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

WRITER'S DIRECT DIAL NO:
740-897-7768

January 17, 2020

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

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

Dear Mr. Pigott:

Re: Indiana-Kentucky Electric Corporation
Clifty Creek Station's 2019 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 2019 CCR annual landfill inspection for OVEC's Kyger 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, 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) 897-7768.

Sincerely,

Tim Fulk

Tim Fulk
Engineer II

TLF:klr

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

January 16, 2020

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: 2019 CCR Rule Inspection
Annual Landfill Inspection
Clifty Creek Generating Station
Madison, Indiana

Dear Mr. Coriell,

Attached is the 2019 annual landfill inspection report for the Clifty Creek Generating Station's Type I Restricted Waste Landfill. The site visit was performed on October 28, 2019. Rainfall was not observed near the site on the day of the inspection and was 2.35 inches total during the three days prior. As a summary:

- In general, the slopes of the active coal combustion residual (CCR) landfill were uniform, mown, and well vegetated.

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

- Rock check dams for erosion and sediment control were in place. 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 attached annual landfill inspection report. See the included figure, GPS coordinate table, and photographic log to support and identify the locations of the noted observations.

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: 2019 CCR Rule Inspection
Annual Landfill Inspection
Clifty Creek Generating Station
Madison, Indiana

Regards,

Stantec Consulting Services Inc.

John G. Banton, P.E.
Senior Project Engineer
Phone: (513) 842-8200 ext 8215
John.Banton@stantec.com

Jacqueline S. Harmon, P.E.
Senior Associate
Phone: (513) 842-8200 ext 8220
Jacqueline.Harmon@stantec.com

Attachment: 2019 Annual Landfill Inspection Report

c. Kyle Blakley, Stan Harris, Stantec

jgb v:\1755\active\175534018\geotechnical\report\2019_annual_landfill_inspection\ltr_175534018_clifty_ann_rpt_20200116.docx

Stantec

2019 CCR Rule Inspection Clifty Creek Landfill

OVEC IKEC
Ohio Valley Electric Corporation Indiana-Kentucky Electric Corporation

Clifty Creek Generating Station
Madison, Indiana
Jefferson County

January 16, 2020

Prepared for:

Indiana-Kentucky Electric Corporation
Piketon, Ohio

Prepared by:

Stantec Consulting Services Inc.
Cincinnati, Ohio

Sign-off Sheet

This document entitled 2019 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)

John G. Banton, P.E.

Reviewed by ______________________________
(signature)

Kyle R. Blakley, P.E.

Reviewed by ______________________________
(signature)

Jacqueline S. Harmon, P.E.

JACQUELINE S. HARMON
REGISTERED
No. 10911138
STATE OF
INDIANA
PROFESSIONAL ENGINEER

1/16/2020

Table of Contents

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 28, 2019.

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:	October 28, 2019
Weather:	Mostly sunny, breezy, 55ºF - 72ºF
Rainfall over previous 72 hours:	October 25, 2019 – 0.00 inches October 26, 2019 – 0.00 inches October 27, 2019 – 2.10 inches October 28, 2019 – 0.25 inches

Precipitation data was collected by the National Environmental Satellite, Data, and Information Service of NOAA for Clifty Creek, Indiana. Precipitation during the 72-hour period prior to the site visit was 2.35 inches.

Stantec's team that performed the fieldwork included:

- John G. Banton, P.E., Senior Project Engineer
  24 years of experience in geotechnical exploration and general civil engineering design
- Kyle R. Blakley, P.E., Senior Project Engineer/Geotechnical Engineer
  10 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 2,666,500 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. Weekly and monthly inspection reports encompassing the 2019 calendar year were provided by plant personnel for review.

IDEM routinely inspects the facility on a quarterly basis through the year. The 2019 inspection reports dated January 17th, May 15th, and July 25th were available for in IDEM's online virtual filing cabinet (IDEM, 2019). The plant provides annual submittals to IDEM, including drawings showing existing conditions.

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. 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. Currently 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 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 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. The original Type III facility was soil capped during the site development. Subphases IA, 1B, and portions of 1C were constructed and certified for waste by late 2012. See Appendix A for a plan view of the CCR for the current constructed footprint. Other features associated with the landfill include:

- West Boiler Slag Pond – 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.

- 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. Area 1C was approved for waste placement in 2016. IKEC submitted a five-year permit renewal to IDEM in July 2018; the status remains pending. IKEC notified IDEM of the intent to begin construction of Subphase 1D in August 2018. IDEM attended a pre-construction meeting for Subphase 1D at the Clifty Creek Plant on August 28, 2018 and a second pre-construction meeting for Phase 2 on October 9, 2019.

According to the third quarter waste placement survey plot for 2019, Subphases 1A and 1B are near permitted grade for CCRs and have been covered with temporary soil and vegetation. The 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). Bottom ash is being stockpiled southwest of the active cell to prepare for underdrain and subgrade placement within the Phase 2 footprint during 2019. 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 to focus attention at particular locations. Also refer to the GPS point descriptions and figure in Appendix A along with the photographs and descriptions in Appendix B for observations in other locations.

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 nearest the paved haul road to the north and one nearest the natural ridge (Devil's Backbone) to the south, convey flow from the surrounding watershed. Two drainage channels towards the middle are intended to manage stormwater flow once final cover is placed in Phase I and flow into a collection ditch at the east end of the closed portion of the landfill. The four channels merge east of the landfill and flow to the West Boiler Slag Pond and its associated National Pollutant Discharge Elimination System (NPDES)-permitted outfall.

This section includes observations on October 28, 2019 beginning with the visible pipes and headwalls at the east end of a single merged channel.

- The channel downstream of the east Conspan headwall is densely vegetated. Refer to Point 39, Appendix A and Photo 1, Appendix B.

- The channel upstream of the east Conspan headwall is densely vegetated. Refer to Point 40, Appendix A and Photo 2, Appendix B. The vegetated stretch ends upstream at Point 42. Refer to Photo 3.

- The rock fill of the gabion mattress of the north stormwater channel near the confluence with the south channel was observed to be somewhat displaced and bulging beneath the wire gabion fabric (Point 43, Appendix A; Photos 4 and 5, Appendix B). This did not appear to impact functionality.

- The culvert pipe lining is deteriorating at Point 41, Appendix A, Photo 9, Appendix B.

