



INDIANA-KENTUCKY ELECTRIC CORPORATION

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WRITER'S DIRECT DIAL NO:
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June 30, 2023

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's 2022 Annual Landfill Inspection**

Dear Mr. Rockensuess:

As required by 40 CFR 257.106(g)(7), 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 2022 CCR annual landfill inspection for OVEC's Clifty Creek Station. The inspection report has been placed in the facility's operating record as well as the company's publicly accessible internet site, which can be viewed 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".

Jeremy Galloway
Environmental Specialist

JDG:tlf



**2022 CCR Rule Inspection
Clifty Creek Landfill**



Clifty Creek Generating Station
Madison, Indiana
Jefferson County

June 2023

Prepared for:

Indiana-Kentucky Electric Corporation
Piketon, Ohio

Prepared by:

Stantec Consulting Services Inc.
Cincinnati, Ohio

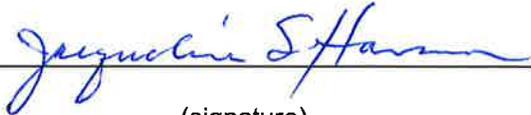
Sign-off Sheet

This document entitled 2022 CCR Rule Inspection Clifty Creek Landfill 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.

Prepared by

Matt Forrai, E.I.T.

Reviewed by



(signature)

Jacqueline S. Harmon, P.E.

Reviewed by



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Kyle R. Blakley, P.E.



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2022 CCR RULE INSPECTION CLIFTY CREEK LANDFILL

Overview
June 2023

1.0 OVERVIEW

Stantec Consulting Services Inc. (Stantec) performed the annual inspection of the existing coal combustion residuals (CCR) landfill at the Clifty Creek Generating Station in Madison, Indiana on October 26, 2022.

This annual landfill inspection is intended to fulfill the requirements of 40 CFR 257.84(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.

The landfill is a Restricted Waste Site (RWS) Type I, operating permit number 39-04, managed in accordance with the Indiana Department of Environmental Management's (IDEM's) regulations. Below is a summary of conditions for the day of the inspection:

Date performed:	October 26, 2022
Weather:	Overcast, 48°F - 55°F
Rainfall over previous 72 hours:	October 23, 2022 – 0.00 October 24, 2022 – 0.00 inch October 25, 2022 – 0.43 inch October 26, 2022 – 0.05 inch

Precipitation data was collected by the National Centers for Environmental Information (NCEI), a service provided by the National Oceanic and Atmospheric Administration (NOAA), for the Madison Sewage Plant, Indiana (USC00125237). Precipitation during the 72-hour period prior to the site visit was 0.48 inches. Rain was not observed during the actual site visit.

Stantec's team that performed the fieldwork included:

- Jacqueline Harmon, P.E., Principal, Project Manager
27 years of experience in geotechnical engineering, including pump stations, levees, and CCR storage facility design, closure, and operation.
- Kyle R. Blakley, P.E., Senior Project Engineer/Geotechnical Engineer
14 years of geotechnical engineering experience for supervision of geotechnical field explorations, design of dams, landslide remediation, and CCR storage facility design, closure, and operation.

The estimated volume of CCRs contained in the landfill is 2,879,730 cubic yards.

IDEM regulations require monthly inspections of the landfill facility, which are performed by plant personnel. Inspections of the landfill facility have commenced in accordance with the CCR Rule as of October 17, 2015 and are being conducted at least once every seven days. Available (January 3 through October 25) weekly

2022 CCR RULE INSPECTION CLIFTY CREEK LANDFILL

Description of Clifty Creek Landfill
June 2023

and monthly (January through September) inspection reports encompassing the 2022 calendar year at the time of the annual inspection were provided by plant personnel for review (IKEC 2022a through 2022c). The reports indicated only minor issues were observed, such as erosion rills and reseeding of bare areas.

IDEM is scheduled to inspect the facility on a routine/quarterly basis. The 2022 inspection and construction reports dated February 24, March 17, May 18, June 13, August 4, and October 21 were available in IDEM's online virtual filing cabinet (IDEM, 2022a through 2022h). The plant also provides annual submittals to IDEM, including drawings showing existing and estimated five-year conditions (Stantec, 2022a and 2022b).

Fieldwork was coordinated with Mr. Danny Hunt, Clifty Creek Station's landfill environmental manager. Observations were briefly discussed with onsite personnel during and after completion of the field activities. Mr. Hunt tracks the maintenance needs and activities through the weekly and monthly inspections.

2.0 DESCRIPTION OF CLIFTY CREEK LANDFILL

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 Ohio Valley Electric Corporation (OVEC). The Clifty Creek Generating Station began operating in 1955. It has six generating units with a total capacity of 1,304 megawatts.

In the late 1980s, IKEC converted the plant from ash sluicing to dry fly ash collection facilities. IKEC submitted a restricted waste construction/operation permit application to IDEM in 1986 to begin landfilling boiler slag and fly ash produced by the Clifty Creek Station. IDEM approved the fly ash landfill permit application as a Type III restricted waste landfill in 1988, and operations began in 1991.

