



December 26, 2017

Mr. Brian Hocutt
Cooperative Energy
P.O. Box 15849
Hattiesburg, MS 39402

Re: Annual CCR Landfill Inspection Report for 2017
R.D. Morrow, Sr. Power Generating Station
Purvis, Lamar County, Mississippi

Dear Mr. Hocutt:

Cooperative Energy (formerly South Mississippi Electric Power Association) retained Environmental Management Services, Inc. (EMS) to conduct the annual inspection for the coal combustion residuals (CCR) landfill at the R.D. Morrow, Sr. Generating Station in Purvis, Mississippi. The purpose of this report is to comply with the air criteria in the federal Coal Combustion Residual Rule (CCR Rule) 40 CFR 257.84(b)(1) and (b)(2) requiring an annual inspection of the CCR landfill at the subject property.

1.0 Introduction

EMS performed the CCR landfill inspection on November 16, 2017, and a land elevation survey was performed on October 3, 2017. The review of available existing information, inspection summary, and conclusions regarding changes in landfill geometry, CCR volume, and the structure, operation, stability, and safety of the landfill are summarized herein.

The CCR Rule requirements for the annual landfill inspection include:

- A review of available information regarding the status and condition of the CCR unit [257.84 (b)(1)(i)]
- A visual inspection of the CCR unit to identify signs of distress or malfunction [257.84(B)(1)(ii)]
- An inspection report that includes the following:
 - Changes in geometry since the last inspection [257.84 (b)(2)(i)]
 - Approximate volume of CCR in unit at time of inspection [257.84 (b)(2)(ii)]
 - Appearance of 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 [257.84 (b)(2)(iii)]
 - Any other changes which may have affected the stability or operation of the CCR unit since the last inspection [257.84 (b)(2)(iv)]

Cooperative Energy must notify the Mississippi Department of Environmental Quality (MDEQ) Director within 30 days of placing the CCR Landfill Annual Inspection Report in the operating record and posting to the CCR web site (40 CFR 257.106 and 257.107).

The landfill site is located in the N1/2 of the NE1/4 of Sec.21, T3N, R14W, in Lamar County, Mississippi, as shown on the Site Location Map presented as **Figure 1**. The site is located at latitude 31° 12' 40" and longitude -89° 23' 53". The approximately 72 acre permitted landfill site is located within the 1,200 acre R.D. Morrow, Sr. Generating Station property. The permitted landfill area is shown on the Existing Site

Plan presented as Figure 2. The 72 acre permitted landfill area includes approximately 46 acres of existing landfill permit and a proposed 26 acre expansion area located to the west of the existing landfill. None of the expansion area has been constructed at this time.

The CCR landfill consists of various cells and partially capped areas as shown in **Figure 2** site plan. An aerial photograph showing the landfill area is shown in **Figure 3**. The entire existing operating footprint of the landfill is regulated as an “existing CCR landfill” in accordance with the definitions in the CCR Rule. The proposed expansion will be classified as a new or lateral expansion of the CCR landfill. However, the landfill also operates under a solid waste permit issued by the Mississippi Department of Environmental Quality.

2.0 Review of Available Information

EMS has worked for Cooperative Energy providing services for over 10 years related to the design, construction, operation, and monitoring of the CCR landfill, so we have a great degree of familiarity with the landfill and relevant records. EMS has also performed professional land surveys of the landfill to calculate filled and available volumes on an approximately annual basis for the past several years, so in preparing this year’s volume estimate EMS had direct access to prior volume survey records. Other information was available for review as needed for this annual inspection and report.

3.0 Inspection Summary

The EMS Mississippi licensed professional engineer, Christopher T. Johnson, P.E., P.S. performed the annual landfill inspection on November 16, 2017. Mr. Johnson was accompanied by Mr. Kenneth Ruckstuhl of EMS, and Messrs. Brian Hocutt and Jeff Pittman of Cooperative Energy. The inspection findings are summarized in the following sections.

