OVEC/IKEC

OHIO VALLEY ELECTRIC CORPORATION
INDIANA-KENTUCKY ELECTRIC CORPORATION
3932 U. S. Route 23
P. O. Box 468
Piketon, Ohio 45661
740-289-7200

WRITER'S DIRECT DIAL NO:
740-289-7267

January 12, 2017

Ms. Carol Comer
Commissioner
Indiana Department of Environmental Management
100 N. Senate Avenue
Mail Code 50-01
Indianapolis, IN 46204-2251

Dear Ms. Comer:

Re: Indiana-Kentucky Electric Corporation
Clifty Creek Station's CCR 2016 Annual Landfill Inspection

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 2016 CCR annual landfill inspection 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 publically 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) 289-7267.

Sincerely,

Gabriel S. Coriell

Gabriel S. Coriell
Environmental Services Manager

GSC:klr

bcc: J. M. Brown
B. S. Canter – Clifty
C. Carnes – Clifty
P. A. de Lamerens – Clifty
J. S. Harmon – Stantech
D. L. Hunt –Clifty
R. A. Osborne
Jeffery Sewell – IDEM

Stantec Consulting Services Inc.
11687 Lebanon Road, Cincinnati OH 45241-2012

January 11, 2017

File: 175534018, 200.209

Ohio Valley Electric Corporation
Indiana-Kentucky Electric Corporation
Attention: Mr. Gabriel Coriell
3932 U.S. Route 23
P.O. Box 468
Piketon, Ohio 45661

Reference: 2016 CCR Rule Inspection
Annual Landfill Inspection
Clifty Creek Generating Station
Madison, Indiana

Dear Mr. Coriell,

Attached is the 2016 annual landfill inspection for the Clifty Creek Generating Station's Type I Restricted Waste Landfill. The site visit was performed on November 16, 2016. Rainfall was not observed near the site on the day of the inspection nor for the three days prior. As a summary:

- In general, the slopes of the active coal combustion residual (CCR) landfill were uniform and well vegetated. Inactive waste placement areas had temporary soil cover in place and were vegetated. The vegetation height was relatively uniform and maintained.

- Surface water channels were riprap lined with some maintenance needed to reduce vegetation obscuring visual inspection; however, flow was not impeded. Pipes and culverts were actively flowing during the inspection.

- The erosion and sediment control measures such as rock check dams were in place during this wet season. Continue maintenance as needed for the best management practices. Address erosion features as part of the maintenance activities.

- Signs of slope instability or excessive ponding within the active cells were not noted during the site visit.

Observations and recommendations are detailed in the associated annual landfill inspection report. A figure is included with GPS location points to assist in addressing the observations. A photographic log is also provided.

Please contact us with any questions or concerns. We appreciate the opportunity to continue to work with the Clifty Creek Generating Station and the Indiana-Kentucky Electric Corporation.

Reference: 2016 CCR Rule Inspection
Annual Landfill Inspection
Clifty Creek Generating Station
Madison, Indiana

Regards,

Stantec Consulting Services Inc.

Jacqueline S. Harmon, P.E.
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Attachment: 2016 Annual Landfill Inspection Report

c. Kyle Blakley

jsh v:\1755\active\175534018\geotechnical\report\2016 annual landfill inspection\final submittal 20170111\175534018 let 20170111.docx

2016 CCR Rule Inspection
Clifty Creek Landfill

Clifty Creek Generating Station
Madison, Indiana
Jefferson County

Prepared for:
Indiana-Kentucky Electric Corporation
Piketon, Ohio

Prepared by:
Stantec Consulting Services Inc.
Cincinnati, Ohio

January 11, 2017

Sign-off Sheet

This document entitled 2016 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 _____ (signature)

Jacqueline S. Harmon, P.E.

Reviewed by _____ (signature)

Kyle R. Blakley, P.E.

Reviewed by _____ (Signature)

Stan A. Harris, P.E.

Stantec

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LIST OF APPENDICES

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 November 16, 2016.

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 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:	November 16, 2016
Weather:	Clear, sunny, breezy, 39°F - 68°F
Rainfall over last 72 hours:	November 13, 2016 – 0.0 inches November 14, 2016 – 0.0 inches November 15, 2016 – 0.0 inches November 16, 2016 – 0.0 inches

Precipitation data was collected from the weather station at Bowman Field in Louisville, Kentucky (KLOU), which is located approximately 36.5 miles from the landfill.

