

# **2022 Annual Landfill Inspection Report**

**Landfill**

**Northeastern Power Plant  
Public Service Company of Oklahoma  
Oologah, OK**

**September 2022**

Prepared for: Public Service Company of Oklahoma – Northeastern Plant

Prepared by: American Electric Power Service Corporation  
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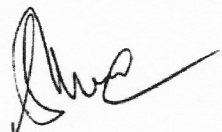
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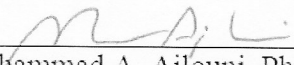
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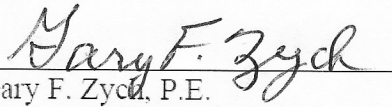
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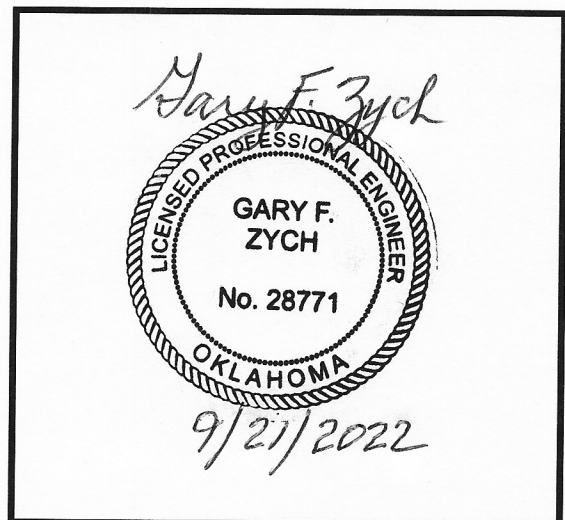
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I certify to the best of my knowledge, information and belief the information contained in this report meets the requirements of OAC § 252:517-13-5.

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Northeastern Power Plant Landfill  
Oologah, OK**

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Inspection Photographs

# **2022 Annual Landfill Inspection Report Northeastern Power Plant Landfill Oologah, OK**

## **1.0 INTRODUCTION**

This report was prepared by AEP- Geotechnical Engineering Services (GES) section, in part, to fulfill requirements of OAC 252:517-13-5 and to provide the Northeastern Plant an evaluation of the facility.

Shah Baig, P.E. performed the 2022 inspection of the Landfill at the Northeastern Plant. This report is a summary of the inspection and an assessment of the general condition of the facility. Bryan White, plant staff, was also present during the inspection. The inspection was performed on August 23, 2022. Weather conditions were good and the temperature was 89's (°F), sunny, light breeze, and clear skies. There was recorded 0.05-inch precipitation over the seven days prior to the inspection.

## **2.0 DESCRIPTION OF LANDFILL**

The Public Service Company of Oklahoma (PSO), Northeastern Power Station is located at the junction of U.S. Highway 169 and Oklahoma highway 88, approximately 1 mile south of Oologah, Rogers County, Oklahoma. The onsite landfill is located southeast side of the power plant, adjacent to the Verdigris River. Figure 1 (Site Location Map) illustrates the location of the landfill with respect to the power plant, ash pond, and coalyard.

Overall, landfill was divided into the following components as a means of organizing the inspection and reporting. These components are shown on Figure 2 (Landfill Facility Map).

- Active Landfill Disposal Area (Cell 1)
- Inactive Landfill Areas (Cells 2, 3, and 4)
- Leachate Collection Pond
- Storm Water Drainage Ditches
- Perimeter Berm

The active landfill disposal area (Cell 1) is currently where waste is being placed. There were some disposal/operational activities taking place at the time of the inspection.

Inactive landfill areas (Cells 2, 3 and 4) consists of the remaining portions of the landfill. The intermediate liner system has a 2-foot thick protective cover. Inactive landfill areas (Cell 2 and 3) were already covered with temporary geomembrane cover (rainflap) and wind defender and at the time of inspection. Installation of rainflap and wind defender was being performed at the landfill area (Cell 4).