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 West Boiler Slag Pond.

- The northern and eastern channels contain dense vegetation. (Point 45 to Point 47, Appendix A; Photos 10, 11, 14, and 15, Appendix B)

- An unmarked one-inch PVC standpipe appears to mark the end of a four-inch PVC pipe on the Type III cover (Point 48, Appendix A, See Photo 11, 2018 report Appendix B).

- An erosion rill (approximately 3 feet wide by 1.5 feet deep) has formed around the utility pole at the western edge of the truck wash area (Point 50, Appendix A; Photo 17, Appendix B).

- The Type III landfill cap appears uniform, mowed, and maintained (Photo 19, Appendix B).

- Dense vegetation was observed in the east end of the southern channel (Point 58, 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.

- Erosion rills (3'w x 3'd to 2'w x 1'd) were observed at the southwest corner of the inactive landfill. (Points 59 & 60, Appendix A; Photo 26)

- As observed in 2018, Subphases 1A1 and 1B1 were observed to be nearly built to permitted final CCR grades. The subphases have been temporarily covered with approximately six inches of soil, and vegetation has generally been established.

- A rock check dam was observed to be near capacity on the south side of the landfill. (Point 64, Appendix A; Photo 29, Appendix B)

- Erosion rills and/or small animal burrows were observed at the eastern toe of the landfill. (Point 55, Appendix A; Photo 33, Appendix B)

- A rock check dam was observed to be near capacity on the northeast corner of the landfill. (Point 54, Appendix A; Photo 23, Appendix B)

- A rock check dam was observed to be near capacity on the north side of the landfill. There is an erosion feature on one side of the dam. (Points 73, 74, Appendix A; Photos 34, 35, Appendix B)

- Another rock check dam, at the northwest corner of the active area, was observed to be near capacity. (Point 87, Appendix A; Photo 37, Appendix B)

- Several bare or rocky areas were observed on the temporary cover slopes of Subphases 1A2/1B2. Several erosion rills were observed in the grassed areas downslope from the rocky/bare areas.

- Active waste placement was ongoing in Cells 1C. Piles of bottom ash, used as chimney drains in the landfill, were visible.

- The temporary cover outslopes of Subphase 1A/1B were consistent with the previous inspections and were generally flatter than and complying with the permitted final cover grades.

- Storm water within Subphase 1C is collected and directed towards the Landfill Runoff Collection Pond. Photo 39 (Appendix B) shows the storm water collection berm at the western edge of Subphase 1C.

- The leachate pipe appeared unrestricted and actively flowing. Vegetation was dense around the headwall making visual observation difficult. (Point 88, Appendix A; Photo 38, Appendix B).

4.0 RECOMMENDATIONS

The following recommendations are offered for the Clifty Creek Station's Type I Restricted Waste Landfill. 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 permitted CCR grades are recommended to be capped, closed, and vegetated (Subphases 1A1, 1B1, 1A2, and 1B2).

- As noted in prior annual inspection reports seepage was observed near the leachate pipe outlets on the northeast corner of the Type III landfill. While not observed during this inspection, the area should continue to be monitored for seeps. Consider ways to segregate and reduce the various source of flows into the eastward stormwater and leachate collection channel.

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. Consider cleaning out sediment traps/rock check dams.

- 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 as gradation specifications deviate from the final cover requirements.

- Remove excess vegetation from drainage channels, pipe inlets, and outlets. Flow was visible at the pipes observed by Stantec during the October site visit.

- Continue to repair erosion features, reestablish vegetation, and monitor in future inspections.

- Continue to monitor the surface water channel headwalls and culverts east of the landfill. Repair as needed.

- Monitor the integrity of the exposed corrugated metal in the southernmost of the culverts near the temporary construction trailers. If needed, remediation of the culvert should be considered to re-establish an internal liner for the pipe.

- Repair erosion feature near the truck wash surface water drainage pipe outlet/headwall area.

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 (2019). Virtual File Cabinet (https://vfc.idem.in.gov/DocumentSearch.aspx). Accessed January 8th.

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.

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Indiana-Kentucky Electric Corporation (2018). "7-Day Inspection Checklist. Clifty Creek Plant. Landfill." Weekly reports for January 2, 2018 to December 31, 2018.

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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 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 (2017). "Landfill Site: Inspection Log." Clifty Creek Landfill. January.

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Stantec Consulting Services Inc. (2018b). "Estimated 5-Year Construction Limits (June 2023)." Indiana-Kentucky Electric Corporation. Clifty Creek Coal Ash Landfill. Drawing no. 38039c-02-5yrcl-2018.dwg.