In December 2006, IKEC applied for a major modification to its landfill permit to modify the existing Type III landfill to a Type I restricted waste landfill. The modification would enable the landfill to accept synthetic gypsum materials generated by the newly constructed flue gas desulfurization (FGD) systems. IKEC's major permit modification application proposed repurposing 109 acres of the originally permitted 200-acre Type III facility as a Type I facility to accept fly ash, boiler slag, synthetic gypsum, and other miscellaneous gypsum-related materials. IDEM approved IKEC's major permit modification in April 2008.

The Type I landfill has a capacity of 13.9 million cubic yards (FMSM, 2006) and includes:

- A composite liner system consisting of a Type 3 geosynthetics clay liner and a 30-mil flexible polyvinyl chloride (PVC) geomembrane in all phases,
- A leachate collection system, directing flow eastward from part of Phase 1 to the West Boiler Slag Pond (WBSP) and the remainder flowing westward to the Landfill Runoff Collection Pond (LRCP),
- A contact and non-contact surface water management system, including sedimentation ponds, multiple sediment traps, drainage channels, and chimney drains that segregate water that comes into contact with the CCRs and water that does not encounter the CCRs,
- A groundwater monitoring system, and
- A final closure cap design.

2022 CCR RULE INSPECTION CLIFTY CREEK LANDFILL

Description of Clifty Creek Landfill
June 2023

See Appendix A for a plan view of the CCR for the current constructed footprint. The two ponds associated with the landfill are:

- West Boiler Slag Pond (WBSP) – a permanent pond accepting sluiced boiler slag, which is periodically dredged, and material is transported to the landfill for beneficial reuse. The pond also accepts most of the leachate from Subphases 1A and 1B, as well as surface water from the eastern side of the landfill.
- Leachate Runoff Collection Pond (LRCP) – a permanent pond at the southwestern end of the landfill that accepts the remainder of the leachate and surface water from Subphases 1A, 1B, 1C, and the area between Phase I and the pond.

Initial site development and construction activities for Phase 1 of the new Type I landfill began in May 2008. The original Type III facility was soil capped during the site development. Subphases 1A, 1B, and portions of 1C were constructed and certified for waste by late 2012.

At the time of this annual inspection, the landfill consisted of Subphases 1A, 1B, and 1C. Subphases 1A and 1B are subdivided into Areas 1A1, 1A2, 1B1, and 1B2. Areas 1A1 and 1B1 were approved for waste placement in 2008. Areas 1A2 and 1B2 were approved for waste placement in 2013. Area 1C was approved for waste placement in 2016. Subphases 1A and 1B are near permitted grade for CCRs and have been covered with temporary soil and vegetation. Subphase 1C is actively receiving CCRs, which are being placed in one-foot lifts in accordance with the facility's Construction Quality Assurance/Quality Control Plan (FMSM, 2008). CCR material was at grade with filling entering cell 1D airspace.

IKEC's five-year landfill permit was renewed by IDEM in October 2019. IKEC notified IDEM of the intent to begin construction of Subphase 1D in August 2018. IDEM attended a preconstruction meeting for Subphase 1D at the Clifty Creek Plant on August 28, 2018, and a second preconstruction meeting for Phase 2 on October 9, 2019. Phase 2 construction includes structural fill placement to create the bottom grades of the cell. IDEM attended a third preconstruction meeting on March 17, 2022, to include Phase 3 construction, allowing boiler slag underdrain placement.

Structural fill placement for Subphase 1D and Phase 2A subgrade is in progress. The clearing of the hillsides in the footprint of Phase 2A was completed in February 2020. The Phase 2A underdrain layer (boiler slag) was completed in May 2020.

In June 2021, IKEC requested authorization under Indiana's Regional General Permit for initiation of a northern ditch to reroute noncontact stormwater around the WBSP and directing it to a National Pollutant Discharge Elimination System (NPDES) permitted stormwater outfall, reducing flows to the WBSP. Appendix C includes a reference drawing for the northern ditch.

In July 2021, IKEC requested a minor permit modification for the Type I RWS landfill and inactive Type III RWS landfill. The purpose was to manage anticipated plant flows and process water streams to meet new federal effluent guidelines. The minor modification allows construction of two leachate collection ponds and two sediment basins at the Type I landfill. One leachate collection pond and one sediment basin will be constructed on the Type III portion of the landfill (Northeast Ponds) and are proposed to be permanent units

2022 CCR RULE INSPECTION CLIFTY CREEK LANDFILL

Observations
June 2023

at the facility, reducing flows to the WBSP. The other leachate collection pond and sediment basin will be constructed within the boundaries of the Type I landfill (Southwest Ponds) near the LRCP and will be temporary, reducing flows to the LRCP. The Southwest Ponds will be removed when the Type I landfill is developed to the landfill's permitted boundaries. IDEM approved IKEC's minor permit modification in May 2022.

Long-term plans require construction of the two leachate ponds and two sediment ponds, decommissioning and repurposing of the existing WBSP, closure of the LRCP, and modifications necessary to continue disposal of solids in the active landfill.

Appendix C includes figures showing the recent survey plot and the final cover topography for the current constructed landfill.