### **3.0 REVIEW OF AVAILABLE INFORMATION (252:517-13-5 (b)(1)(A))**

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

### **4.0 INSPECTION (252:517-13-5 (b)(1)(B))**

#### **4.1 CHANGES IN GEOMETRY SINCE LAST INSPECTION (252:517-13-5(b)(2)(A))**

No modifications have been made to the geometry of the Landfill since the last annual inspection. The geometry of the landfill has remained essentially unchanged, except for the change in topography of the active disposal area.

#### **4.2 VOLUME (252:517-13-5(b)(2)(B))**

The total volume of CCR in the landfill as of the inspection date is estimated to be 1,707,623 cubic yards (1,688,230 in 2021 + 19,393 in 2022 based on the tonnage during reporting period October 2021 – August 2022 and using conversion factor of 1 ton/cubic-yard).

#### 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 dam. 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 (252:517-13-5(b)(1)(B))**

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, leachate ponds, 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 that are disrupting to the safe operation of the landfill. Inspection Map and photographs are included in Appendix B.. Additional pictures taken during the inspection can be made available to the Owner upon request.

#### **Inactive Landfill Disposal Areas**

1. Photograph No. 1 illustrates Cell 2 surface of the inactive disposal areas covered with temporary geomembrane (rainflap) and wind defender. The wind defender was repaired due to the tears at the seams (Photograph No. 2). The overall condition of Cell 2 area appeared good.
2. Cell 3 area is illustrated in Photograph No. 3. This area is also covered with the rainflap and wind defender. The containment berm and the geomembrane lined perimeter ditch are illustrated in Photograph No. 4. There were no observations of erosion or other unsatisfactory conditions of the Cell 3 areas. The perimeter berm and ditch are

functioning as designed and the liner was intact and in good condition. Some areas indicated minor standing water issue in the perimeter ditch.

3. The exterior south slope and access perimeter road (Photograph Nos. 5 and 6) appeared in good and stable condition. The slope adjacent to the river is very steep and observation of the slope from the chain link fence indicated the slope was heavily vegetated with mature trees and small bushes. The access road appeared in good condition without any signs of settlement, misalignment, or excessive erosion.
4. At the time of inspection, installation of rainflap and wind defender was being performed in the landfill area (Cell 4). Photograph No. 7 depicts the installation work in progress. The access road adjacent to Cell 4 is illustrated in Photograph No. 8. The road was in good condition with no sign of misalignment, settlement, or excessive erosion. The perimeter ditch was functioning as designed and the liner was intact and in good condition. The exterior slope adjacent to the Cell 4 appeared in good and stable condition.

#### **Active Landfill Disposal Area**

5. Photograph No. 9 illustrate typical condition of Cell 1 which is currently the active landfill disposal area. The surface appeared graded and free of ponding water. Temporary grades are maintained to direct runoff to the perimeter ditch.
6. Cell 1 area is located adjacent to Cell 2 and the interim grades are slightly at a lower level (Photograph No. 10). There was no erosion, minor ponding of water with no instability noticed throughout the area.

#### **Storm Water Drainage Ditches**

7. Overall, the perimeter ditches were in good condition and functioning as designed. The ditches are currently lined with geomembrane. There were some local areas of very shallow ponding due to either minor sediment or small wrinkles in the geomembrane. The north ditch adjacent to Cell 1 landfill area (Photograph No. 11) exhibited excessive vegetation but appeared to have positive water flow toward the pipe culvert.
8. The north and south perimeter ditches at the eastern, downstream end of the landfill consists of pipe box culverts (Photographs Nos. 12 and 13). These pipe box culverts



were clear of any debris and indicated no obstruction to flow. The south box culvert pipes (Photograph No. 12) indicated slightly lower level in the ditch compared to the concrete apron slab of the box culvert.

### **Leachate Collection Pond**

9. The north and south conveyance channel are illustrated in Photograph Nos. 14-17). Also illustrated is the crest of the dikes adjacent to the channels. The crest were repaired and appeared in good and stable condition. The runoff channel and pipe culverts appeared in good and functional condition.
10. Typical condition of the dike, interior slope, and pond bottom is illustrated in Photograph No. 18. The interior slope of the pond was in fair condition with minor erosion (Photograph No. 19) at the west dike slope. The pond was partly dry to the south end and appeared to have minimal amount of leachate water.
11. The splitter dike between the leachate pond and Basin C is illustrated in Photograph No. 20. The splitter dike appeared in good and stable condition without any settlement or misalignment.