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

APPENDIX A
FIGURE 1 – PLAN VIEW

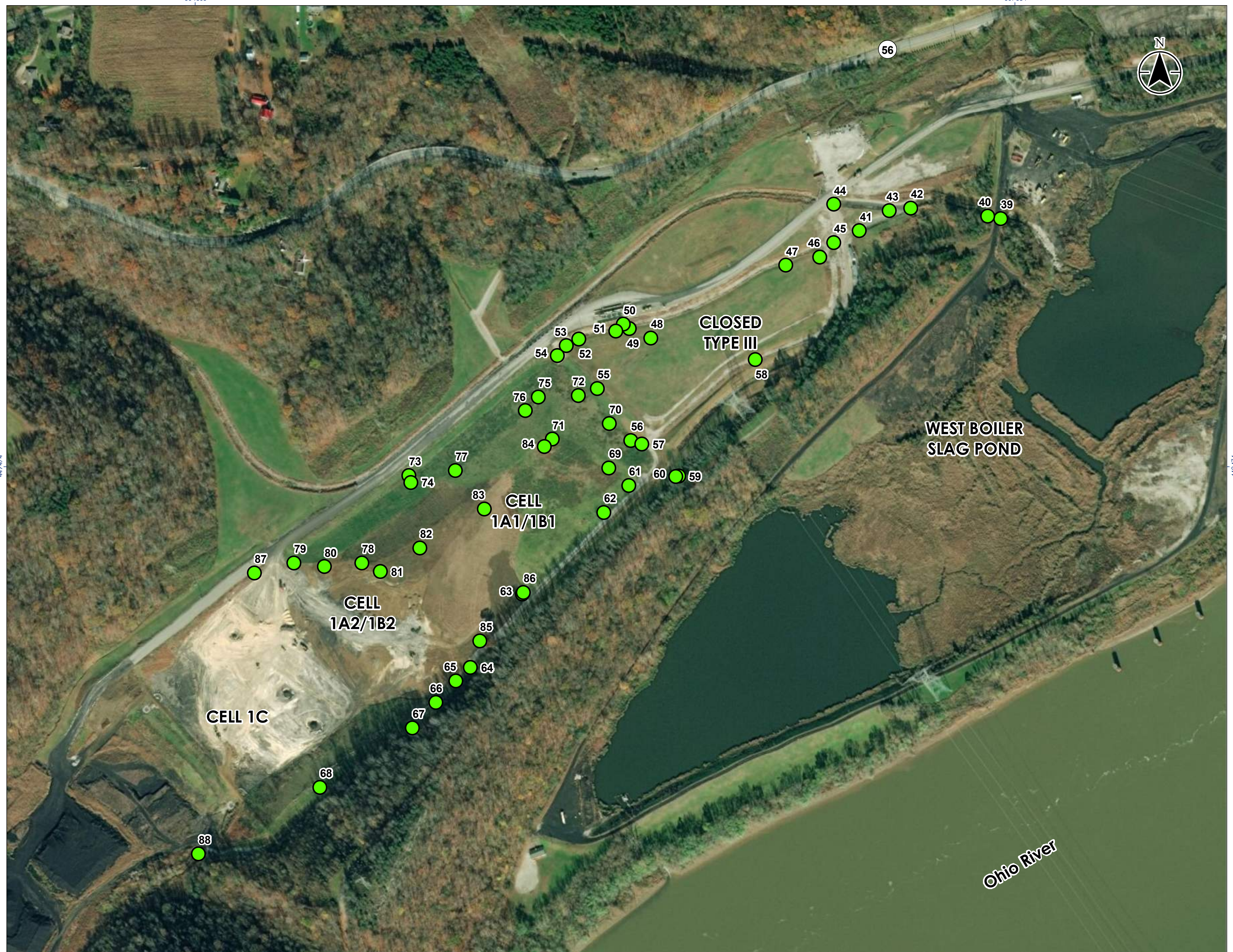
Clifty Creek Ash Landfill
2019 Annual Inspection

Point ID	Comment	Latitude, N.	Longitude, W.
39	At east Conspan headwall. Dense vegetation growing in stormwater drainage ditch that flows to West Boiler Slag Pond.	38.736862	-85.429901
40	At west Conspan headwall. Dense vegetation growing in stormwater drainage ditch from landfill to West Boiler Slag Pond.	38.736893	-85.430080
41	Dense vegetation at headwall of south storm water drainage channel above confluence.	38.736734	-85.431882
42	Looking east (downstream) between access road and landfill at dense vegetation growing in stormwater drainage ditch from landfill to West Boiler Slag Pond.	38.736983	-85.431164
43	Looking west at stormwater drainage ditch confluence between access road and landfill. Gabion fill rock has shifted within baskets creating uneven channel lining.	38.736955	-85.431466
44	Looking west at clear channel at headwall of north storm water drainage channel upstream of confluence.	38.737026	-85.432243
45	View looking west showing dense vegetation in drainage channel on north side of inactive landfill Subphases 1A and 1B and point of overview of access road at east end of inactive landfill Subphases 1A and 1B looking south showing dense vegetation in drainage area.	38.736606	-85.432241
46	Outlet location of inactive landfill (subphases 1A and 1B) leachate pipes.	38.736446	-85.432443
47	West end of dense vegetation in drainage channel on north side of inactive landfill Subphases 1A and 1B.	38.736357	-85.432916
48	Location of 4-in dia PVC pipe of unknown purpose.	38.735560	-85.434815
49	Ash in invert of drainage channel just downstream of truck wash outlet.	38.735667	-85.435112
50	Erosion and vegetation at truck wash outlet to drainage channel.	38.735713	-85.435199
51	Ash in invert of ditch.	38.735641	-85.435302
52	Ash in invert of ditch.	38.735551	-85.435825
53	Rock check dam in drainage channel just west of truck wash outlet.	38.735479	-85.435997
54	Sediment behind rock check dam.	38.735370	-85.436125
55	Erosion rills and/or small animal burrowing at eastern toe of landfill.	38.735008	-85.435566
56	Repaired slope on east side of landfill.	38.734436	-85.435100
57	Sediment in ditch.	38.734396	-85.434945
58	East end of drainage channel on south side of inactive landfill Subphases 1A and 1B showing dense vegetation in channel.	38.735321	-85.433348
59	Erosion rills (3’w x 3’d to 2’w x 1’d) at southwest corner of inactive landfill Subphases 1A and 1B.	38.734045	-85.434429
60	Erosion rills (3’w x 3’d to 2’w x 1’d) at southwest corner of inactive landfill Subphases 1A and 1B.	38.734040	-85.434468
61	Slope of active landfill 14 degrees (4H:1V)	38.733940	-85.435126

62	Slope of active landfill 14 degrees (4H:1V)	38.733645	-85.435479
63	Slope of active landfill 13 degrees (4.3H:1V)	38.732753	-85.436628
64	Rock check dam at capacity on south side of landfill near top of active area.	38.731948	-85.437358
65	Unseeded/bare area above full rock check dam at southeastern edge of active ash area on south side of landfill.	38.731797	-85.437560
66	Southeastern edge of active area.	38.731563	-85.437843
67	High point on slope of Devil's Backbone	38.731284	-85.438171
68	West edge of slope of active landfill	38.730631	-85.439475
69	Slope of active landfill 13 degrees (4.3H:1V)	38.734133	-85.435405
70	Soft soil at toe	38.734624	-85.435402
71	Slope of active landfill 13 degrees (4.3H:1V)	38.734452	-85.436198
72	Area of several erosion rills	38.734929	-85.435834
73	Rock check dam at capacity on northeast corner of active landfill.	38.734056	-85.438214
74	Erosion feature at south edge of check dam on northeast corner of active landfill (4 ft w x 2 ft deep)	38.733982	-85.438183
75	Slope of active landfill 11 degrees (5H:1V)	38.734918	-85.436392
76	Erosion with exposed ash on north face of active landfill.	38.734766	-85.436573
77	Erosion rill on north face of active landfill.	38.734112	-85.437563
78	East end of newly vegetated north slope of active landfill.	38.733099	-85.438873
79	West end of newly vegetated north slope of active landfill. Collected sediment at bottom of slope apparently from regrading/revegetation of slope above.	38.733098	-85.439826
80	Slope of active landfill 11 degrees (5H:1V)	38.733057	-85.439398
81	Slope of active landfill 11 degrees (5H:1V)	38.733002	-85.438618
82	Slope of active landfill 11 degrees (5H:1V)	38.733259	-85.438058
83	Slope of active landfill 11 degrees (5H:1V)	38.733688	-85.437155
84	Slope of active landfill 10 degrees (5.7H:1V)	38.734373	-85.436314
85	Slope of active landfill 6 degrees (9.5H:1V)	38.732235	-85.437222
86	Slope of active landfill 7 degrees (8H:1V)	38.732768	-85.436611
87	Rock check with sediment on both sides of dam.	38.732992	-85.440380
88	Leachate outlet pipe and headwall.	38.729903	-85.441181