A landfill sector index map showing the various portions of the active landfill with alphanumeric sector labels is attached **Figure 4**. At the time of the inspection, CCR materials had recently been placed in Sector F as shown on the index map.

3.1 Vegetation

Healthy grassy vegetation is present on all sectors of the landfill except the active working face area, Sector F, and the top surface of the western cell designated as Sector A. The grass is mowed with a bush hog several times per year. No trees or woody vegetation are present on the landfill surfaces or capped areas.

The earthen drainage ditches along the south side of the landfill had recently been cleared of cattails and other vegetation and the ditches drained uniformly eastward to the serpentine ditch treatment system.

The eastern edge of Sector A2 which had seepage during the 2016 inspection contained very little seepage during the 2017 inspection, and conditions are significantly better than 2016.

3.2 Erosion

Generally, very little erosion was noted in November 2017 on the landfill. Early stage rill erosion that was beginning to form during the 2016 annual inspection could not be located during this inspection. Increased

grass growth and routine maintenance and mowing appears to have mitigated the prior erosion rills. Therefore, no corrective measures are required.

3.3 Storm Water Management

Storm water management around the landfill consists primarily of a system of earthen perimeter ditches that route contact leachate eastward into the serpentine treatment system. A limited amount of non-contact storm water runoff from closed areas including the northern half of Sector A1 and all of Sector A4 drain westward, then south into Black Creek. The storm water ditch on the north side of sector A1 contains cattails and has somewhat reduced drainage efficiency toward its west end due to rip-rap velocity breaks in that area. Storm water runoff south of the landfill cells flowing toward the east is robust due to recent ditch maintenance.

3.4 Leachate Collection System

The leachate collection system is served by six individual sumps with siphon pumps that are regularly maintained during the weekly inspections performed by the Cooperative Energy inspector during his weekly inspection rounds. At the time of the EMS inspection three of the sumps (No. 3, 4, and 5) were equipped with portable gasoline powered generators to power submersible pumps for enhanced leachate pumping efficiency. At the time of the inspection on November 16, 2017, one of the sump pumps (No. 4) was actively pumping. No gravity overflow of any of the sumps was occurring at the time of the inspection.

Earlier in the fourth quarter of 2017 Cooperative Energy applied to the MDEQ for permission to install permanent sump pumps and associated connecting piping leading to the serpentine ditch treatment system. MDEQ granted permission by letter reply. Cooperative Energy is now in the planning and internal funding authorization phase of that pump installation project.

3.5 Record Keeping

Cooperative Energy's inspection records are kept in paper files. EMS reviewed the records and found that the records indicate that routine landfill inspections are being performed on a weekly basis as required by the CCR regulations.

3.0 Changes in Geometry

Given that most of the landfill is covered by lush grassy vegetation, it is readily apparent from visual inspection where CCR has been placed recently. The inspection indicated that CCR had recently been filled only in Sector F.

The EMS licensed professional land surveyor performs elevation surveys of the landfill on an approximately annual basis. EMS performed the 2017 survey on October 3, 2017. Then EMS used the survey data to create a digital elevation terrain model. Inspection of the model surface confirmed that CCR placement had been limited to Sector F.

4.0 CCR Volume

As described in the previous section, an AutoCAD® surface model was prepared based on an elevation survey of the landfill. The model surface was compared to the prior year model surface using the AutoCAD® Civil 3D package to calculate the change in volume from 2016 to 2017. The map representing the results of this effort is included as **Figure 5** Depth of Fill Map showing airspace volume calculations.

The CCR volume in the Landfill as of October 3, 2017, is estimated to be approximately 2,143,500 cubic yards (CY). Approximately 5,500 CY of material was added to the landfill since the last survey conducted November 22, 2016. Based on the design volume and the latest topographic survey, approximately 1,070,500 CY of airspace remains available in the developed portion of the landfill.

