2019 Annual Landfill Inspection Report

Landfill

H.W. Pirkey Plant

Southwestern Electric Power Company

Hallsville, Texas

October 18, 2019

Prepared for: Southwestern Electric Power Company – H.W. Pirkey Plant

Prepared by: American Electric Power Service Corporation

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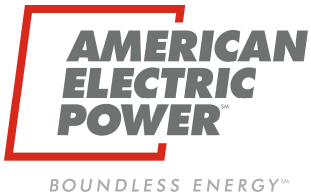

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2019 Annual Landfill Inspection Report
(CCR Landfill)

H.W. Pirkey Plant

Document Number: GERS-19-024
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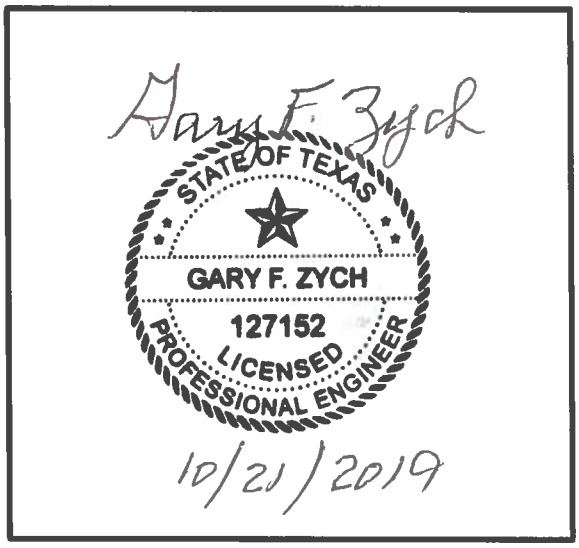

I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of 40 CFR § 257.84(b).

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Attachments

1.0 INTRODUCTION

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of 40 CFR 257.84 and to provide the H.W. Pirkey Plant an evaluation of the facility.

Mr. Brett Dreger, P.E. performed the 2019 inspection of the Landfill at the H.W. Pirkey Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Mr. Ron Franklin of the plant was the facility contact. Also in attendance for the landfill inspection was Mr. Lane Roberts, P.E. with Akron Consulting LLC. The inspection was performed on September 25, 2019. Weather conditions were mostly sunny and the temperature was in the low 90's (°F). There was 0.93 inches of rainfall over the seven days prior to the inspection. Portions of the landfill had been recently mowed.

2.0 DESCRIPTION OF LANDFILL

The overall features of the landfill were categorized into the following components as a means of organizing the inspection and reporting:

- Closed Landfill Area (1984, 1987, 1993, 1995, 1997, 1999, and 2005 Cells)
- Inactive Landfill Areas (2012, 1985 Pond Cell and 1993 Cell)
- Active Landfill Disposal Areas (2015 Cell)
- Landfill Construction Area for 2018 Cell
- Storm Water Drainage Ditches

These features, including the approximate limits of each area, are shown on the site map included as Attachment A. Selected photographs taken during the inspection and used to illustrate the visual observations presented in the report are presented in Attachment B. Additional inspection photos not included in the report can be made available to the Plant upon request.

In general, the southwestern area of the landfill is active. The remainder of the landfill area is considered closed and has a grass cover present or is considered inactive. The landfill was developed around an existing oil/gas well known as the Mohan well and is located near the eastern edge of the landfill. Perimeter ditches carry non-contact water to the surrounding natural drainage courses. Multiple catch basins collect and convey non-contact water via "let-down" piping systems. All contact water is directed towards the Landfill Run-off Pond. The four leachate collection discharge pipes outlet on the southern end of the landfill and all leachate water is conveyed to the Landfill Runoff Pond. There are two parallel ditches on the western boundary of the landfill area, one ditch for contact water and one ditch for non-contact water.

Material to be placed in the active portions of the landfill is hauled via dump trucks on a haul road, which runs along the north and western edge of the landfill area. The active portion of landfill area has vertical chimney drains, which connect to the leachate collection system. Surface water runoff from the active landfill areas is collected and routed to the Landfill Runoff Pond via the chimney drains.

3.0 REVIEW OF AVAILABLE INFORMATION (257.84(b) (1)(I))

A review of available information regarding the status and condition of the Landfill, which include files available in the operating record, such as design, and construction information, previous 7-day inspection reports, and previous annual inspections have been conducted. Based on the review of the data there were no signs of actual or potential structural weakness or adverse conditions.