Stantec's team that performed the fieldwork included:

- Jacqueline S. Harmon, P.E., Senior Associate/Geotechnical Engineer
  19 years of experience in geotechnical engineering, including dams, levees, and CCR storage facility closure.

- Kyle R. Blakley, P.E., Senior Project Engineer/Geotechnical Engineer
  7 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 1,645,000 cubic yards.

IDEM regulations require monthly inspections of the landfill facility, which are performed by plant personnel. The 2016 monthly reports were provided for review prior to the site visit. 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. Weekly reports encompassing the 14 weeks prior to the annual inspection were also provided for review. IKEC has also established an annual landfill inspection report action plan as a tracking device to prioritize and document action items or repairs needed. Information in the action plan since the 2015 landfill inspection was provided for review.

IDEM routinely inspects the facility throughout the year. Annual submittals to IDEM include drawings showing existing conditions and a five-year estimate of site conditions. Per site personnel, IDEM inspected the closed Type III landfill on November 15, 2016.

Fieldwork was coordinated with Mr. Danny Hunt, Clifty Creek Station's Landfill Operator. Observations were briefly discussed with onsite personnel during and after completion of the field activities.

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 and currently consists of six generating units with a total generating capacity of 1,304 megawatts.

In the late 1980s, IKEC converted ash sluicing to dry fly ash collection facilities at the plant and transitioned to a dry ash landfill. 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 landfill. The modification would enable the landfill to accept synthetic gypsum materials generated by the flue gas desulfurization (FGD) systems that were being constructed at that time. 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 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 and the remainder flowing westward to the Landfill Runoff Collection Pond;

- A contact and non-contact surface water management system, including sedimentation ponds, multiple sediment traps, drainage channels, and chimney drains that segregates 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.

Initial site development and construction activities for Phase 1 of the new Type I landfill began in May 2008. Subphases IA, 1B, and portions of 1C were constructed and certified for waste by late 2012. See Figure 1 in Appendix A for a plan view of the CCR facility. Other features associated with the landfill include:

- West Boiler Slag Pond – a permanent pond accepting sluiced boiler slag, which is periodically dredged and transported to the landfill for beneficial re-use. The pond also accepts most of the leachate from Subphases 1A and 1B, as well as surface water from the landfill.

- Landfill Runoff Collection Pond – 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.

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. IKEC notified IDEM in August 2016 of the intent to open Cell 1C for waste placement.

According to the monthly waste placement survey plot from October 2016, Subphases 1A1 and 1B1 are near permitted grade for CCRs and have been covered with temporary soil and vegetation. Subphases 1A2 and 1B2 are currently active and receiving CCRs, which are being placed in one-foot lifts in accordance with the facility's Construction Quality Assurance/Quality Control Plan (FMSM, 2008). The northeast corner of Subphase 1A2 is near permitted grade for CCRs. Approximately 2/3 of the constructed Subphase 1C area has been stripped of temporary cover to prepare for CCR placement.

3.0 OBSERVATIONS

The following observations were made during the site visit within the Type I active subphase I (A through C) footprint and the applicable surface drainage features toward the West Boiler Slag Pond:

3.1 SURFACE CHANNELS TO WEST BOILER SLAG POND

Four riprap-lined surface water channels are constructed east of the Type I active landfill. See reference Drawing No. 16-30870-05 in Appendix C, provided to clarify the four surface water channels observed east of the Type I landfill. The channels nearest the paved haul road and the southern ridge (Devil's Backbone) control flow from the surrounding watershed. The two channels in the middle are intended to manage stormwater flow once final cover is placed in Phase I. Flow from the four channels moves eastward to the West Boiler Slag Pond and its associated National Pollutant Discharge Elimination System (NPDES)-permitted outfall.

This section includes the observations for the two stormwater channels only near the haul road and the southern ridge. The two final cover channels are discussed in Section 3.2.

- The northern final grade surface/storm water channel Conspan outlet has a trapezoidal shape with riprap and gabions in place as designed. The amount of vegetation and debris in the channel is low and does not impede proper function of the channel (Photo 1, Appendix B). This channel lies just south of the paved haul road, east of the landfill.

- A log was noted in the combined channel east of the construction trailer and upstream of the Conspan outlet flowing into the West Boiler Slag Pond (Photo 2). The Conspan is a precast concrete culvert and foundation represented on reference Drawing No. 16-30870-05 in Appendix C and is 72-lf long and 20' wide by 5' tall culvert at a1.25% slope.

- CCR materials were not noted in the channel aside from backfill near the Conspan headwall flowing into the West Boiler Slag Pond.