### **Basin C**

12. The crest and interior slope of Basin C appeared in good condition (Photograph Nos. 21 and 22). The geosynthetic liner was in place, intact and in good condition without any tear or damage. The crest also used as haul road of the north dike appeared in good and stable condition.
13. The runoff from the landfill is discharged into Basin C. Photograph Nos. 23 and 24 illustrates the inlets of the north discharge pipes and overflow discharge structure. At the time of inspection, the condition was dry and no water flowing from the pipes. The overflow discharge structure appeared in good, functional condition.

#### **4.5 CHANGES THAT EFFECT STABILITY OR OPERATION (252:517-13-5(b)(2)(D))**

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. Exposed CCR areas of the landfill (Cell 2, 3, and 4) were covered with geomembrane (Rainflap cover) and wind defender as part of the operations in order to prevent infiltration due to runoff.

### **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. All areas of the facility are maintained and in good condition.
- 2) The Plant is performing regular maintenance and inspections as required.
- 3) Installation of the temporary geomembrane (rainflap) and wind defender in the landfill areas (Cell 2, 3, and 4) is complete in order to prevent infiltration for better management of the leachate generation.
- 4) Repair work recommended in the 2021 inspection report of the leachate pond dikes was completed.
- 5) The north side drainage ditch at the east end have excessive vegetation.
- 6) The south ditch subgrade at the box culvert apron location (Photograph No. 12) should be at or higher than apron elevation.

## **5.2 MAINTENANCE ITEMS**

The following specific maintenance items were identified during the visual inspection.

- 1) Clear excessive vegetation from the exterior slope and the north side ditch.
- 2) The subgrade of the south ditch at the box culvert apron should be backfilled to match the slope and/or extend the geomembrane liner over to the apron.

## **5.3 ITEMS TO MONITOR**

No specific issues or areas were identified during the visual inspection as items to be monitored.

## **5.4 DEFICIENCIES (252:517-13-5(b)(5))**

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:

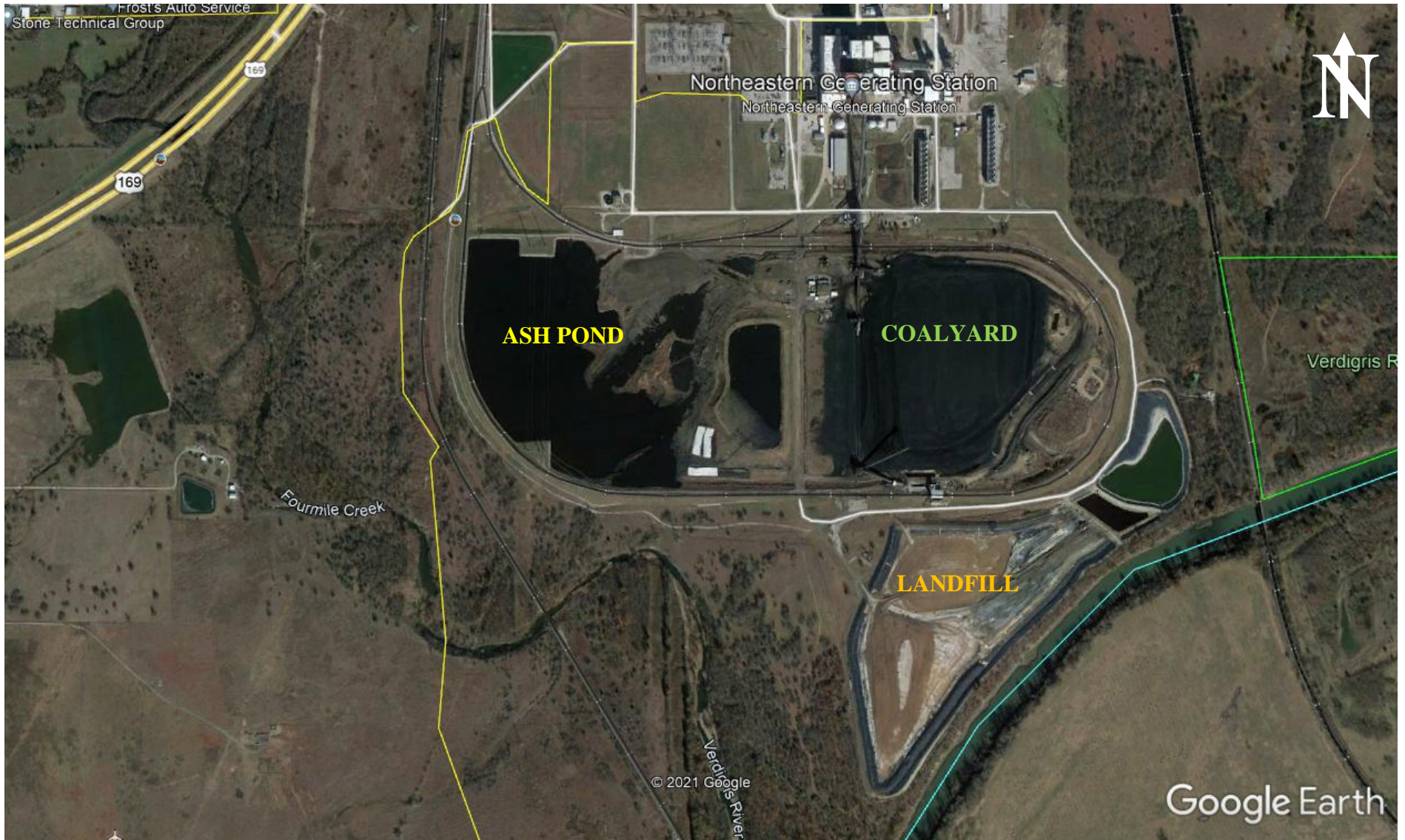
- 1) Uncontrolled seepage (leachate outbreak),
- 2) Displacement of the embankment,
- 3) Significant blockage of drainage features or drain pipes, or
- 4) Erosion, more than minor maintenance.

In general, routine inspections, monitoring and maintenance by plant personnel should continue. If you have any questions with regard to this report, please contact Shah Baig, P.E. at (Ph: 614-716-2241, email: [sbaig@aep.com](mailto:sbaig@aep.com)) or Gary Zych, P.E. (Ph: 614-716-2917, email: [gfzych@aep.com](mailto:gfzych@aep.com)).