5.0 Structural Weakness and Disrupting Conditions

Based on a review of available information and the November 16, 2017 observations, EMS found no significant indications of structural weakness of the landfill. However, saturated conditions, seepage, and small soil creep along a portion of the boundary between Sectors A2 and F were noted. Additionally, the toe drain areas along the north side of Sector A1 contained wet conditions. During the annual engineering inspection, EMS used a soil probe and a metal detector to attempt to locate the toe drains and associated cleanout pipes. However, none of the drain pipes or cleanouts could be located.

6.0 Changes Affecting Stability or Operations

Based on the inspections, survey, and review of records performed in association with this annual inspection, to our knowledge, there have been no changes in condition or operation that have affected stability or operation of the CCR landfill.

7.0 Recommendations

The CCR Rule requires deficiencies or releases to be remedied as soon as feasible in accordance with 257.84(b)(5) which states

“If a deficiency or release is identified during an inspection, the owner or operator must remedy the deficiency or release as soon as feasible and prepare documentation detailing the corrective measures taken.”

Based on the findings of this annual inspection of the CCR landfill, EMS has identified no items that in our opinion constitute a deficiency under the CCR Rule.

EMS offers the following recommendations for items that in our opinion do not constitute a deficiency or release under the CCR Rules, but which would improve the operation and maintenance of the landfill:

- Clean out ditches along the northern side of landfill to remove cattail vegetation and remove rip-rap velocity breaks in the same area that are obstructing free drainage.

8.0 Closing

The inspection of the CCR landfill at the R. D. Morrow, Sr. Generating Station was conducted to satisfy the requirements of the federal CCR rule. Based on the field observations and a review of available information, EMS concludes that the design, construction, operation, and maintenance of the landfill with implementation of corrective measures for the identified deficiency will be consistent with recognized and generally accepted good engineering standards.

Please contact us at your convenience with any questions you may have. I can be reached at (601) 544-3674.

Sincerely,

Environmental Management Services, Inc.



Christopher T. Johnson, P.E., P.S.
Engineering Manager/Vice President
Mississippi Professional Engineer No. #15761