- The gabion and riprap mattresses appear to be functioning as designed and in acceptable condition.

- Some grass and vegetation was present in the channel on the upstream side of the West Boiler Slag Pond Conspan outlet. The vegetation present did not impede proper function of the channel. (Photo 2)

- The area of the channel near the tree line appears to be low and holding some water. Vegetation obscures inspection. Flow does not seem impeded, but the area should be monitored for changes. (Photo 3)

- The West Boiler Slag Pond Conspan flow appears unrestricted with slight vegetation growing. (Photos 4 and 5)

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

As discussed in Section 3.1, the final grade surface/storm water channels are the two interior channels flowing eastward from the landfill into the West Boiler Slag Pond and discharging through its monitored NPDES-permitted outfall.

- The final grade surface/storm water channels include two headwalls passing under the access road past the temporary construction office trailers. A slight bow in the crown of the southern of the two pipes was observed in 2015 and 2016; however, no depression was noticed in the road, and flow is not impeded. The bow did not appear to change between 2015 and 2016. (Photo 6)

- The reeds and vegetation within the final grade surface/storm water channel northeast of the closed Type III landfill, which were noted in 2015, were markedly reduced near the construction trailer area culverts. Riprap and gabions were in place. Observations of the headwalls for the leachate pipes were obscured by grasses, though flow did not appear to be impeded. (Photos 7 and 8; Point 1, Appendix A)

- The cracks noted on the surface of the inlet headwall for the northwest final grade channel appears unchanged from 2015. Flow is not impeded; this is a maintenance observation for continued monitoring. (Photo 9)

- A bare zone was observed along the northwestern final grade surface/storm water channel. It lies near the channel bottom along the riprap zone. (Photo 10; Points 2 and 3, Appendix A)

- The side slopes along the northern final grade surface/storm water channel were covered with grasses between 1 to 3 feet tall. (Photo 11)

- A low spot was noted in the southern final grade surface/storm water channel with possible erosion of the riprap. Visual observation was obscured by vegetation. (Photo 12; Point 4, Appendix A)

- Vegetation obscures observation of the southern final grade surface/storm water channel near its junction with the southern storm water channel. (Photo 13)

- Vegetation obscures observation of the southern storm water channel. (Photo 14)

- Several erosion rills were noted on the southern ridge side of the southern stormwater channel. These are located outside of the limits of waste and are noted as maintenance

concerns only for access to the southern ridge near the landfill. (Photo 15; Points 5 and 6, Appendix A)

- Several trees one to three inches in diameter were observed near the base of the transmission line tower in the southern storm water channel. (Photo 16; Point 7, Appendix A)

- A low spot with possible erosion was noted in the southern storm water channel near the southeastern corner of Subphases 1A1 and 1B1. This channel is located on the southern ridge side of the maintenance road adjacent to the landfill, outside of the limits of waste. (Photo 17; Point 8, Appendix A)

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 and mowed. Crews were actively seeding and mulching along the southern slope of the landfill during the November site visit.

- Subphases 1A1 and 1B1 were observed to be nearly built to permitted final CCR grades. The subphases have been temporarily covered with six inches of soil, and vegetation has been established.

- The temporary cover vegetation on Subphases 1A1/1B1 was generally less than six inches tall and appeared to be maintained. Some taller grasses were present with a height of approximately two feet. (Photo 18)

- Minor erosion rills were observed at the juncture of the northeastern landfill slope and the southwestern final cover surface/storm water channel. (Photo 19)

- An erosion rill runs from top to bottom of the northeastern slope of Subphases 1A1/1B1 near the north corner. It was approximately 12 inches deep and obscured by vegetation. (Photo 20; Point 9, Appendix A)

- Several minor erosion rills were noted at the toe of the northeastern slope on the temporary cover of Subphases 1A1 and 1B1. CCRs were not observed near the rills during the November site visit.

- A recent compacted soil repair on the northeastern slope was noted during the November field visit. (Photo 21; Point 10, Appendix A)

- Subphase 1A2 is nearing permitted final CCR grade. The northwestern slope along the haul road has temporary soil cover placed with established grass cover. The vegetation is less than six inches tall on a uniform slope. (Photo 22)

- The rock check dams appeared recently maintained with additional gravel placement, little to no silt buildup, and established vegetation in the regions flowing towards the check dams. (Photo 23)

- The temporary cover outslopes of Subphase 1A1/1B1 were measured to be between approximately 4H:1V and 5.1H:1V. The temporary cover top slope of the subphase was measured to be approximately 19.1H:1V. The temporary cover outslopes of Subphase 1A2 were measured to be 4.7H:1V to 5.1H:1V. The temporary slopes are flatter than the permitted final cover grades for the outslopes of 4H:1V along the paved haul road and 10H:1V (10%) on the top slope towards the south.