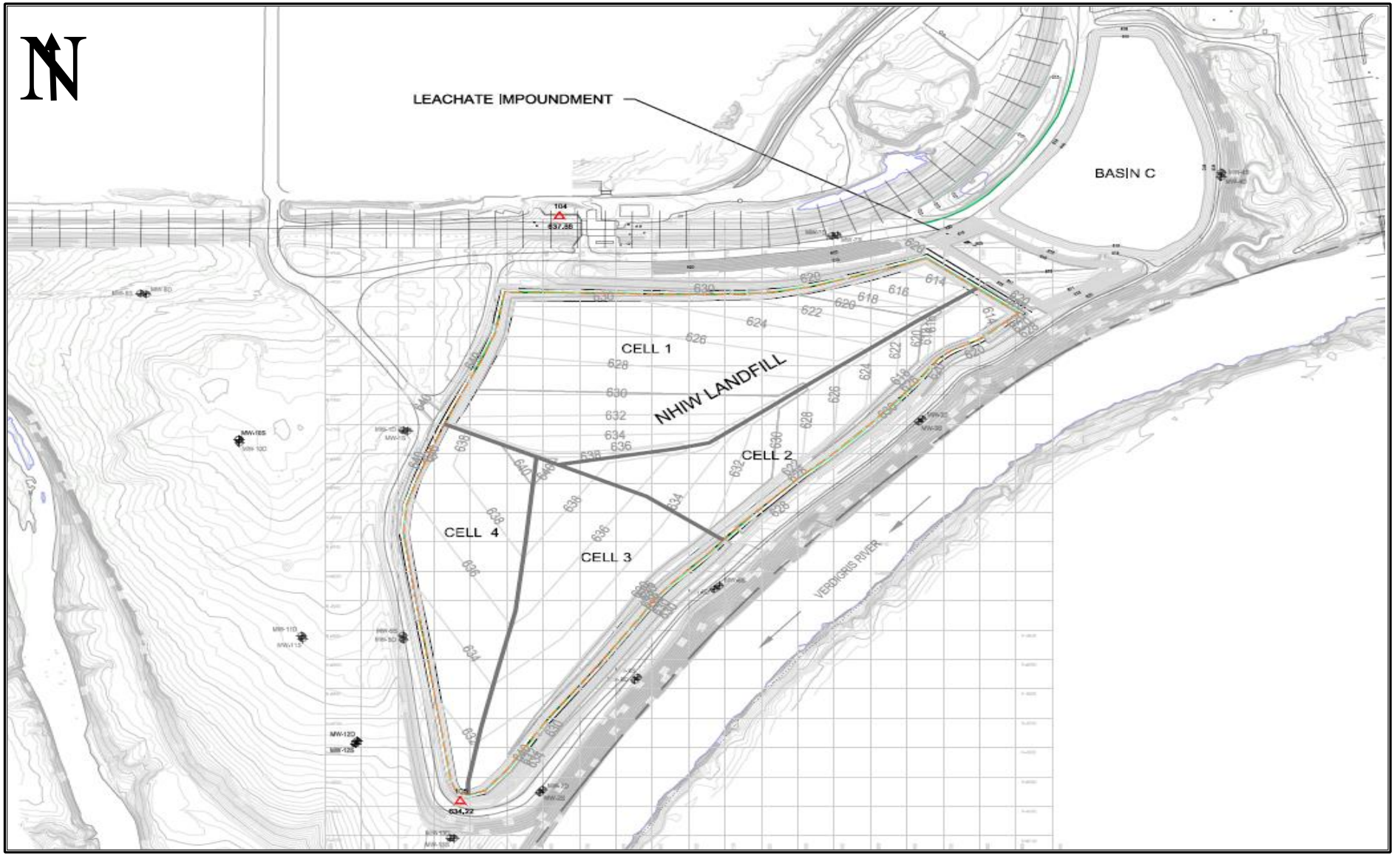
## **LIST OF FIGURES**

- ▶ Figure 1 – Site Location Map
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**Figure 1 – Site Location Map**  
**Northeastern Landfill**  
**Northeastern Plant, Oologah, OK**



**Figure 2 – Landfill Facility Map**  
**Northeastern Landfill**  
**Northeastern Plant, Oologah, OK**



**Figure 3 – Inspection Photograph Location Map**  
**Northeastern Landfill**  
**Northeastern Plant, Oologah, OK**






**Figure 4 – Inspection Photograph Location Map**  
**Northeastern Landfill Leachate Pond and Basin C**  
**Northeastern Plant, Oologah, OK**









## **ATTACHMENT**

▶ Inspection Photographs

<p>Photograph No. 1 Cell 2 area with rainflap and wind defender (looking southwest).</p>	 A wide-angle photograph of a landfill cell covered in dark green geomembrane. A long, narrow strip of white material, likely a wind defender or rainflap, runs across the middle of the cell. The sky is blue with scattered white clouds. A chain-link fence and trees are visible in the background.
<p>Photograph No. 2 Cell 2 area wind defender repair work.</p>	 A close-up photograph of the geomembrane surface. A section of the dark green material is being repaired or replaced, showing a lighter, textured area. In the background, industrial structures and a conveyor belt are visible under a cloudy sky.
<p>Photograph No. 3 Cell 3 rainflap and wind defender installed.</p>	 A photograph showing a landfill cell with a newly installed rainflap and wind defender. The material is dark green and appears to be in the process of being laid out or secured. The background shows industrial equipment and a blue sky with clouds.

