBSP has been terminated at the perimeter of the pond, and the pipes removed from within the pond.

The inlet for the LVWTS outfall structure in the southwestern corner of the pond was observed from the shore due to work being done on the railings accessing the structure and around it. Both the upstream and the downstream side of the outfall structure to the Ohio River appear to be in satisfactory condition. No other water inlet or outlet structures were observed for the WBSP other than the pipe carrying process water to the LVWTS. A culvert controls flow between the two LVWTS lined basins.

The WBSP can be divided into three areas: the LVWTS at the southwestern end of the pond, the inactive CCR deposition and processing area at the northeast end, and a marsh-like area in between. A plan view of the impoundment is included in Appendix A.

Since the 2022 inspection, the interior slopes of the LVWTS have been stripped of vegetation and covered with a filter fabric and a layer of crushed stone. Reference drawings for the LVWTS construction are included in Appendix B. Interior slopes are relatively uniform, riprap covered, and appear to be in good condition. Only one plant was observed growing on the newly constructed slope.

The southern portion of the embankment dam/dike (facing the Ohio River) near the LVWTS is covered with grass but is clear of tall foliage. At the access road to the WBSP outfall, there is minor rutting. There were no observed animal burrows in the grassy area of the dike. Northeast of the LVWTS the interior is marsh-like, and the interior slopes of the embankment dam/dike on the south side are covered with tall weeds and dense brush. The riverside slope northeast of the LVWTS is overgrown with small to large trees, dense brush, and tall grass. The end of the cleared path is noted on the figure in Appendix A. Inspection of these slopes was not possible due to the overgrown vegetation.

In general, the internal and external slopes where the vegetation has been controlled appear to be in satisfactory condition. There were no visible signs of impoundment impairment that could affect the normal operation of the facility.

3.1.5 Changes that Affect Stability or Operation (257.83(b)(2)(vii))

Significant construction changes to the operation and geometry of the WBSP and new LVWTS system have been noted above. Based on discussions with IKEC representatives and observations made during the field inspection, there were no changes to the WBSP impoundment that would affect its stability or future

2023 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

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operational needs. Improvements and changes associated with the phased construction do not appear to negatively affect the embankment stability.

3.2 LANDFILL RUNOFF COLLECTION POND

3.2.1 Changes in Geometry Since Last Inspection (257.83(b)(2)(i))

The Phase 1 changes to the LRCP dam were completed in October of 2023. Modifications include construction of a lined stormwater channel to collect stormwater run-on and discharge from the southwest landfill sedimentation basin. The flows are directed through the dam via a new culvert placed in the dam. Approximately three-quarters of the dam has been lowered about 10 to 12 feet with the downstream slopes regraded for better maintenance access. Downstream of the dam the new outfall channel extends to the Ohio River. As part of the improvements, a new access road was constructed across the top of the dam and adjacent to the channel. Future Phase 2 improvements will involve dewatering and grading the CCR and the installation of the final cover system. Modifications to the existing outfall structure will also be required. Reference drawings are provided in Appendix B (Stantec 2021b).

3.2.2 Instrumentation (257.83(b)(2)(ii))

Prior to the Phase 1 improvements, fifteen piezometers were located in the toe and downstream area of the dam. One of the piezometers, CF-9405, was removed at the start of construction due to its location in the proposed downstream channel. Locations of the instruments are shown on excerpts from the respective reports in Appendix C. Table 3 below summarizes the maximum reading since the last annual inspection.

Table 3. LRCP Maximum Piezometer Readings within the Past Year

Instrument ²	Installation Date	Maximum Reading (ft)	Date of Reading
CF-9405A	7/21/2021	441.48	3/13/2023
CF-9406	5/10/1994	441.91	3/13/2023
CF-9407	5/12/1994	446.74	1/10/2023
SP-84-7	9/25/1984	445.80	1/10/2023
SP-84-8A ¹	9/26/1984	437.48	3/13/2023
CF-15-042	12/3/2015	442.67	3/13/2023
CF-15-05	12/1/2015	437.83	3/13/2023
CF-15-06	11/30/2015	428.62	3/13/2023
WBSP-15-01	11/30/2015	453.73	3/13/2023
WBSP-15-02	11/11/2015	468.14	5/23/2023
CF-15-07	11/23/2015	436.29	7/5/2023
CF-15-08	11/19/2023	440.34	6/14/2023
CF-15-09	11/25/2023	446.66	1/10/2023
CF-19-14	3/8/2019	445.62	6/14/2023
CF-19-15	3/13/2019	424.46	3/13/2023

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Notes:

1. Piezometer SP-84-8A was closed on 7/19/2023.
2. Wells CF-15-04, CF-15-05, CF-15-06, WBSP-15-01 and WBSP-15-02 are part of both the LRCP and WBSP CCR networks.

Per AGES, the uppermost aquifer below the LRCP is a discontinuous confined aquifer with pressures reflected in the potentiometric surface. Some piezometric levels are higher than the pool within the surface impoundment, suggesting artesian conditions.

3.2.3 Impoundment Characteristics (257.83(b)(2)(iii, iv, v))

The LRCP is an inactive facility that ceased wet CCR disposal in 1986 (AEPSC, 2016b). As part of the Phase 1 activities, the surface water in the pond was lowered and maintained at approximately elevation 478 feet. Table 4 summarizes the impoundment characteristics since the previous annual inspection.

Table 4. Summary of LRCP Impoundment Characteristics

Characteristics	2023 Values ¹
Approximate Minimum Depth (Elevation) of impounded water	2.9 ft (477.9 ft)
Approximate Maximum Depth (Elev) of impounded water	6.2 ft (481.2 ft)
Approximate Current Depth (Elev) of impounded water	3 ft (478 ft)
Approximate Minimum Depth (Elev) of CCR	Less than 5 ft (assumed) (Varying elevations) ³
Approximate Maximum Depth (Elev) of CCR	45 ft (485 ft) ³
Approximate Current Depth (Elev) of CCR	Less than 5 ft to 55 ft (Varying elevations) ³
Storage Capacity of impounding structure at the time of the inspection	697,500 cy
Approximate volume of impounded water at the time of the inspection	21,000 cy
Approximate volume of CCR at the time of the inspection	2,000,000 cy

Notes:

1. All values in feet (ft) or cubic yards (cy). Elevation (Elev.) is shown in feet (NAVD88).
2. Depth of impounded water is shown as water ponded above the CCR elevation (estimated at elevation 475 feet).
3. Ground surface within the LRCP conservatively estimated as 430 feet, reflecting the pond's estimated lowest elevation (Stantec, 2018). Bottom elevation varies across the footprint.
4. Volumes of water based on stage-storage curves and the current depth of impounded water.

3.2.4 Visual Inspection (257.83(b)(2)(vi))

With the recent construction work performed for the Phase 1 improvements, most of the visible surfaces of the dam were regraded and improved with the exception of the riprap-covered slope at the eastern end of the dam and the existing untouched portion on the west side. The newly graded slopes were recently seeded and mulched, and new grass was sprouting. On the downstream side, there were a few locations

2023 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

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along the north edge of the new channel where erosion rills had started to form and one location below the access road to the toe where the seeded surface had sloughed off the slope. On the downstream slope between the access road to the toe and the riprap-covered slope are several areas where minor grading occurred. In these areas the bulldozer trampled the grass and may require reseeding to prevent erosion. Overall, the dam and associated structures appear to be in satisfactory condition.

Appendix A includes a plan view and table with inspection points identified in the field. Appendix D includes a photographic log of the conditions.

3.2.5 Changes that Affect Stability or Operation (257.83(b)(2)(vii))

Dam degradation and the addition of the 12-foot by 4-foot box culvert to allow routing of run-on stormwater around the LRCP have potential for affecting the stability of the dam. Placement of a structure in or below an earthen dam provides the potential for seepage around the structure. Stantec provided a professional engineer to provide quality assurance during construction activities on the LRCP dam. Based on review of the construction observation reports, clay fill was adequately placed and compacted around the outside of the culvert structure. Shortly after completion of construction, the culvert appeared to adequately convey water from the upstream side to the downstream channel. Grass should help protect the slopes from erosion once the newly seeded slopes have matured.

4.0 SUMMARY OF FINDINGS

The following recommendations regarding maintenance, monitoring, and deficiencies are offered for the Clifty Creek Station's two CCR surface impoundments.

4.1 MAINTENANCE

4.1.1 West Boiler Slag Pond

The upstream and downstream dike slopes and crest areas, east of the LVWTS, are overgrown with small to large trees and heavy brush (Photographs 6, 7, and 8 in Appendix D). These conditions make it virtually impossible to inspect the slopes. The trees and larger brush can also provide seepage pathways as the larger foliage dies off. Trees that topple in windstorms can leave large holes exposed in the face of the dam. Stantec recommends that the overgrown crest and downstream side of the dam be stripped of foliage, graded for ease of maintenance, and seeded with grass to protect it from erosion. This will allow for future inspections to be conducted on this portion of the dam.

On the downstream face of the dam near the LVWTS, the minor rutting should be backfilled, graded, and reseeded. It appears that minor rutting of the south dike crest mentioned in the 2022 inspection report was repaired.

The structural integrity of the dikes and components of the WBSP should be maintained during continuing closure activities.

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January 19, 2024

4.1.2 Landfill Runoff Collection Pond

Minor maintenance for the LRCP includes mowing of the dam slopes to observe potential issues or concerns, repairing the erosion rills above the downstream channel (Photograph 10) and the disturbed areas on the western downstream slope just west of the newly graded slope (Photograph 9). The surface-sloughed area beneath the access road to the toe (Photograph 12) and the thinly vegetated slopes east of the access road (Photograph 13) will likely require attention as well.

Some additional riprap may be necessary around the top and sides of the upstream and downstream ends of the new 12-foot by 4-foot culvert to fill in bare spots that are inside of the silt fencing (Photographs 17 and 19).

At the outlet for Outfall 001, we recommend that all brush and tall foliage around the wingwalls be removed to a distance of about 20 feet and replaced with either grass or riprap to aid in observation of the outlet structure. A railing around the top of the head and wing walls could also be considered. Debris left over from previous clearing activities should be removed from inside the culvert outlet box (Photograph 5). Since water will no longer be impounded in the LRCP, we recommend that an area at a distance of 20 feet around the inlet structure be cleared of all tall grasses and brush (Photographs 6 and 7). In addition, railings should be replaced or reinstalled around the inlet structure. A portion of the metal grating that covers one of the old inlets has been cut away leaving an open hole (Photograph 7). The grating should be replaced or the hole covered. Any superfluous materials or fixtures associated with the inlet structure should be removed. It is understood that the inlet elevation will be adjusted as part of the Phase 2 construction (Photograph 8).

Appendix A includes a plan view and table with inspection points identified in the field. Appendix D includes a photographic log of the conditions.

