ENVIRONMENTAL • GEOTECHNICAL
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VISUAL SITE INSPECTION REPORT - 2017

SOUTHERN INDIANA GAS AND ELECTRIC
A. B. BROWN GENERATING STATION
TYPE III RESTRICTED WASTE LANDFILL
WEST FRANKLIN, IN

ATC PROJECT NO. 170LF00430

DECEMBER 18, 2017

PREPARED FOR:

SOUTHERN INDIANA GAS AND ELECTRIC COMPANY
dba VECTREN POWER SUPPLY
A.B. BROWN GENERATING STATION
8511 WELBORN ROAD
MOUNT VERNON, IN 47620
ATTENTION: MS. ANGIE SCHELLER

December 18, 2017

ATC Group Services LLC

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Indianapolis, IN 46256

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Angie Scheller
Southern Indiana Gas and Electric Company
8511 Welborn Road
Mount Vernon, IN 47620

Re: Visual Site Inspection Report - 2017
A.B. Brown Generating Station
Type III Restricted Waste Landfill
West Franklin, Indiana
ATC Project No. 170LF00430

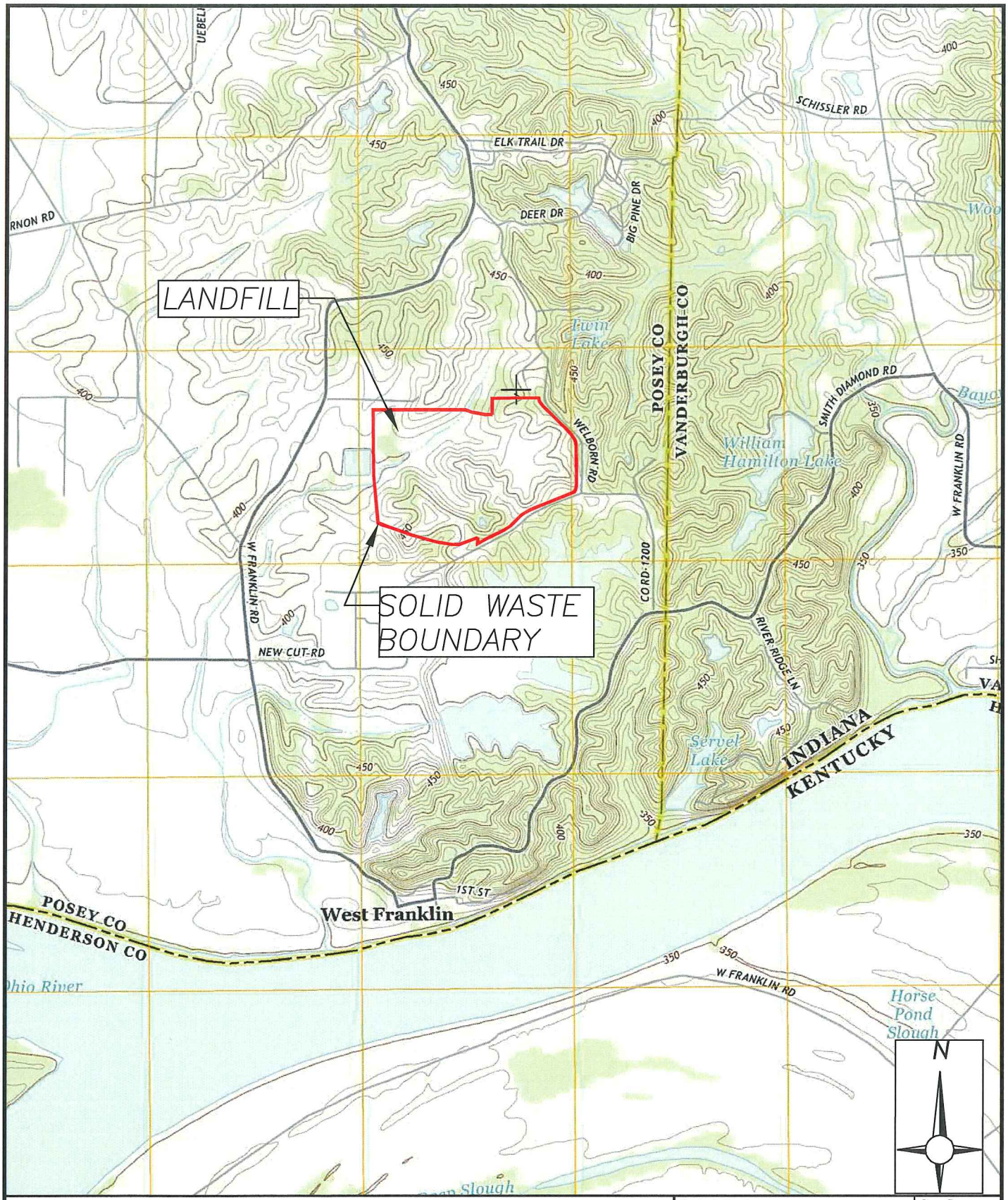
Dear Ms. Scheller:

Submitted herewith is the report of our November 8, 2017 Visual Site Inspection of the Type III Restricted Waste Landfill at the A.B. Brown Generating Station. This visual inspection and report were done in accordance with guidelines established by the Coal Combustion Residuals (CCR) Rule published by the Environmental Protection Agency on April 17, 2015.

The scope of this inspection was limited to an examination of readily observable surficial features of the landfill and its appurtenant structures, and a review of information that you provided. Please note that the inspection did not include any test drilling, testing of materials, precise physical measurements of landfill features, detailed calculations to verify slope stability or other engineering analyses. Although the inspection was conducted by competent personnel in accordance with generally accepted methods for inspecting landfills, it should not be considered as a warranty or guaranty of the future performance/safety of the landfill.

The landfill is located within the A.B. Brown Station property in Section 24, Township 7 South, and Range 12 West, about a half mile north of the Ohio River in Posey County, Indiana as highlighted on the West Franklin, IN USGS Quadrangle map, Figure 1 on the following page.

The landfill inspection was completed by Don Bryenton and Charles Dewes of ATC Group Services LLC (ATC). The weather during the inspection was approximately 50° F and sunny and ground conditions were generally dry. The landfill system features are highlighted on the attached Site Plan in Appendix A.



A.B. BROWN GENERATING STATION
TYPE III RWS LANDFILL

8511 WELBORN ROAD
MOUNT VERNON, INDIANA 47620
POSEY COUNTY, INDIANA

Project Number: 170lf00271		Drn. By: WS
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ATC		Figure: 1

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The landfill system was divided into the following components to help organize the inspection and the reporting:

- Top of Landfill Areas with Partial Closure Completed (east end);
- Landfill Side Slopes with Partial Closure Completed;
- Vertical Expansion Areas (generally top central portion of landfill);
- Active Areas (generally the west end of the landfill); and
- Sedimentation Basin;

The approximate limits of each of these areas is noted on Sheet 1 in Appendix A. The following paragraphs include a summary of the observations made during the inspection followed by our recommendations in bold print. Approximate locations of some of the observed conditions are also documented on Sheet 1 in Appendix A.

Significant regrading of the landfill occurred in 2017 within the Active Area and within the portion of the site designated the Vertical Expansion Area. As a result of the added fill and grading work, new vegetative cover has been installed recently and has not yet fully matured. Overall however, the vegetative cover was generally in good condition with only isolated problem areas as noted in the following sections.

TOP OF LANDFILL PARTIAL CLOSURE AREAS – OBSERVATIONS / RECOMMENDATIONS

The final cover in this approximately 28 acre area consists of a 40 mil LLDPE geomembrane overlain with a 16 oz/sy nonwoven geotextile, 2.5 ft of protective soil and 0.5 ft of topsoil. The final cover was constructed in stages from 2012 through 2014. Documentation of the completion of closure activities in this area was submitted to the Indiana Department of Environmental Management (IDEM) in three separate reports in 2012, 2013 and 2014. Items noted during the visual inspection of this area are described in the following list.

1) In general, this area is well vegetated and well maintained (Locations 2, 3, and 4). No concerns exist at this time.
   Recommendation: None at this time.

In 2017, riprap has been added as an erosion protection measure around stormwater downdrain inlet grates (Location 1). The riprap appears to be effective in preventing grass clippings and soil from clogging the downdrain inlets and is a good best management practice.

It was observed that an active erosion repair and seeding program is being followed across the final cover as part of the ongoing maintenance of the area. These practices should continue to be followed.