- The storm water channel along the southern ridge of Subphase 1C appears recently graded with additional riprap placement. (Photo 24)

- Storm water within the inactive Subphase 1C is collected from the temporary cover and directed towards the Landfill Runoff Collection Pond. The pipe outlet was located during the November site visit. (Photos 25 and 26; Point 11, Appendix A)

- The leachate pipe appeared unrestricted and actively flowing. Vegetation was maintained around the headwall to allow visual observation. (Photo 24; Point 12, Appendix A)

- The construction portions of Subphase 1C are being stripped of temporary cover in preparation for CCR placement. The southern slopes remain vegetated and appear unchanged from the 2015 report. (Photo 27)

4.0 RECOMMENDATIONS

The following recommendations are offered for the Clifty Creek Station. The recommendations are not listed in order of priority.

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 to permitted CCR grades are recommended to be capped, closed, and vegetated (Subphases 1A1, 1B1, and 1A2).

- An Operations and Maintenance Manual should be developed that includes provisions for the placement of materials within the landfill, the maintenance of the landfill, and the procedure to follow if issues arise during the operation of the landfill.

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 by removing taller weeds and woody vegetation or reestablishing vegetation as needed.
- Remove excess vegetation from drainage channels, pipe inlets, and outlets. Flow was observed by Stantec and plant personnel at the pipes observed during the November site visit.
- Continue to repair erosion features, reestablish vegetation, and continue to monitor in future inspections.
- Continue to monitor the surface water channel headwalls and culverts east of the landfill. Repair as needed.

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.

Fuller, Mossbarger, Scott & May Engineers, Inc. (FMSM) (2006). Permit Drawings. Indiana-Kentucky Electric Corporation. Clifty Creek Coal Ash Landfill Modification. Jefferson County, Madison Township, Indiana. Prepared for American Electric Power, Columbus, Ohio. November. Cincinnati, Ohio.

Indiana Department of Environmental Management (2008). "Approval of Major Modification and Renewal of Solid Waste Facility Permit FP 39-04." Letter to Indiana-Kentucky Electric Corporation, April 15, 2008.

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 2006.

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 2006.

Indiana-Kentucky Electric Corporation (2015). "Landfill Site: Inspection Log." Clifty Creek Landfill. December.

Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Clifty Creek Landfill. January.

Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Clifty Creek Landfill. February.

Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Clifty Creek Landfill. March.

Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Clifty Creek Landfill. April.

Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Clifty Creek Landfill. May.

Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Creek Landfill. June.

Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Clifty Creek Landfill. July.