4.2 MONITORING

EPA regulations require weekly and monthly inspections of the CCR surface impoundments, which are performed by qualified plant personnel. These inspections include observations for actual or potential structural weaknesses or other conditions that may disrupt the operation or safety of the CCR unit. The discharge from outlets of hydraulic structures under the base of the surface impoundment or through the dike of the CCR unit is observed for abnormal discoloration or discharge of debris or sediment. Available 2023 weekly and monthly inspection reports were provided by plant personnel for review (IKEC 2023a through 2023d).

Per 40 CFR 257.83(a)(iii), instrumentation should be monitored at least every 30 days by a qualified person. AGES performs a monthly inspection/inventory of the instrumentation at the BSP and SFAP. Daily field activity updates are provided to OVEC and Stantec at a frequency less than 30 days, documenting instrument condition and sampling events (AGES 2023c).

Annual inspections by a qualified professional engineer are required under the EPA regulations. The dam and dike inspections for 2015 through 2022 were performed by American Electric Power Service

2023 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

References

January 19, 2024

Corporation (AEPSC) (AEPSC 2015, 2016, 2017, 2022a through 2022e). Copies are available on IKEC's publicly accessible CCR website (IKEC 2023e).

4.2.1 WBSP Monitoring

Special or more frequent monitoring of the facility other than that already being performed should not be necessary unless conditions change.

4.2.2 LRCP Monitoring

With the Phase 1 construction activities complete, the new culvert performance and newly graded and seeded slopes should be monitored for erosion until the grass is sufficiently established. Settlement of the approach fill on either side of the culvert may become evident by a bump that precedes the culvert.

4.3 DEFICIENCIES

No structural deficiencies in the dam/dike structures were observed during the 2023 annual inspection.

5.0 REFERENCES

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2023 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

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2023 CCR RULE – SURFACE IMPOUNDMENTS CLIFTY CREEK DAM/DIKE INSPECTIONS

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January 19, 2024

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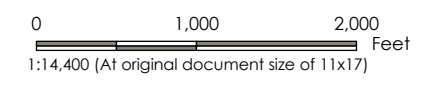
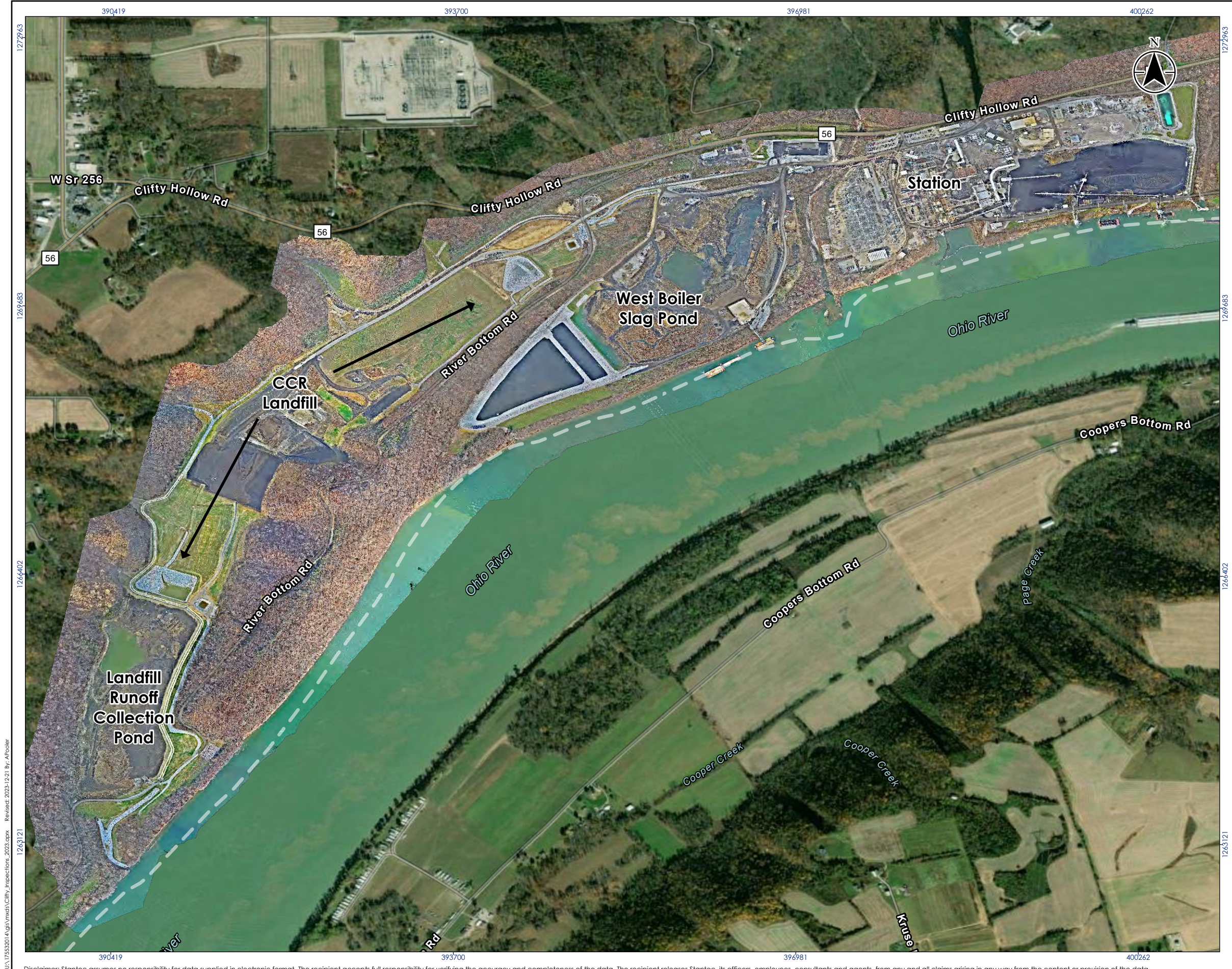
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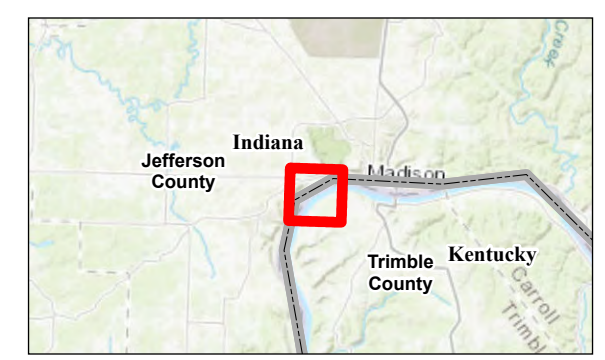
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APPENDIX A

Figures



- Notes**
- 1. Coordinate System: Latitude/Longitude NAD83
 - 2. Base features - ESRI
 - 3. Ortho-Imagery represents conditions from November 2023.



Project Location
Clifty Creek Station
Jefferson County, IN

175532014
Prepared by ANP on 2023-12-21
Technical Review by DP on 2023-12-21
Independent Review by JSH on 2023-12-21

Client/Project
Indiana - Kentucky Electric Corporation
Clifty Creek Station

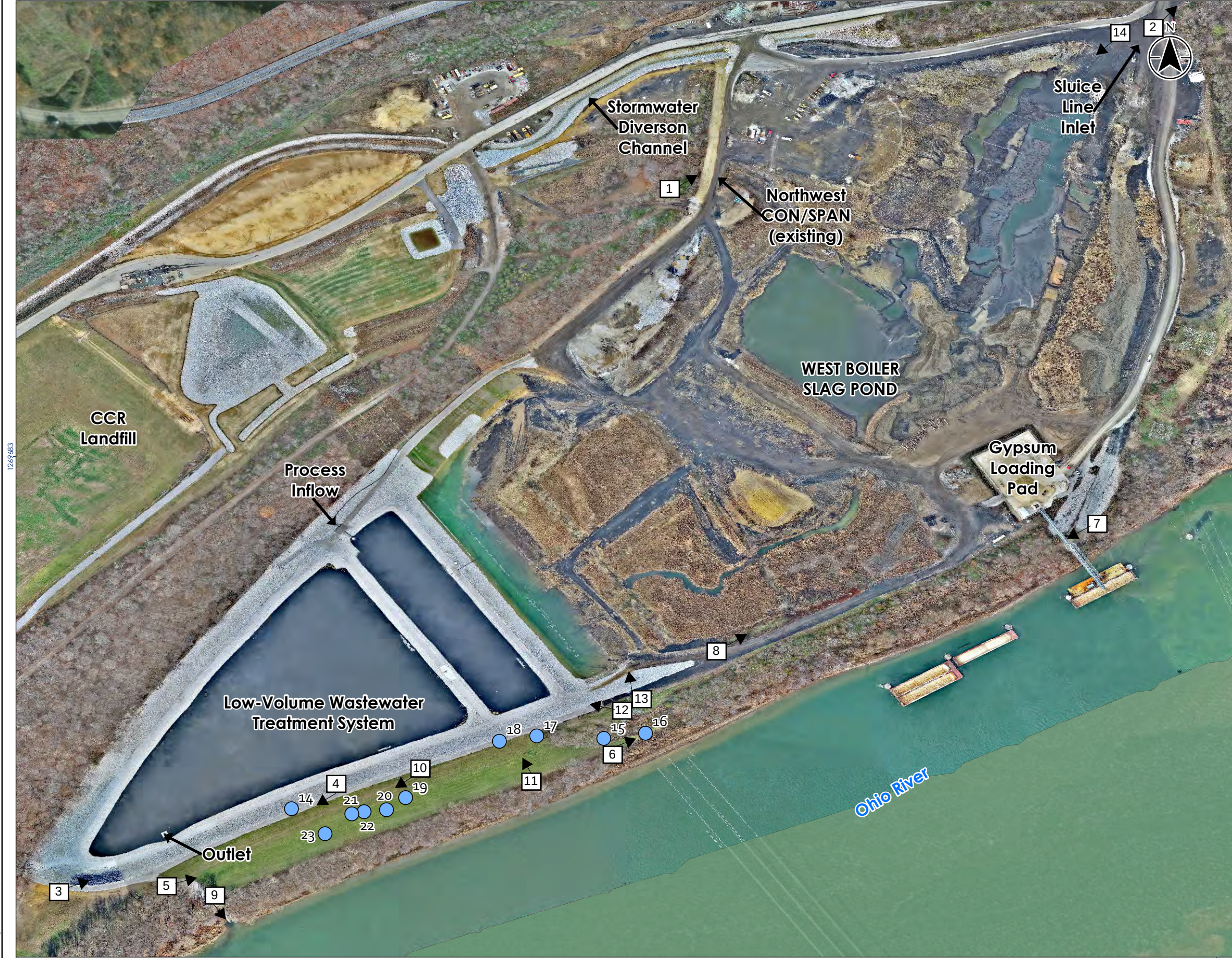
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1

Title
**2023 Annual CCR Facility Inspections -
Station Overview**

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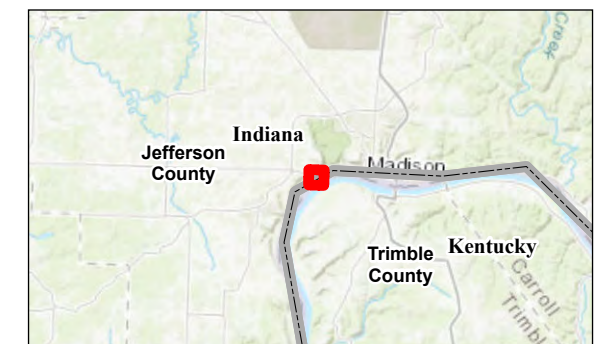
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- Legend
- 1 → Photo Location
 - Inspection Locations 2023

0 200 400 Feet
1:4,200 (At original document size of 11x17)

- Notes
- 1. Coordinate System: Latitude/Longitude NAD83
 - 2. Base features - ESRI
 - 3. Ortho-Imagery represents conditions from November 2023.