Clifty Creek Ash Landfill
2019 Annual Inspection

GPS Point Name	GPS Point Number	Distance (ft)	Bearing (degrees)	Slope (degrees)	Slope
Slope Shot	62	21	118	-14	4H:1V
Slope Shot	63	21.9	124	-13	4.3H:1V
Slope Shot	64	29.7	118	-11	5.1H:1V
Slope Shot	70	137	51	-13	4.3H:1V
Slope Shot	72	221	46	-13	4.3H:1V
Slope Shot	76	80.3	335	-11	5.1H:1V
Slope Shot	81	91.7	337	-11	5.1H:1V
Slope Shot	82	250	338	-11	5.1H:1V
Slope Shot	83	263	334	-11	5.1H:1V
Slope Shot	84	293	332	-11	5.1H:1V
Slope Shot	85	264	332	-10	5.7H:1V
Slope Shot	86	275	321	6	9.5H:1V
Slope Shot	87	307	320	7	8.1H:1V



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

Stantec

Legend

- Inspection Location
- Impacted Area

0 500 1,000 Feet

1:4,800 (At original document size of 11x17)

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

175534018
Prepared by ANP on 2019-11-7
Technical Review by JB on 2019-11-7
Independent Review by JSH on 2019-11-7

Client/Project
Indiana - Kentucky Electric Corporation
Clifty Creek Plant

Figure No.
1

Title
2019 Annual CCR Landfill Inspection

APPENDIX B
PHOTOGRAPHIC LOG

Photo 1

Dense vegetation growing in stormwater drainage ditch that flows to West Boiler Slag Pond. Photo taken at access road Conspan and looking east from downstream headwall. (Point 39, Appendix A)

Photo 2

Dense vegetation growing in stormwater drainage ditch from landfill to West Boiler Slag Pond. Photo taken atop access road Conspan and looking west (upstream) toward landfill. Ditch is in center of photograph. (Point 40, Appendix A)

Photo 3

Looking east (downstream) between access road and landfill at dense vegetation growing in stormwater drainage ditch from landfill to West Boiler Slag Pond. Log and other debris are also present. (Point 42, Appendix A)

Photo 4

Looking west at stormwater drainage ditch confluence between access road and landfill. Gabion fill rock has shifted within baskets creating uneven channel lining. (Point 43, Appendix A)

Photo 5

Looking west at uneven gabion fill rock in north stormwater drainage ditch. (Point 43, Appendix A)

Photo 6

Looking west at clear channel at headwall of north storm water drainage channel upstream of confluence. Note a small amount of vegetation downstream of headwall. (Point 44, Appendix A)

Photo 7

Looking west at clear channel of south storm water drainage channel upstream of confluence.

Photo 8

Dense vegetation at headwall of south storm water drainage channel above confluence. (Point 41, Appendix A)

Photo 9

Photo of culvert outlet at headwall of south storm water drainage channel showing deterioration of culvert pipe lining. (Point 41, Appendix A)

Photo 10

View looking west of dense vegetation in drainage channel on north side of inactive landfill Subphases 1A and 1B. Headwall of culvert beneath access road in foreground. (Point 45, Appendix A)

Photo 11

Overview of access road at east end of inactive landfill Subphases 1A and 1B looking south showing dense vegetation in drainage area. (Point 45, Appendix A)

Photo 12

Headwall of north leachate collection line of inactive landfill Subphases 1A and 1B with orange-colored leachate. (Point 46, Appendix A)

Photo 13

Headwall of south leachate collection line of inactive landfill Subphases 1A and 1B, unobstructed but filling with sediment. (Point 46, Appendix A)

Photo 14

Dense vegetation in east end of drainage channel on north side of inactive landfill Subphases 1A and 1B.

Photo 15

West end of dense vegetation in drainage channel on north side of inactive landfill Subphases 1A and 1B. (Point 47, Appendix A)

Photo 16

Ash (center of photo) in invert of drainage channel on north side of inactive landfill Subphases 1A and 1B just downstream of truck wash outlet. (Point 49, Appendix A)

Photo 17

Erosion and vegetation at truck wash outlet to drainage channel on north side of inactive landfill Subphases 1A and 1B. (Point 50, Appendix A)

Photo 18

Rock check dam in drainage channel on north side of inactive landfill Subphases 1A and 1B just west of truck wash outlet. (Point 53, Appendix A)

Photo 19

Overview of inactive landfill Subphases 1A and 1B showing maintained temporary cover.

Photo 20

Repaired slope on east side of landfill. (Point 56, Appendix A)

Photo 21

Toe of repaired slope on east side of landfill. Collected sediment at bottom of slope. (Point 57, Appendix A)

Photo 22

Maintained channel at bottom of east slope of landfill.

Photo 23

Sediment basin at northeast corner of landfill. (Point 54, Appendix A)

Photo 24

West end of drainage channel on south side of inactive landfill Subphases 1A and 1B showing channel lining and dense vegetation in channel beyond.

Photo 25

East end of drainage channel on south side of inactive landfill Subphases 1A and 1B showing dense vegetation in channel. (Point 58, Appendix A)

Photo 26

Erosion rills (3'w x 3'd to 2'w x 1'd) at southwest corner of inactive landfill Subphases 1A and 1B. (Points 59 & 60, Appendix A)

Photo 27

View looking west along ditch and road on south side of landfill.