4.0 INSPECTION (257.84(b)(1)(ii))

4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (257.84(b)(2)(i))

The construction of a new cell has occurred since the 2018 annual inspection. The 2018 cell is approximately 12 acres in size and is located on the south side of the landfill adjacent to the 2012 cell and 1993 cell areas. No other modifications occurred to the geometry of the Landfill since the 2018 annual inspection.

4.2 VOLUME (257.84(b)(2)(ii))

The total volume of ash disposed at the landfill as of September 2019 was estimated by Lane Roberts with Akron Consulting LLC as 15.2 million cubic yards.

4.3 DEFINITIONS OF VISUAL OBSERVATIONS AND DEFICIENCIES

This summary of the visual observations uses terms to describe the general appearance or condition of an observed item, activity or structure. The meaning of these terms is as follows:

Good:	A condition or activity that is generally better or slightly better than what is minimally expected or anticipated from a design or maintenance point of view.
Fair/Satisfactory:	A condition or activity that generally meets what is minimally expected or anticipated from a design or maintenance point of view.
Poor:	A condition or activity that is generally below what is minimally expected or anticipated from a design or maintenance point of view.
Minor:	A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is below what is normal or desired, but which is not currently causing concern from a structure safety or stability point of view.
Significant:	A reference to an observed item (e.g. erosion, seepage, vegetation, etc.) where the current maintenance program has neglected to improve the condition. Usually conditions that have been identified in the previous inspections, but have not been corrected.
Excessive:	A reference to an observed item (e.g., erosion, seepage, vegetation, etc.) where the current maintenance condition is above or worse than what is normal or desired, and which may have affected the ability of the observer to properly evaluate the structure or particular area being observed or which may be a concern from a structure safety or stability point of view.

This document also uses the definition of a "deficiency" as referenced in the CCR rule section §257.84(b)(5) Inspection Requirements for CCR Landfills. This definition has been assembled using the CCR rule preamble as well as guidance from MSHA, "Qualifications for Impoundment Inspection" CI-31, 2004. These guidance documents further elaborate on the definition of deficiency. Items not defined by deficiency are considered maintenance or items to be monitored.

A "deficiency" is some evidence that a landfill has developed a problem that could impact the structural integrity of the landfill. There are four general categories of deficiencies. These four categories are described below:

1. Uncontrolled Seepage (Leachate Outbreak)
   Leachate outbreak is the uncontrolled release of leachate from the landfill.
2. Displacement of the Embankment
   Displacement of the embankment is large scale movement of part of the landfill. Common signs of displacement are cracks, scraps, bulges, depressions, sinkholes and slides.
3. Blockage of Control Features
   Blockage of Control Features is the restriction of flow at spillways, decant or pipe spillways, or drains.
4. Erosion
   Erosion is the gradual movement of surface material by water, wind or ice. Erosion is considered a deficiency when it is more than a minor routine maintenance item.

4.4 VISUAL INSPECTION (257.84(b)(1)(ii))

A visual inspection of the landfill was conducted to identify any signs of distress or malfunction of the landfill and appurtenant structures. Specific items inspected included all structural elements of the landfill perimeter berms, temporary and final covers, drainage features, open cells, and appurtenances such as chimney drains etc.

Overall, the facility is in good condition. The landfill is functioning as intended with no signs of potential structural weakness or conditions which are disrupting to the safe operation of the landfill. Inspection photos are included in Attachment B. Additional pictures taken during the inspection can be made available upon request. A site map presenting locations of the inspection observations is included in Attachment A.

Closed Landfill Areas (1984, 1987, 1993, 1995, 1997, 1999, and 2005 Cells)

1. In general, surface water runoff from the cap was draining as designed. There were no signs of erosion, undermining, scarps or sloughs in the surface vegetation covering the top and side slope areas.
2. The closed landfill areas were observed to have a thick stand of grass cover over the majority of the capped area. The landfill cover of cells 1984, 1987, 1993, 1995, 1999 and 2005 were well vegetative with a few minor tire ruts as a result of mowing activities. Most of these disturbed areas were the result of mowing under wet conditions.
3. There were no signs of settlement, signs of movement or distress of the landfill area. Access roads on top and adjacent to the landfill area were in good condition.
4. Minor brush and some cattails were observed to be growing in the perimeter ditch and around the energy dissipater structures for the "let down" piping on the eastern edge of the landfill area.
5. There is ponded water in the downstream end of the perimeter ditch on the north side of the landfill.

Inactive Landfill Disposal Areas (2012, 1985 Pond Cell and 1993 Cell)

6. The outlet area to an 18-inch-diameter leachate collection discharge pipe was about 90% silted in near the southern edge of the 1985 Pond Cell.