Project Location
Clifty Creek Station
Jefferson County, IN

175532014
Prepared by ANP on 2023-12-21
Technical Review by DP on 2023-12-21
Independent Review by JSH on 2023-12-21

Client/Project
Indiana - Kentucky Electric Corporation
West Boiler Slag Pond

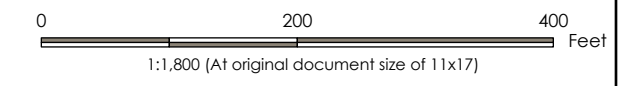
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Title
2023 Annual CCR Surface Impoundment Inspection

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- Legend
- 1 → Photo Location
 - Inspection Locations 2023



- Notes
- 1. Coordinate System: Latitude/Longitude NAD83
 - 2. Base features - ESRI
 - 3. Ortho-Imagery represents conditions from November 2023.



Project Location
Clifty Creek Station
Jefferson County, IN

175532014
Prepared by ANP on 2023-12-21
Technical Review by DP on 2023-12-21
Independent Review by JSH on 2023-12-21

Client/Project
Indiana - Kentucky Electric Corporation
Landfill Runoff Collection Pond

Figure No.
3

Title
2023 Annual CCR Surface Impoundment Inspection

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12/6/21
Revised: 2024-01-08 By: A.Pooder

GPS Data Points
2023 Annual Inspection

Clifty Creek CCR Surface Impoundments
Jefferson County, Indiana

Point ID No.	Comment	Latitude	Longitude	Impoundment
1	soft or wet areas	38.71721921	-85.44887571	LRCP
2	soft or wet areas	38.71721954	-85.44894026	LRCP
3	depressions, small burrows	38.71721585	-85.44892846	LRCP
4	denuded area reseed, 1 ft	38.71691157	-85.44850552	LRCP
5	soft areas, 20 ft strip	38.71703769	-85.44846267	LRCP
6	5 ft depression, toe of slope	38.71705499	-85.44809360	LRCP
7	soft area below new road	38.71712318	-85.44802500	LRCP
8	erosion top to bottom	38.71737268	-85.44693560	LRCP
9	erosion end of guardrail, riprap	38.71929480	-85.44500785	LRCP
10	hump at southeast past riprap	38.71886289	-85.44519779	LRCP
11	soft area, new grading	38.71836721	-85.44560407	LRCP
12	erosion, reseeding est. 20 ft	38.71799902	-85.44601785	LRCP
13	erosion, reseeding est. 20 ft	38.71788884	-85.44615516	LRCP
14	plant near bottom 1/3 slope	38.73068996	-85.43401725	WBSP
15	debris in heavy brush	38.73136361	-85.43102513	WBSP
16	start of heavy brush	38.73141328	-85.43062515	WBSP
17	erosion rill from road	38.73138721	-85.43166717	WBSP
18	equipment ruts parallel crest	38.73133624	-85.43202483	WBSP
19	buried manhole	38.73079597	-85.43292400	WBSP
20	dead spot est. 5 ft	38.73068006	-85.43310700	WBSP
21	dirt area est. 3 ft	38.73066113	-85.43332126	WBSP
22	dead spot est. 2 ft x 4 ft	38.73064049	-85.43343925	WBSP
23	soft low area est. 5 ft x 8 ft	38.73045058	-85.43369539	WBSP

APPENDIX B

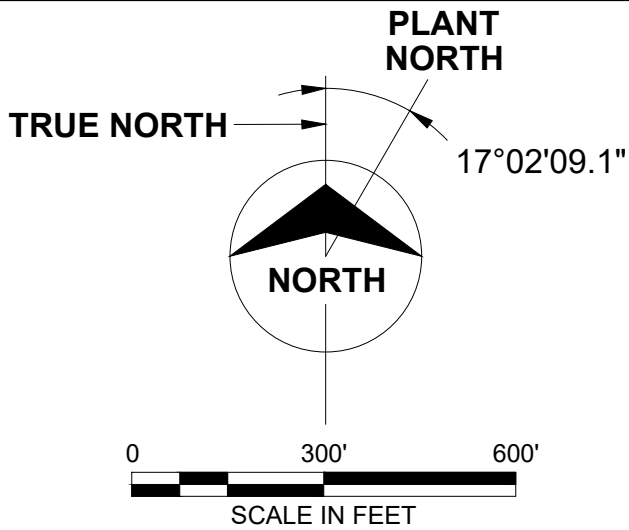
Reference Drawings

APPENDIX B

Burns & McDonnell (2023)



PROJECT CONTROL POINTS						
NAME	PLANT COORDINATES			IN EAST STATE PLANE NAD27		
	NORTHING	EASTING	ELEV	NORTHING	EASTING	NAVD88 ELEV
MON-1	N 5,525.100	E 1,234.577	511.424	N 443,950.450	E 563,164.420	510.084
MON-2	N 10,813.224	E 6,644.368	511.767	N 450,591.790	E 566,786.870	510.427
MON-3	N 10,817.721	E 8,875.428	473.007	N 451,249.940	E 568,918.63	471.667
MON-4	N 8,466.325	E 4,855.629	469.729	N 447,823.730	E 565,764.48	468.389



CONFORMING TO
CONSTRUCTION
RECORDS

9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co., Inc.

designed
A. MYERS

detailed
C. DONNICI

Ohio Valley Electric Corporation Indiana-Kentucky Electric Corporation

CLIFTY CREEK GENERATING STATION
CCR / ELG PROJECT

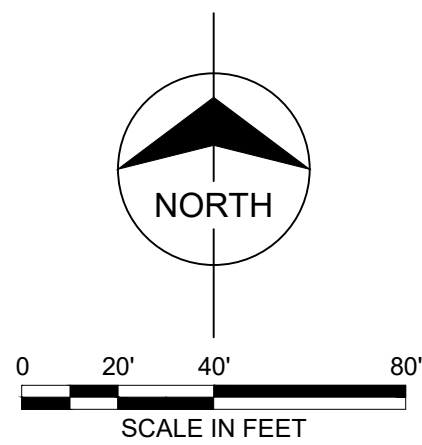
JEFFERSON COUNTY, INDIANA

LVWTS BASIN SITE PLAN			
project	142597	contract	8120
drawing	CS102		rev. 3
sheet	of	sheet	of
file 142597_CS102_SITE_PLAN.dwg			



NOTES:

1. SEE DETAIL DRAWING CG151 FOR BASIN DIVIDER BERM DETAILS.



CONFORMING TO
CONSTRUCTION
RECORDS



9400 WARD PARKWAY
KANSAS CITY, MO 64114
816-333-9400
Burns & McDonnell Engineering Co., Inc.

designed
A. MYERS

detailed
C. DONNICI



CLIFTY CREEK GENERATING STATION
CCR / ELG PROJECT

JEFFERSON COUNTY, INDIANA

LVWTS BASIN
FINISH GRADING PLAN
SHEET 2

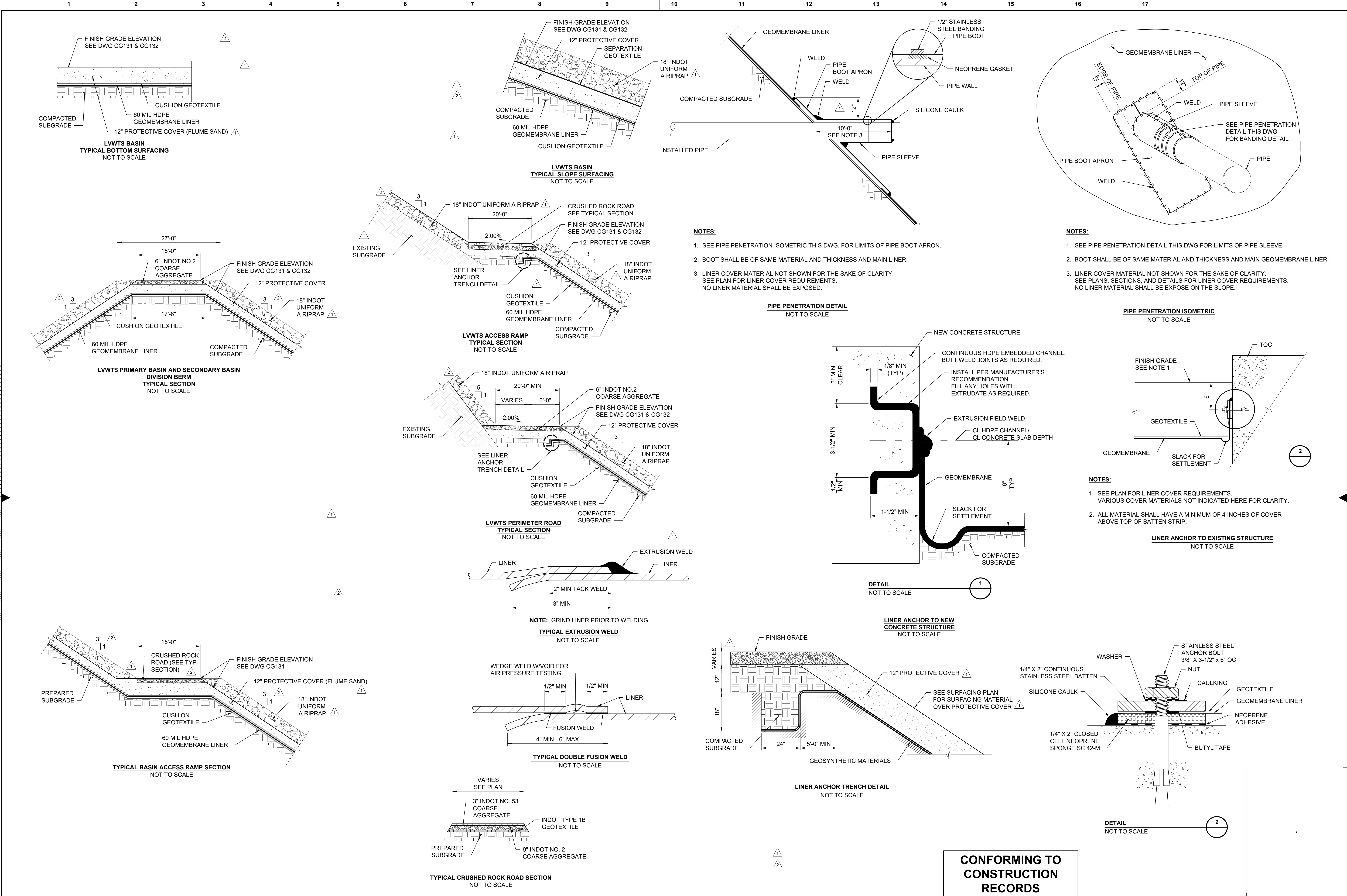
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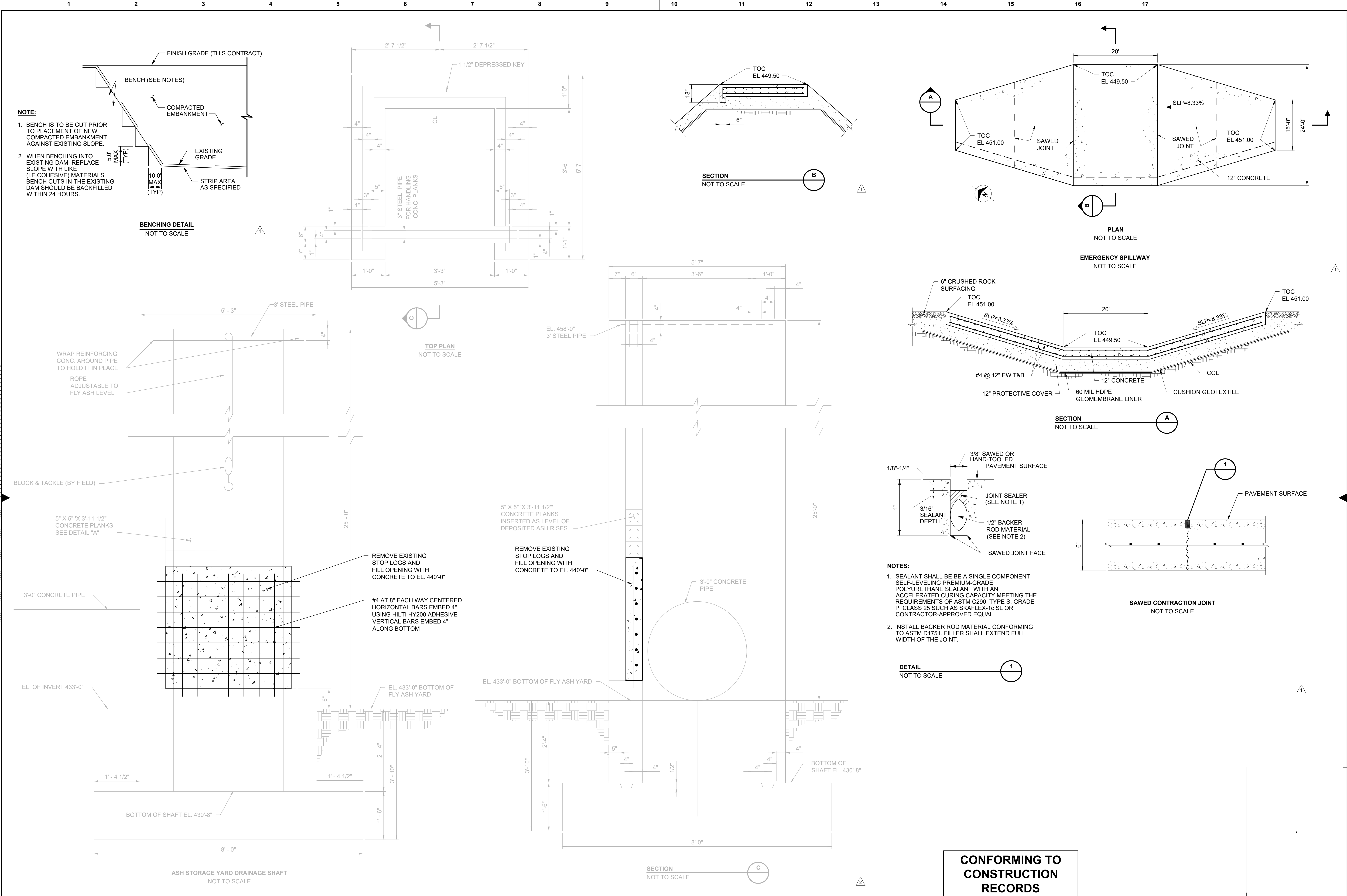
drawing rev.

CG132 — **2**

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file 142597_CG132_FINISH_GRADING_PLAN_SH2.dwg





3	09/15/23	AMM		CONFORMING TO CONSTRUCTION RECORDS																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																													
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APPENDIX B

Stantec (2021b)

Notes

MAPPING SOURCE NOTE:

TOPOGRAPHIC, BATHYMETRIC, AND PLANIMETRIC SURVEY INFORMATION FOR THE PLANS WERE OBTAINED FROM MAPPING PROVIDED BY INDIANA-KENTUCKY ELECTRIC CORPORATION (IKEC) AND AMERICAN ELECTRIC POWER (AEP). FIELD SURVEY OF THE WEST BOILER SLAG POND ARE WAS PERFORMED JULY THROUGH OCTOBER 2020 BY HREZO ENGINEERING, INC. FIELD SURVEY OF THE LANDFILL RUNOFF COLLECTION POND WAS PERFORMED SEPTEMBER THROUGH DECEMBER 2020 BY HREZO ENGINEERING, INC.. ACTIVE WORK AREAS NOT COVERED IN THE 2020 SURVEYS ARE BASED ON AERIAL AND FIELD SURVEYS DATED APRIL 2018, MAY 2018, AND SEPTEMBER 2019. SOME AREAS OUTSIDE OF RECENT WORK ZONES WERE SUPPLEMENTED WITH DATA USED IN THE LANDFILL PERMIT AND CONSTRUCTION DRAWINGS (AERIAL AND FIELD SURVEYS DATED 1992, 2005, 2007, 2008) AND 2011 - 2013 INDIANA STATEWIDE LIDAR (EAST). HORIZONTAL DATUM IS NAD27 AND VERTICAL DATUM IS NAVD88.

LEGEND

	ELECTRIC TOWER
	ELECTRIC PULLBOX
	TREE/SHRUB
	ELECTRIC POLE
	POWER POLE
	STORM CATCH BASIN
	OVERHEAD ELECTRIC
	UNDERGROUND ELECTRIC
	FENCE
	PROPERTY LINE
	RAILROAD TRACKS
	STORM SEWER
	EDGE OF WATER
	TREELINE
	EXISTING INDEX CONTOUR
	EXISTING INTERMEDIATE CONTOUR
	PROPOSED INDEX CONTOUR
	PROPOSED INTERMEDIATE CONTOUR
	GROUNDWATER MONITORING WELL
	CONTROL MONUMENT
	GRADING LIMITS
	TYPE I LANDFILL WASTE BOUNDARY
	CONSTRUCTION LIMITS
	COVER SYSTEM LIMITS
	PROPOSED PIEZOMETER

Revision	By	Appd	YYYY-MM-DD

A	ISSUED FOR PERMIT	ACS	MCV	2021-04-16
Issued		By	Appd	YYYY-MM-DD

File Name:	ACS	ACS	MCV	2021-04-16
104-LRCP-104-FG1-104-LRCP-104-FG1-104-LRCP-104-FG1	Dwn	Dgn	Chks	YYYY-MM-DD

Permit/Seal

Client/Project Logo

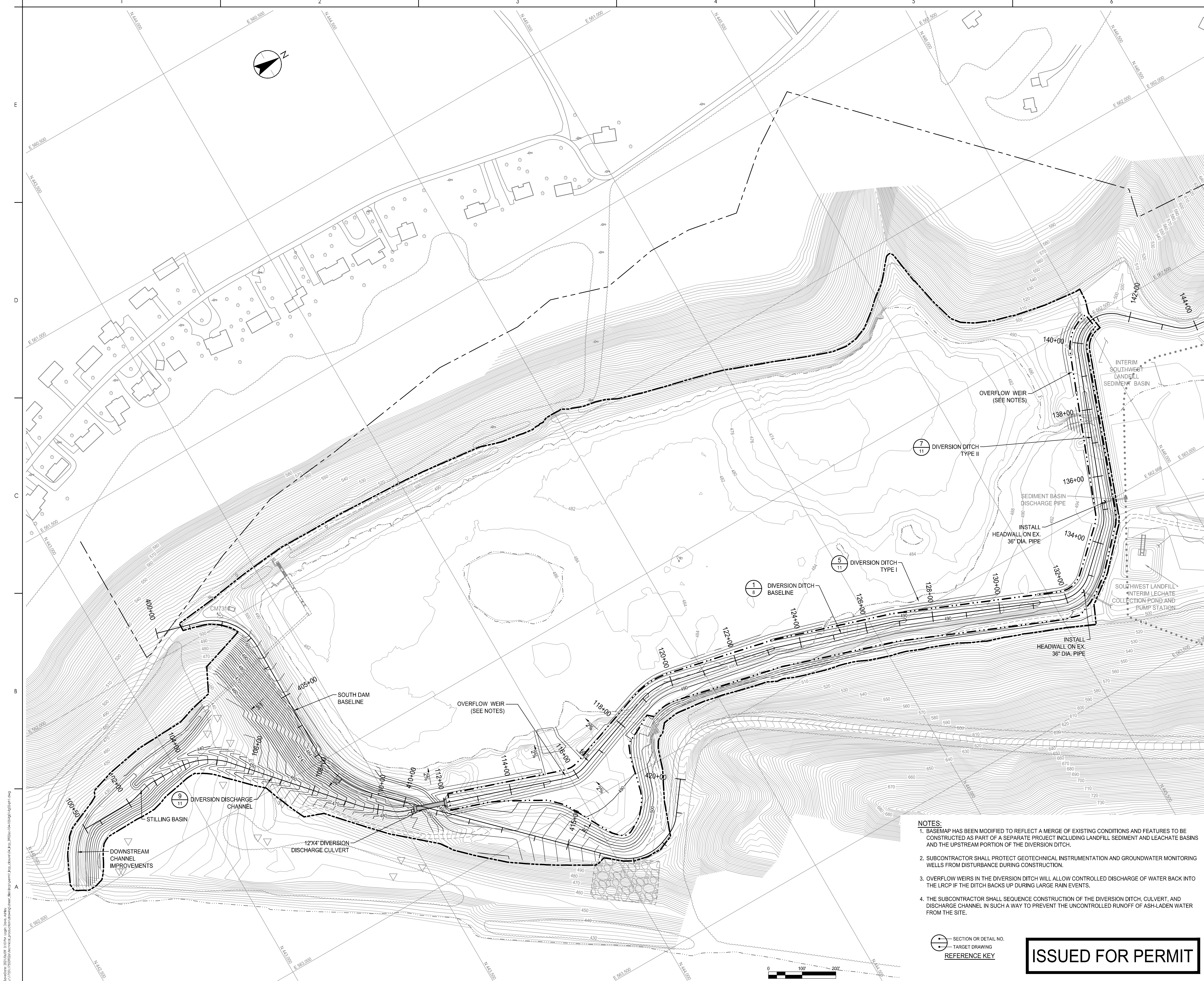


Client/Project
OHIO VALLEY ELECTRIC CORPORATION
INDIANA-KENTUCKY ELECTRIC CORPORATION
POND CLOSURE - LANDFILL RUNOFF
COLLECTION POND, CLIFTY CREEK STATION
MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA

Title

FINAL GRADING PLAN - PHASE 1
STORMWATER RUN-ON DIVERSION
AND OUTFALL

Project No.	Scale
175539026	1" = 100'
Revision Sheet	Drawing No.
A 4	P-LRCP-104-FG1

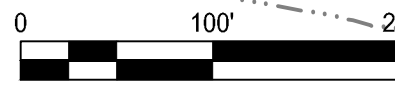


NOTES:

1. BASEMAP HAS BEEN MODIFIED TO REFLECT A MERGE OF EXISTING CONDITIONS AND FEATURES TO BE CONSTRUCTED AS PART OF A SEPARATE PROJECT INCLUDING LANDFILL SEDIMENT AND LEACHATE BASINS AND THE UPSTREAM PORTION OF THE DIVERSION DITCH.
2. SUBCONTRACTOR SHALL PROTECT GEOTECHNICAL INSTRUMENTATION AND GROUNDWATER MONITORING WELLS FROM DISTURBANCE DURING CONSTRUCTION.
3. OVERFLOW WEIRS IN THE DIVERSION DITCH WILL ALLOW CONTROLLED DISCHARGE OF WATER BACK INTO THE LROP IF THE DITCH BACKS UP DURING LARGE RAIN EVENTS.
4. THE SUBCONTRACTOR SHALL SEQUENCE CONSTRUCTION OF THE DIVERSION DITCH, CULVERT, AND DISCHARGE CHANNEL IN SUCH A WAY TO PREVENT THE UNCONTROLLED RUNOFF OF ASH-LADEN WATER FROM THE SITE.

SECTION OR DETAIL NO.
TARGET DRAWING
REFERENCE KEY

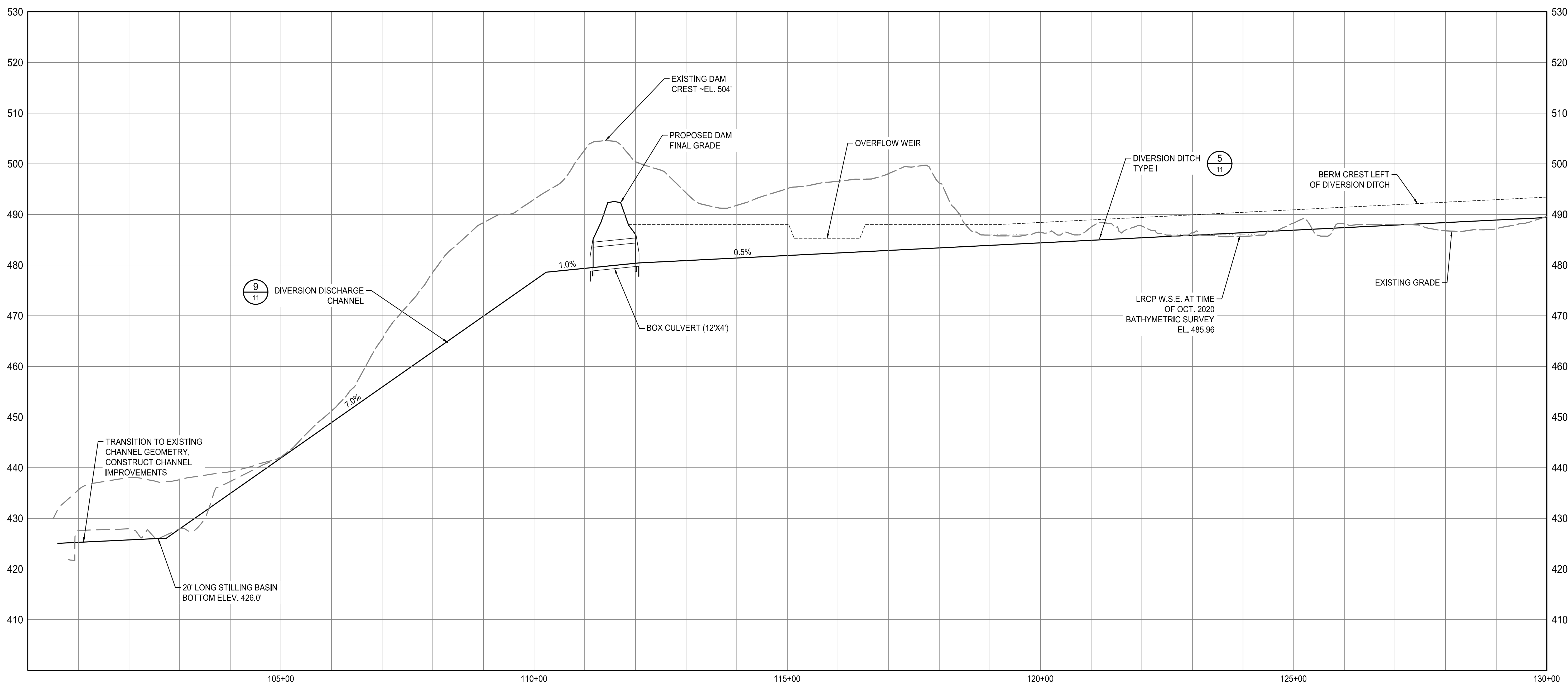
ISSUED FOR PERMIT





Consultant

Notes



SECTION OR DETAIL NO.
TARGET DRAWING
REFERENCE KEY

ISSUED FOR PERMIT

[illegible]

Permit/Seal

Client/Project Logo



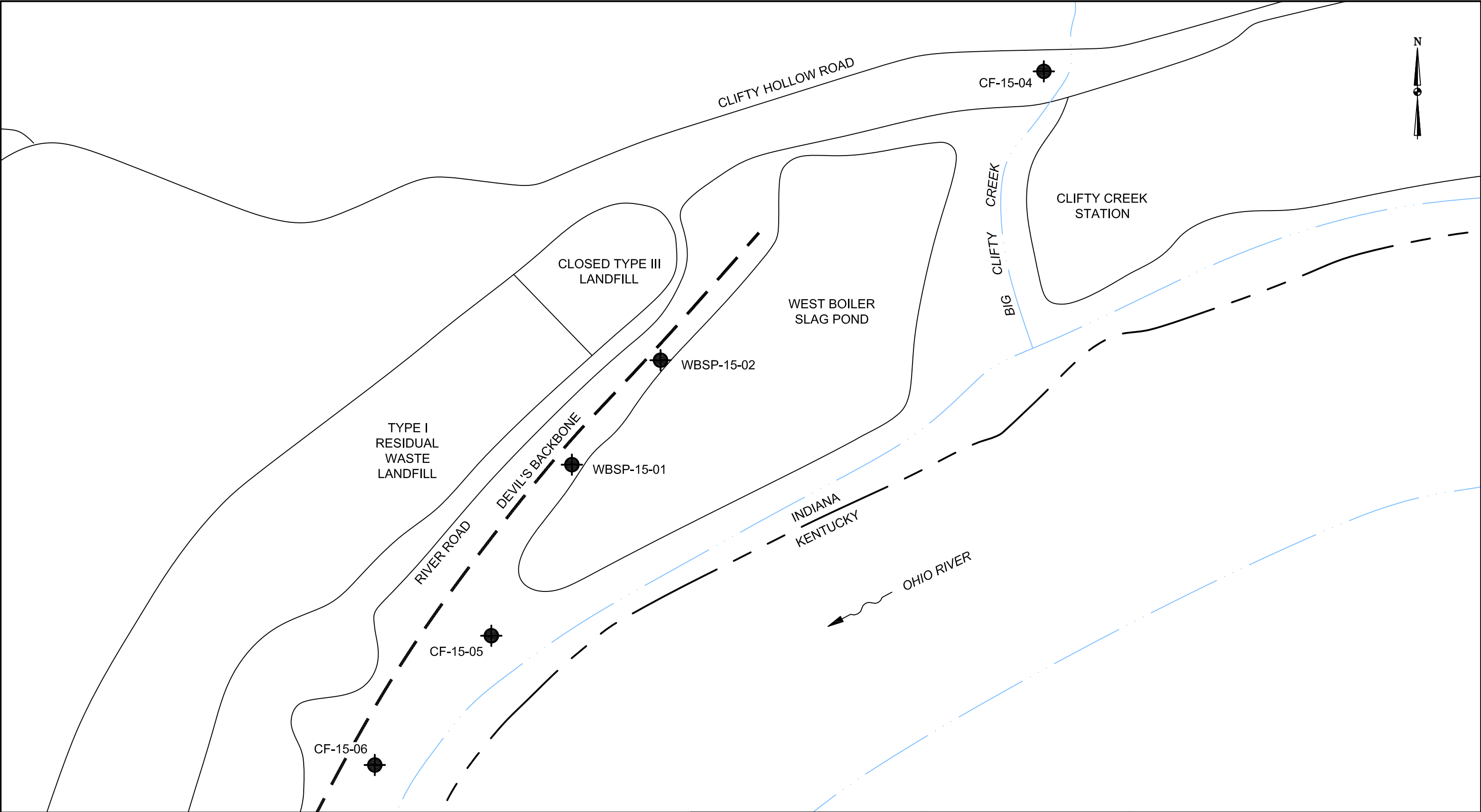
Client/Project
OHIO VALLEY ELECTRIC CORPORATION
INDIANA-KENTUCKY ELECTRIC CORPORATION
POND CLOSURE - LANDFILL RUNOFF
COLLECTION POND, CLIFTY CREEK STATION
MADISON TOWNSHIP, JEFFERSON COUNTY, INDIANA

PROFILE - DIVERSION DITCH BASELINE

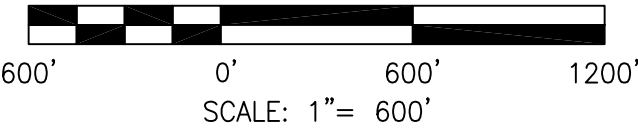
Project No. 175539026		Scale AS SHOWN
Revision A	Sheet 8	Drawing No. P-LRCP-220-PR1