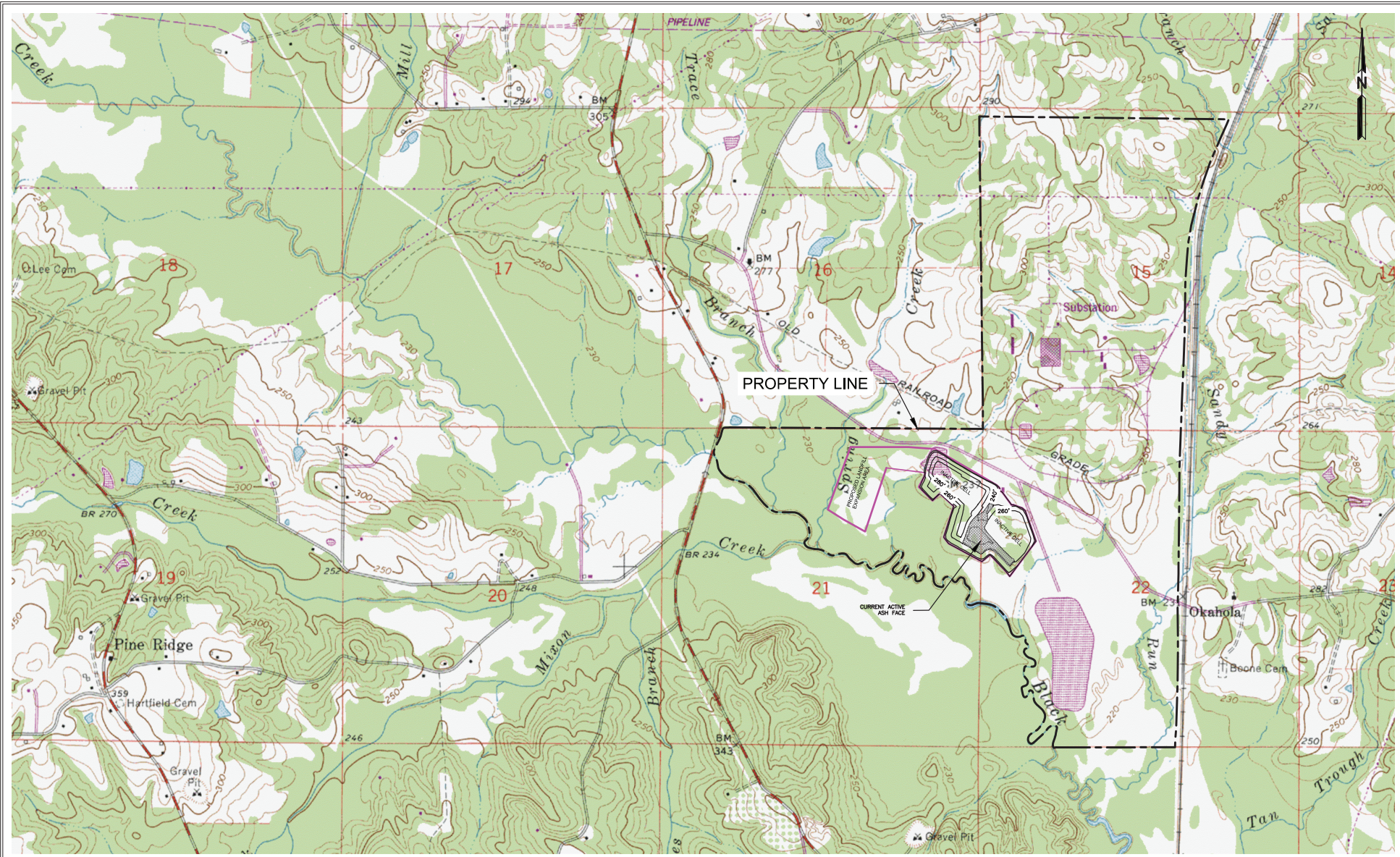


Date: 12/26/2017

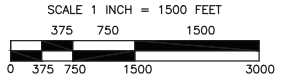
Attached Figures:

- Site Location Map
- Landfill Sector Index Map
- Site Plan
- Site Aerial Photo
- Depth of Fill Grid (at final capacity)