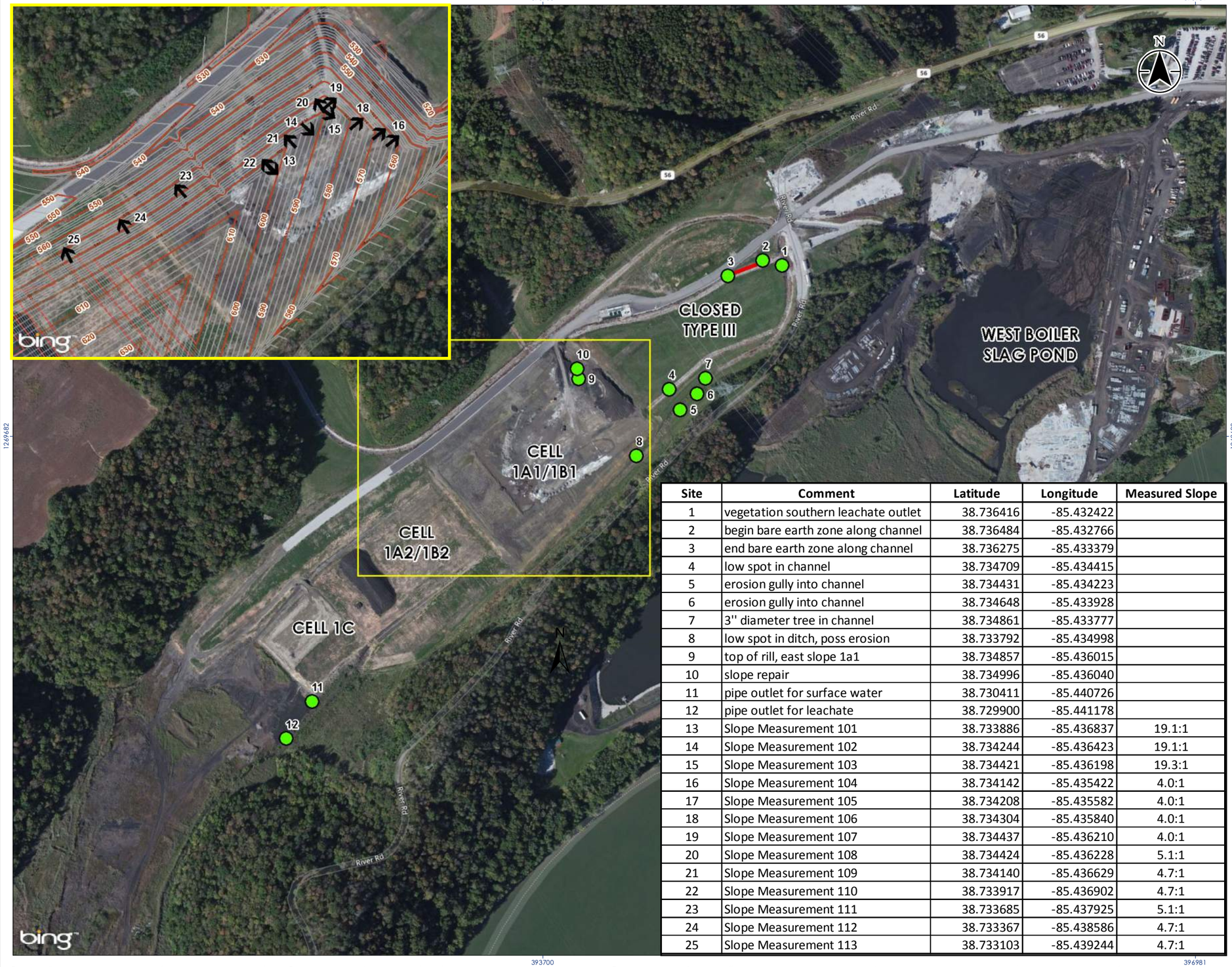
Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Clifty Creek Landfill. August.

Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Clifty Creek Landfill. September.

Indiana-Kentucky Electric Corporation (2016). "Landfill Site: Inspection Log." Clifty Creek Landfill. October.

Indiana-Kentucky Electric Corporation (2016). "7-Day Inspection Checklist. Clifty Creek Plant. Landfill. " Weekly reports for September 27, 2016 to November 10, 2016.

APPENDIX A
FIGURE 1 – PLAN VIEW



Site	Comment	Latitude	Longitude	Measured Slope
1	vegetation southern leachate outlet	38.736416	-85.432422	
2	begin bare earth zone along channel	38.736484	-85.432766	
3	end bare earth zone along channel	38.736275	-85.433379	
4	low spot in channel	38.734709	-85.434415	
5	erosion gully into channel	38.734431	-85.434223	
6	erosion gully into channel	38.734648	-85.433928	
7	3" diameter tree in channel	38.734861	-85.433777	
8	low spot in ditch, poss erosion	38.733792	-85.434998	
9	top of rill, east slope 1a1	38.734857	-85.436015	
10	slope repair	38.734996	-85.436040	
11	pipe outlet for surface water	38.730411	-85.440726	
12	pipe outlet for leachate	38.729900	-85.441178	
13	Slope Measurement 101	38.733886	-85.436837	19.1:1
14	Slope Measurement 102	38.734244	-85.436423	19.1:1
15	Slope Measurement 103	38.734421	-85.436198	19.3:1
16	Slope Measurement 104	38.734142	-85.435422	4.0:1
17	Slope Measurement 105	38.734208	-85.435582	4.0:1
18	Slope Measurement 106	38.734304	-85.435840	4.0:1
19	Slope Measurement 107	38.734437	-85.436210	4.0:1
20	Slope Measurement 108	38.734424	-85.436228	5.1:1
21	Slope Measurement 109	38.734140	-85.436629	4.7:1
22	Slope Measurement 110	38.733917	-85.436902	4.7:1
23	Slope Measurement 111	38.733685	-85.437925	5.1:1
24	Slope Measurement 112	38.733367	-85.438586	4.7:1
25	Slope Measurement 113	38.733103	-85.439244	4.7:1

OVEC/IKEC
Ohio Valley Electric Corporation / Indiana-Kentucky Electric Corporation

Stantec

Legend
- Slope Measurement
- Inspection Location
- Bare Earth Zone

0 500 1,000 Feet
1:6,000 (At original document size of 11x17)

Notes
1. Coordinate System: NAD 1983 StatePlane Indiana East FIPS 1301 Feet
2. Base features - BING
3. Ortho-Imagery does not represent current conditions.
4. Inset Topo shows Permitted Top of Cover.