APPENDIX C

Instrumentation



LEGEND:
 MONITORING WELL LOCATION

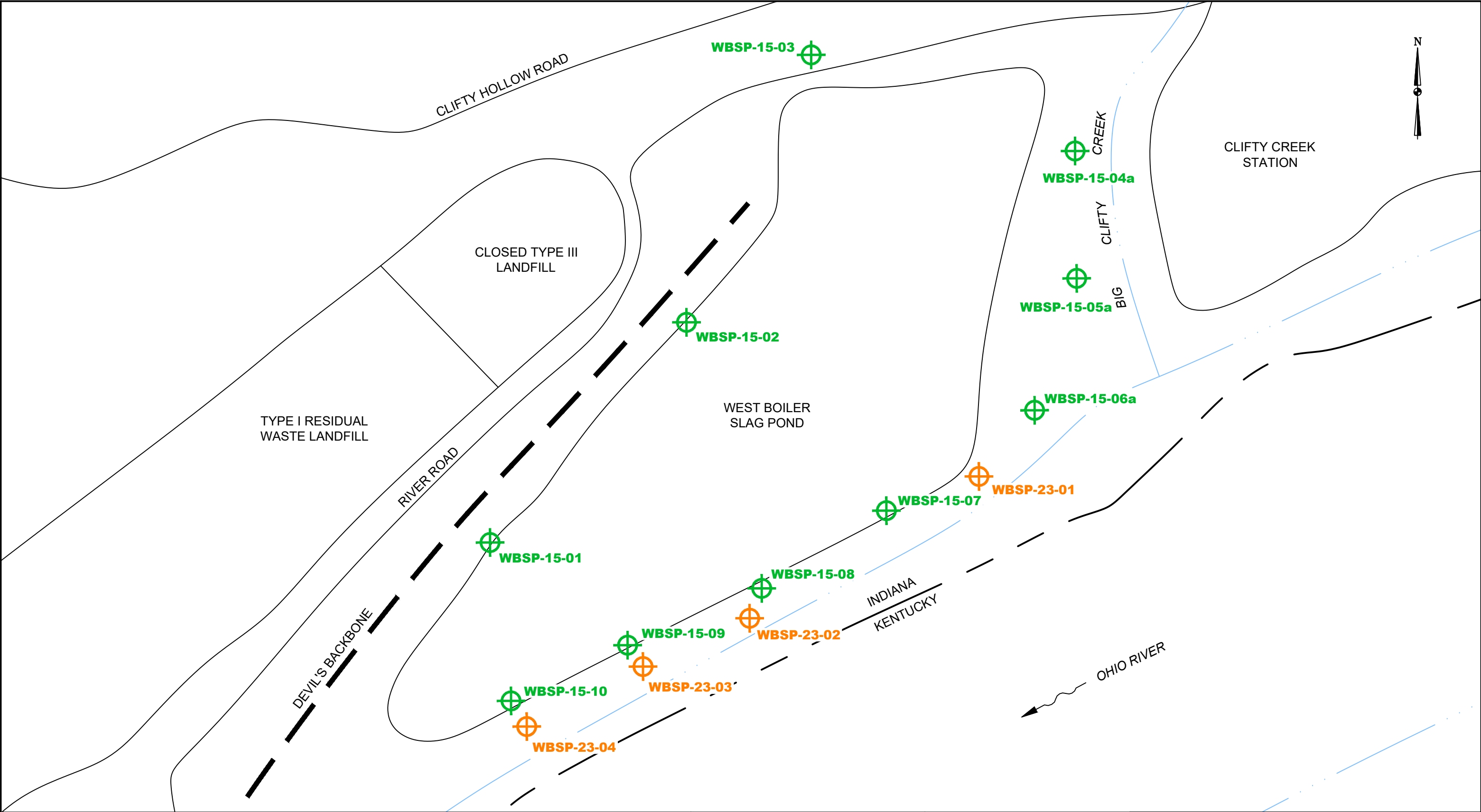


DRAWN BY	JM
DATE	
CHECKED BY	
JOB NO.	2015067-CLI
DWG. FILE	IKEC_Clifty MW Install_MWs_b02-b03-b04.dwg
DRAWING SCALE	AS SHOWN

**AGES**
Applied Geology And Environmental Science, Inc.

2402 Hookstown Grade Road, Suite 200
Clinton, PA 15026
412.264.6453

INDIANA-KENTUCKY ELECTRIC CORPORATION	
CLIFTY CREEK STATION MADISON, INDIANA TYPE I RESIDUAL WASTE LANDFILL AND LANDFILL RUNOFF COLLECTION POND BACKGROUND MONITORING WELL LOCATIONS	
DRAWING NAME	REV.
FIGURE 9	0



LEGEND:

CCR EXISTING PROGRAM MONITORING WELL

CCR INTERIM PROGRAM MONITORING WELL

SCALE: 1"= 400'

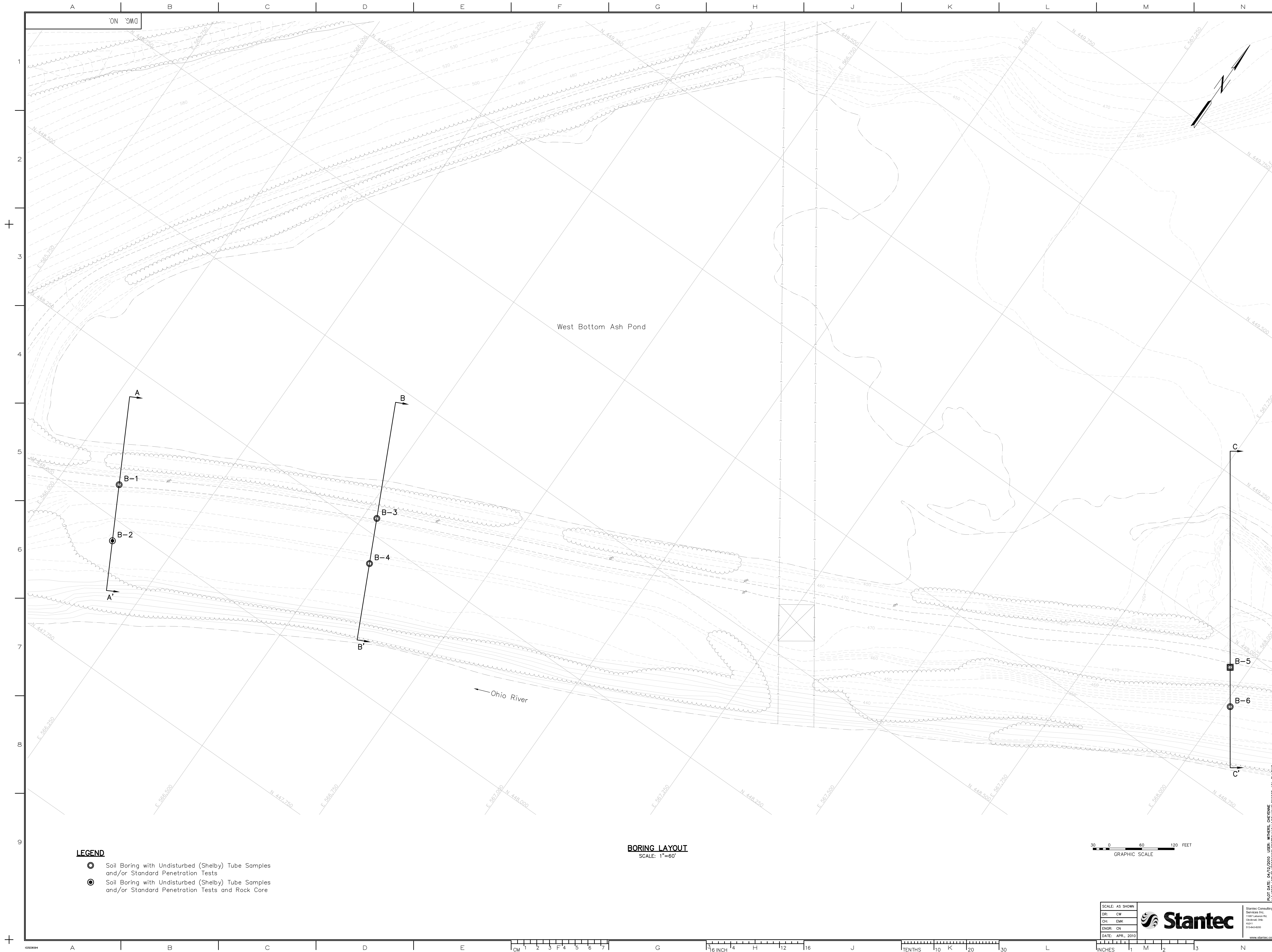
DATE	AB
CHECKED BY	
JOB NO.	2023004-CLI
DWG FILE	IKEC-Clifty_WBSP_Additional Locations.dwg
DRAWING SCALE	AS SHOWN

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INDIANA-KENTUCKY ELECTRIC CORPORATION

CLIFTY CREEK STATION
MADISON, INDIANA
WEST BOILER SLAG POND
EXISTING AND INTERIM MONITORING WELL LOCATION MAP

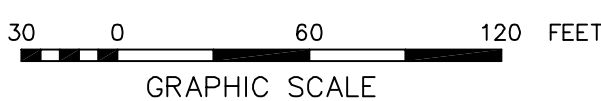
DRAWING NAME	FIGURE 5-2	REV.	0
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LEGEND

- Soil Boring with Undisturbed (Shelby) Tube Samples and/or Standard Penetration Tests
- Soil Boring with Undisturbed (Shelby) Tube Samples and/or Standard Penetration Tests and Rock Core

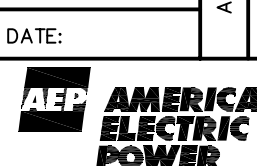
BORING LAYOUT
SCALE: 1"=60'



SCALE: AS SHOWN
DR: CW
CH: EMK
ENGR: CN
DATE: APR., 2010



Stantec Consulting
Services Inc.
11855 Lakeside Rd.
Cincinnati, Ohio
45241
513-442-6500
www.stantec.com



AEP SERVICE CORP.
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COLUMBUS, OH 43215