c: Ken Ruckstuhl, EMS



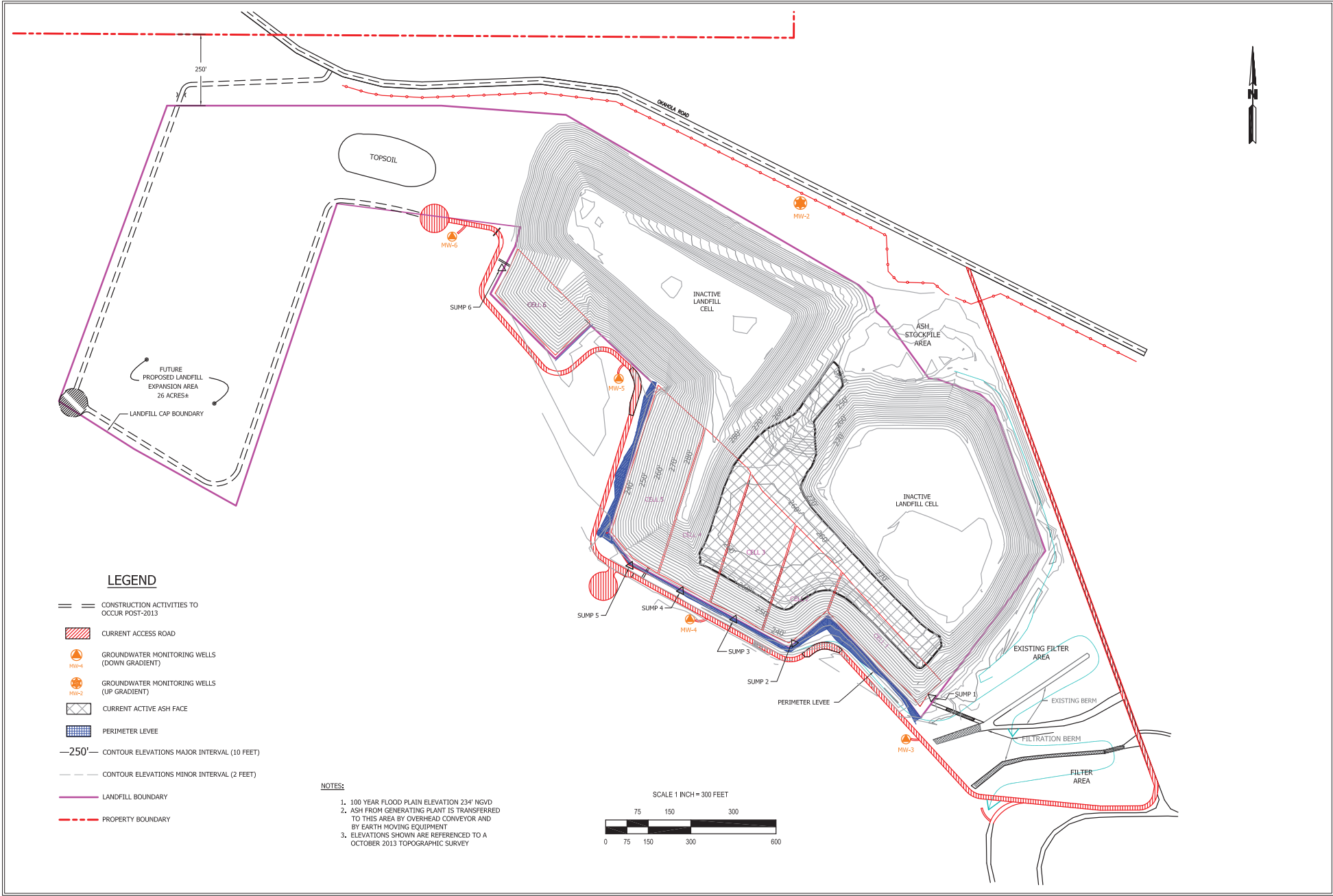
REFERENCE: 7.5 MIN. SERIES TOPOGRAPHIC MAP
PURVIS, MISSISSIPPI 1982



PREPARED FOR

SITE LOCATION
R.D. MORROW, SR. GENERATING PLANT
PURVIS, MISSISSIPPI

SHEET TITLE	
DATE	12/20/2016
SCALE	AS SHOWN
SHEET NO.	1
PROJECT NO.	SOU2-16-002

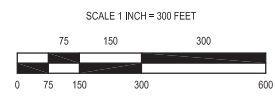


LEGEND

- CONSTRUCTION ACTIVITIES TO OCCUR POST-2013
- CURRENT ACCESS ROAD
- GROUNDWATER MONITORING WELLS (DOWN GRADIENT)
- GROUNDWATER MONITORING WELLS (UP GRADIENT)
- CURRENT ACTIVE ASH FACE
- PERIMETER LEVEE
- CONTOUR ELEVATIONS MAJOR INTERVAL (10 FEET)
- CONTOUR ELEVATIONS MINOR INTERVAL (2 FEET)
- LANDFILL BOUNDARY
- PROPERTY BOUNDARY

NOTES:

1. 100 YEAR FLOOD PLAIN ELEVATION 234' NGVD
2. ASH FROM GENERATING PLANT IS TRANSFERRED TO THIS AREA BY OVERHEAD CONVEYOR AND BY EARTH MOVING EQUIPMENT
3. ELEVATIONS SHOWN ARE REFERENCED TO A OCTOBER 2013 TOPOGRAPHIC SURVEY