Project Location
Clifty Creek Plant
Jefferson County, IN

175534018
Prepared by ANP on 2016-12-08
Technical Review by KB on 2016-12-08
Independent Review by JH on 2016-12-08

Client/Project
Indiana - Kentucky Electric Corporation
Clifty Creek Plant

Figure No.
1

Title
2016 Annual CCR Landfill Inspection

APPENDIX B
PHOTOGRAPHIC LOG

Photo 1

Northwest final grade surface water channel (right) and final grade surface/storm water channel looking west.

Photo 2

The combined surface/storm water channel flowing east to the West Boiler Slag Pond. The log is in the foreground. The vegetation and low area are in the background near the tree line.

Photo 3

A low area in the combined surface/storm water channel upstream of the Conspan flowing into the West Boiler Slag Pond.

Photo 4

West Boiler Slag Pond Conspan downstream headwall.

Photo 5

West Boiler Slag Pond Conspan looking upstream.

Photo 6

The southern of two final grade surface/storm water channel culverts passing beneath the access road to the temporary construction office trailers. A slight bow was observed in the crown.

Photo 7

The two headwalls for the final grade surface/storm water channels upstream of the temporary construction office trailer area. Vegetation and reeds near the construction trailer area culverts were minimal for 2016 visit.

Photo 8

Vegetation visible in final grade surface/storm water channels west of the temporary construction office trailer area, obscuring observation of the leachate piping headwalls. Discharge flow did not appear to be impeded.

Photo 9

The cracks in the inlet headwall for the northwest final grade channel appears unchanged from the 2015 visit.

Photo 10

A bare zone was observed in the northwest surface/storm water channel in the channel bottom along the riprap.

Photo 11

Grasses along the northwestern final grade surface/storm water channel.

Photo 12

Low spot and riprap erosion in southwestern final grade surface/storm water channel.

Photo 13

Vegetation in southwestern final grade surface/storm water channel near its junction with the southern storm water channel.

Photo 14

Vegetation in southern storm water channel.

Photo 15

Erosion rill on south side of southern storm water channel.

Photo 16

Small tree in southern storm water channel.

Photo 17

Low spot with possible erosion in the southern storm water channel near the southeastern corner of Subphases 1A1 and 1B1.

Photo 18

Vegetative cover on northern slope of Subphases 1A1 and 1B1.

Photo 19

Minor erosion rills at juncture of northeastern landfill slope and the southwestern final cover surface/storm water channel.

Photo 20

Erosion rill running top to bottom near northeast corner of Subphase 1A1.

Photo 21

Repair of temporary cover on northeastern side of Subphases 1A1 and 1B1.

Photo 22

Northwestern slope of Subphase 1A2 with established vegetation and uniform slope.

Photo 23

Rock check dam and storm water channel at the northeast corner of Subphases 1A1 and 1B1.

Photo 24

The storm water channel along the Devil's Backbone side of Subphase 1C1. The leachate pipe headwall is in the foreground.

Photo 25

Southwestern edge of inactive Subphase 1C. Termination berm and sediment trap for storm water management.

Photo 26

Storm water pipe outlet for Subphase 1C temporary cover area.

Photo 27

Subphase 1C with temporary cover removal and active face of Subphase 1A2.

APPENDIX C
REFERENCE DRAWINGS

DWG. NO. 16-30870-05

Notes:

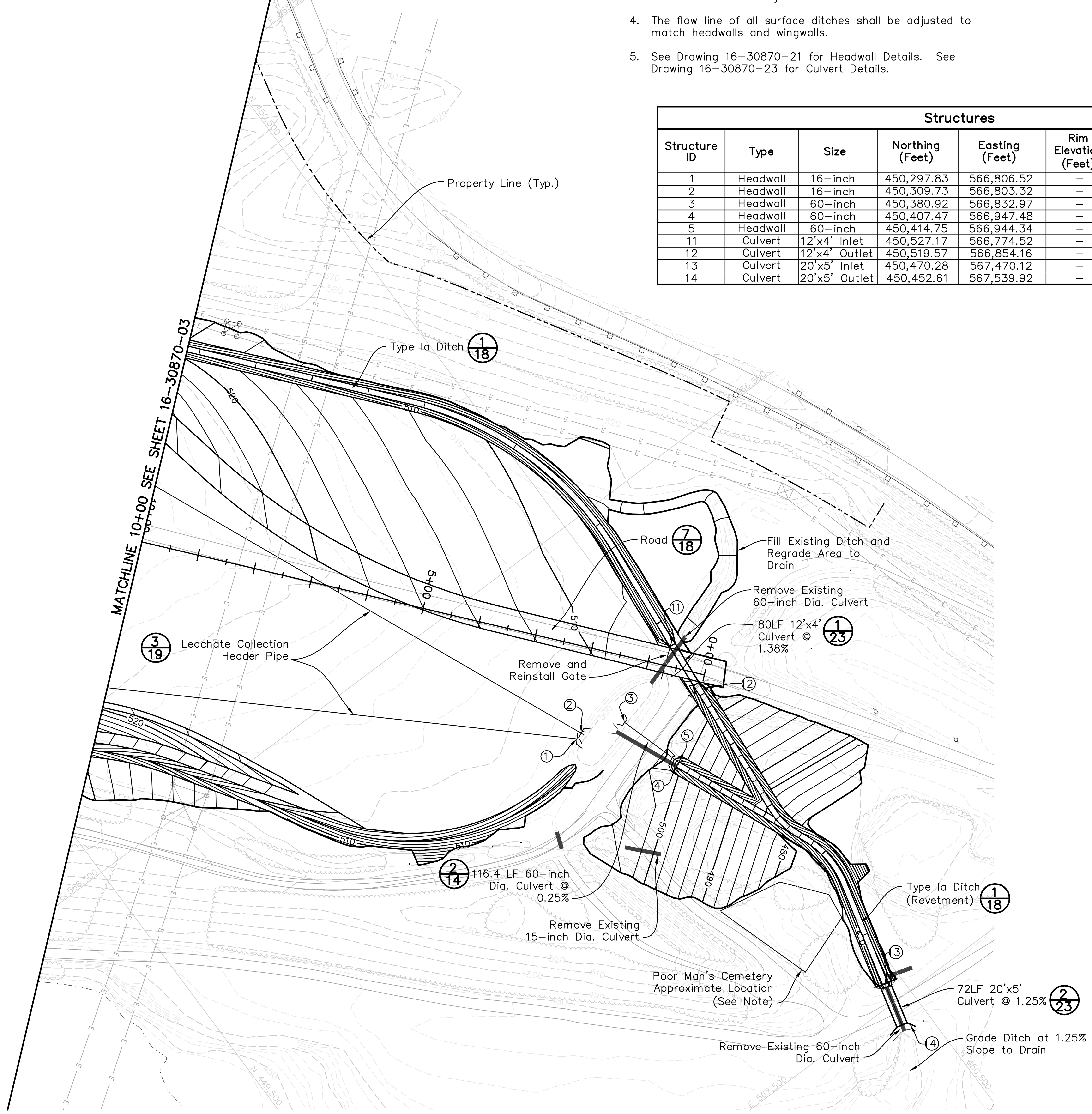
1. Topographic mapping for the hill sides and areas east of the existing landfill are supplied by Photogrammetric Services, Inc., Reynoldsburg, Ohio (April 28, 1992). Topographic mapping for the surface of the existing ash pond and landfill was supplied by Henderson Aerial Surveys, Inc., Grove City, Ohio (April 16, 2005) and Bowen, Inc. (June, 2007). Hydrographic survey of existing fly ash pond performed on May 4, 2005.
2. Information presented in Indiana State Plane coordinate system (NAD27/NAVD88 Indiana East, feet).
3. IKEC will locate and stake the limits of the Poor Man's Cemetery. The Contractor shall not operate within the limits of the Cemetery.
4. The flow line of all surface ditches shall be adjusted to match headwalls and wingwalls.
5. 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