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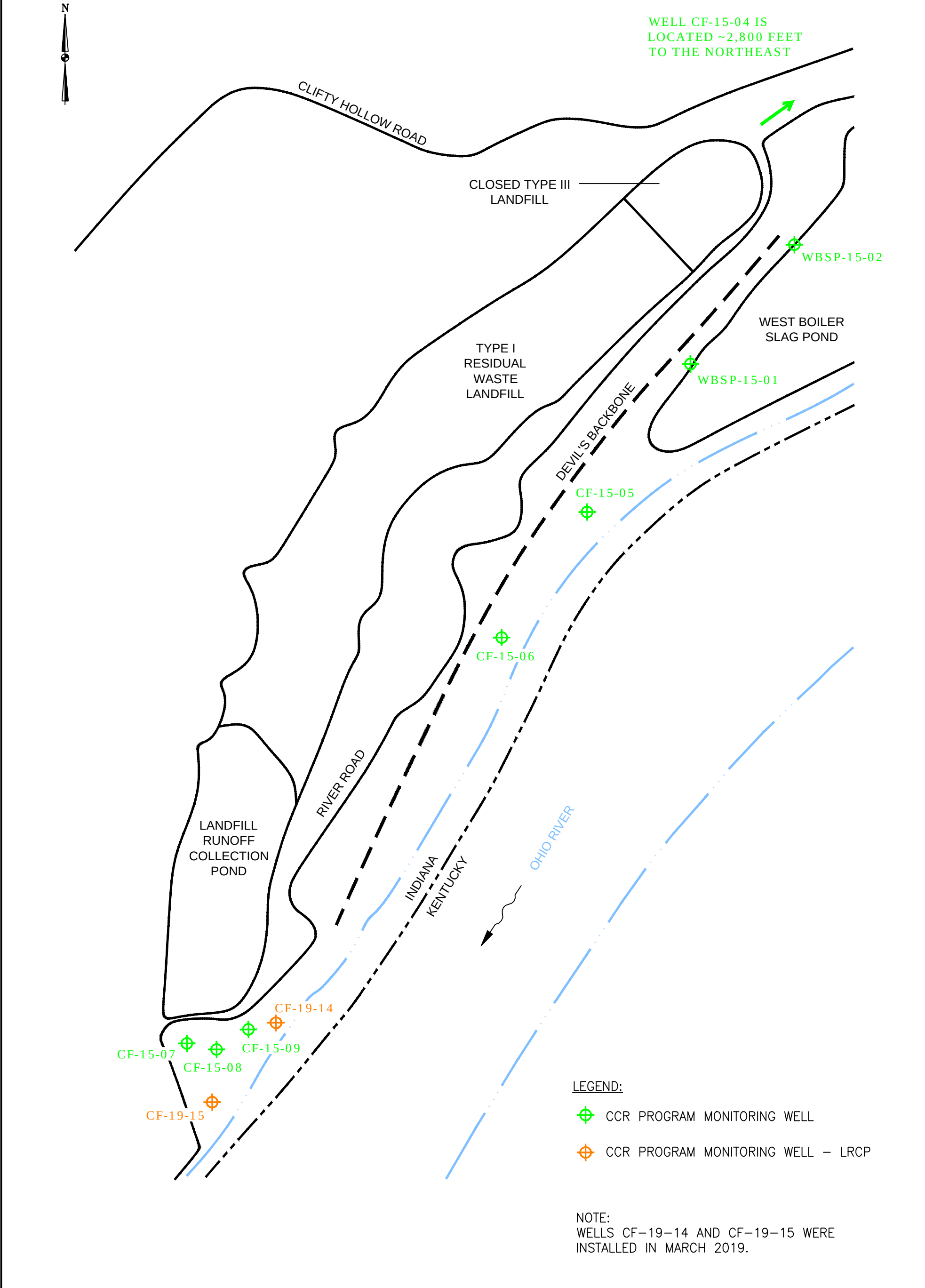
INDIANA - KENTUCKY ELECTRIC CO.
CLIFTY CREEK PLANT
MADISON INDIANA

GEOTECHNICAL EXPLORATION
WEST BOTTOM ASH POND
BORING LAYOUT

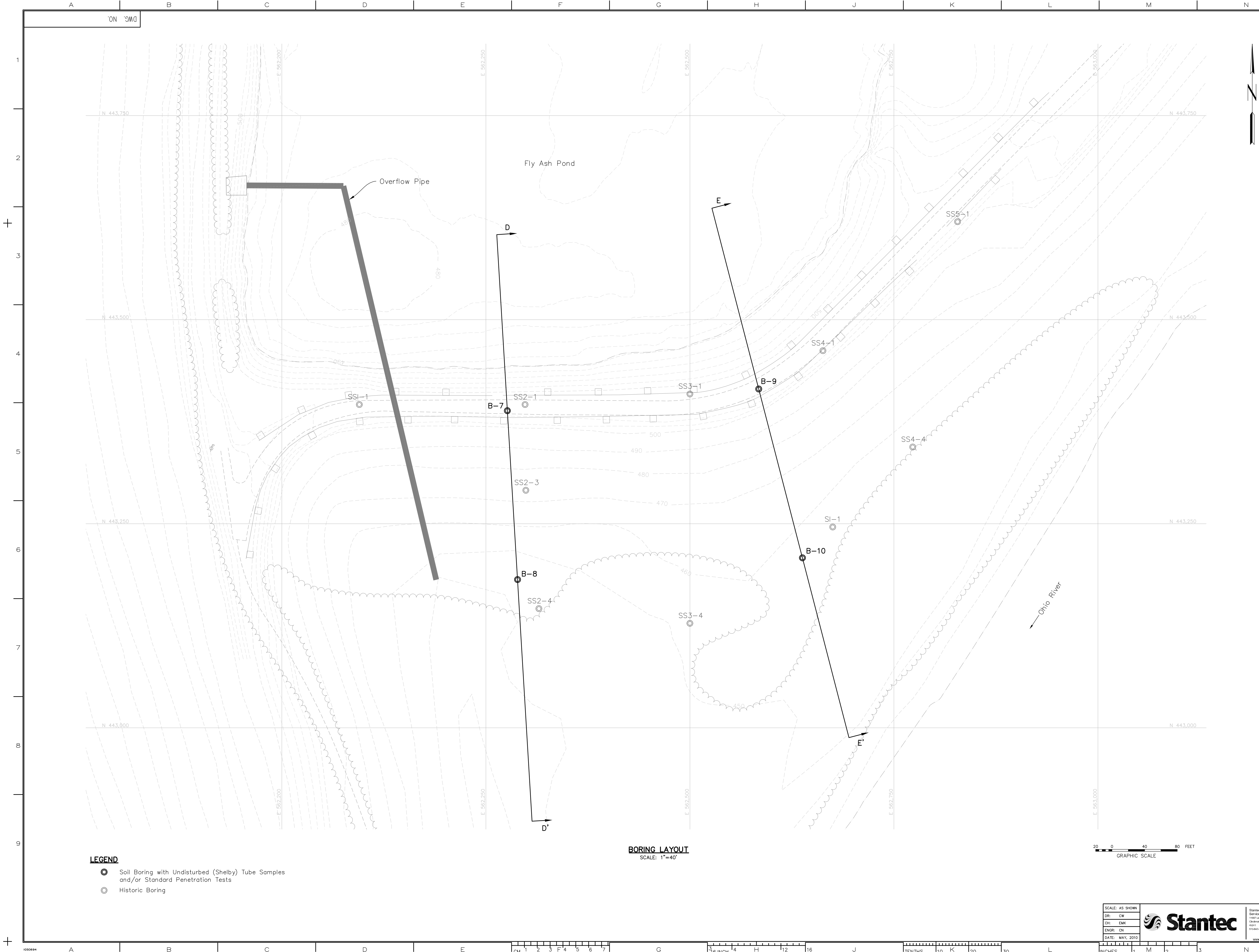
DWG. NO.

SCALE: CIVIL ENGINEERING DIVISION

APPROVED BY
ENGR:
ARCH:
DATE:



DRAWN BY		JM		 AGES Applied Geology And Environmental Science, Inc. 2402 Hookstown Grade Road, Suite 200 Clinton, PA 15026 412.264.6453	INDIANA-KENTUCKY ELECTRIC CORPORATION	
DATE					CLIFTY CREEK STATION MADISON, INDIANA TYPE I RESIDUAL WASTE LANDFILL AND LANDFILL RUNOFF COLLECTION POND MONITORING WELL LOCATION MAP	
CHECKED BY						
JOB NO.		2020010-CLIFTY				
DWG FILE		2_2020_IKEC_Clifty_GW MW LOCs_LANDFILL b01.dwg			DRAWING NAME	FIGURE 2
DRAWING SCALE		NOT TO SCALE				



NOTES

REFERENCE DRAWINGS

DATE	NO.	DESCRIPTION	APPRO.
REVISIONS			
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INDIANA - KENTUCKY ELECTRIC CO. CLIFTY CREEK PLANT MADISON INDIANA GEOTECHNICAL EXPLORATION LANDFILL RUNOFF COLLECTION POND DAM BORING LAYOUT			
DWG. NO.			
SCALE:		CIVIL ENGINEERING DIVISION	
DR:		APPROVED BY	
CH:		DATE:	
ENGR:		DATE:	
DATE: MAY, 2010		AEP SERVICE CORP. 1 RIVERSIDE PLAZA COLUMBUS, OH 43215	

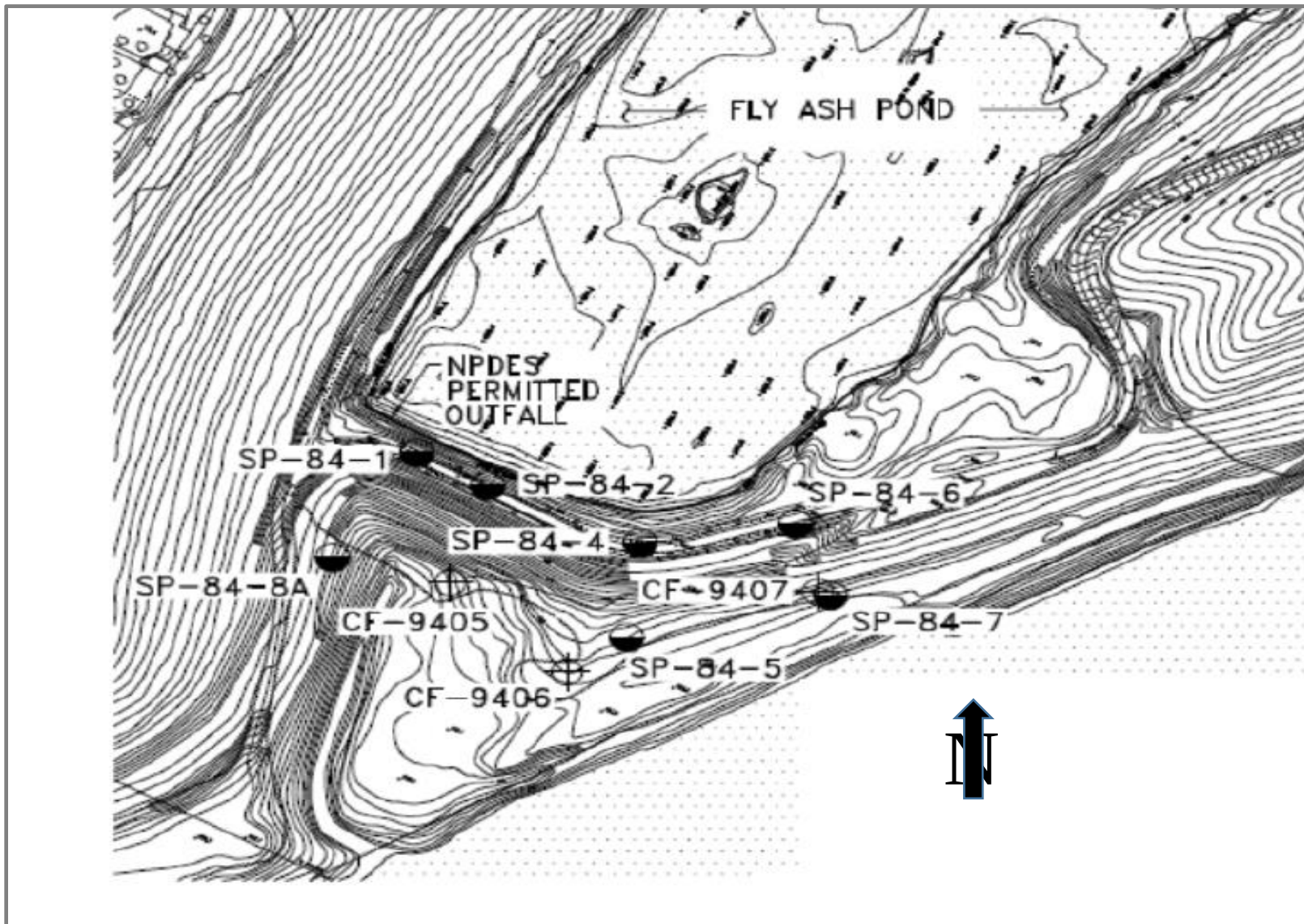
- LEGEND**
- Soil Boring with Undisturbed (Shelby) Tube Samples and/or Standard Penetration Tests
 - Historic Boring