3.0 OBSERVATIONS

The following sections present observations made during the site visit within the Type I active Subphase I (A through C) footprint and pertinent surface drainage to the West Boiler Slag Pond. Refer to the GPS point descriptions and figure in Appendix A along with the photographs and descriptions in Appendix B for observations. Where pertinent, nearby construction activities are noted.

3.1 SURFACE CHANNELS TO WEST BOILER SLAG POND

Four riprap-lined surface water drainage channels are constructed east of the Type I active landfill. See reference Drawing No. 16-30870-05 in Appendix C showing the four surface water channels observed east of the Type I landfill. Two channels, one north of the paved haul road and one nearest the natural ridge (Devil's Backbone) to the south, convey flow from the surrounding watershed. Two drainage channels towards the middle (south of the paved haul road) are intended to manage stormwater flow once final cover is placed in Phase I. The two middle channels flow into a collection ditch at the east end of the closed portion of the Type III landfill. As designed, the four channels then merge east of the landfill and flow towards the WBSP and an NPDES-permitted outfall.

This section includes observations on October 26, 2022, beginning with the visible pipes and headwalls at the east end of the single merged channel.

- The channel upstream of the east Conspan headwall is densely vegetated between Points 1 and 2. (Appendix A and Photos 1 and 2, Appendix B)
- The east end of the Conspan headwall is funneling flows into two HDPE pipes towards a specific area of the WBSP to allow construction within the pond. (Point 3, Appendix A; Photo 3, Appendix B)
- The rock fill of the gabion mattress of the northernmost stormwater channel was observed downstream of the Conspan crossing the haul road. The channel appeared somewhat displaced

2022 CCR RULE INSPECTION CLIFTY CREEK LANDFILL

Observations
June 2023

and bulging beneath the wire gabion fabric (Photo 4, Appendix B). The condition of this rock lining has not changed since 2019 and does not appear to impact functionality.

- The combined channel between the two headwalls on the eastern access road and Point 4 (Appendix A) is relatively clear of vegetation. (Photo 5, Appendix B)
- The new northern noncontact stormwater ditch is constructed and diverting flows from the northernmost drainage channel. (Photos 6-8, Appendix B; Reference drawing, Appendix C) The remaining three channels converge and continue to flow towards the WBSP.

3.2 FINAL GRADE SURFACE/STORM WATER CHANNELS – EAST OF PHASE I TYPE I LANDFILL

As discussed in Section 3.1, the final cover storm water channels are the two interior channels flowing eastward from the landfill into the WBSP.

- During the site visit, a sand stockpile was present between the two final cover channels on the Type III landfill footprint. A topsoil stockpile is present north of the haul road. (Photos 9 and 10, Appendix B)
- Two leachate collection header pipe headwalls exit the closed Type III landfill footprint at the eastern end of the site. Flow from the leachate collection pipes, two final cover channels, and southernmost stormwater channel combine near Point 4 (Appendix A). The combined flow continues through culverts under the eastern access road and towards Point 1 and the WBSP. (Appendix A; Photos 11-14, Appendix B)
- Seepage was noted at southern leachate collector headwall. (Point 4, Appendix A)
- Dense vegetation along the edges of the northern final cover channel limit visual observations. (Photo 15, Appendix B)
- A temporary access road has been located from the haul road across the northernmost final cover channel to allow sand stockpile placement. Point 7 indicates the end of the access road on the Type III cover. (Points 5-7, Appendix A; Photos 16-17, Appendix B)
- Humps were visible in the working area of the stockpiles on the Type III footprint. (Points 8-11, Appendix A; Photos 18-19, Appendix B)
- The closed Type III landfill cap, where visible, remains mowed and maintained. (Photo 20, Appendix B)
- An outlet pipe from the truck wash shows sediment build up and a low pipe invert. (Point 12, Appendix A, Photo 21, Appendix B)

2022 CCR RULE INSPECTION CLIFTY CREEK LANDFILL

Observations
June 2023

- The two southern channels (final cover and stormwater) have dense vegetation limiting visual observations. (Photos 22-24, Appendix B)
- A bare spot and sediment buildup were noted in the southern final cover channel nearest the Phase 1 landfill boundary. (Point 15, Appendix A; Photo 25, Appendix B)

3.3 PHASE I TYPE I LANDFILL

The Phase I Type I landfill began accepting CCRs in 2008. No subphases within the waste footprint have been permanently capped and closed. Areas nearing final grades have temporary cover and are vegetated. The slopes are relatively uniform.