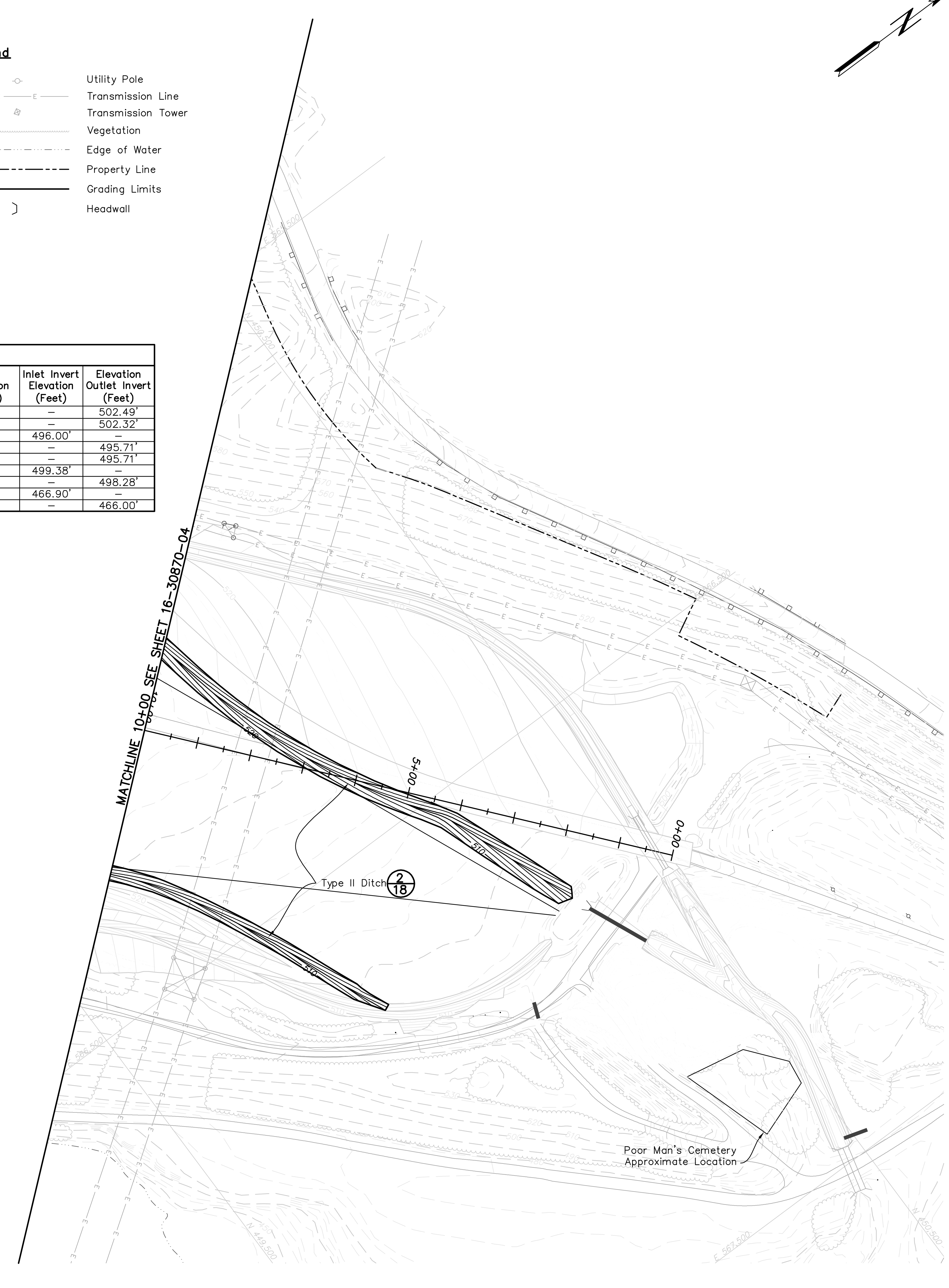
Structures

Structure ID	Type	Size	Northing (Feet)	Easting (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'



INITIAL CONSTRUCTION

50 0 100 200 FEET
GRAPHIC SCALE



FINAL GRADE

50 0 100 200 FEET
GRAPHIC SCALE

Section or Detail No.
Sheet Where Shown
REFERENCE KEY

NOTES

REFERENCE DRAWINGS

DATE	NO.	DESCRIPTION	APPD.
5/08	A	ISSUED FOR CONSTRUCTION	

REVISIONS

INDIANA – KENTUCKY ELECTRIC CO.

CLIFTY CREEK PLANT

MADISON INDIANA

COAL ASH LANDFILL SUBPHASE 1A INITIAL CONSTRUCTION AND FINAL GRADE

DWG. NO. 16-30870-05

SCALE: | CIVIL ENGINEERING DIVISION
DR:
CH:
ARCH:
ENGR:
DATE:
APPROVED BY

AEP AMERICAN ELECTRIC POWER
AEP SERVICE CORP.
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215

SCALE: AS SHOWN
DR: CW
CH: DMD
ENGR: DPG
DATE: JAN., 2010

Stantec
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PLOT DATE: 01/11/2010 USER: WITHERS, CHEYENNE
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