BORING LAYOUT
SCALE: 1"=40'



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FIGURE 5 - LANDFILL RUNOFF COLLECTION POND PIEZOMETERS LOCATION MAP



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Notes

	ELECTRIC TOWER
	ELECTRIC PULLBOX
	TREE/SHRUB
	ELECTRIC POLE
	POWER POLE
	STORM CATCH BASIN
	OVERHEAD ELECTRIC
	UNDERGROUND ELECTRIC
	FENCE
	GUARDRAIL
	PROPERTY LINE
	RAILROAD TRACKS
	STORM SEWER
	EDGE OF WATER
	TREELINE
	EXISTING INDEX CONTOUR
	EXISTING INTERMEDIATE CONTOUR
	DITCH / FLOW DIRECTION
	TYPE I LANDFILL WASTE BOUNDARY
	LANDFILL LEACHATE FORSCAIN
	GROUNDWATER MONITORING WELL
	CONTROL MONUMENT
	PHASE BOUNDARY

Permit/Seal

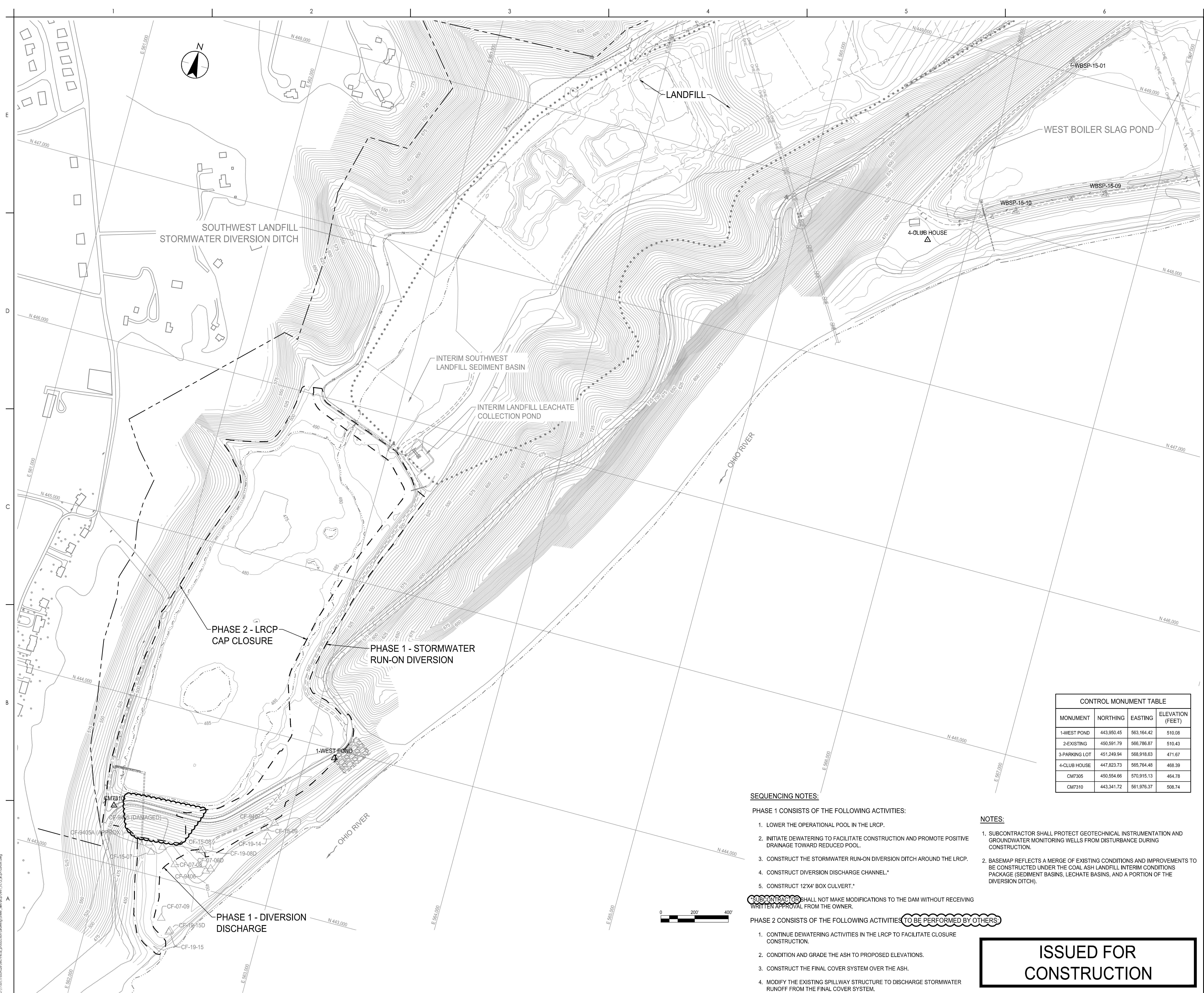
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title

OVERVIEW / SEQUENCING PLAN

Project No. 175539026		Scale AS SHOWN
Revision 1	Sheet 3	Drawing No. LRCP-103-OVR



SEQUENCING NOTES:

PHASE 1 CONSISTS OF THE FOLLOWING ACTIVITIES:

1. LOWER THE OPERATIONAL POOL IN THE LRCP.
2. INITIATE DEWATERING TO FACILITATE CONSTRUCTION AND PROMOTE POSITIVE DRAINAGE TOWARD REDUCED POOL.
3. CONSTRUCT THE STORMWATER RUN-ON DIVERSION DITCH AROUND THE LRCP.
4. CONSTRUCT DIVERSION DISCHARGE CHANNEL.*
5. CONSTRUCT 12'X4' BOX CULVERT.*

*SUBCONTRACTOR SHALL NOT MAKE MODIFICATIONS TO THE DAM WITHOUT RECEIVING WRITTEN APPROVAL FROM THE OWNER.

PHASE 2 CONSISTS OF THE FOLLOWING ACTIVITIES TO BE PERFORMED BY OTHERS:

1. CONTINUE DEWATERING ACTIVITIES IN THE LRCP TO FACILITATE CLOSURE CONSTRUCTION.
2. CONDITION AND GRADE THE ASH TO PROPOSED ELEVATIONS.
3. CONSTRUCT THE FINAL COVER SYSTEM OVER THE ASH.
4. MODIFY THE EXISTING SPILLWAY STRUCTURE TO DISCHARGE STORMWATER RUNOFF FROM THE FINAL COVER SYSTEM.

NOTES:

1. SUBCONTRACTOR SHALL PROTECT GEOTECHNICAL INSTRUMENTATION AND GROUNDWATER MONITORING WELLS FROM DISTURBANCE DURING CONSTRUCTION.
2. BASEMAP REFLECTS A MERGE OF EXISTING CONDITIONS AND IMPROVEMENTS TO BE CONSTRUCTED UNDER THE COAL ASH LANDFILL INTERIM CONDITIONS PACKAGE (SEDIMENT BASINS, LECHATE BASINS, AND A PORTION OF THE DIVERSION DITCH).

CONTROL MONUMENT TABLE			
MONUMENT	NORTHING	EASTING	ELEVATION (FEET)
1-WEST POND	443,950.45	563,164.42	510.08
2-EXISTING	450,591.79	566,786.87	510.43
3-PARKING LOT	451,249.94	568,918.63	471.67
4-CLUB HOUSE	447,823.73	565,764.48	468.39
CM7305	450,554.66	570,915.13	484.78
CM7310	443,341.72	561,976.37	508.74

ISSUED FOR
CONSTRUCTION

APPENDIX D

Photographic Log

PHOTOGRAPHIC LOG

West Boiler Slag Pond (WBSP)



Photograph 1 – Northwest (upstream) side of inlet culvert structure, northwest side of WBSP



Photograph 2 – Former CCR sluice pipes, terminated, northeast side of WBSP.



Photograph 3 – South dike embankment, upstream side looking east. Crew repairing railing around outfall structure.



Photograph 4 – South dike embankment crest, looking west. Note the brown damaged vegetation parallel to the top of the slope.



Photograph 5 – South dike embankment, downstream side looking east.



Photograph 6 – Southern dike embankment downstream side, overgrown section with trail cut in, looking east.



Photograph 7 – Southern dike embankment downstream side, overgrown section looking west beneath the gypsum conveyor.



Photograph 8 – Southern dike embankment upstream side, overgrown section looking east beneath the power lines.



Photograph 9 – WBSP Outfall outlet to the Ohio River.



Photograph 10 – Southern dike embankment downstream side, showing damaged vegetation from vehicle traversing slope.



Photograph 11 – Southern dike embankment downstream side, showing erosion in damaged vegetation.



Photograph 12 – Looking north and west across western settling ponds from the southern dike embankment.



Photograph 13 – Looking north and east across marsh area east of the settling ponds from the southern dike embankment.



Photograph 14 – Looking south and west from the north western corner of the WBSP.

PHOTOGRAPHIC LOG

Landfill Runoff Collection Pond (LRCP)



Photograph 1 – West downstream side of LRCP looking east.



Photograph 2 – West upstream side of LRCP looking east. Starting from recent construction.



Photograph 3 – Downstream side of dam, newly constructed outfall channel to the Ohio River.



Photograph 4 – Western downstream side of dam where new channel area and toe meet.



Photograph 5 – Outfall 001 outlet structure at toe of dam.



Photograph 6 – Access to inlet of Outfall 001.



Photograph 7 – Previous inlets for Outfall 001. Access to current inlet via stairway on the left.



Photograph 8 – Current inlet structure for Outfall 001.



Photograph 9 – Western downstream side where the channel extends along the face and toe of the embankment. Note disturbed spots in grass from equipment.



Photograph 10 – Western part of reggraded downstream side of dam. Note the erosion rills forming above the channel.



Photograph 11 – Downstream side of dam below the access road to the toe, looking east.



Photograph 12 – Regraded downstream side of dam below access road. Minor surface sloughing.



Photograph 13 – Downstream side of dam east of access road. Several areas of sparse vegetation where the bulldozer traversed the slope.



Photograph 14 – Downstream side of dam, previous rip rap slope. Looking east.



Photograph 15 – Crest of dam at the east end, looking north at new access road and teardrop area.



Photograph 16 – Crest of dam at the east end, looking west at the new access road and the top of the dam.



Photograph 17 – Upstream side of dam at new 12x4 culvert.



Photograph 18 – Upstream side of dam at new 12x4 culvert, looking south west through the culvert.



Photograph 19 – Downstream side of dam at new 12x4 culvert.