- A gravel-filled erosion rill was located at the southeast corner of the landfill. (Point 16, Appendix A; Photo 26, Appendix B)
- Subphases 1A1 and 1B1 are at or near permitted final CCR grades. The CCR of the subphases has been temporarily covered with soil and vegetation has been established. Locations of temporary cover are noted by Points 17-19 (Appendix A; Photo 28, Appendix B).
- Slope angles were estimated using the handheld GPS unit at Points 13, 14, 21-23, 25, 28, and 29 (Appendix A). Slopes ranged from 4.44 (horizontal, H):1(vertical, V) to 5.24H:1V. The design slope is 4H:1V. (Photos 27, 30, 34, 35, and 37, Appendix B)
- Active waste placement was ongoing in Cell 1C. (Photos 28 and 31, Appendix B) The end of the active Phase 1 road is Point 20 (Appendix A).
- Straw sedimentation socks are placed cross slope on the temporary cover areas to mitigate erosion. (Point 24, Appendix A; Photo 29, Appendix B)
- A depression was identified at the toe of slope downhill of Point 26 (Appendix A). (Photo 36, Appendix B)
- A bare spot with erosion was located in Subphase 1B. (Point 27, Appendix A; Photo 32, Appendix B)
- Structural fill to create the liner subgrade was being placed in Subphase 1D and Subphase 2A. (Photos 33 and 38, Appendix B)
- Sediment and vegetation are built up in front of the north end of the culvert for the active landfill crossing. (Point 30, Appendix A; Photo 39, Appendix B)

2022 CCR RULE INSPECTION CLIFTY CREEK LANDFILL

Recommendations
June 2023

4.0 RECOMMENDATIONS

The following recommendations are offered for the Clifty Creek Station's Type I Landfill. The recommendations are listed in no particular order.

Stability Issues:

None noted.

Operational Issues:

- Conduct field surveys to measure current topography and compare to design geometry. Regrade surface as needed to conform to design. Areas near permitted CCR grades are recommended to be capped, closed, and vegetated (Subphases 1A1, 1B1, 1A2, 1B2, and 1C).
- Seepage was noted near the southern leachate pipe outlet on the northeast corner of the closed Type III landfill. Flows into the eastward stormwater and leachate collection channel are being segregated and reduced as part of current construction activities.
- Prior to completion of ongoing construction activities, it is recommended to explore the integrity of the two leachate collection header pipes east of the Type I landfill for sections intended for continued use.

Maintenance Issues:

- Continue to conduct weekly and monthly field inspections to schedule and maintain the necessary best management practices for the stormwater channels, sediment traps, and rock check dams serving the landfill.
- Maintain the vegetation along the exterior slopes and within the surface drainage channels to facilitate inspections. Remove taller weeds and woody vegetation or reestablish vegetation as needed. Temporary cover should be monitored and maintained. Flow was visible at the pipes observed by Stantec during the October 2022 site visit.
- Monitor the depression on the northern toe of the Subphase 1A slope and address if the depression changes.

5.0 REFERENCES

Fuller, Mossbarger, Scott & May Engineers, Inc. (FMSM) (2008). Clifty Creek Fly Coal Ash Landfill Construction. Construction Quality Assurance/Quality Control Plan. Coal Ash Landfill, Type I Restricted Waste Landfill. Attachment 21 (Revised). May 13.

2022 CCR RULE INSPECTION CLIFTY CREEK LANDFILL

References

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Indiana-Kentucky Electric Corporation (2006). "Type I Restricted Waste Landfill Permit Application, Coal Ash Landfill, Clifty Creek Power Plant, Madison, Jefferson County, Indiana, Attachment 22 – Design Report." Prepared by Fuller, Mossbarger, Scott, & May Engineers, Inc. November.

2022 CCR RULE INSPECTION CLIFTY CREEK LANDFILL

References

June 2023

Indiana-Kentucky Electric Corporation (2006). "Type I Restricted Waste Landfill Permit Application, Coal Ash Landfill, Clifty Creek Power Plant, Madison, Jefferson County, Indiana, Attachment 23 – Report of Geotechnical Exploration." Prepared by Fuller, Mossbarger, Scott, & May Engineers, Inc. November.

Stantec Consulting Services Inc. (2022a). "Phases 1, 2, and 3 Existing Conditions (June 2022)." Indiana-Kentucky Electric Corporation. Clifty Creek Coal Ash Landfill. Drawing no. 32010c-01-econ-2022.dwg.

Stantec Consulting Services Inc. (2022b). "Estimated 5-Year Construction Limits (June 2027)." Indiana-Kentucky Electric Corporation. Clifty Creek Coal Ash Landfill. Drawing no. 32010c-02-5yrcl-2022.dwg.

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Stantec Consulting Services Inc. (2020). "2019 CCR Rule Inspection, Clifty Creek Landfill (January)." Indiana-Kentucky Electric Corporation. Clifty Creek Coal Ash Landfill.

Stantec Consulting Services Inc. (2019). "2018 CCR Rule Inspection, Clifty Creek Landfill (January)." Indiana-Kentucky Electric Corporation. Clifty Creek Coal Ash Landfill.