<p>Photograph No. 4 Cell 3 and perimeter berm (looking northeast).</p>	 A wide-angle photograph showing a long, narrow landfill cell covered in black plastic liner. The cell is bordered by a gravel berm on the left. The background shows a clear blue sky with scattered white clouds and some distant trees.
<p>Photograph No. 5 Access road adjacent Cell 3 (looking northeast).</p>	 A photograph of an access road made of gravel and grass, running alongside a chain-link fence. The fence is supported by a row of white rocks. In the background, the landfill cell and a blue sky with clouds are visible.
<p>Photograph No. 6 Sloped area outside the fence.</p>	 A close-up photograph of a sloped area with dense green vegetation, including trees and bushes, located outside the chain-link fence.

<p>Photograph No. 7 Cell 4 area rainflap and wind defender installation.</p>	 A wide-angle photograph showing a large area of a landfill cell covered with a dark, heavy-duty plastic liner. The liner is laid out in long, parallel strips, creating a grid-like pattern. The sky is blue with scattered white clouds. In the background, there is a line of trees.
<p>Photograph No. 8 Cell 4 berm and access road.</p>	 A photograph of a gravel access road running alongside a landfill cell. The road is bordered by a chain-link fence on the right side, which is supported by a concrete or stone berm. The landfill cell is visible on the left side of the road. The sky is blue with white clouds.
<p>Photograph No. 9 Cell 1 surface graded (looking northwest).</p>	 A photograph showing a wide, flat, graded surface of a landfill cell. The surface is dark and appears to be made of compacted earth or gravel. In the background, there are some industrial structures and a large body of water. The sky is blue with white clouds.

Photograph No. 10  
Cell 1 surface graded  
(looking west).






Photograph No. 11  
Cell 1 area runoff  
perimeter water ditch  
(looking northwest).



Photograph No. 12  
South side perimeter  
runoff ditch and pipe  
culvert inlet.



<p>Photograph No. 13 North side perimeter runoff ditch and pipe culvert inlet.</p>	 A photograph showing a concrete pipe culvert inlet with two circular openings, partially buried in a bed of light-colored gravel. The culvert is situated in a runoff ditch. The background features a grassy embankment under a blue sky with scattered white clouds.
<p>Photograph No. 14 Leachate pond north side perimeter runoff channel and pipe culvert outlet (looking east).</p>	 A photograph showing a concrete pipe culvert outlet with two circular openings, surrounded by a bed of light-colored gravel. To the left of the culvert is a black geomembrane liner. In the background, a silver SUV is parked on a gravel area, and a white building is visible under a blue sky with scattered white clouds.
<p>Photograph No. 15 Leachate pond north side perimeter runoff channel and pipe culvert outlet (looking west).</p>	 A photograph showing a concrete pipe culvert outlet with two circular openings, surrounded by a bed of light-colored gravel. To the right of the culvert is a black geomembrane liner. In the background, a gravel area and a building are visible under a blue sky with scattered white clouds.

Photograph No. 16  
Leachate pond south side perimeter runoff channel and pipe culvert outlet (looking west).






Photograph No. 17  
Leachate pond south side perimeter runoff channel and pipe culvert outlet (looking east).



Photograph No. 18  
Contact water ditch.



<p>Photograph No. 19 Minor erosion.</p>	
<p>Photograph No. 20 Splitter dike between the leachate pond and Basin C.</p>	
<p>Photograph No. 21 Interior slope and south runoff water pipe at Basin C.</p>	



<p>Photograph No. 22 Overall view of interior slope.</p>	 A wide-angle photograph showing a large, calm body of water in the foreground, reflecting the blue sky and scattered white clouds. In the background, a dark line of trees marks the horizon under a clear sky.
<p>Photograph No. 23 Runoff discharge pipes.</p>	 A photograph of a landfill's interior slope covered in dark, impermeable liner. Several black discharge pipes are visible, with water being discharged into a pool of water. A car is parked on a gravel area to the left, and a grassy embankment is visible in the background.
<p>Photograph No. 24 Overflow discharge structure.</p>	 A close-up photograph of an overflow discharge structure. The structure is a metal platform with a large pipe discharging into a pool of water. A vertical scale is visible on the structure, with markings from 5 to 11. The structure is surrounded by a rocky area.