LANDFILL SIDESLOPE PARTIAL CLOSURE AREAS – OBSERVATIONS / RECOMMENDATIONS

The final cover on the perimeter slopes noted on Sheet 1 in Appendix A consists of a minimum of 24 inches of cohesive soils, covered with 0.5 ft of topsoil. The approximate limits of the 24.5 acre closed portion of the slopes are noted on Sheet 1 in Appendix A. Documentation of the completion of the closure activities along these slopes was submitted to IDEM in 2015. Items noted during the visual inspection of this area are described in the following list.

1) Vegetation cover of the side slopes and perimeter ditches is generally good (Locations 6, 9, 13, and 14).
Recommendation: None at this time.

2) Several surface depressions/erosion features have formed in areas adjacent to riprap downchute channels, along the flow line of diversion berms and alongside downdrain pipes (Locations 8 and 10). One such erosion feature, adjacent to a riprap downchute channel, located on the north side of the landfill, west of the north-south haul road on the backside of the upper level berm (Location 19) is approximately 8-feet long, 2-feet wide, and 1-foot deep. An additional erosion feature is located alongside one outlet pipe drainage structure near the base of the landfill in the vicinity of the perimeter ditch on the east side of the landfill.
Recommendation: Fill depressions and erosion gullies. Either revegetate or apply additional riprap as needed. Where needed, divert water around the erosion area to prevent continued erosion. Monitor the repaired areas for the redevelopment of the erosion.

3) The perimeter ditch on the south and east sides of the east partial closure area is generally well vegetated. Some areas along the ditch do, however, have standing water where equipment has left shallow depressions from track marks. (Location 7).
Recommendation: Fill depressions along the ditch to prevent standing water accumulation in the ditch.

4) The downdrain pipes and the riprap lined downchutes on the north side of the landfill are generally in good condition. The outlet area at the top of one of the riprap downchute channels has formed erosion gullies just downstream of the culvert inverts. (Location 17).
Recommendation: Fill and line the outlet area with gravel or erosion control mat to prevent erosion at the outlets.

5) A seep is present on the north slope near the east end of the landfill. A trench has been excavated in the area to collect the seep water and convey it in pipes to the Capital Pond. It is our understanding that the flow rate varies seasonally and that the peak rate continues to decrease following the construction of the composite final cover across the top of the east end of the landfill. Early in the fall of 2016 a hay bale diversion berm was replaced upstream of the trench to divert potential overland runoff from intermingling with seep waters. It appears that a straw waddle has also been added to divert stormwater from the trench.

These measures will allow for improved assessment of the volume of water that is actually seepage. (Location 11).
Recommendation: Continue to collect and convey the seep water by discharging to the Capital Pond.

6) A toe drain pipe near Riser Pipe #5, located on the north edge of the landfill, adjacent to the perimeter ditch, has salt deposits on the exterior of the pipe and around its base (Location 15). Additionally, some salts were noted along the north side of Manhole #10. Neither area appeared to be blocked at the time of inspection however these salts indicate past blockage in the pipes. According to visual inspection, water levels appeared to be normal inside manholes, so blockage at the time of inspection is unlikely. The facility has recently installed additional manholes and lines to alleviate potential blockages that may be associated with the toe drain lines. Additionally, a controlled chemical flush and vac procedure was performed in the summer of 2017 to clear lines.
Recommendation: Continue a regular maintenance program on the toe drain lines to minimize the potential for development of blockages.

7) There are seeps discharging from the south slope that collect in the valley (bowl) area. This includes seeps noted within one of the riprap lined downchutes. The combined flow rate at the time of this visual inspection was estimated to be approximately 1 gpm. The toe of slope is generally wet and covered with phragmites with isolated areas of standing water (Location 23).
Recommendation: Continue to collect water discharging from the seeps and route to the Capitol Pond through the Sedimentation Basin. Monitor the area between the south side of the Vertical Expansion Area and the north slope of the bowl area to prevent the ponding of surface water which could be a source of water for the seeps. .

8) Salt residue is present in the base of the ditch on the north side of the landfill and at the base of the slope on the south side of the landfill. It appears that these salts are associated with the seeps described in Items 6, 7, and 8.
Recommendation: Perform regular maintenance on the toe drain system on the north side and prevent the ponding of surface water between the Vertical Expansion Area and the north slope of the bowl area.