Photo 28

Dense vegetation along invert of drainage ditch along south side of landfill.

Photo 29

Rock check dam at capacity on south side of landfill near top of active area. (Point 64, Appendix A)

Photo 30

Unseeded/bare area above full rock check dam at southeastern edge of active ash area on south side of landfill. (Point 65, Appendix A)

Photo 31

Southeastern corner of active ash area. (Point 66, Appendix A)

Photo 32

Western edge of active cell.

Photo 33

Erosion rills and/or small animal burrowing at eastern toe of landfill. (Point 55, Appendix A)

Photo 34

Rock check dam at capacity on northeast corner of active landfill. (Point 73, Appendix A)

Photo 35

Erosion feature at south edge of check dam on northeast corner of active landfill (Point 74, Appendix A)

Photo 36
Unseeded area on north side of active landfill. Sediment apparently from regrading/revegetation of slope above. (Point 79, Appendix A)

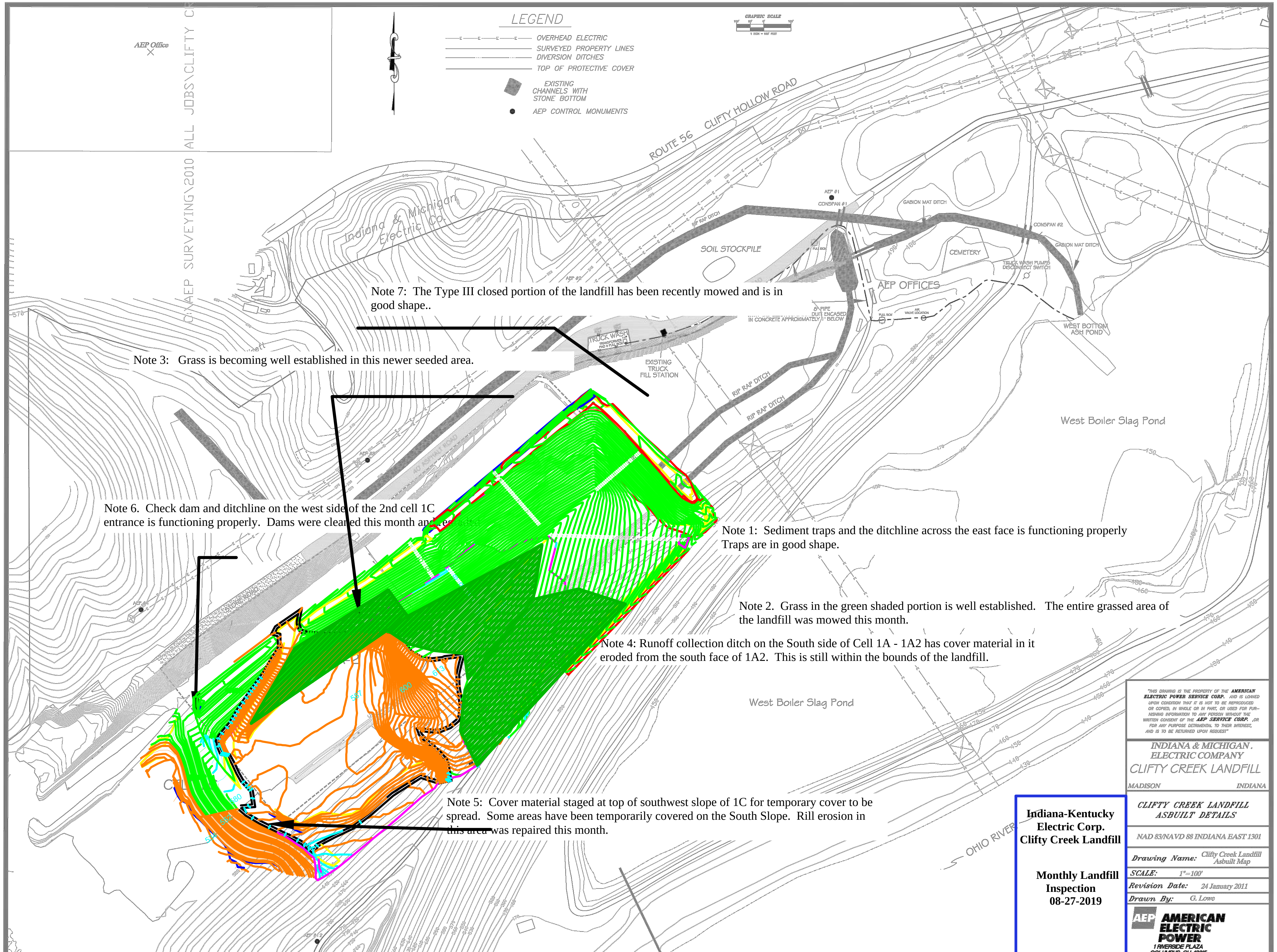
Photo 37
Full rock check dam on north side of active landfill. (Point 87, Appendix A)

Photo 38
Leachate pipe outlet, west of Subphase 1C. (Point 88, Appendix A)

Photo 39
Pond at west end of active landfill.

Photo 40
Sediment trap of pond at west end of landfill.

APPENDIX C
REFERENCE DRAWINGS



LEGEND
OVERHEAD ELECTRIC
SURVEYED PROPERTY LINES
DIVERSION DITCHES
TOP OF PROTECTIVE COVER
EXISTING CHANNELS WITH STONE BOTTOM
AEP CONTROL MONUMENTS
AEP Office
ROUTE 56 CLIFTY HOLLOW ROAD
Indiana & Michigan Electric Co.
SOIL STOCKPILE
AEP OFFICES
CEMETERY
GABION MAT DITCH
RIP RAP DITCH
EXISTING TRUCK FILL STATION
TRUCK WASH
WEST BOTTOM ASH POND
West Boiler Slag Pond
OHIO RIVER
Note 7: The Type III closed portion of the landfill has been recently mowed and is in good shape..
Note 3: Grass is becoming well established in this newer seeded area.
Note 6. Check dam and ditchline on the west side of the 2nd cell 1C entrance is functioning properly. Dams were cleaned this month and reset.
Note 1: Sediment traps and the ditchline across the east face is functioning properly Traps are in good shape.
Note 2. Grass in the green shaded portion is well established. The entire grassed area of the landfill was mowed this month.
Note 4: Runoff collection ditch on the South side of Cell 1A - 1A2 has cover material in it eroded from the south face of 1A2. This is still within the bounds of the landfill.
Note 5: Cover material staged at top of southwest slope of 1C for temporary cover to be spread. Some areas have been temporarily covered on the South Slope. Rill erosion in this area was repaired this month.
Indiana-Kentucky Electric Corp. Clifty Creek Landfill
Monthly Landfill Inspection 08-27-2019
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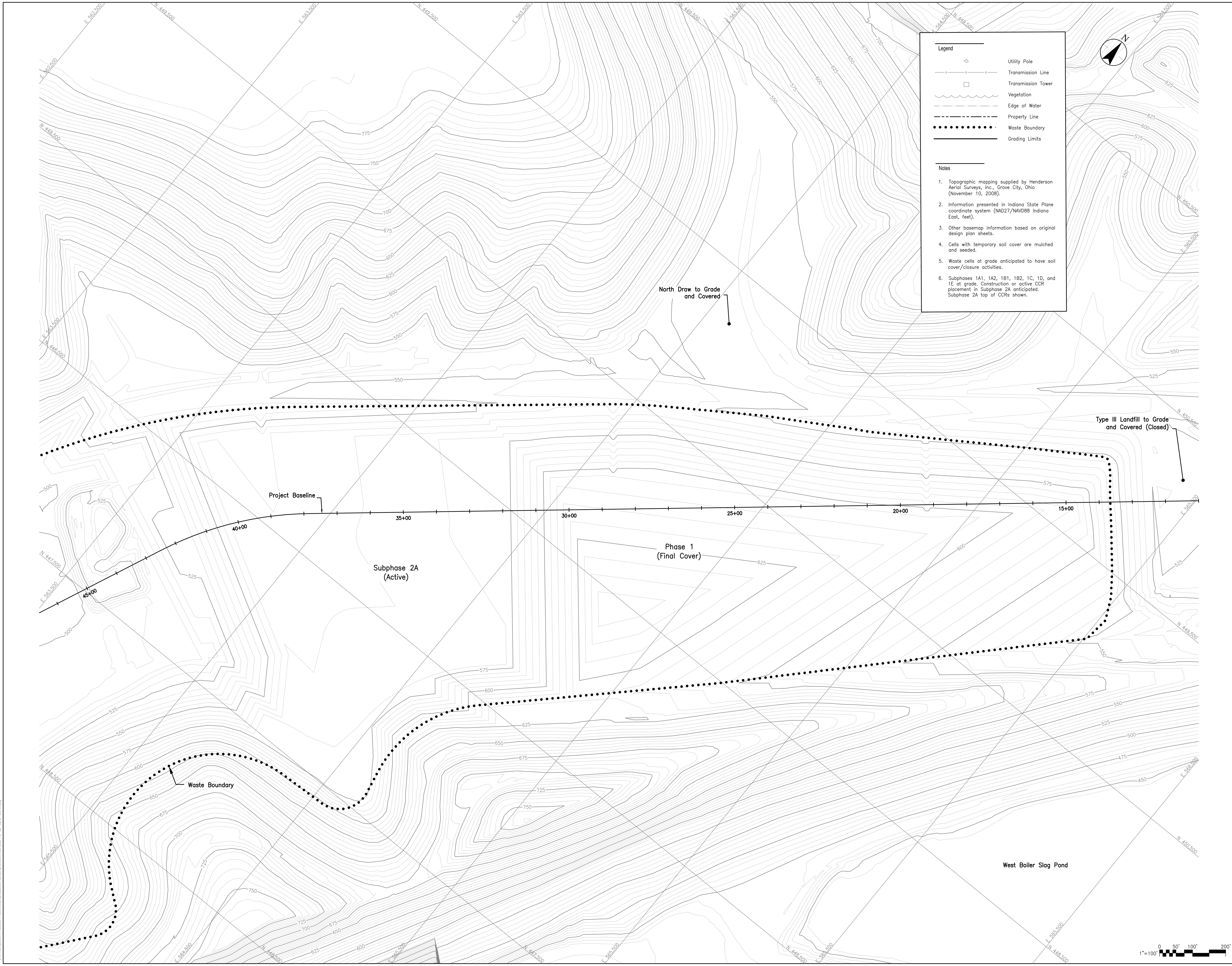
INDIANA & MICHIGAN . ELECTRIC COMPANY
CLIFTY CREEK LANDFILL
MADISON INDIANA
CLIFTY CREEK LANDFILL ASBUILT DETAILS
NAD 83/NAVD 88 INDIANA EAST 1301
Drawing Name: Clifty Creek Landfill Asbuilt Map
SCALE: 1"=100'
Revision Date: 24 January 2011
Drawn By: G. Lowe
AMERICAN ELECTRIC POWER
1 RIVERSIDE PLAZA
COLUMBUS, OH 43215



Notes

1. Topographic mapping supplied by Henderson Aerial Surveys, Inc., Grove City, Ohio (November 10, 2008).
2. Information presented in Indiana State Plane coordinate system (NAD27/NAVD88 Indiana East, feet).
3. Other basemap information based on original design plan sheets.
4. Cells with temporary soil cover are mulched and seeded.
5. Waste cells at grade anticipated to have soil cover/closure activities.
6. Subphases 1A1, 1A2, 1B1, 1B2, 1C, 1D, and 1E at grade. Construction or active CCR placement in Subphase 2A anticipated. Subphase 2A top of CCRs shown.

