

# 2020 Annual Landfill Inspection Report

Northeastern Plant Landfill  
Public Service Company of Oklahoma  
Oologah, OK  
ODEQ Permit No. 3566010  
Document ID: GEVR-20-020

November 12, 2020  
Project No. 35207217



**PUBLIC SERVICE  
COMPANY OF  
OKLAHOMA**<sup>SM</sup>

*A unit of American Electric Power*

**Prepared for:**

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### PROFESSIONAL ENGINEER'S CERTIFICATION

The following Sections contain information, studies, findings, data, and observations compiled by Terracon Consultants, Inc. (Terracon) for Public Service Company of Oklahoma (PSO) Northeastern Power Station. This report documents findings for the Northeastern Ash Landfill, an existing non-hazardous industrial solid waste (NHIW) landfill located in Rogers County, Oklahoma. Public Service Company of Oklahoma is a unit of American Electric Power.

This document is intended to comply with OAC 252:517-13-5 *Inspection requirements for CCR landfills*. The information that comprises this Annual Inspection Report was prepared under the direction of F. Owen Carpenter, a licensed professional engineer in the State of Oklahoma.

As required by *Oklahoma Title 59 O.S. Supp. 2010- Section 475*, Terracon Consultants, Inc. is authorized by the Oklahoma State Board of Professional Engineers and Land Surveyors to provide engineering services in the State of Oklahoma. In testimony thereof, Certificate Number 4531 was issued under seal of the Board on March 24, 2004. The current certification expiration date is June 30, 2021.

"I certify that, to the best of my knowledge, the information contained herein is accurate and verifiable."

F. Owen Carpenter, P.E., P.G.  
Oklahoma Professional Engineer No. 23514

November 16, 2020  
Date



**Expires 31-OCT-21**

## 1.0 INTRODUCTION

This report was prepared by Terracon Consultants, Inc. (Terracon), partially to fulfill requirements of OAC 252:517-13-5, and to provide the Northeastern Plant an evaluation of the facility.

F. Owen Carpenter, P.E. performed the 2020 inspection of the Landfill at the Northeastern Plant. Quin Baber of Terracon accompanied Mr. Carpenter. 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 October 14, 2020. Weather conditions were mostly clear with temperatures ranging from about 60 to 75 (°F) over the course of the inspection, with high winds. There was no measurable rainfall over the seven days prior to the inspection.

## 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:

- Active Landfill Disposal Areas (Cell 2 and partial Cell 1)
- Inactive Landfill Areas (Cells 3 and 4 and partial Cell 1)
- Leachate Collection Pond
- Storm Water Drainage Ditches and Basin C
- Perimeter (riverside) Dike

These features are shown on **Figure 1 of Attachment B**.

The Active Landfill Disposal Area (within Cells 1 & 2) is currently where waste is being placed. Wastes have been placed in the whole Cell 2 footprint and within a partial cell footprint within Cell 1 that roughly corresponds to Phase 5 of the 5-Year Phasing Plan for the landfill. There were no active disposal operations at the time of the inspection. Watering vehicles were active for suppression of dust during the inspection.

Inactive Landfill Areas (Cells 3 and 4) and the southern and western majority of Cell 1 constitute the remaining unfilled portions of the landfill. The intermediate liner system has a 2-foot thick protective cover. Portions of the inactive area also have a temporary geomembrane cover (rainflap) to limit infiltration.

## 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 report summaries, 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 areas.

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

The total volume of CCR disposed in the landfill as of the inspection date is estimated to be 1,674,012 cubic yards (1,671,032 CY in 2019 + 2,980 CY based on tonnage during reporting year Nov. 2019 – Oct 2020). Reported tonnages – Fly Ash 833 tons, Byproduct 2,130 tons.

##### **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, scarps, 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 exposed geomembrane covers 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. Selected inspection photos are included in **Attachment A**. Additional pictures taken during the inspection will be submitted to the Owner under separate cover.

#### **Active Landfill Areas (Cell 2 & Partial Cell 1)**

1. Cell 2 was the initial active disposal area (photos 1.1 and 1.2). No ponding of water was observed on the surface. A water truck sprayed the active area surface for dust suppression. The material in the Cell is divided from the upgradient inactive areas by a separation berm.
2. The facility has begun placement of waste in the low end (northeast area) of Cell 1 (photos 1.3 and 1.4).

3. There was no erosion of the CCR material in the active areas. The height of the fill above the intermediate liner in Cell 2 is around 12 feet. A relatively thin initial waste lift has been placed in the lower areas of Cell 1.
4. No slopes or other areas of the active landfill have received permanent cover.

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

5. The exposed surface within the inactive disposal areas is the protective cover material over the intermediate liner system. There were no observations of erosion or other unsatisfactory conditions of the areas. Photos 2.1 and 2.2 show inactive areas with rainflap covers over the flowline portions of the inactive disposal areas.
6. There was no ponding of water on the surface of the inactive areas. A water truck sprayed water on the surfaces to suppress dust. The inactive areas drain along the rainflap covered flowline areas to the perimeter stormwater channels. The channels flow into Basin C, which is pumped to the permitted outfall.
7. The west end of the landfill has exposed geomembrane as a cover over the slopes of the CCR material. No damage to the temporary cover was observed. (photo 2.2)
8. The exterior soil slopes of the north containment berm had recently been mowed and included occasional areas of denuded soils (photo 2.3).

### ***Leachate Collection Pond***

9. The leachate collection pond was at a low level as a result of dry weather over the past few weeks prior to the inspection (photos 3.1 through 3.3). The outlets of the two leachate pipes from the landfill, that discharge into the pond, were visible. The flap gate on the Cell 2 leachate collection pipe discharge end was raised up, and therefore not functioning as intended.
10. The plant has temporarily utilized a manual pumping system instead of the existing leachate pumping system. Generally, the leachate is used for dust control and compaction water for the CCR material placed in the active areas, over the intermediate liner.

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

11. The perimeter ditches were in good condition. The ditches are currently lined with exposed geomembrane (photos 4.1 and 4.2). There were some local areas of shallow ponding due to sags in the flowline, minor sediment and tree debris, or small wrinkles in the geomembrane.
12. No breaches to the geomembrane was observed during the inspection. Waves in the geomembrane cover were observed, which was expected. A number of small folds in the geomembrane that had resulted in noticeable creases were observed on the riverside ditch lining geomembrane. The mechanism for the small, localized creases is unknown. The features could potentially be a locus for weakening during long-term UV exposure over time.
13. The exposed geomembrane liner in Basin C was observed to be in good condition (photos 4.3 and 4.4)

### ***Southeast (Riverside) Perimeter Dike***

14. The crest of the perimeter dike was in good condition (photo 4.2). There were a few minor ruts in the surface of the perimeter access road aggregate surface.
15. The exterior slope of the dike is steep and heavily vegetated (photo 5.1). The natural riverbank slope below the dike is exposed rock.

## **4.5 CHANGES THAT AFFECT 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.

## **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 in good condition.
- 2) The Plant is performing regular maintenance and inspections as required.

### **5.2 MAINTENANCE ITEMS**

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

- 1) The exterior slope of the north containment berm should be reseeded in denuded areas if required.
- 2) Place separation berm between Cell 1 new waste and lower end temporary weir (see Figure 1, location 1.4) or remove temporary weir per operations protocol.
- 3) Remove plastic debris from upstream culvert opening (near Figure 1, location 3.1)

### **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.



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Public Service Company of Oklahoma Northeastern Plant ■ Oologah, OK  
November 2020 ■ Project No. 35207217



If deficiencies occur before the next annual inspection contact AEP Geotechnical Engineering immediately.

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# **Attachment A**




## **Inspection Photographs**




**Attachment A: Northeastern Plant Landfill – Annual Inspection Photo Log  
Photographs Captured 10.14.2020**

| Photos by F. Owen Carpenter  |  |  |  |
|------------------------------|--|--|--|
| Photograph ID #<br>(GPS Loc) | Description  | Comments   | Photo  |
| 1.1<br>(112)                 | Looking north at active area – Cell 2                                    | From top of perimeter berm.  |    |
| 1.2<br>(115.5)               | Looking west from leachate collection pond to Cell 2 waste in background | From near Cell 2 leachate collection pipe discharge into southeast corner of leachate collection pond. |   |
| 1.3<br>(116)                 | Looking southwest from leachate pond to Cell 1                           | New waste has been placed in Cell 1 including side-gradient to up-gradient of the temporary weir.      |  |

|                      |  |  |  |
|----------------------|--|--|--|
| <p>1.4<br/>(117)</p> | <p>Looking south over the lower end of Cell 1</p>                                  | <p>New waste has been placed in Cell 1 including side-gradient to up-gradient of the temporary weir shown in foreground.</p>   |    |
| <p>2.1<br/>(101)</p> | <p>Looking northeast over inactive up-gradient portions of Cell 1 on the right</p> | <p>Temporary rain blanket shown to the left. DuraSkrim rain blanket is a five-year+ exposure reinforced geomembrane in good condition. No photodegradation defects indicated on any observed rain blanket.</p> |   |
| <p>2.2<br/>(102)</p> | <p>Looking south along the perimeter berm. Inactive Cell 4 to the left</p>         | <p>Shown from left to right – riverside berm in background, inactive Cells 3 &amp; 4, rain blanket to top of exposed geomembrane berm cover, perimeter road along southwest side, perimeter fencing.</p>       |  |

|                        |   |  |  |
|------------------------|---|--|--|
| <p>2.3<br/>(121)</p>   | <p>Looking northeast at north outer berm soil slope</p>   | <p>North slope recently mowed. Occasional areas of soil exposure. Coal railcar building in background.</p>     |    |
| <p>3.1<br/>(112.4)</p> | <p>Looking north into leachate collection pond near Cell 2 leachate collection pipe discharge</p> | <p>Leachate and Basin C pump stations in background.</p>   |   |
| <p>3.2<br/>(114.5)</p> | <p>Looking south into leachate collection pond near pump station</p>                              | <p>Shown are leachate collection riser pipes, pooled leachate, level gauge and Cell 2 waste in background.</p> |  |

|                      |   |   |  |
|----------------------|---|---|--|
| <p>3.3<br/>(115)</p> | <p>Looking north into leachate collection pond near Cell 1 leachate collection pipe discharge</p> | <p>Leachate pump station and Basin C in background.</p>   |    |
| <p>4.1<br/>(107)</p> | <p>Looking northeast at riverside lined berm and perimeter channel</p>                            | <p>Soil and vegetative debris in low area of drainage channel. Flow is to the left toward Basin C.</p>  |   |
| <p>4.2<br/>(109)</p> | <p>Looking northeast along riverside berm and perimeter channel</p>                               | <p>Shown from left to right – temporary weir from Cell 3 into perimeter channel in foreground, Cell 2 waste in background, geomembrane lined perimeter berm and cleanout riser/headwall, lined perimeter drainage channel, perimeter access road, perimeter fencing, approximate 1:1 slope down to river.</p> |  |

|                        |  |   |  |
|------------------------|--|---|--|
| <p>4.3<br/>(112.5)</p> | <p>Looking west along south side of Basin C (non-contact water) at southeast ditch discharge</p>   | <p>Exposed geomembrane liner and HDPE stormwater discharge pipes with geomembrane boots. Basin C pump station in right background.</p>  |    |
| <p>4.4<br/>(113)</p>   | <p>Looking south along Basin C eastern (riverside) edge</p>  | <p>Basin C showing exposed geomembrane liner and riverside perimeter road and fencing.</p>  |   |
| <p>5.1<br/>(100)</p>   | <p>Looking west at steep (approximately 1:1) slope from riverside outside of perimeter fencing</p> | <p>Separation dike above the river is heavily vegetated and appeared stable as observed. The dike was visually inspected as available and no large-scale movement was indicated. Heavy vegetation and steep slopes do not allow for full observation of the area.</p> |  |

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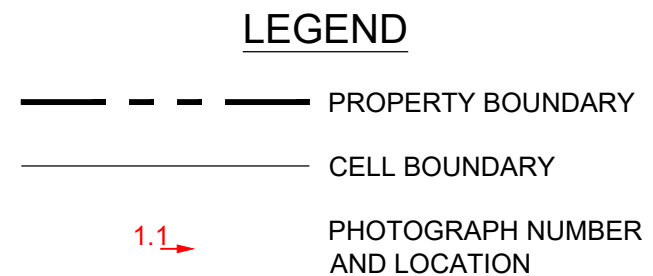
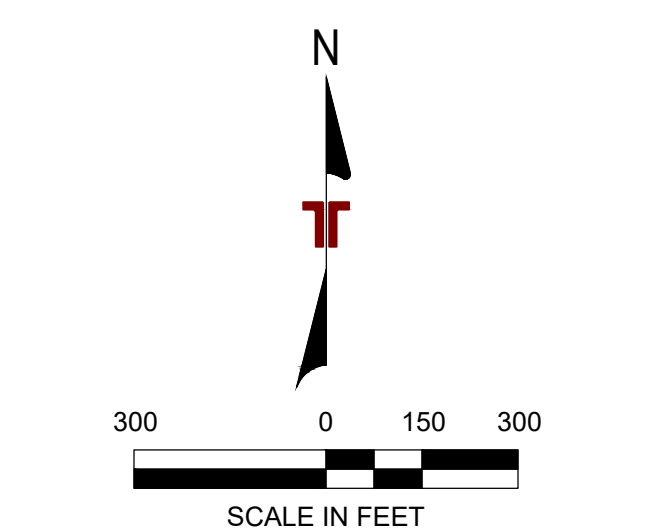
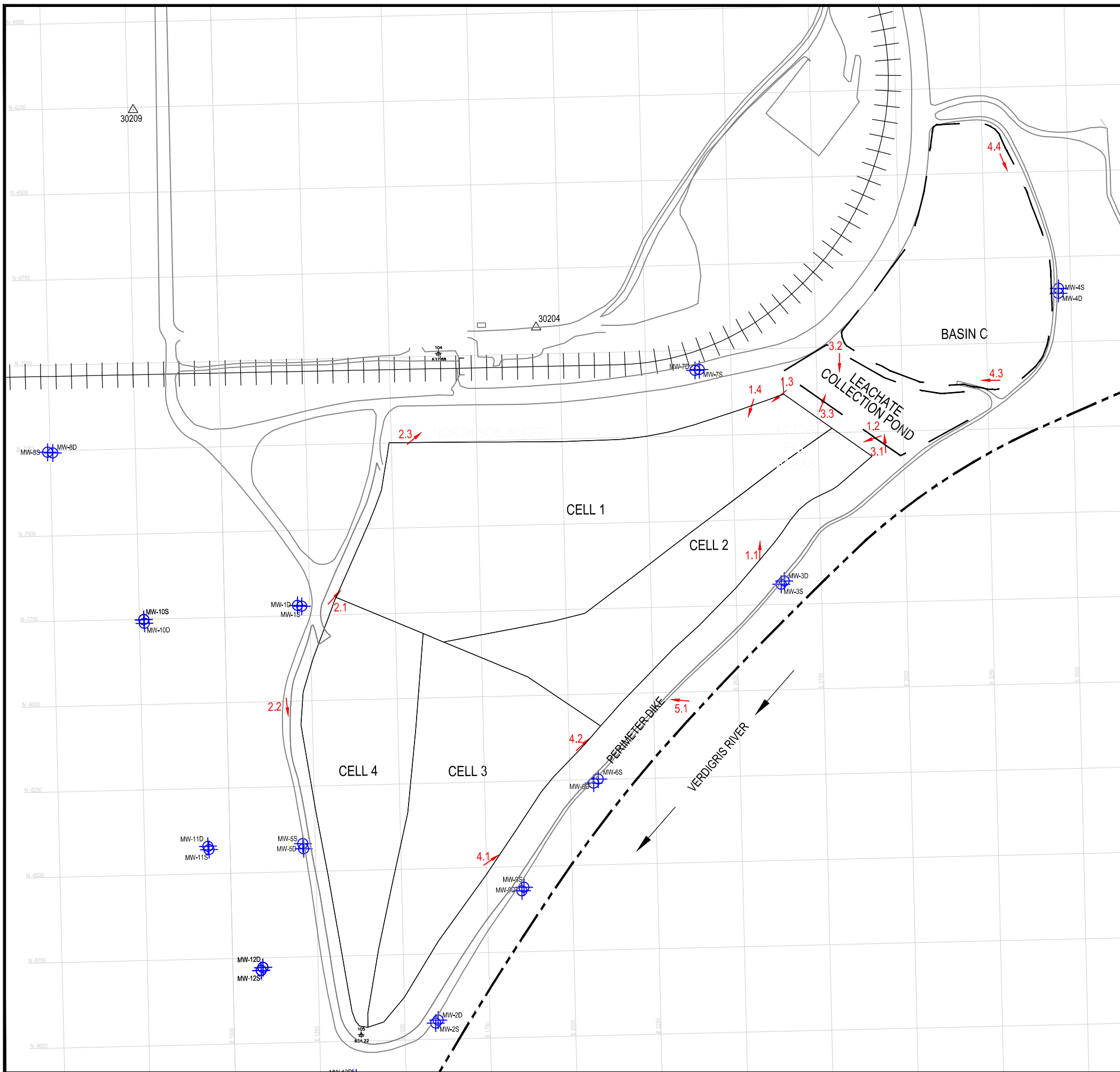
Public Service Company of Oklahoma Northeastern Plant ■ Oologah, OK  
November 2020 ■ Project No. 35207217



# **Attachment B**

## **Inspection Map**





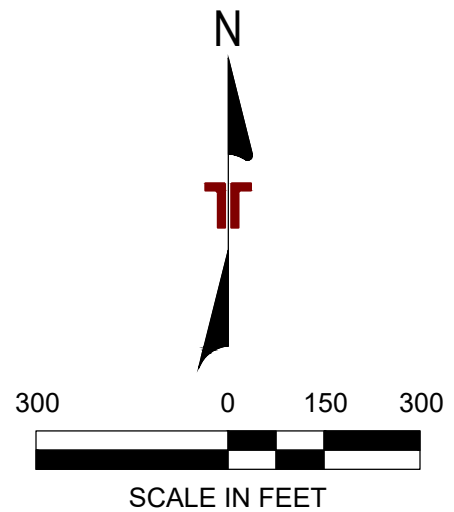
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**LANDFILL INSPECTION LOCATION PLAN**  
 2020 ANNUAL LANDFILL INSPECTION  
**AEP / PSO**  
 NORTHEASTERN PLANT LANDFILL  
 OKLOGAH, OKLAHOMA

Consulting Engineers and Scientists  
 25509 I-30 SOUTH  
 BRYANT, AR 72022  
 PH: (501) 847-9292  
 FAX: (501) 847-9210

**FIGURE 1**

|              |                  |
|--------------|------------------|
| DESIGNED BY: | FOC              |
| DRAWN BY:    | FOC              |
| APPVD. BY:   | QMB              |
| SCALE:       | 1" = 300'        |
| DATE:        | 10/27/2020       |
| JOB NO.:     | 216-003-35207217 |
| ACAD NO.:    | 001              |
| SHEET NO.:   | 1 OF 1           |



- LEGEND**
- PROPERTY BOUNDARY
  - CELL BOUNDARY
  - 1.1 → PHOTOGRAPH NUMBER AND LOCATION

| REV. | DATE | BY | DESCRIPTION |
|------|------|----|-------------|
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 NORTHEASTERN PLANT LANDFILL  
 OOLOGAH, OKLAHOMA

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**FIGURE 1**

|              |                  |
|--------------|------------------|
| DESIGNED BY: | FOC              |
| DRAWN BY:    | FOC              |
| APPVD. BY:   | QMB              |
| SCALE:       | 1" = 300'        |
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