**APPENDIX A – PLAN VIEW AND TABLE OF
INSPECTION LOCATIONS**

**GPS Data Points
2022 Annual Inspection**

**Clifty Creek Landfill
Jefferson County, Indiana**

Point ID No.	Comment	Latitude	Longitude
1	edge of heavy vegetation in channel	38.73688944682	-85.43124103124
2	vegetation extends to headwall	38.73688122914	-85.43010079954
3	construction headwall/pipes	38.73682601601	-85.42986512377
4	sheen at leachate outlet pipe	38.73640619415	-85.43242272215
5	new access road	38.73580582556	-85.43433286792
6	edge of new access road	38.73577484852	-85.43455233967
7	inside end of access road	38.73565513701	-85.43442622626
8	top hump type 3 cover	38.73554862660	-85.43450428706
9	bottom hump type 3 cover	38.73550495222	-85.43447189227
10	top hump type 3 cover	38.73523915677	-85.43428893403
11	bottom hump type 3 cover	38.73520547973	-85.43425288259
12	channel above pipe invert	38.73567089336	-85.43520339279
13	slope shot 1	38.73441712420	-85.43614655671
14	slope shot 2	38.73424850346	-85.43568746117
15	heavy sediment in channel	38.73452509280	-85.43473154365
16	gravel-filled rill	38.73408951616	-85.43466824150
17	edge of stripped temporary cover	38.73400697901	-85.43530733696
18	southeast corner of inner temporary cover	38.73306845062	-85.43709030940
19	northwest corner of new top Phase 1 fill	38.73337367240	-85.43739971714
20	end of active road at Phase 1 crest	38.73266286138	-85.43807112125
21	slope shot 3	38.73207377048	-85.44044026708
22	slope shot 4	38.73231860296	-85.44012603090
23	slope shot 5	38.73263755812	-85.43952103578
24	end of straw sedimentation socks	38.73291180627	-85.43888818557
25	slope shot 6	38.73294660579	-85.43875184075
26	top of slope, depression at toe	38.73319178580	-85.43821294005
27	bare spot with erosion	38.73374333977	-85.43733703632
28	slope shot 7	38.73378641661	-85.43723415746
29	slope shot 8	38.73437083246	-85.43640684012
30	sediment-filled culvert pipe	38.73237470789	-85.44119350520



Legend
 ● Inspection Location



Notes
 1. Coordinate System: Latitude/Longitude NAD83
 2. Base features - ESRI
 3. Ortho-imagery does not represent current conditions.



Project Location
 Clifty Creek Plant
 Jefferson County, IN

175532010
 Prepared by ANP on 2023-02-17
 Technical Review by JSH on 2023-02-17
 Independent Review by KRB on 2023-02-17

Client/Project
 Indiana - Kentucky Electric Corporation
 Clifty Creek Plant

Figure No.
1

Title
2022 Annual CCR Landfill Inspection

APPENDIX B – PHOTOGRAPHIC LOG



Photo 1

Dense vegetation growing in front of the west face of the Conspan in the stormwater drainage ditch from the landfill to West Boiler Slag Pond. The photo was taken on the channel edge at western limits of vegetation. (Point 1, Appendix A)



Photo 2

Dense vegetation growing in front of the west face of the Conspan in the stormwater drainage ditch from the landfill to West Boiler Slag Pond. The photo was taken on the channel edge. (Point 2, Appendix A)



Photo 3

Looking east (downstream) of the Conspan towards the WBSP. The pipes collect and direct the flows to a specific region of the WBSP to allow construction. (Point 3, Appendix A)



Photo 4

Looking west at stormwater drainage ditch confluence crossing haul road and the eastern access road towards the landfill. Gabion fill rock has shifted within baskets creating uneven channel lining. Condition is unchanged from the previous year.



Photo 5

Looking east from two western headwalls of the combined stormwater channel towards WBSP and Point 1, Appendix A.



Photo 6

Eastern end of new northern noncontact stormwater ditch looking northwest where access road crosses from the haul road towards Big Clifty Creek.



Photo 7

New northern noncontact stormwater ditch looking northwest at crossing from haul road towards the northwest corner of WBSP.



Photo 8

New northern noncontact stormwater ditch looking east at crossing from haul road towards northwest corner of WBSP.



Photo 9

Temporary stockpiles located on the north and south side of the landfill haul road within the closed Type III landfill footprint.



Photo 10

Temporary sand stockpile located on the Type III landfill footprint between the two final cover channels.



Photo 11

Headwalls for the two culverts crossing under the eastern landfill access road, looking west. (across road from Point 4, Appendix A)



Photo 12

Upstream headwalls for the two culverts crossing under the eastern landfill access road looking northeast. Confluence of southern three stormwater channels and two leachate collections pipes. (Point 4, Appendix A)



Photo 13

North leachate collection header pipe headwall at the eastern edge of the Type III landfill looking downstream. (Point 4, Appendix A)



Photo 14

South leachate collection header pipe headwall at the eastern edge of the Type III landfill looking downstream. (Point 4, Appendix A)



Photo 15

Riprap ditch along north edge of closed Type III landfill south of haul road and east of the truck wash looking west.



Photo 16

Temporary access road from haul road across northern final cover channel to closed Type III footprint, looking west. (Point 5, Appendix A)



Photo 17

Temporary access road from haul road across northern final cover channel to closed Type III footprint, looking east. (Point 6, Appendix A)



Photo 18

Type III footprint between two final cover channels, looking south. Humps visible in the working area. (Points 8-11, Appendix A)



Photo 19

Type III footprint between two final cover channels, looking southwest. Humps visible in the working area. (Points 8-11, Appendix A)



Photo 20

Type III footprint between two final cover channels, looking east.



Photo 21

Outlet pipe from the truck wash into the northern final cover channel, looking north. (Point 12, Appendix A)



Photo 22

Southern final cover channel with dense vegetation, looking east. Type III landfill footprint on left side of photo.