7. A temporary soil cover consisting of a red clay material has been placed for an erosion protection measure. The soil cover has been seeded but most of the area still has no vegetative cover. In addition, minor erosion rills have developed in the bare soils cover due to lack of vegetation. In addition to the soils cover, adjacent areas have been covered with a 20-mil geo-membrane rain flap material for erosion protection.

8. The remaining top portions of the 2012 cell area are currently under construction of a final cap system. At the time of inspection, the area under construction consisted of geo-composite layer overlying a geo-membrane and clay cap layer. The geo-composite layer still needs to be covered with 18-inches of topsoil to complete the cap system.

9. There is standing water at the surface near the groundwater interceptor drain manhole on the southern side of the landfill. Groundwater is also pushing up on the liner system in the perimeter ditch near the groundwater interceptor drain manhole. The check valve drain leading from the manhole to the pond is closed causing the ground water to back up and push to the surface.

Active Landfill Disposal Areas (2015 Cell)

10. During the inspection, the majority of the active disposal area (2015 Cell) had been covered with 12 inches of temporary soil cover to reduce the amount of contact water going to the landfill runoff pond. The active disposal area used for waste placement has reduced to approximately 2 acres. The chimney drains were functioning as designed and there was no evidence of pooling water around the drains. In general, the chimney drain consists of bottom ash placed by filling in a 10-foot-diameter circle with a perforated drainpipe wrapped in filter fabric placed in the center that is connected to the leachate discharge pipes.

11. The waste is being placed and graded in such a manner that any runoff from the active landfill area is collected, contained and drained through the chimney drain system.

12. An erosion scarp (gully) of about 1 to 2 deep has cut through the temporary soil cover as concentrated flow moves toward the outlet pipe. The erosion scarp appears to be occurring due to concentrated flow coming off the adjacent rain flap areas.

13. The lower slopes of the 2015 active cell have been covered with a 20-mil geomembrane rain flap material for erosion projection and to minimize contact water in the perimeter ditches.

2018 Landfill Cell Construction

14. The construction of the 2018 Landfill Cell bottom liner system is complete. Final grading outside the cell area is complete and the perimeter ditches are functioning. Once the leachate collection system is installed and a protective cover layer is in place, the cell will be ready for accepting CCR waste.

15. Based on the current conditions, storm water runoff from the liner area and perimeter ditches is considered non-contact water and is diverted around the landfill runoff pond.

Storm Water Drainage Ditches

16. Concrete slope protection installed on the inlet side of two, 36-inch-diameter culverts, which discharge leachate and contact water into the Landfill Runoff Pond was observed to be broken

and distressed. The geomembrane landfill liner extends underneath the entire length of the culverts and does not appear to be damaged. An access road is present over the top of the culverts.

17. A non-contact water ditch runs along the eastern edge of the landfill area. The vegetation along this ditch was good with some areas being slightly overgrown with cattails. There was no evidence of erosion, obstructions or poor drainage conditions.
18. A contact water ditch runs along the western edge of the landfill area and is lined with a geomembrane. The ditch was observed to be clear of any obstructions but there was some sediment build up in the lower portion of the ditch. Water flowing through this ditch eventually ends up in the Landfill Runoff Pond.
19. A non-contact storm water ditch runs along the western edge of the landfill is lined with a geomembrane material. Runoff from the 2005 Cell is collected into a 36-inch-diameter conduit and this conduit discharges into the non-contact water ditch. An earthen berm armored with riprap material has been placed at the end of the non-contact water ditch to divert flow away from the toe area of the Landfill Runoff Storm Water Pond Dam. Small holes about 2 inches in diameter have been cut into the geomembrane to allow any trapped groundwater under the geomembrane to drain and prevent floating of the geomembrane liner.
20. A non-contact storm water ditch runs along the western edge and southern edge of the landfill that is covered with a rain flap material. Runoff from the lower outside slope of the 2015 Cell is collected into a lined ditch and then discharges into the non-contact water ditch on the western side of the landfill.

4.5 CHANGES THAT EFFECT STABILITY OR OPERATION (257.84(b)(2)(iv))

Based on interviews with plant personnel and field observations there were no changes to the landfill since the last annual inspection that would affect the stability of the landfill.

5.0 SUMMARY OF FINDINGS

5.1 GENERAL OBSERVATIONS

The following general observations were identified during the visual inspection:

1) In general, the landfill is functioning as intended and the active cell, inactive cells, closed areas, and storm water ditches are in good condition. The Plant is performing regular maintenance and inspections as required. Several maintenance items have been noted and are described in Section 5.2.