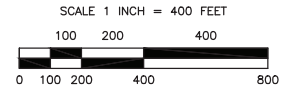




REFERENCE: AERIAL IMAGE
2012 GOOGLE EARTH
PURVIS, MISSISSIPPI

LEGEND

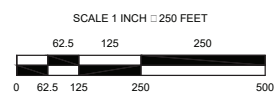
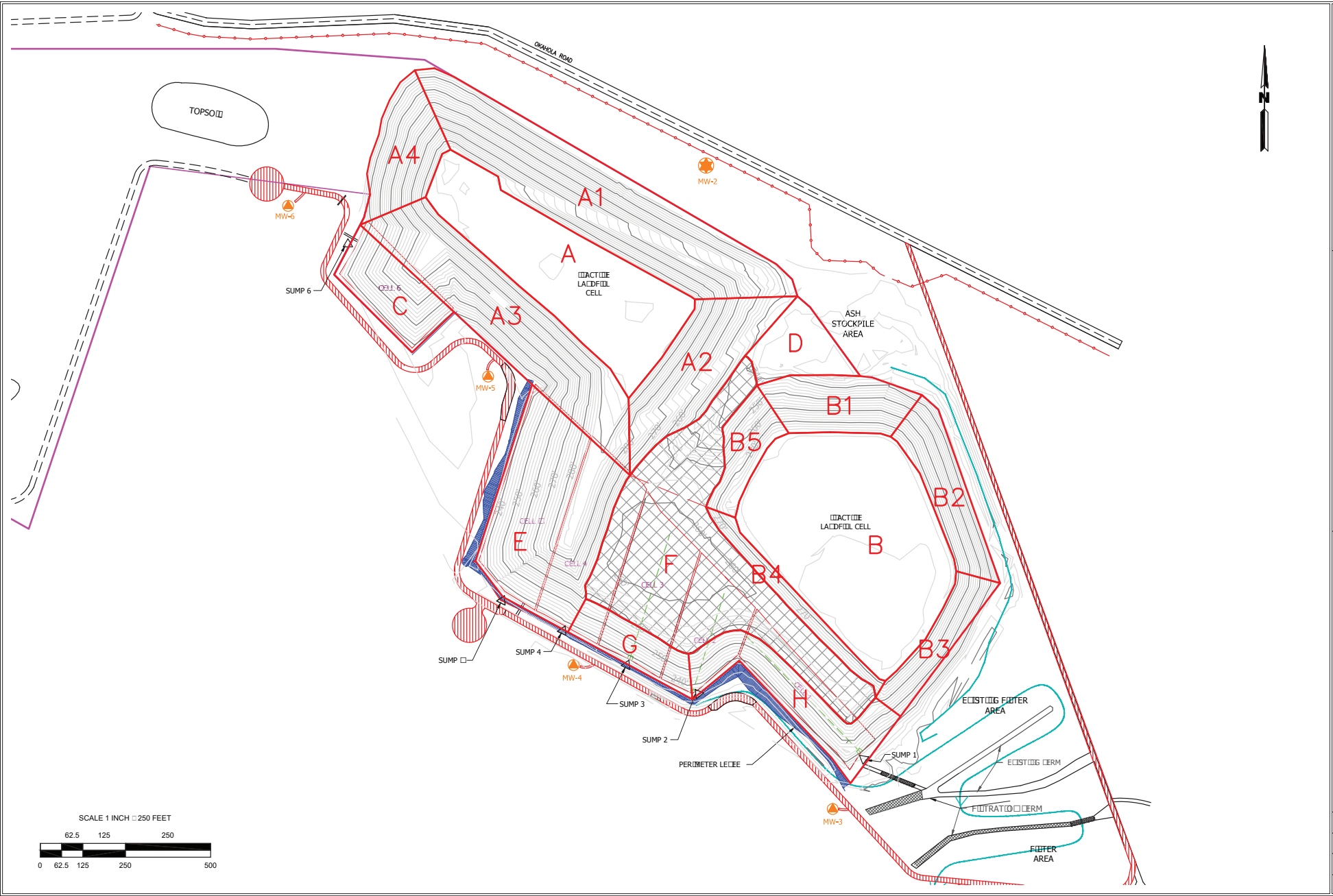
- LANDFILL BOUNDARY
- CHAIN LINK FENCE