9) There are salt deposits in the perimeter ditch located south of the landfill and the inlet to the culvert of the drainage ditch is nearly totally blocked with sediment (Locations 21 and 22). At the time of the inspection these salt deposits were discussed with facility personnel and were determined to be the likely result of runoff from the haul road.
Recommendation: Continue to implement good engineering controls for haul trucks to prevent spilling of CCR material onto perimeter roadways and ditches. Evaluate options to redirect haul road runoff to direct water back to the truck pit or other methods of routing water to the lined sediment basin.

10) The south slope of the landfill immediately north of the "bowl" area had not been mowed at the time of inspection which made it difficult to thoroughly inspect this area (Location 24). Per facility personnel, shortly after the time of inspection, this area was mowed.

Recommendation: The slope should be mowed on a regular basis to facilitate inspection of this area.

VERTICAL EXPANSION LANDFILL OBSERVATIONS / RECOMMENDATIONS

The vertical expansion disposal area noted on Sheet 1 in Appendix A generally consists of approximately 18 acres across the top of the central portion of the landfill. This area has not yet been filled to the approved final grades. Additional waste was placed in the area during 2017. The revised grades have been covered with an intermediate soil cover and vegetated until filtercake placement resumes. Items noted during the visual inspection of this area are described in the following list.

1) The condition of vegetation, soil cover and downdrains is good (Locations 25 & 28).
   Recommendation: None at this time.

2) The area along the south-facing slope of the vertical expansion portion of the landfill is a relatively flat terrace which transitions to a section of the partial closure slopes described in the previous section (Location 26). It appears that the area was regraded in 2017 to try to minimize the potential for the ponding of surface water. Per facility personnel, a pipe inlet was installed to collect from the lowest spot and direct water to a down drain pipe in the bowl.
   Recommendation: Monitor this area during wet season conditions. If surface water ponds in this area, additional modifications should be made to the grades in this area to promote surface water runoff.

3) Portions of the vertical expansion portion of the landfill had recently been seeded and mulched (Locations 26, 27, and 28).
   Recommendation: Monitor the newly seeded areas to ensure that an acceptable vegetative cover is established.

ACTIVE LANDFILL OBSERVATIONS / RECOMMENDATIONS

The active disposal area generally consists of portions of Cells 16, 17 and 18, which occupy an area of approximately 21 acres. Items noted during the visual inspection of this area are described in the following list.

1) Some minor surface erosion was observed in isolated areas on the west slope of the haul road on the west side of cell 18.
   Recommendation: Continue to monitor/repair the slope for surface erosion until the vegetative cover is well established.

2) At the northwest corner of Cell 18 at the edge of the haul road, the water surface of the standing water in the cell is only slightly below road elevation indicating a small amount of freeboard (Location 29). During large magnitude storm events the cell may become more susceptible to overtopping.

Recommendation: Maintain a low normal pool elevation inside the cell collection area and continue to monitor elevation rise during storm events. Consider additional drainage from inside the cell or the addition of a soil berm to increase freeboard in this area as needed.

SEDIMENTATION BASIN OBSERVATIONS / RECOMMENDATIONS

The existing sedimentation basin was constructed in 2015 to receive water that has been in contact with waste in the landfill. The pond has a composite liner across the base and a riprap protective layer. The inlet pipe is located in the southeast corner of the pond while the drop inlet for the outlet to the Capital Pond is located in the northwest corner of the pond. Items noted during the visual inspection of this area are described in the following list.

1.) The upstream slopes of the sediment pond were lined with riprap and appeared in satisfactory condition (Locations 31 & 34). However, soil erosion has occurred on the east bank of the pond above the inlet pipe.
Recommendation: Place erosion control or stormwater diversion above the riprap slope to prevent soil erosion into the pond. Overseed recent areas of disturbance along the east overbank below the haul road.

2.) Both the inlet and outlet pipe of the Sedimentation Basin appeared to be functioning properly and were unobstructed.
Recommendation: None at this time.

3.) As noted in the landfill sideslope partial closure area, salt deposits were noted in the ditch along the east and north banks of the pond near the manhole upstream from the sediment basin inlet pipe (Location 32) and also downstream of the green culvert pipe located at the southeast corner of the Sedimentation Basin (Location 33). It appears that the salt deposits are associated with surface water runoff from the landfill haul road.
Recommendation: Modify the drainage ditch located on the south side of the haul road to discharge to the lined sediment basin.