5.2 MAINTENANCE ITEMS

The following maintenance items were identified during the visual inspection, see site map for locations. Contact GES for specific recommendations regarding repairs:

1) Repair the erosion rills in the temporary soil cover on the lower portion of the 2012 cell near the 1985 pond area on the south side.

2) Remove the soil/ash accumulation from the 18-inch diameter leachate collection discharge pipe outlet area on the south side of the 1985 Pond Cell so that the outlet has fee draining conditions.

3) Remove the broken and distressed concrete slab slope protection at the inlet of the two, 36-inch-diameter culverts. After removing the concrete slab, monitor this area for erosion. If it is deemed necessary, additional erosion protection can be re-installed.

4) Remove the brush and/or cattails growing around the outlets of the "let down" piping on the east side of the landfill. Establish grass cover on any disturbed areas.

5) Repair the erosion scarp on the temporary soil cover in the 2015 cell area.

6) Open the check valve drain in the ground water interceptor manhole to allow the ground water pipes to drain into the landfill pond.

5.3 ITEMS TO MONITOR

The following items were identified during the visual inspection as items to be monitored:

1) After removing the broken and distressed concrete slope protection around the two pipes, monitor the 36-inch-diameter culverts underneath the access road along the southern edge of the landfill for erosion. If excessive erosion is observed, install additional erosion protection.

2) Monitor the riprap armored earthen berm at the outlet of the non-contact water ditch near the southwestern corner of the landfill area after heavy rain events for erosion or overtopping of the berm.

5.4 DEFICIENCIES (257.84(b)(2)(iii))

There were no signs of structural weakness or disruptive conditions that were observed at the time of the inspection that would require additional investigation or remedial action. There were no deficiencies noted during this inspection or during any of the periodic 7-day inspections.

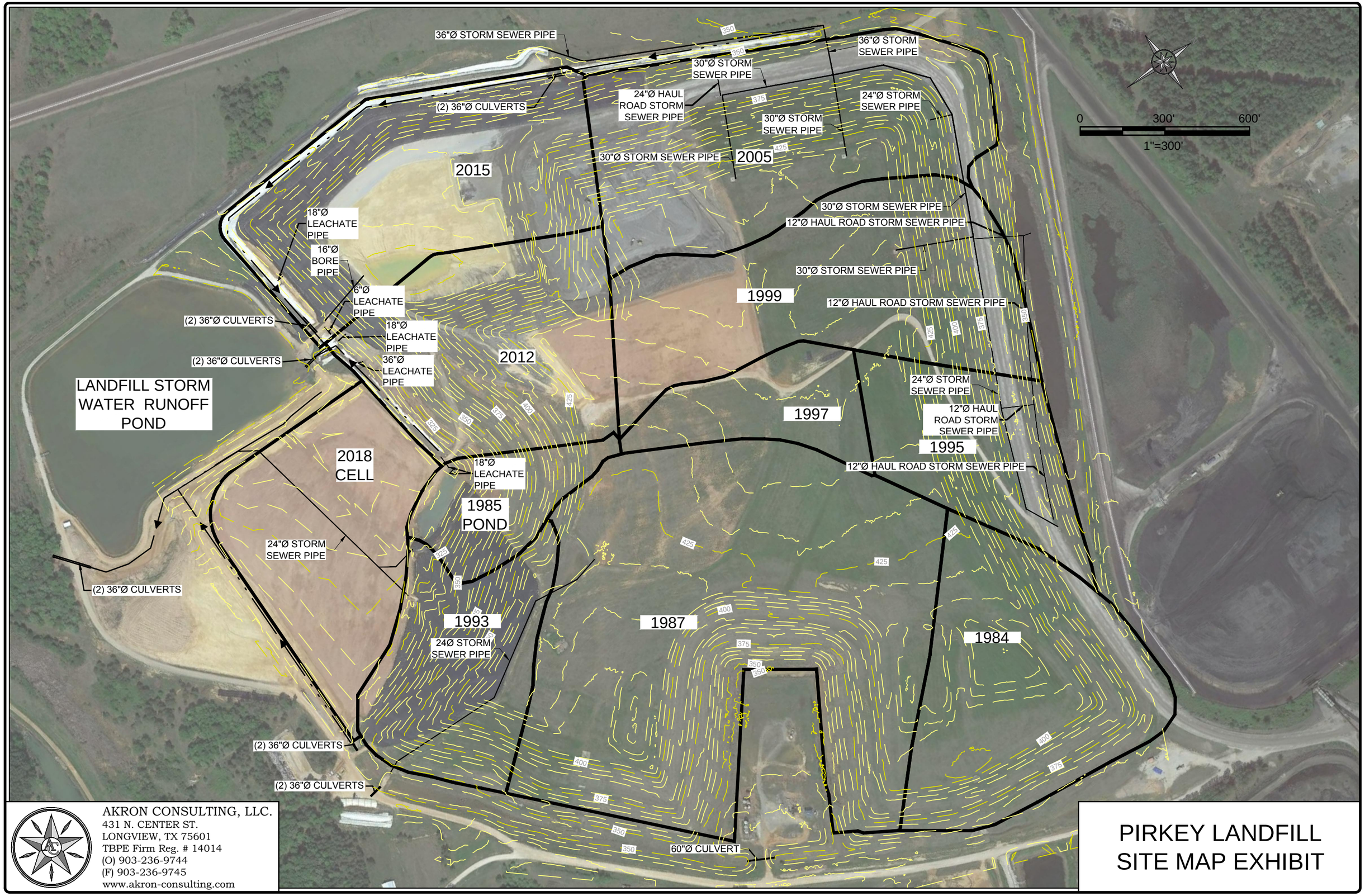
A deficiency is defined as either:

1) Uncontrolled seepage (leachate outbreak),
2) Displacement of the embankment,
3) Blockage of control features, or
4) Erosion, more than minor maintenance.

If any of these conditions occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

ATTACHMENT A

Site Map



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PIRKEY LANDFILL SITE MAP EXHIBIT

ATTACHMENT B

Photos

Photo # 1	
View of the contact-water perimeter ditch on the northwest side of the landfill area. Notice the sediment buildup in the bottom of the ditch.	
Photo # 2	
View of the contact-water perimeter ditch on the southwest side of the landfill area. Notice the sediment buildup in the bottom of the ditch.	
Photo # 3	
View of the non-contact water perimeter ditch on the west side of landfill area.	

Photo # 4	
View of the temporary cover (rain flap and soil cover) on the outside slopes of the 2015, 2012 and 1993 cells.	

Photo # 5	
View of the let-down ditch of the non-contact water coming off the rain flap material on the southern end of the landfill.	

Photo # 6	
View of the 18-inch diameter leachate pipe coming out of southern end of landfill.	

Photo # 7	
View of the 6-inch diameter leachate pipe coming out of southern end of landfill.	

Photo # 8	
View of the 36-inch diameter leachate pipe coming out of southern end of landfill.	

Photo # 9	
View of the 18-inch diameter leachate pipe coming out of southern end of landfill.	

Photo # 10	
Landfill Cover – View of erosion rill in the temporary soil cover on the south end of landfill.	
Photo # 11	
View of groundwater interceptor drain manhole cover. The check vale drain into the landfill pond is closed and groundwater is pushing to the surface.	
Photo # 12	
View of groundwater pushing up under liner in the perimeter ditch on the southern side of landfill.	

Photo # 13	
View looking at the dual 36-inch culvert pipe that drain the perimeter ditches from the landfill into the runoff pond.	
Photo # 14	
View of the storm water let-down pipe on the east side of the landfill area.	
Photo # 15	
View of the storm water let-down pipe and energy dissipater structure on the east side of the landfill area.	

Photo # 16	
Typical condition of the northern slope areas above the haul road.	

Photo # 17	
Typical condition of the northern slope areas below the haul road. Notice the ponded water at the downstream end of the perimeter ditch.	

Photo # 18	
Typical condition of the vegetative cover over the northern and eastern areas of the landfill cap.	

Photo # 19	
Typical condition of the vegetative cover over the eastern and southern areas are of the landfill cap.	
Photo # 20	
Typical view of the eastern side slopes areas around the Mohan Well location.	
Photo # 21	
View of the southern slopes covered with temporary soil cover and rain-flap material.	

Photo # 22	
View of the vegetative cover and access road on the Landfill final cap area.	
Photo # 23	
View of the geo-composite layer over parts of the 2012 Cell final cap. This area needs to be covered with 18-inches of topsoil to complete the final cap.	
Photo # 24	
View of the vegetative cover on the landfill final cap on the western slope areas.	

Photo # 25	
View of the 2015 active cell area. Looking at area receiving waste by dump truck.	
Photo # 26	
View of the 2015 Cell with temporary soil cover and rain flap material to reduce contact water volume going to the landfill runoff pond.	
Photo # 27	
View of the active material placement inside the 2015 cell looking south. Notice the rain flap material protecting the outside slope.	

Photo # 28	
View of the temporary soil cover over the 2015 active cell area. Notice the erosion scarp created form concentrated runoff flow.	
Photo # 29	
View of the temporary soil cover over the 2015 active cell area. Notice the significant erosion scarp near the outlet pipe. Temporary soil cover eroded almost down to ash level.	