PREPARED FOR

AERIAL PHOTOGRAPH
R.D. MORROW, SR. GENERATING PLANT
PURVIS, MISSISSIPPI

SHEET TITLE	
DATE	12/20/2016
SCALE	AS SHOWN
SHEET NO.	3
PROJECT NO.	SOU2-16-002



PREPARED FOR

LANDFILL SECTOR INDEX MAP
R.D. MORROW, SR. GENERATING PLANT
PUYUIS, MISSISSIPPI

SHEET TITLE
DATE 12/26/2011
SCALE AS SHOWN
SHEET NO. 1
PROJECT NO. SOU2-16-002

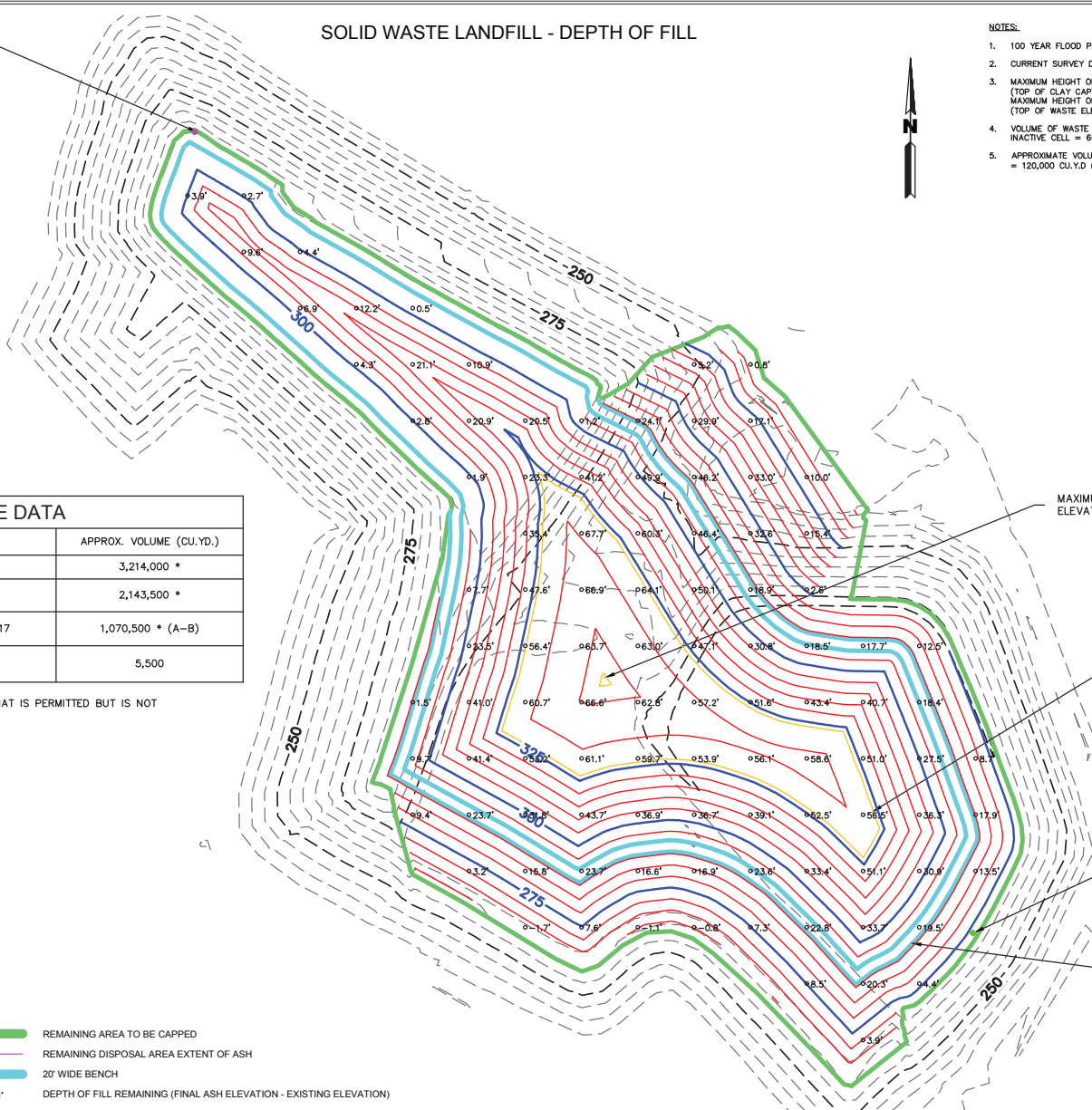
P.O. BOX 15849
HATTIESBURG, MS 39404

SOLID WASTE LANDFILL - DEPTH OF FILL

WESTERN ELEVATION POLE
FLANGE ELEVATION = 296.03'
FINAL ELEVATION = 330.00'
APPROXIMATE LENGTH = 33.0'
POLE NOT INSTALLED

NOTES:

- 100 YEAR FLOOD PLAIN ELEVATION 234' NGVD
- CURRENT SURVEY DATA WAS OBTAINED OCTOBER 3, 2017
- MAXIMUM HEIGHT OF THE LANDFILL
(TOP OF CLAY CAP COVER ELEVATION) = 340.0'
MAXIMUM HEIGHT OF THE LANDFILL WASTE
(TOP OF WASTE ELEVATION) = 337.0'
- VOLUME OF WASTE IN THE
INACTIVE CELL = 603,688 CU.YD.
- APPROXIMATE VOLUME OF COVER NEEDED TO CAP REMAINING LANDFILL
= 120,000 CU.YD. (INCLUDES 2.0' CLAY CAP AND 1.0' TOPSOIL COVER)



2017 AIRSPACE DATA

DESCRIPTION	APPROX. VOLUME (CU.YD.)