Photo 23

Southern final cover channel with dense vegetation, looking west. Type III landfill footprint on right side of photo.



Photo 24

Southern stormwater channel with dense vegetation, looking west.



Photo 25

Bare spot and sediment buildup in southern final cover channel near Phase 1 landfill edge, looking north. (Point 15, Appendix A)



Photo 26

A gravel-filled erosion rill at the southeast corner of the Type I Landfill, looking east. (Point 16, Appendix A)



Photo 27

Slope measurement 2 from top of Type I landfill looking east. (Point 14, Appendix A)



Photo 28

Top of Subphases 1A and 1B edge of temporary cover from Point 14, looking west (Appendix A).



Photo 29

Eastern extent of straw sedimentation sock in Subphase 1A and 1B, looking south.



Photo 30

Eastern slope of Type 1 landfill, looking northwest.



Photo 31
Top of active Subphase 1C edge of temporary cover, looking west (Appendix A).



Photo 32
Bare spot with erosion in Subphase 1B. (Point 27, Appendix A)



Photo 33
Subphase 1D structural fill looking west.



Photo 34

Western vegetated slope of active landfill, looking southwest. Subphase 1D in background on left and Subphase 2A on right.



Photo 35

Northern vegetated slope of Subphases 1A, 1B, and 1C, looking east. Haul road on left.



Photo 36

Depression at toe of slope from Point 26, looking upslope towards the south. (Appendix A)



Photo 37

Northern vegetated slope of Subphases 1A, 1B, and 1C, looking west.



Photo 38

Phases 2 and 3 viewed from Subphase 1C, looking west.



Photo 39

Sediment and vegetation built up at north end of culvert for the active landfill crossing. (Point 30, Appendix A)

APPENDIX C – REFERENCE DRAWINGS

Notes:

- Topographic mapping for the hill sides and areas east of the existing landfill are supplied by Photogrammetric Services, Inc., Reynoldsburg, Ohio (April 28, 1992). Topographic mapping for the surface of the existing ash pond and landfill was supplied by Henderson Aerial Surveys, Inc., Grove City, Ohio (April 16, 2005) and Bowen, Inc. (June, 2007). Hydrographic survey of existing fly ash pond performed on May 4, 2005.
- Information presented in Indiana State Plane coordinate system (NAD27/NAVD88 Indiana East, feet).
- IKEC will locate and stake the limits of the Poor Man's Cemetery. The Contractor shall not operate within the limits of the Cemetery.
- The flow line of all surface ditches shall be adjusted to match headwalls and wingwalls.
- See Drawing 16-30870-21 for Headwall Details. See Drawing 16-30870-23 for Culvert Details.