Coal Combustion Residuals Rule Landfill Requirements/Observations

In addition to the general observations and recommendations outlined in the preceding pages, this visual inspection was also performed to address the standards and guidelines required by the CCR Rule instituted by the Environmental Protection Agency on April 17, 2015. As a result, CCR Landfills are now required to meet the requirements of 40 C.F.R. §257 to conduct annual inspections of the landfill in accordance with 40 C.F.R. §257.84(b). Listed below are requirements specified within the CCR Rule and the observations made by Don Bryenton and Charles Dewes during the third annual inspection:

40 C.F.R. §257.84
(b) Annual inspections by a qualified professional engineer.

(1) Existing and new CCR landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards. The inspection must, at a minimum, include:

(i) A review of available information regarding the status and condition of the CCR unit, including, but not limited to, files available in the operating record (e.g., the results of inspections by a qualified person, and results of previous annual inspections); and

The annual inspection of the AB Brown Landfill was conducted by the undersigned professional engineers on November 8, 2017. Prior to the inspection, operating records along with design plans were reviewed by the undersigned.

(ii) A visual inspection of the CCR unit to identify signs of distress or malfunction of the CCR unit.

The inspection conducted on November 8, 2017 did not reveal any signs of immanent failure for the landfill. However, there are isolated areas of erosion, seepage and sparse vegetation that require repair and/or modification as part of the ongoing maintenance of the landfill area.

(2) Inspection report. The qualified professional engineer must prepare a report following each inspection that addresses the following:

(i) Any changes in geometry of the structure since the previous annual inspection;

In general, the following changes in the geometry of the structure were noted during the 2017 visual inspection:

- **In the past year the site continued filling operations in Cells 16, 17 and 18.**
- **New waste was also placed along the west and south sides of the Vertical Expansion Landfill Area. New haul roads and downchute channels, along with new soil cover and erosion control measures, were also added to this area.**
- **In 2017, a new pump station was added between the Sedimentation Basin and Capital Pond to monitor the underdrain systems for both the Sedimentation Basin and the Capital Pond.**
- **A new large diameter concrete manhole was installed on the north side of the landfill as an add-on to the perimeter toe drain system. This manhole allows for good access by contractors and equipment for cleaning.**
- **In response to 2016 observations regarding the presence of isolated areas of sparse vegetation, soil testing was performed to analyze nutritional deficiencies. Based on this information, soil amendments were added and the areas were overseeded.**

- **Erosion gullies were repaired with additional soil cover and riprap where needed. Finally measures were implemented as part of an ongoing animal and rodent control program.**

The measures taken as outlined above have improved the overall condition of this facility.

(ii) The approximate volume of CCR at the time of the inspection;

The approximate volume of CCR within the limits of the 1988 landfill expansion is 4,550,000 cubic yards.

(iii) Any appearances of an actual or potential structural weakness of the CCR unit, in addition to any existing conditions that are disrupting or have the potential to disrupt the operation and safety of the CCR unit; and

There were no signs of structural weakness noted within the permitted solid waste boundary at the time of this visual inspection. However, several shallow depressions and erosion gullies were noted on the slopes of the landfill near pipe outlets and adjacent to riprap downchute channels. It is recommended that the depressions and erosion gullies be filled, seeded, and where necessary stabilized with erosion control mats or riprap to prevent the undermining of channel beds and soil cover. Further, low-flow seeps should be monitored and the flow collected and discharged to the Capitol Pond.

(iv) Any other change(s) which may have affected the stability or operation of the CCR unit since the previous annual inspection.

None noted at the time of this inspection.

We appreciate the opportunity to assist you with this project. If you have any questions concerning information contained in this report, please do not hesitate to call either of the undersigned at 317.849.4990.