A) GROSS AIRSPACE PERMITTED FOR CONSTRUCTED CELLS	3,214,000 *
B) VOLUME OF WASTE IN ENTIRE LANDFILL	2,143,500 *
C) AIRSPACE AVAILABLE FOR DISPOSAL AS OF OCT. 3, 2017	1,070,500 * (A-B)
D) WASTE PLACED FROM 11/22/2016 TO 10/3/2017	5,500

* DOES NOT INCLUDE WESTERN SECTION (±26 ACRES THAT IS PERMITTED BUT IS NOT PLANNED FOR DEVELOPMENT AT THIS TIME)

MAXIMUM FLY ASH EXTENTS
ELEVATION = 337.0'

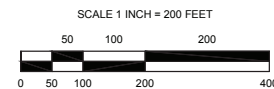
4:1 TOP OF ASH EXTENTS
ELEVATION = 327'

EASTERN ELEVATION POLE
FLANGE ELEVATION = 275.10'
FINAL ELEVATION = 330.00'
APPROXIMATE LENGTH = 54.9'
POLE NOT INSTALLED

20' WIDE FLY ASH BENCH
ELEVATION = 291.0'

LEGEND

- EXISTING GRADE ELEVATION CONTOURS
- 250' --- MAJOR INTERVAL (25-FT)
 - 245' --- MINOR INTERVAL (5-FT)
- FINISHED GRADE ELEVATION CONTOURS (TOP OF ASH)
- 275' --- MAJOR INTERVAL (25-FT)
 - 270' --- MINOR INTERVAL (5-FT)
- REMAINING AREA TO BE CAPPED
 - REMAINING DISPOSAL AREA EXTENT OF ASH
 - 20' WIDE BENCH
 - DEPTH OF FILL REMAINING (FINAL ASH ELEVATION - EXISTING ELEVATION)



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