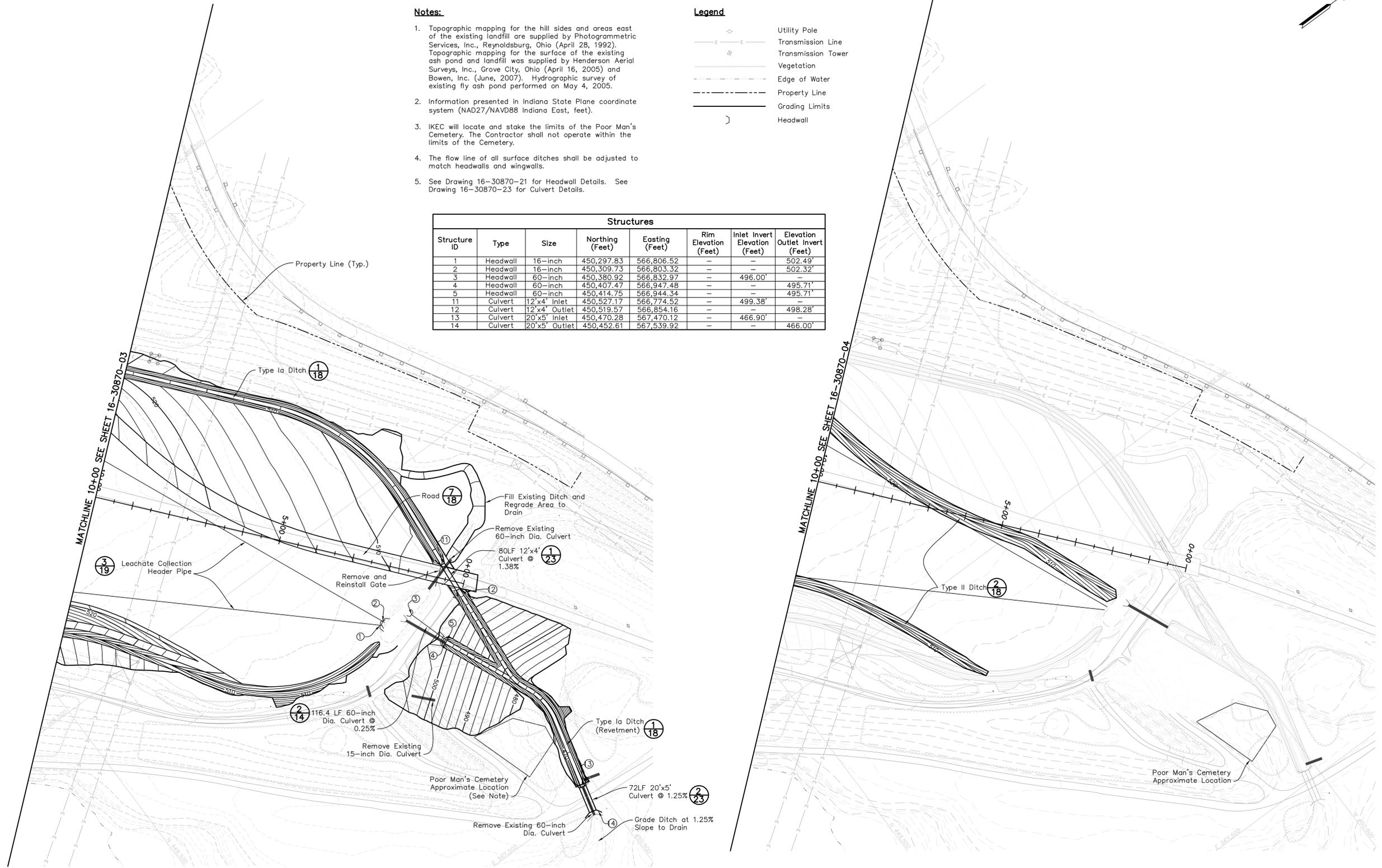
Legend

- Utility Pole
- Transmission Line
- Transmission Tower
- Vegetation
- Edge of Water
- Property Line
- Grading Limits
- Headwall

Structures							
Structure ID	Type	Size	Northing (Feet)	Eastng (Feet)	Rim Elevation (Feet)	Inlet Invert Elevation (Feet)	Elevation Outlet Invert (Feet)
1	Headwall	16-inch	450,297.83	566,806.52	-	-	502.49'
2	Headwall	16-inch	450,309.73	566,803.32	-	-	502.32'
3	Headwall	60-inch	450,380.92	566,832.97	-	496.00'	-
4	Headwall	60-inch	450,407.47	566,947.48	-	-	495.71'
5	Headwall	60-inch	450,414.75	566,944.34	-	-	495.71'
11	Culvert	12 x4' Inlet	450,527.17	566,774.52	-	499.38'	-
12	Culvert	12 x4' Outlet	450,519.57	566,854.16	-	-	498.28'
13	Culvert	20 x5' Inlet	450,470.28	567,470.12	-	466.90'	-
14	Culvert	20 x5' Outlet	450,452.61	567,539.92	-	-	466.00'

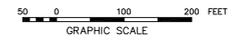
MATCHLINE 10+00 SEE SHEET 16-30870-03

MATCHLINE 10+00 SEE SHEET 16-30870-04



INITIAL CONSTRUCTION

FINAL GRADE



DATE	NO.	DESCRIPTION	APPD.
REVISIONS			
<p>THIS DRAWING IS THE PROPERTY OF THE AMERICAN ELECTRIC POWER SERVICE CORP. AND IS LOANED UPON CONDITION THAT IT IS NOT TO BE REPRODUCED OR COPIED, IN WHOLE OR IN PART, OR USED FOR FURNISHING INFORMATION TO ANY PERSON WITHOUT THE WRITTEN CONSENT OF THE AEP SERVICE CORP., OR FOR ANY PURPOSE DETRIMENTAL TO THEIR INTEREST, AND IS TO BE RETURNED UPON REQUEST.</p>			
INDIANA - KENTUCKY ELECTRIC CO. CLIFTY CREEK PLANT MADISON INDIANA COAL ASH LANDFILL SUBPHASE 1A INITIAL CONSTRUCTION AND FINAL GRADE			
DWG. NO. 16-30870-05			
CIVIL ENGINEERING DIVISION			
SCALE:	CIVIL ENGINEERING DIVISION		
DR:	APPROVED BY		
CH:	DATE:		
ARCH:	DATE:		
ENGR:	DATE:		
DATE:	DATE:		
SCALE: AS SHOWN DR: CW CH: DMD ENGR: DPG DATE: JAN., 2010			
Section or Detail No. Sheet Where Shown		AEP SERVICE CORP. 1 RIVERSIDE PLAZA COLUMBUS, OH 43215	

- LEGEND**
-  UTILITY POLE
 -  TRANSMISSION LINE
 -  TRANSMISSION TOWER
 -  VEGETATION
 -  EDGE OF WATER
 -  PROPERTY LINE
 -  WASTE BOUNDARY
 -  GRADING LIMITS

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. AN AERIAL SURVEY OF THE SOUTHWEST LANDFILL AREA PERFORMED MAY 2022 WAS PROVIDED BY R. B. JERGENS. THE MARCH 2022 QUARTERLY LANDFILL SURVEY WAS PROVIDED BY IKEC. HORIZONTAL DATUM IS NAD27 AND VERTICAL DATUM IS NAVD88.

- NOTES:**
1. OTHER BASEMAP INFORMATION BASED ON ORIGINAL DESIGN PLAN SHEETS.
 2. ANY REMAINING PHASE 1 CONSTRUCTION WILL BE PERFORMED DURING FUTURE CONSTRUCTION SEASONS. PHASES 2 AND 3 SUBGRADE CURRENTLY UNDER CONSTRUCTION.
 3. CELLS WITH TEMPORARY SOIL COVER ARE MULCHED AND SEEDED.

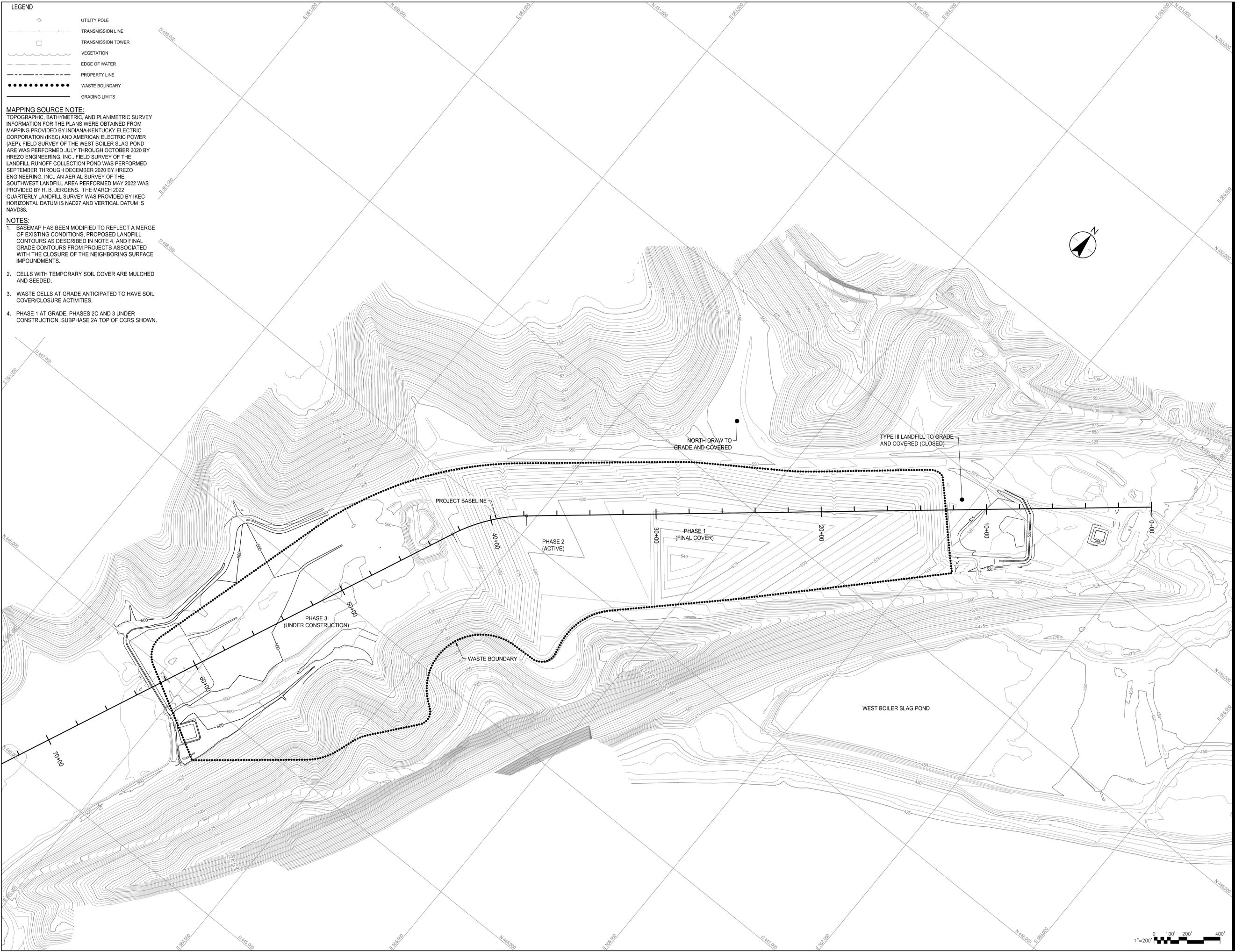


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 Project Number: 175532010

- LEGEND**
-  UTILITY POLE
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- NOTES:**
1. BASEMAP HAS BEEN MODIFIED TO REFLECT A MERGE OF EXISTING CONDITIONS, PROPOSED LANDFILL CONTOURS AS DESCRIBED IN NOTE 4, AND FINAL GRADE CONTOURS FROM PROJECTS ASSOCIATED WITH THE CLOSURE OF THE NEIGHBORING SURFACE IMPOUNDMENTS.
 2. CELLS WITH TEMPORARY SOIL COVER ARE MULCHED AND SEEDED.
 3. WASTE CELLS AT GRADE ANTICIPATED TO HAVE SOIL COVER/CLOSURE ACTIVITIES.
 4. PHASE 1 AT GRADE, PHASES 2C AND 3 UNDER CONSTRUCTION. SUBPHASE 2A TOP OF CCRS SHOWN.



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Project Number: 175532010

Drawing No. 2
 Revision Sheet



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