Stantec
11687 Lebanon Road
Cincinnati, Ohio 45241-2012
www.stantec.com

Client/Project
INDIANA-KENTUCKY ELECTRIC CORPORATION

CLIFTY CREEK COAL-ASH LANDFILL MODIFICATION

Project Location

Title
ESTIMATED 5-YEAR CONSTRUCTION LIMITS (JUNE 2024)

Permit-Seal

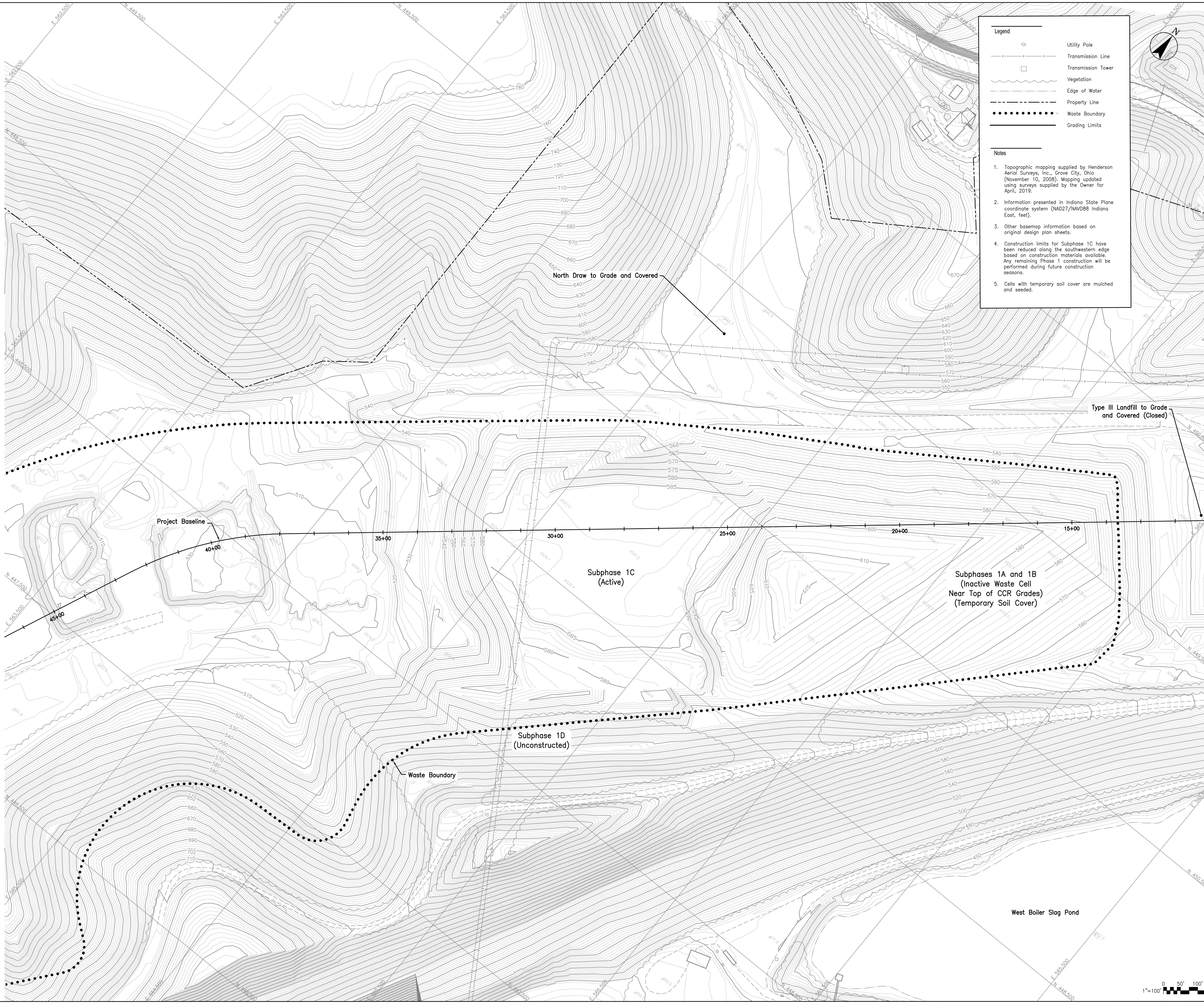
Project Number: 175538044

File Name: 38044c-02-5yrcl-2019.dwg	ACC	JSH	JSH	19.05.31
	Dwn.	Chkd.	Dsgn.	YY.MM.DD

Drawing No. 2

Revision -

Sheet 2 of 2



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Client/Project
INDIANA-KENTUCKY ELECTRIC CORPORATION

CLIFTY CREEK COAL-ASH LANDFILL MODIFICATION

Project Location

Title
PHASE 1 EXISTING CONDITIONS (JUNE 2019)

Permit-Seal

Project Number: 175538044

File Name: 38044c-01-econ-2019.dwg | ACC Dwn. | JSH Chkd. | JSH Dsgn. | 19.05.31 YY.MM.DD

Drawing No. 1

Revision: -

Sheet: 1 of 2

DWG. NO. 16-30870-05

NOTES

Notes:

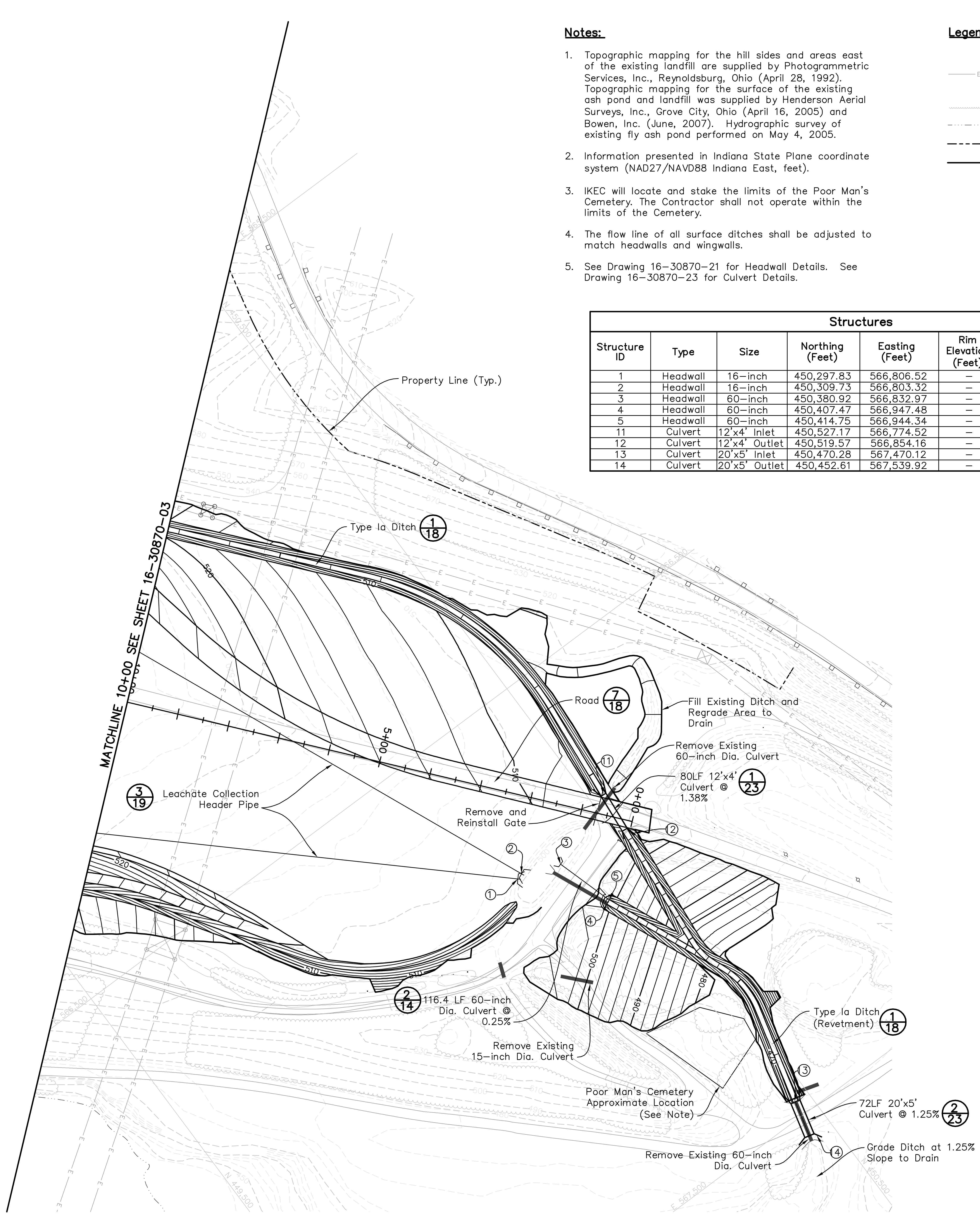
1. Topographic mapping for the hill sides and areas east of the existing landfill are supplied by Photogrammetric Services, Inc., Reynoldsburg, Ohio (April 28, 1992). Topographic mapping for the surface of the existing ash pond and landfill was supplied by Henderson Aerial Surveys, Inc., Grove City, 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

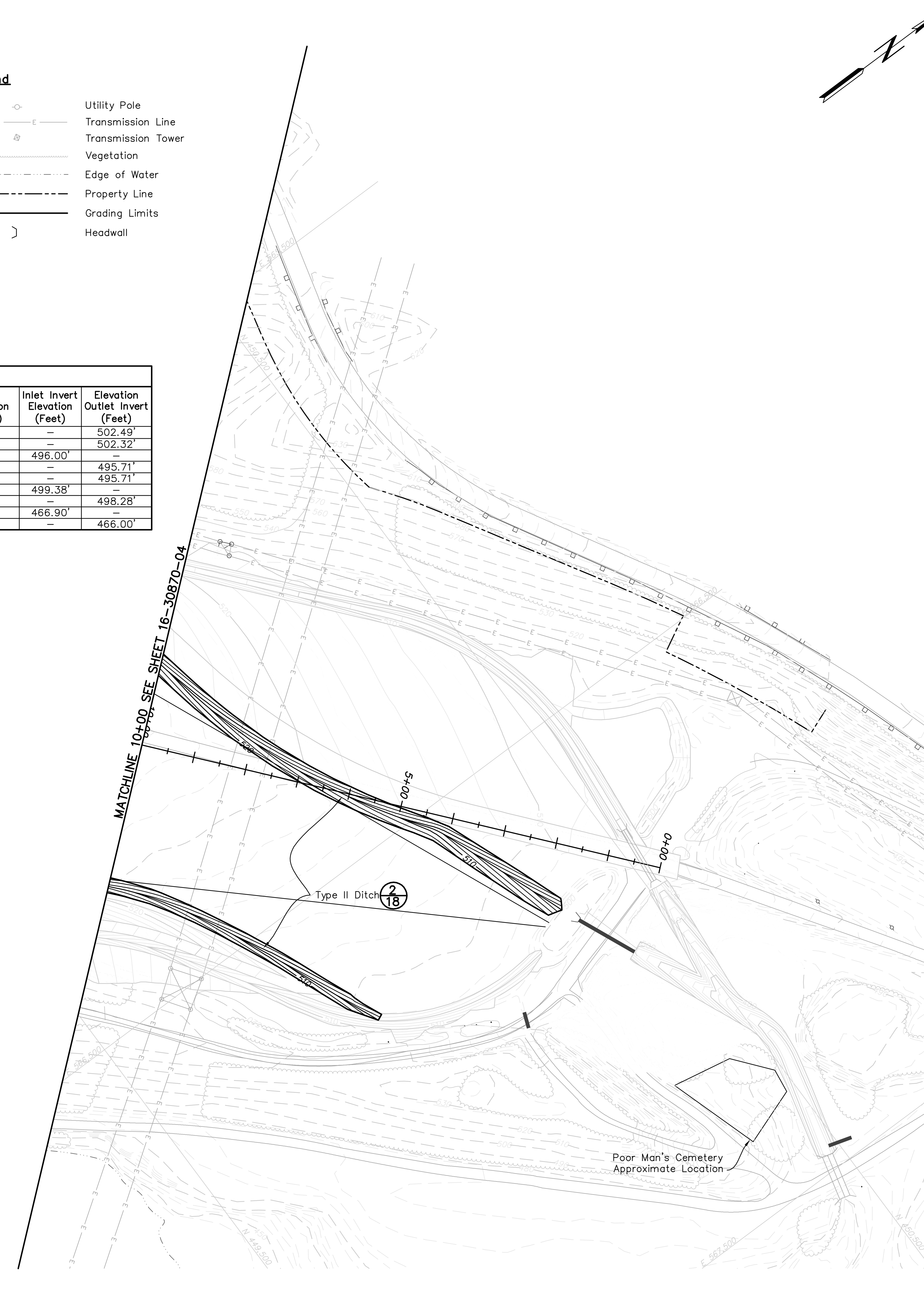
Structures

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

REFERENCE DRAWINGS

Section or Detail No.
Sheet Where Shown
REFERENCE KEY

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

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

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

Stantec

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11687 Lebanon Rd.
Cincinnati, Ohio
45241
513-842-8200
www.stantec.com

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