Sincerely,

ATC Group Services LLC

Charles P. Dewes, P.E., CFM, CESSWI
Project Engineer

Donald L. Bryenton, P.E.
Principal Engineer

DONALD LEE BRYENTON
REGISTERED
No
17877
STATE OF
INDIANA
PROFESSIONAL ENGINEER

Copies: (3) Angie Scheller - SIGECO
(1) Brandie Rucker – SIGECO
(1) Travis Peay - SIGECO

Appendix A: Site Plan

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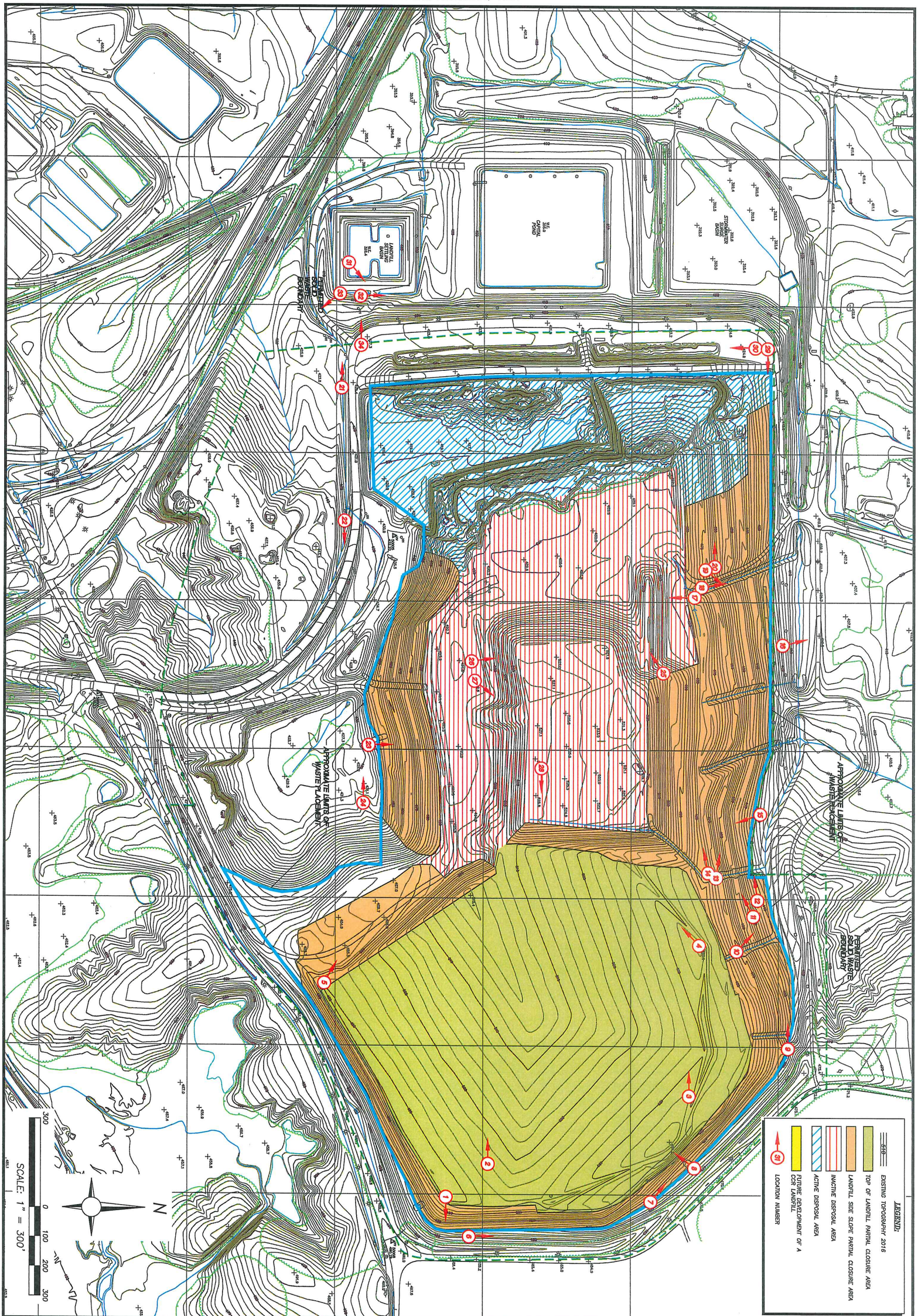

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2017 INSPECTION SITE PLAN

TYPE III RESTRICTED WASTE LANDFILL
A.B. BROWN GENERATING STATION

Project Number: 170LF00430	Drn. By: CR
Drawing File: SEE LEFT	Ckd. By: CD
ATC	App'd By:
	Ckd. Date: