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December 17, 2025

Ross D. Williams, RPG  
Mississippi Department of Environmental Quality (MDEQ)  
Office of Pollution Control  
Waste Division Permitting  
515 E. Amite Street  
Jackson, Mississippi 39201

Re: Greenway Environmental Services, LLC  
Green Meadow Sustainable Solutions Landfill  
Solid Waste Application Deficiency  
Jefferson County, Mississippi  
Permit No. SW0320040549

Dear Mr. Williams:

On behalf of Greenway Environmental Services, LLC (Greenway), Allen Engineering and Science, Inc. (AllenES) is submitting this letter to address application comments and concerns previously made by the MDEQ in a letter dated October 2, 2025 regarding the December 15, 2024 Revision 0 Permit Application Report (PAR). Listed below are the comments (previously made) along with a response.

**1. Section 5.2, Landfill Operator – Provide the names of all certified operators along with their Manager of Landfill Operations (MOLO) Certification.**

Response:

AllenES has provided the name(s) of all certified operators and has included the required certification in **Appendix L** of the PAR Revision 01.

**2. Sections 5.8 and 5.9.3, Waste Solidification Plan (Appendix K) – Three referenced figures (Figures 1, 2, and 3) are missing from the Waste Solidification Plan. Please provide the missing figures.**

Response:

AllenES has provided the three missing figures in **Appendix K** of the PAR Revision 01 at the end of the Solidification Plan document.



3. **Section 5.13.2, Cover Material** – The application notes potential use of an Alternate Daily Cover (ADC). Please describe the effect of ADC use on soil balance over the life of the facility.

Response:

AllenES has provided additional narrative in Section 5.13.2 in Revision 01 of the PAR Revision 01.

4. **Appendix D – Closure/Post Closure Plan: Section 2.0, Site Description** – The plan references a five-foot natural buffer as part of the landfill design. This buffer is not applicable for the proposed expansion area. Please revise this section to accurately reflect the proposed natural and engineered buffer.

Response:

The Commission on Environmental Quality (Commission) approved a variance from the natural geology siting criteria requirement to allow constructed buffer where adequate natural geology may not be present. A copy of the Commission meeting minutes is provided in **Appendix L** of the PAR Revision 01. AllenES has revised Section 2.0 of the Closure/Post Closure Plan to include constructed buffer, and a copy is provided in **Appendix D** of the PAR Revision 01.

5. **Appendix D – Closure/Post Closure Plan: Section 3.2.1 – Final Cover Option A** – This option specifies an 18-inch infiltration layer with a permeability  $\leq 1 \times 10^{-5}$  cm/sec. Current regulations require the infiltration layer permeability to be less than or equal to the permeability of any bottom liner system or natural subsoils present, or a permeability no greater than  $1 \times 10^{-5}$  cm/sec, whichever is less. As this facility will be designed with a composite liner system with a permeability of  $1 \times 10^{-7}$ , please revise the specified infiltration layer permeability.

Response:

AllenES feels the infiltration layer with a permeability less than or equal to  $1 \times 10^{-5}$  cm/sec combined with a flexible membrane liner (FML) meets the regulatory requirement for the infiltration layer permeability to be less than or equal to the bottom liner. In addition, AllenES believes the EPA's Solid Waste Disposal Facility Criteria dated November 1993 supports this conclusion and design approach. Figure 6-3a, *Example of Final Cover Design for a MSWLF Unit with a FML and Leachate Collection System*, shows an infiltration layer with a permeability of  $1 \times 10^{-5}$  cm/sec in the final cap combined with a FML compared to a bottom clay liner having a permeability of  $1 \times 10^{-7}$  cm/sec combined with a FML and leachate collection system. In order to compare the performance of the proposed composite final cap to the composite bottom liner system, AllenES performed an equivalence evaluation for the two systems. Based on this analysis, the proposed Final Cover Option A will hydraulically perform better than the bottom liner. The calculations are attached in **Appendix L**.





6. **Section 6.4, Fault Area, Seismic Impact Zones, and Unstable Areas – The application references USGS literature identifying the site in the Gulf-Margin Normal Faults Class B to C Zone, while the consultant suggests minimal impact being in this zone. Please provide supporting evidence, such as surface geologic maps generated by the MS Office of Geology, or other information supporting your position of little to no impact.**

Response:

The Green Meadow Sustainable Solutions Landfill is located in a region with strikingly low historical seismic activity. Evidence is provided to support this position including: Structural Features of Mississippi Map (MDEQ, Office of Geology), Fact Sheet 1 – Earthquakes in MS (MDEQ), and Geologic Map of the Church Hill Quadrangle (MDEQ, Office of Geology). These documents are included in **Appendix L** of the PAR Revision 01.

7. **Section 6.5, Hydrocarbon Wells and Water Wells – The application references an abandoned hydrocarbon well plugged in October 2023. Please provide the official plug and abandonment form.**

Response:

AllenES has located the official plug and abandonment form for the hydrocarbon well plugged in October 2023. The official form has been included in **Appendix L** of the PAR Revision 01.

8. **Section 6.9, Natural Geology and Appendix E – Soil boring logs (e.g., B-16 and AB-59) suggest seasonal perched groundwater may be encountered during disposal cell construction. Please provide a plan to address management of wet, in-situ earthen material under these conditions.**

Response:

AllenES has added narrative to the CQA Plan Revision 1 Section 5.1.1 on how to address seasonal perched water, if encountered during construction.

9. **Appendix E, Geological/Hydrogeological Report – Provide a copy of missing soil boring log BCM Engineers B-32. Provide legible copies of Eustis Boring Logs, EB-18, EB-19, and EB-20.**

Response:

AllenES has located the missing soil boring log B-32 and has included legible copies of boring logs B-18, B-19, B-20. These boring logs can be found in **Appendix E** in the soil boring logs.



**10. Appendix G, Construction Quality Assurance Plan (CQA) – Section 2.3.1, Pre-Construction Meeting: Please include the Department on the contact list.**

Response:

AllenES has updated Section 2.3.1 to include notification to MDEQ prior to holding preconstruction meetings.

**11. Appendix G, Construction Quality Assurance Plan (CQA) – Section 2.3.3, Problem/Deficiency Meeting: Please include the Department on the contact list.**

Response:

AllenES has updated the Problem/Deficiency Meeting narrative to give notice prior to these meetings and/or update MDEQ as appropriate for major problems/deficiencies.

**12. Section 9.2, Monitoring Well Installation – Please provide a schedule for the phased installation of monitoring wells in relation to disposal cell development.**

Response:

AllenES has provided narrative and a table listing the proposed landfill cell construction that will include the phased installation of respective upgradient and downgradient wells in proximity to active/constructed landfill. This narrative and schedule have been provided in the Geological/Hydrogeological Report Revision 01 Section 3.1 located in **Appendix E** of the PAR Revision 01.

**13. Well Nomenclature – References to MW-4 and MW-5R are inconsistent across the text and drawings. Please reconcile the nomenclature.**

Response:

AllenES identified an inconsistency in the MW-5R nomenclature. Drawings 3, 4, & 6 labeled MW-5R as MW-5. Drawings 3, 4, and 6 have been revised and may be found in **Appendix L**. AllenES did not find an inconsistency in the MW-4 nomenclature. MW-4 and MW-4R are shown as existing and proposed wells, respectively, on Drawing 6, and their respective legend symbols identify the wells as either existing or proposed.

**14. Drawing 16B – External side slopes do not coincide in the referenced sections. Please revise.**

Response:

AllenES has updated Drawing 16B to address the Department's comment. The revised Drawing 16B has been included in **Appendix L**.



**15. Drawing 19 – Please specify the well diameter for landfill gas extraction wells.**

Response:

AllenES has updated Drawing 19 to specify the landfill gas extraction well diameter. The revised Drawing 19 has been included in **Appendix L**.

**Closing**

If during your review, you or members of your staff have any questions or require any additional information, please do not hesitate to contact Joseph Wilson at [jwilson@allenes.com](mailto:jwilson@allenes.com) or Jeff Allen at [jallen@allenes.com](mailto:jallen@allenes.com), or either at (601) 936-4440. Thank you in advance for your timely attention to this matter.

Sincerely,  
Allen Engineering and Science, Inc.

Joseph Wilson, P.E.  
Project Engineer

Jeffrey L. Allen, P.E.  
President & Senior Principal Engineer

cc: Trent Jones (MDEQ)  
Ethan Mayeu (MDEQ)  
Jesse Stallone (Green Meadow Sustainable Solutions)  
Jim McNaughton (Consultant)

Enclosures: **Attachment A: Response to October 2, 2025 Comments PAR Revision 01 Documents**



**Attachment A:**  
**Response to October 2, 2025 Comments**  
**PAR Revision 01 Documents**



**PAR Revision No. 1 - December 2025**  
**PAR Text - Section 5.13.2 - Cover Material**



### **5.13.2 COVER MATERIAL**

In accordance with MDEQ requirements, at least six inches of earthen or other approved material will be placed on any active face of the landfill at the end of each operating day.

This daily cover is required to prevent and/or control the following:

- Disease vectors,
- Fires,
- Odors,
- Blowing litter, and
- Scavenging.

Daily cover material consists of soils which are excavated from an on-site borrow area or imported from offsite sources as available. At the beginning of each day, portions of the daily cover will be removed to promote leachate migration to the leachate collection and removal system. Twelve inches of intermediate cover will be used to cover areas not receiving wastes for more than 30 days. Intermediate cover will be provided using soil cover and will be placed and shaped to promote storm water runoff and prevent ponding.

Green Meadow Landfill has opted to use alternate daily cover (ADC) materials to extend the life of the landfill, reduce the volume of soil cover required, help reduce precipitation infiltration, and provide for a more efficient operation. When utilized, ADC will be applied daily at the end of the day's landfilling operations by either deploying a landfill tarp system such as the Airspace Saver™ or applying mineral-mortar coating such as Posi-Shell® to the exposed working face. The utilization of ADC is anticipated to reduce the volume of cover soil required at least 50% or approximately 1,200,000 cubic yards. Reduction in volume will have a positive impact on the facility soil balance by ensuring a positive soil balance, preserving soils for construction of clay liner, infiltration layer, and erosion layer.

Tarp systems if utilized will consist of a high-density woven polyethylene coated fabric manufactured by that is manufactured for the solid waste industry. A series of high tensile strength polyester web straps are sewn on every material seam as well as around the perimeter for added strength. Steel D-rings are precision sewn around the edges. Tarp shall be water resistant and flame resistant. Tarp systems such as Airspace Saver™ or its equivalent will be utilized.

Spray-on cover systems will consist of a blend of clay binders, reinforcing fibers, and polymers that, when mixed with water, produces a spray-applied mortar that dries in the form of a thin durable stucco over the working face such as Posi-Shell® or its equivalent.

If inclement weather that could prevent sufficient installation of the ADC is forecasted, the ADC will not be used, and 6 inches of cover soil will be placed for the day. If ADC is utilized, a six (6) inch soil cover will be applied at least once per week.

Greenway employees, who work in landfilling operations, will be trained in properly mixing, deploying, and maintenance of the ADC application system. Greenway will repair or replace the ADC in areas where the ADC has been damaged, eroded, or in instances where the product service life has expired

Any material utilized as ADC at the Landfill will be required to:



**Geological /Hydrogeological Report Revision 01**  
**Section 3.1 Text**





### 3.0 SITE HYDROGEOLOGY

#### 3.1 SITE-SPECIFIC GROUNDWATER

Five (5) groundwater monitoring wells are located on the Site. Three (3) of the monitoring wells were installed as hydrogeologic test wells (originally HTH-1 through HTH-3) in 1993 and the remaining two (2) monitoring wells (originally HTH-4 and HTH-5) were installed in 1996. These wells were renamed to MW-1 through MW-5 as early as 2004, Well MW-2 serves as the upgradient (background) well while wells MW-1, MW-3, MW-4, and MW-5R are currently positioned hydraulically downgradient from the active landfill. Well MW-5 was replaced with well MW-5R in 2014. These five (5) wells represent the landfill's leak detection groundwater monitoring system. Well construction diagrams for the monitoring wells MW-1 through MW-5 are provided in **Appendix I** following the Sampling and Analysis Plan (SAP). A summary of key construction and gauging data from the recent November 2024 event for each of these monitoring wells are presented in the table below. Locations of these wells are provided in **Drawing 6**.

| Well ID | Construction                 | TOC Elevation (ft. MSL) | Well Total Depth (ft. bls) | Depth to Water (ft. bls) | Water Elevation (ft MSL) |
|---------|------------------------------|-------------------------|----------------------------|--------------------------|--------------------------|
| MW-01   | 4" PVC<br>10' 10-slot screen | 258.92                  | 113.61                     | 87.73                    | 171.12                   |
| MW-02   | 4" PVC<br>20' 10-slot screen | 327.10                  | 137.49                     | 135.04                   | 192.06                   |
| MW-03   | 4" PVC<br>20' 10-slot screen | 293.33                  | 126.80                     | 119.72                   | 173.51                   |
| MW-04   | 4" PVC<br>20' 10-slot screen | 223.39                  | 72.10                      | 52.17                    | 171.18                   |
| MW-05R  | 4" PVC<br>20' 10-slot screen | 267.25                  | 108.64                     | 85.71                    | 181.46                   |

In reviewing boring logs and well construction diagrams provided by BCM, each of these wells are screened within fine- to medium-grained sands of the Hattiesburg formation. These saturated sands are believed to be generally unconfined although semi-confined conditions are likely due to the lateral and vertical variability of the sands and clays at depth at the Site. These saturated sands represent the uppermost water bearing zone (UWZ) at the Site.

Due to the topographic relief of the Site, wells range in total depth from approximately 72.10 feet to 137.49 feet bgs. Groundwater generally flows to the southwest across the Site. The UWZ potentiometric surface ranges from 192.41 (MW-02; upgradient) feet to 170.79 feet (MW-04; downgradient) above MSL. The average hydraulic gradient is approximately 0.0038.

As noted previously in this report, the site geology features shallow, lenticular Sands and Gravels discontinuously overlying the Clay proposed to serve as the natural buffer overlying the UWZ. These Sand and Gravel units contain varying amounts of moisture (ranging from dry to saturated), suggesting they may contain perched water zones which likely are influenced by seasonality, shallow infiltration of precipitation, and other variables.

Following AllenES review of the hydrogeologic conditions representative of the Site and to better evaluate potential releases from the future land operations, several new groundwater monitoring wells will be proposed to supplement the existing well network. Up to five (5) new downgradient monitoring wells (including replacing MW-4 with MW-4R) will be proposed along the western edge



of the proposed waste boundary to ensure adequate downgradient detection. Up to two (2) new upgradient monitoring wells are proposed along the eastern edge of the waste boundary. The five (5) proposed downgradient wells are spaced approximately 750 feet away from each other. The proposed new groundwater monitoring wells are illustrated on **Drawing 6**.

New wells may be installed in a phased approach as new landfill cells are constructed. Please refer to the table below for an outline of phased well installation during each applicable cell construction. The exact location and depths of each new well will be determined by a qualified hydrogeologist after reviewing applicable geologic and hydrogeologic field data. Wells can be installed prior to the schedule provided.

| Monitoring Well Phased Installation Schedule |                            |
|----------------------------------------------|----------------------------|
| Cell Construction                            | Proposed Well Installation |
| Cell 6                                       | MW-9                       |
| Cell 7                                       | MW-10                      |
| Cell 4                                       | MW-8                       |
| Cell 2                                       | MW-7, MW-11                |
| Sedimentation Basin No. 2 Expansion          | MW-4R                      |
| TBD                                          | MW-6                       |

### 3.2 SITE-SPECIFIC SURFACE WATER

Surface water at the Site is ephemeral (e.g., only flows after a precipitation event). One (1) ephemeral drainageway lies within the bottom of the steep valley through the center of the northeast proposed waste boundary and drains to the south into a permitted stormwater outfall. Two (2) ephemeral drainageways lie to the west of the permitted landfill area. Stormwater from the western portion of the site flows to the south of the property after precipitation events. Stormwater from the central portion of the Site property exits the Site through a permitted stormwater outfall and flows to the western drainageway. All stormwater eventually flows offsite then into Stampley Creek where it drains to the northeast into South Fork Coles Creek which flows to the north.



**Closure/Post-Closure Plan  
Revision 01**

# **GREEN MEADOW SUSTAINABLE SOLUTIONS LANDFILL**

## **CLOSURE/POST-CLOSURE PLAN**

**PREPARED FOR:**

**GREENWAY ENVIRONMENTAL SERVICES, LLC**

**4451 HIGHWAY 61  
FAYETTE, MISSISSIPPI 39069**

**PREPARED BY:**



**6360 I-55 NORTH, SUITE 330  
JACKSON, MISSISSIPPI 39211  
ALLEN ENGINEERING AND SCIENCE PROJECT NO. 24051**

**REVISION No. 1 – NOVEMBER 2025**

**REVISION No. 0 – DECEMBER 2024**



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## **1.0 INTRODUCTION**

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This closure and post-closure plan (plan) for Greenway Environmental Services, LLC (Greenway)'s municipal solid waste landfill (Green Meadow Sustainable Solutions Landfill) has been prepared in accordance with the Mississippi Nonhazardous Solid Waste Management Regulations and Criteria (SWMR) and Title 40 of the Code of Federal Regulations (CFR), Part 258, Subpart F (Part 258).

This plan describes the necessary steps to close the Green Meadow Landfill at any point during the active life of the facility. This plan provides details on:

- Closure cover design and soil layer placement procedures,
- Survey and deed notation requirements,
- Schedule for closure and post-closure activities,
- Borrow Area reclamation, and
- Certification of closure and post-closure activities.



## 2.0 SITE DESCRIPTION

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Green Meadow Sustainable Solutions Landfill (Green Meadow Landfill) is located on US Highway 61, approximately 6.6 miles southwest of Fayette, Mississippi as shown in the Engineering Drawings which is included in the solid waste permit application report. The facility is located in Sections 29, 30, 44, 46, and 69, Township 8 North, Range 1 East in Jefferson County, Mississippi specifically at the following geographic position:

Latitude: 31°39'11.21" N

Longitude: 91°08'36.32" W

Datum: NAD83

Church Hill 7.5-Minute Quadrangle Map

Fayette 7.5-Minute Quadrangle Map

The Green Meadow Landfill's current and future disposal area is comprised of approximately 160.4 acres. The landfill is the primary waste disposal facility for Jefferson County and is permitted to receive solid waste from the 48 contiguous states. The types of waste at the facility will be municipal solid wastes generated from residential, commercial, and industrial activities. Access to the site will be from US Highway 61 to the south of the site. The design of the landfill includes a minimum five-foot natural buffer or three-foot constructed buffer, a two-foot constructed clay liner, HDPE liner, leachate collection and storage system, sedimentation basins, composite final cap, and groundwater and methane monitoring systems.



### **3.0 CLOSURE**

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#### **3.1 GENERAL**

This section of the plan provides statements of compliance with some of the general requirements of Rule 1.4.E.1 of the SWMR.

The MDEQ will be notified of the placement of this plan in the operating record of the facility. Closure and post-closure activities will be conducted in accordance with the MDEQ approved closure/post-closure plan. Any changes to the plan will be made after approval by MDEQ. A copy of the approved plan will be kept at the facility, or other approved location, until the owner has been released from the requirements for closure and post-closure care.

Unauthorized access and disposal is prevented by security measures such as manned entrance gates and fences, and inspection of waste loads. Prior to permanent closure of the facility, the site will be cleaned of any scattered wastes which will be landfilled or transferred to an offsite landfill for proper management. Signs will be posted to inform the public of the facility's permanent closure.

In accordance with the SWMR, the estimate of maximum inventory of wastes must account for the maximum amount of wastes on site and not yet disposed. The estimated maximum inventory of wastes ever on-site, and not yet disposed, over the active life of the landfill facility is zero. The estimated largest area of a landfill unit ever requiring a final cover at any time during the active life of the landfill is 44 acres.

#### **3.2 CLOSURE COVER DESIGN AND PLACEMENT**

Cover designs proposed in this section are in accordance with Rule 1.4.E.2 of the SWMR. The final cover system is designed to minimize the need for further maintenance and controls including the minimization of infiltration and erosion. A total of two (2) final cover alternatives have been proposed and details on the cap components can be found below:

##### **3.2.1 FINAL COVER OPTION A**

Final Cover Option A will consist of an 18-inch infiltration layer with a permeability less than or equal to  $1.0 \times 10^{-5}$  cm/sec, 40 Mil LLDPE geomembrane liner, doubled sided geocomposite drainage net, minimum 12-inch erosion layer capable of sustaining vegetation on the top 4% crown and 4:1 side slopes.

##### **3.2.2 FINAL COVER OPTION B**

Final Cover Option B will consist of a geosynthetic clay liner with a permeability less than or equal to  $5.0 \times 10^{-9}$  cm/sec, 40 Mil LLDPE geomembrane liner, doubled sided geocomposite drainage net, minimum 12-inch erosion layer capable of sustaining vegetation on the top 4% crown and 4:1 side slopes.

The cover will be installed using Construction Quality Control (CQC) and established Construction Quality Assurance (CQA) methods and procedures.





### **3.2.3 INFILTRATION LAYER**

The soil proposed for use in the infiltration layer will be evaluated through laboratory testing prior to acceptance. Such testing may include:

- Atterberg limits,
- Percentage of fines,
- Moisture/density relationships, and
- Laboratory permeability tests.

Once acceptable cover material is identified, the surface of the landfill will be properly graded and compacted before placement of the infiltration layer soils. Soil will be placed in controlled manner by processing and moisture conditioning, if necessary, prior to incorporating the soil into lifts. Lift thickness will be monitored during placement in accordance with the CQA plan. Standard construction equipment will be used for soil placement and construction. The following tests may be performed on the prepared and compacted soil:

- moisture content,
- dry density, and
- hydraulic conductivity.

The soil will be compacted to a specified range of water content at a minimum dry unit weight. The precise limits of soil moisture and density will be determined from the results of the abovementioned laboratory tests prior to construction of the liner.

Moisture content and dry density are critical factors in ensuring proper compaction of the soil material and in achieving the desired hydraulic conductivity. Visual observations will be made to protect each lift from desiccation or other damaging forces. The latest edition of the American Society for Testing and Materials (ASTM) test methods will be used, as appropriate, for quality control and quality assurance tests. If necessary, a test pad may be constructed to verify laboratory test results and construction techniques.

### **3.2.4 EROSION LAYER**

The erosion layer will consist of a minimum of 12 inches of suitable soils that are capable of supporting a native grass cover. Trees may not be used in-lieu of or in addition to the grass cover. The soil will be placed with standard construction equipment. To aid in root development, the erosion layer will not be compacted. The type of grass/vegetation will be indigenous and shallow-rooted to minimize soil erosion. Fertilizer will be added to promote growth. The CQA plan will specify procedures for establishing and maintaining the vegetative cover. The final cover gradient will be a minimum of 4 percent and a maximum of 25 percent as shown on the Final Grading Plan of the Engineering Drawings.

### **3.2.5 LANDFILL GAS EXTRACTION SYSTEM**

The landfill gas extraction system will consist of landfill gas extraction wells that convey landfill gas through lateral piping to a flare unit. Installation of this system will be performed by utilizing the industries' standard of practice at the time of installation. Typically, this extraction system will be installed before installation of the final cap. However, the extraction system may be installed



during or after installation of the final cap as necessary to complete closure requirements. The system will be installed in accordance with CQC and CQA procedures to ensure proper system performance and ensure that the other landfill cap components have not been compromised. Should any part of the landfill cap be compromised as a result of the extraction system installation, it shall be properly repaired to restore full integrity to the landfill cap.

### **3.2.6 ALTERNATIVE COVER DESIGN**

An alternative cover design may be proposed as provided in Rule 1.4.E.2.b. of the SWMR. The alternative design will be equivalent to the above design, and if proposed, approval of MDEQ will be obtained prior to implementation.

### **3.2.7 CLOSURE CERTIFICATION**

The closure activities including this plan and CQA plan will be monitored by a registered professional engineer. A professional engineer will certify that the final cover system has been completed in accordance with the approved closure plan. As portions of the landfill are closed, closure certifications will be placed in the landfill's operating record. The MDEQ will be notified that the certification was placed in the operating record within 60 days after completion of construction and seeding of the final cover for the landfill.

### **3.2.8 BORROW AREA RECLAMATION**

On-site borrow areas which are used for excavation of daily or final cover soil will be reclaimed by regrading, to stabilize slopes, and by establishing permanent vegetation. Borrow areas that are within a portion of the permitted landfill will be closed in accordance with the approved closure plan for the landfill.

### **3.2.9 CLOSURE SCHEDULE**

Prior to beginning closure of each landfill unit, Greenway will notify the MDEQ that a notice of intent to close the unit or landfill has been placed in the operating record. Closure activities will generally begin within 30 days after the date on which the landfill unit receives the known final receipt of waste or, if the unit has remaining capacity and there is a reasonable likelihood that the unit will receive additional wastes, no later than one year after the most recent receipt of wastes.

The closure activities of each unit will be completed within 180 days following the beginning of closure as previously mentioned, except where an extension is requested by Greenway and approved by the MDEQ.

The following are several tasks involved in the closure of the landfill:

- Borrow area soil evaluation testing,
- Preparation of the landfill surface,
- Installation of the Infiltration Layer,
- Installation of the geosynthetic clay liner, LLDPE geomembrane, or geocomposite drainage layer, and
- Seeding of the Erosion Layer.



#### **4.0 SURVEY PLAT AND NOTATION**

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Within 90 days after all landfill units are closed, a survey plat indicating the location and surveyed dimensions of the landfill in respect to permanently surveyed benchmarks or Section corners and a notation will be submitted to the Jefferson County courthouse for recording into the permanent land records. The plat and a notation will be prepared by a registered land surveyor in the state of Mississippi. The notation will include the following information:

- Name of the facility owner,
- Past use of the facility as a landfill,
- Year the landfill started and ended disposal operations, and
- Post-closure land use of the property.

The MDEQ will be notified within the above time limit that the notation and plat have been recorded and a copy of each has been placed in the operating record. Greenway may request permission from the MDEQ to remove the notation and survey plat from the land records if all wastes are removed from the facility.



## **5.0 POST-CLOSURE**

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### **5.1 GENERAL MAINTENANCE**

Following closure of each landfill unit, post-closure care activities will be conducted. Post-closure care will be conducted for a period of 30 years, except where an alternative period is approved by the MDEQ. The integrity of the final cover will be maintained by inspecting and taking corrective actions as necessary, to correct the effects of settlement, subsidence, erosion; and by preventing run-on and run-off from eroding or otherwise damaging the final cover. Grass cover over the closed landfill units will be maintained by mowing periodically in order to allow for visual inspection of the final cover. Any necessary repairs and associated corrective actions will be documented and submitted to the MDEQ. Unauthorized access and disposal will be prevented by an established facility security system. The landfill will be inspected periodically, at least quarterly, to verify the integrity of the final cover.

### **5.2 LEACHATE COLLECTION SYSTEM MONITORING**

The leachate collection system (LCS) will be maintained and operated to comply with applicable design criteria. LCS monitoring will be conducted to ensure that no blockages are present in the leachate collection pipe. If blockages are present, the collection pipe will be cleared through the use of appropriate equipment in the cleanout pipe. Leachate will be removed and managed in accordance with landfill permit requirements during the post-closure period. MDEQ may allow the owner to stop managing leachate if the owner demonstrates that leachate no longer poses a threat to human health and the environment.

### **5.3 GROUNDWATER MONITORING**

Groundwater monitoring will be conducted in accordance with the applicable monitoring program requirements of the SWMR during the post-closure period.

### **5.4 METHANE GAS MONITORING**

The landfill units will be operated such that the concentration of the methane gas generated by the facility does not exceed 25 percent of the lower explosive limit for methane in facility structures (excluding gas control or recovery system components); and the concentration of methane gas does not exceed the lower explosive limit for methane at the facility boundary.

Methane will be monitored quarterly, unless a different frequency is proposed and approved by the MDEQ. Results of monitoring will be submitted to the MDEQ within 60-days following each monitoring period. Should methane gas levels exceed the above limits, appropriate corrective measures will be taken and the MDEQ will be notified in accordance with Rule 1.4.B.4 of the SWMR.

### **5.5 POST-CLOSURE SITE USE**

The name, address, and telephone number of the person or office to contact about the facility during post-closure period will be provided at the time of closure. The post-closure use of the site is vegetated open space. The MDEQ will be notified for approval of any other planned postclosure use of the property. The final landfill cover or any other component of the containment system will not be disturbed without the prior approval of the MDEQ.



## **5.6 POST-CLOSURE CERTIFICATION**

The completion of the post-closure care period in accordance with the approved plan will be certified by a registered professional engineer. The MDEQ will be notified by Greenway that such a certification was placed in the operating record within 60 days after completion of the post-closure care period.



**BCM Engineers B-32 Boring Log  
and  
Eustis EB-18, EB-19, & EB-20 Boring Logs**

Project Description: Jefferson Co. LandfillSheet 1 of 1

MGPTF ID#:

BCM Project No.: 05-6184-01Drilling Date(s): 8-6-93Logged By: John GreenWell/Boring Location: Irregular Section 29- T. 8 N., R. 1 E., See CommentsTitle: Geologist

Longitude:

Latitude:

Drilling Method: Hollow Stem AugerDrilling Contractor: BCM Drilling ServiceElevations: Ground Surface, ft: 318.65

Top of Casing, ft:

Elevation Reference:

Water Table, ft:

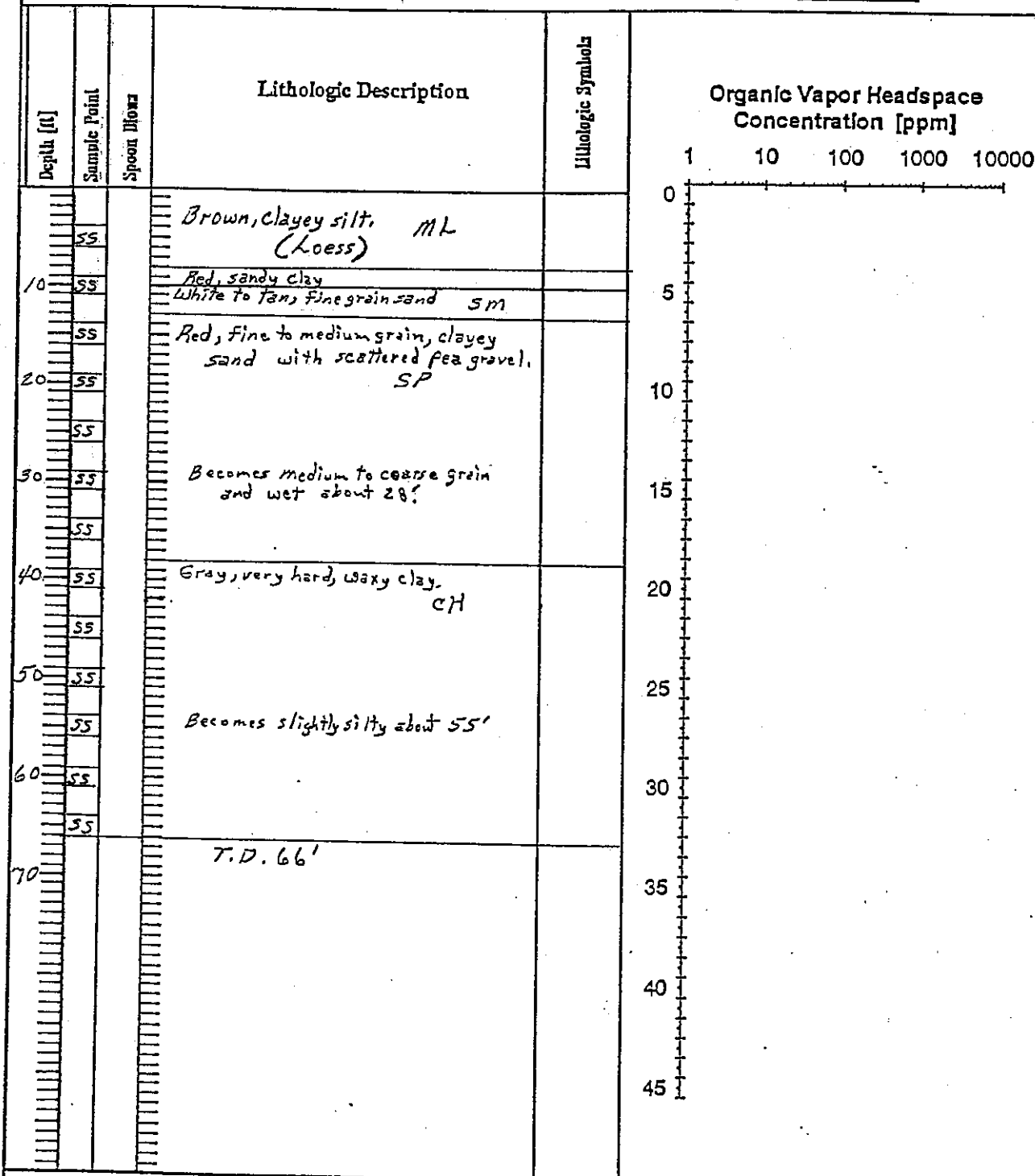
Elevation Date(s):

Depth to 1st Water, ft:

Product Thickness, ft:

After:

Hours



COMMENTS: Transverse Mercator Coordinates: Y=423185.59; X=247418.49

## LOG OF BORING AND TEST RESULTS

**Boring: B-18**

**Project No:** G0524  
**Date:** 07/13/2022  
**Latitude:** 31.66214°  
**Longitude:** -91.14357°

**Water Depth:** See Text  
**Total Depth:** 80.0 ft

| Scale in Feet | PP   | SPT | SPLR | Symbol | Visual Classification                                                        | USC | Sample Number | Depth in Feet | Water Content % | Density |         | Shear Tests |   |       | Atterberg Limits |    |    | Other Tests  |
|---------------|------|-----|------|--------|------------------------------------------------------------------------------|-----|---------------|---------------|-----------------|---------|---------|-------------|---|-------|------------------|----|----|--------------|
|               |      |     |      |        |                                                                              |     |               |               |                 | Dry pcf | Wet pcf | Type        | φ | C psf | LL               | PL | PI |              |
| 0             |      |     |      |        | Moist, medium dense tan fine SILT                                            | ML  | PB-1          | 0             |                 |         |         |             |   |       |                  |    |    |              |
|               |      |     |      |        |                                                                              |     | 2             | 2             |                 |         |         |             |   |       |                  |    |    |              |
| 5             |      | 16  |      |        |                                                                              |     | PB-3          | 3.5           | 10              |         |         |             |   |       | NP               | NP | NP | #200 = 99.7% |
|               |      | 21  |      |        |                                                                              |     | PB-4          | 6.5           | 10              |         |         |             |   |       |                  |    |    |              |
| 10            |      | 13  |      |        | Moist, medium dense reddish-brown fine CLAYEY SAND                           | SC  | PB-5          | 9.5           | 10              |         |         |             |   |       | 19               | 10 | 9  |              |
| 15            |      | 16  |      |        | Moist, medium dense reddish-brown & tan fine SILTY SAND w/trace of clay      | SM  | PB-6          | 13.5          |                 |         |         |             |   |       |                  |    |    |              |
| 20            |      | 17  |      |        |                                                                              |     | PB-7          | 18.5          | 13              |         |         |             |   |       |                  |    |    |              |
| 25            |      | 18  |      |        | Moist, stiff to very stiff gray & tan FAT CLAY w/trace of silt & concretions | CH  | PB-8          | 23.5          | 29              |         |         |             |   |       |                  |    |    |              |
| 30            | 3.75 |     |      |        | w/trace of silty sand pockets                                                |     | 9             | 28            | 26              | 96      | 121     | OB          | 0 | 1866  | 59               | 19 | 40 |              |
| 35            | 4.50 |     |      |        |                                                                              |     | 10            | 33            |                 |         |         |             |   |       |                  |    |    |              |
| 40            | 4.00 |     |      |        | w/trace of silt pockets                                                      |     | 11            | 38            | 28              |         |         |             |   |       |                  |    |    |              |
| 45            |      | 73  |      |        | Moist, hard gray LEAN CLAY w/few fine sand                                   | CL  | PB-12         | 43.5          | 15              |         |         |             |   |       |                  |    |    |              |
| 50            |      | 86  |      |        |                                                                              | CL  | PB-13         | 48.5          | 15              |         |         |             |   |       |                  |    |    |              |

NOTES:





Green Meadow Sustainable Solutions  
Fayette Landfill  
4451 U.S. Highway 61  
Fayette, Mississippi

## LOG OF BORING AND TEST RESULTS

**Boring: B-18**

Project No: G0524  
Date: 07/13/2022  
Latitude: 31.66214°  
Longitude: -91.14357°

Water Depth: See Text  
Total Depth: 80.0 ft

| Scale in Feet | PP | SPT | SPLR | Symbol | Visual Classification                                         | USC   | Sample Number | Depth in Feet | Water Content % | Density |         | Shear Tests |   |       | Atterberg Limits |    |    | Other Tests |
|---------------|----|-----|------|--------|---------------------------------------------------------------|-------|---------------|---------------|-----------------|---------|---------|-------------|---|-------|------------------|----|----|-------------|
|               |    |     |      |        |                                                               |       |               |               |                 | Dry pcf | Wet pcf | Type        | φ | C psf | LL               | PL | PI |             |
| 50            |    |     |      |        | Moist, hard light gray fine SANDY LEAN CLAY                   | CL    |               |               |                 |         |         |             |   |       |                  |    |    |             |
| 55            |    | 70  | X    |        |                                                               |       | PB-14         | 53.5          |                 |         |         |             |   |       |                  |    |    |             |
| 60            |    | 39  | X    |        | Moist, dense light gray & tan fine SILTY SAND                 | SM    | PB-15         | 58.5          | 16              |         |         |             |   |       |                  |    |    |             |
| 65            |    | 38  | X    |        |                                                               |       | PB-16         | 63.5          |                 |         |         |             |   |       |                  |    |    |             |
| 70            |    | 32  | X    |        |                                                               |       | PB-17         | 68.5          |                 |         |         |             |   |       |                  |    |    |             |
| 75            |    | 37  | X    |        |                                                               |       | PB-18         | 73.5          |                 |         |         |             |   |       |                  |    |    |             |
| 80            |    | 46  | X    |        | Moist, dense light gray & tan fine POORLY GRADED SAND W/ SILT | SP-SM | PB-19         | 78.5          | 14              |         |         |             |   |       |                  |    |    |             |
| 85            |    |     |      |        |                                                               |       |               |               |                 |         |         |             |   |       |                  |    |    |             |
| 90            |    |     |      |        |                                                               |       |               |               |                 |         |         |             |   |       |                  |    |    |             |
| 95            |    |     |      |        |                                                               |       |               |               |                 |         |         |             |   |       |                  |    |    |             |
| 100           |    |     |      |        |                                                               |       |               |               |                 |         |         |             |   |       |                  |    |    |             |

NOTES:

## LOG OF BORING AND TEST RESULTS

**Boring: B-19**

Project No: G0524  
Date: 07/12/2022  
Latitude: 31.66133°  
Longitude: -91.13980°

Water Depth: See Text  
Total Depth: 80.0 ft

| Scale in Feet | PP | SPT | SPT | Symbol | Visual Classification                                                       | USC   | Sample Number | Depth in Feet | Water Content % | Density |         | Shear Tests |   |       | Atterberg Limits |    |    | Other Tests |
|---------------|----|-----|-----|--------|-----------------------------------------------------------------------------|-------|---------------|---------------|-----------------|---------|---------|-------------|---|-------|------------------|----|----|-------------|
|               |    |     |     |        |                                                                             |       |               |               |                 | Dry pcf | Wet pcf | Type        | φ | C psf | LL               | PL | PI |             |
| 0             |    |     |     |        | Loose tan SAND                                                              | SP    | PB-1          | 0             |                 |         |         |             |   |       |                  |    |    |             |
| 4.75          |    |     |     |        | Moist, stiff brown LEAN CLAY (brittle)                                      | CL    | 2             | 2             |                 |         |         |             |   |       |                  |    |    |             |
| 5             |    |     |     |        |                                                                             |       | 3             | 5             | 22              | 103     | 125     | UC          | — | 1073  | 41               | 21 | 20 |             |
| 1.75          |    |     |     |        |                                                                             |       | 4             | 8             |                 |         |         |             |   |       |                  |    |    |             |
| 10            |    |     |     |        | Moist, very soft to soft brown LEAN CLAY                                    | CL    | 5             | 11            | 28              |         |         |             |   |       | 32               | 19 | 13 |             |
| 0.25          |    |     |     |        |                                                                             |       | 6             | 14            | 27              |         |         |             |   |       |                  |    |    |             |
| 0.00          |    |     |     |        |                                                                             |       | 7             | 18            | 14              |         |         |             |   |       |                  |    |    |             |
| 20            |    |     |     |        | Moist, loose brown medium to fine POORLY GRADED SAND w/trace of silt & clay | SP    | PB-8          | 20.5          |                 |         |         |             |   |       |                  |    |    |             |
| 30            |    |     |     |        | Moist, medium dense brown fine POORLY GRADED SAND w/trace of silt           | SP    | PB-9          | 23.5          | 14              |         |         |             |   |       |                  |    |    |             |
| 25            |    |     |     |        |                                                                             |       | PB-10         | 26.5          |                 |         |         |             |   |       |                  |    |    |             |
| 26            |    |     |     |        | Moist, dense brown fine POORLY GRADED SAND w/CLAY                           | SP-SC | PB-11         | 29.5          | 14              |         |         |             |   |       |                  |    |    |             |
| 30            |    |     |     |        | Moist, stiff yellow FAT CLAY                                                | CH    | PB-12         | 33.5          | 16              |         |         |             |   |       | 35               | 16 | 19 |             |
| 35            |    |     |     |        |                                                                             |       | 13            | 38            |                 |         |         |             |   |       |                  |    |    |             |
| 40            |    |     |     |        | w/few silt pockets                                                          |       | 14            | 43            | 29              |         |         |             |   |       | 50               | 17 | 33 |             |
| 3.50          |    |     |     |        |                                                                             |       | 15            | 48            |                 |         |         |             |   |       |                  |    |    |             |
| 3.00          |    |     |     |        |                                                                             |       |               |               |                 |         |         |             |   |       |                  |    |    |             |
| 2.50          |    |     |     |        | Moist, medium stiff gray & tan LEAN CLAY w/few fine silty sand pockets      | CL    |               |               |                 |         |         |             |   |       |                  |    |    |             |

NOTES:



Green Meadow Sustainable Solutions  
Fayette Landfill  
4451 U.S. Highway 61  
Fayette, Mississippi

## LOG OF BORING AND TEST RESULTS

Boring: B-19

Project No: G0524  
Date: 07/12/2022  
Latitude: 31.66133°  
Longitude: -91.13980°

Water Depth: See Text  
Total Depth: 80.0 ft

| Scale in Feet | PP   | SPT | SPLR | Symbol | Visual Classification                                                  | USC   | Sample Number | Depth in Feet | Water Content % | Density |         | Shear Tests |        |       | Atterberg Limits |    |    | Other Tests  |
|---------------|------|-----|------|--------|------------------------------------------------------------------------|-------|---------------|---------------|-----------------|---------|---------|-------------|--------|-------|------------------|----|----|--------------|
|               |      |     |      |        |                                                                        |       |               |               |                 | Dry pcf | Wet pcf | Type        | $\phi$ | C psf | LL               | PL | PI |              |
| 50            | 3.00 |     |      |        | Moist, medium stiff gray & tan LEAN CLAY w/few fine silty sand pockets | CL    | 16            | 53            | 27              |         |         |             |        |       | 45               | 15 | 30 | #200 = 89.0% |
| 55            |      |     |      |        | Moist, very dense tan medium to fine POORLY SAND W/SILT                | SP-SM |               | 55.5          | 8               |         |         |             |        |       |                  |    |    |              |
| 60            |      |     |      |        |                                                                        |       |               | 58.5          |                 |         |         |             |        |       |                  |    |    |              |
| 65            |      |     |      |        |                                                                        |       |               | 61.5          |                 |         |         |             |        |       |                  |    |    |              |
| 70            |      |     |      |        |                                                                        |       |               | 64.5          | 9               |         |         |             |        |       |                  |    |    |              |
| 75            |      |     |      |        |                                                                        |       |               | 68.5          |                 |         |         |             |        |       |                  |    |    |              |
| 80            |      |     |      |        |                                                                        |       |               | 73.5          |                 |         |         |             |        |       |                  |    |    |              |
| 85            |      |     |      |        |                                                                        |       |               | 78.5          | 21              |         |         |             |        |       |                  |    |    |              |
| 90            |      |     |      |        |                                                                        |       |               |               |                 |         |         |             |        |       |                  |    |    |              |
| 95            |      |     |      |        |                                                                        |       |               |               |                 |         |         |             |        |       |                  |    |    |              |
| 100           |      |     |      |        |                                                                        |       |               |               |                 |         |         |             |        |       |                  |    |    |              |

NOTES:



Green Meadow Sustainable Solutions  
Fayette Landfill  
4451 U.S. Highway 61  
Fayette, Mississippi

## LOG OF BORING AND TEST RESULTS

**Boring: B-20**

Project No: G0524  
Date: 07/11/2022 - 07/12/2022  
Latitude: 31.66210°  
Longitude: -91.13908°

Water Depth: See Text  
Total Depth: 50.0 ft

| Scale in Feet | PP | SPT | S P L R | Symbol | Visual Classification                                           | USC   | Sample Number | Depth in Feet | Water Content % | Density |         | Shear Tests |   |       | Atterberg Limits |    |    | Other Tests   |
|---------------|----|-----|---------|--------|-----------------------------------------------------------------|-------|---------------|---------------|-----------------|---------|---------|-------------|---|-------|------------------|----|----|---------------|
|               |    |     |         |        |                                                                 |       |               |               |                 | Dry pcf | Wet pcf | Type        | φ | C psf | LL               | PL | PI |               |
| 0             |    |     |         |        | Moist, medium stiff brown LEAN CLAY (brittle)                   | CL    | PB-1          | 0             |                 |         |         |             |   |       |                  |    |    |               |
| 1.75          |    |     |         |        |                                                                 |       | 2             | 2             | 21              |         |         |             |   |       |                  |    |    |               |
| 5             |    |     |         |        | Moist, extremely stiff brown LEAN CLAY (brittle)                | CL    | 3             | 5             | 20              | 108     | 129     | UC          | — | 4467  | 46               | 20 | 26 |               |
| 4.50          |    |     |         |        |                                                                 |       | 4             | 8             |                 |         |         |             |   |       |                  |    |    |               |
| 10            |    |     |         |        | Moist, medium stiff brown LEAN CLAY w/trace of roots            | CL    | 5             | 11            | 23              |         |         |             |   |       |                  |    |    |               |
| 2.25          |    |     |         |        |                                                                 |       | 6             | 14            | 23              |         |         |             |   |       | 37               | 21 | 16 |               |
| 15            |    |     |         |        |                                                                 |       |               |               |                 |         |         |             |   |       |                  |    |    |               |
| 2.25          |    |     |         |        | Moist, medium stiff brown fine SANDY SILTY CLAY                 | CL-ML | 7             | 18            | 13              |         |         |             |   |       | 18               | 12 | 6  | -#200 = 52.8% |
| 20            |    |     |         |        |                                                                 |       |               |               |                 |         |         |             |   |       |                  |    |    |               |
| 25            |    | 26  |         |        | Moist, loose tan fine POORLY GRADED SAND w/SILT                 | SP-SM | PB-8          | 23            | 7               |         |         |             |   |       |                  |    |    |               |
|               |    |     |         |        | Moist, medium dense tan fine POORLY GRADED SAND                 | SP    | PB-9          | 24.5          |                 |         |         |             |   |       |                  |    |    |               |
| 30            |    | 30  |         |        | Moist, medium dense tan fine POORLY GRADED SAND w/trace of silt | SP    | PB-10         | 27.5          | 7               |         |         |             |   |       |                  |    |    |               |
| 33            |    |     |         |        |                                                                 |       | PB-11         | 30.5          |                 |         |         |             |   |       |                  |    |    |               |
| 35            |    | 32  |         |        |                                                                 |       | PB-12         | 33.5          | 10              |         |         |             |   |       |                  |    |    |               |
| 40            |    | 30  |         |        |                                                                 |       | PB-13         | 38.5          | 17              |         |         |             |   |       |                  |    |    |               |
| 45            |    | 47  |         |        | Moist, dense tan fine POORLY GRADED SAND                        | SP    | PB-14         | 43.5          | 9               |         |         |             |   |       |                  |    |    |               |
| 50            |    | 75  |         |        |                                                                 |       | PB-15         | 48.5          |                 |         |         |             |   |       |                  |    |    |               |

NOTES:



**Appendix G**  
**Construction Quality Assurance Plan**  
**Revision 01**

**GREEN MEADOW  
SUSTAINABLE SOLUTIONS  
LANDFILL**

**CONSTRUCTION QUALITY ASSURANCE  
(CQA) PLAN**

**PREPARED FOR:**

**GREENWAY ENVIRONMENTAL SERVICES, LLC**

**4451 HIGHWAY 61  
FAYETTE, MISSISSIPPI 39069**

**PREPARED BY:**



**6360 I-55 NORTH, SUITE 330  
JACKSON, MISSISSIPPI 39211  
ALLEN ENGINEERING AND SCIENCE PROJECT No. 24051**

**REVISION 01: DECEMBER 2025**

**DECEMBER 16, 2024**



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## **1.0 INTRODUCTION**

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### **1.1 PURPOSE**

The purpose of this Construction Quality Assurance (CQA) plan is to identify the minimum observation, inspection, and testing requirements for construction of Green Meadow Sustainable Solutions Landfill (Green Meadow Landfill), a municipal waste landfill for Greenway Environmental Services, LLC (Greenway), located in Jefferson County, Mississippi.

### **1.2 SCOPE**

This plan presents the minimum construction observation, test methods and frequencies, and documentation necessary to ensure contractor adherence to the construction drawings, material specifications, and this CQA plan. Protocol for reporting test results, certifying compliance with construction specifications, correcting construction deficiencies, and documenting such corrections is also provided for by this plan.

### **1.3 DEFINITIONS AND RESPONSIBILITIES**

Company The Party for whom the work is to be performed. The Company is responsible for the successful completion of the construction work. Greenway Environmental Services, LLC is the company and will be responsible for successful completion.

Construction Quality Control (CQC) The formal procedures and test methods utilized to ensure conformance of construction to drawings, specifications, or other criteria established for the project. CQC programs are not a part of this plan, although they will be reviewed to ensure general conformance with the objectives stated herein.

Construction Quality Assurance (CQA) The formal organization and procedures utilized by the Company for verifying that work performed meets project requirements. The CQA effort will generally include a comprehensive and continuous review and independent verification of contractor CQC programs, test results, and construction materials.

Construction Quality Assurance (CQA) Consultant Third party, independent engineering consulting firm, individual, or representative, technically accountable to the Company and responsible for monitoring landfill construction. The CQA consultant will review and approve the contractors' construction procedures and results of the contractors' CQC program.

The CQA Consultant will review the procedures and results of the borrow area soils, geosynthetic, and leachate collection system materials evaluation testing and will notify the Company that the material is approved for shipment. The CQA Consultant will be responsible for the overall administration of quality control testing and quality assurance procedures and for the control of quality assurance documents. The CQA Consultant will be responsible for the oversight and coordination of quality control and quality assurance representatives and testing laboratories.

Certifying Engineer An independent, registered professional engineer who is responsible for the certification of the project by fulfilling the needs of the Company in terms of function and requirements of regulatory agencies. The Certifying Engineer is responsible for certification of the construction work as being in conformance with the project requirements, if applicable, and this CQA plan and for the preparation of the construction quality assurance report.



Atterberg Limits The liquid limit, plastic limit and shrinkage limit for soils (ASTM D4318-84 and D427-83, respectively). The water content when the soil behavior changes from the liquid to the plastic state is the liquid limit; from the plastic to the semi-solid state is the plastic limit; and from the semi-solid to the solid state is the shrinkage limit.

Compaction The process of increasing the density or unit weight of soil by rolling, tamping, vibrating, or other mechanic means.

Density Mass density of soil is its weight per unit volume, usually reported in pounds per cubic foot.

Grain Size Distribution The distribution of particle sizes within a soil (ASTM D422-63).

Geosynthetic Clay Liner are factory manufactured hydraulic barriers consisting of a layer of bentonite or other very low-permeability material supported by geotextiles and/or geomembranes (Gundseal), mechanically held together by needling, stitching, or chemical adhesives.

In situ "as is" or as it exists in place naturally.

Moisture Content Ratio of weight of water in the soil to the weight of the soil solids (dry soil), expressed in percentage; also referred to as water content.

Optimum Moisture Content (OMC) Moisture content corresponding to maximum dry density as determined in Standard Proctor Test, ASTM D698 or Modified Proctor Test, ASTM D1557.

Permeability Ability of pore fluid to travel through a soil mass via interconnected voids. "High" permeability indicated relatively rapid flow, and vice versa. Coefficients of permeability are generally reported in centimeters per second (cm. per second).

Plasticity The property of soil which allows it to be deformed without cracking or appreciably changing volume. Generally that range of soil water content between the liquid and plastic limit.

Project Manager The official representative of the Company for this project. The Project Manager is a duly authorized employee or representative of the Company and is the individual in charge of coordinating field activities and administering the project.

Contractor The individual or firm contractually responsible to the company for the construction work.

Geomembrane An impermeable liner or barrier material typically used in civil engineering projects to prevent water flow.

Geocomposite Drainage Net A geocomposite material comprised of geotextile and geonet typically used in civil engineering projects as a drainage material.

Geotextile A relatively porous construction or reinforcing fabric typically used in civil engineering projects to allow water flow while preventing soil transport.

Hand Weld A bond between two high density polyethylene (HDPE) materials which is achieved



by extruding a bead of HDPE over the overlap area followed by pressure, utilizing a hand-held apparatus.

Machine Weld A bond between two HDPE materials which is achieved by extruding a bead of HDPE between the overlap areas followed by pressure, or by fusing both HDPE surfaces in a homogeneous bond of the two surfaces. Either system must use a power-driven apparatus for heating, extrusion, and pressure.



## **2.0 CONSTRUCTION QUALITY ASSURANCE PROJECT ORGANIZATION**

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### **2.1 PARTICIPANTS IN THE PLAN**

Participants in the project should review this document with particular attention to the sections applicable to their responsibilities. Communication protocol among members of the CQA organization is discussed in Section 2.2.

### **2.2 PROJECT ORGANIZATION AND COMMUNICATION**

Clear lines of authority and communication are required for the success of any CQA program. The CQA organization assembled for this project will consist of individuals with professional licenses and experience on similar projects.

Formal communication pathways will be developed between members of the project team. Members of the project team are also encouraged to communicate informally to gain a mutual understanding regarding each individual's responsibilities and the project in general. However, if a potential problem is perceived by a team member, that team member should contact the responsible individual to clarify the particular issue. If the problem cannot be resolved, the team member should notify the project manager.

### **2.3 PROJECT MEETINGS**

The establishment of clear channels of communication and adherence to planned procedures is essential to the success of a CQA program. Preconstruction, progress, and problems/deficiency meetings will be held as necessary to provide assurance and documentation that effective communication is taking place.

#### **2.3.1 PRECONSTRUCTION MEETING**

A preconstruction meeting will be held at the site. The meeting will be attended by the Project Manager, CQA Consultant, Certifying Engineer, and the Contractor. The CQA Consultant shall notify MDEQ of this meeting prior to being held. Topics which may be discussed in this meeting include:

- Overview of the project.
- The responsibilities of each party.
- Lines of authority and communication.
- Project meetings.
- Methods for documenting and reporting and for distributing documentation.
- Site safety requirements.
- Construction schedule.
- Site walk, review material storage, and stockpiling locations.
- Placement procedures for earthen materials.
- Procedures for control and use of water.
- Protective methods for the soils and geosynthetics from wind, drying, dust control, and site housekeeping.
- Sampling procedures.
- Test procedures.
- Repair procedures.



### **2.3.2 PROGRESS MEETINGS**

Construction progress meetings will be held at the site. At these meetings, current progress, planned activities, problems/deficiencies and any new business or revisions to the project requirements or CQA plan will be discussed. The CQA Consultant will document problems, decisions and questions arising at these meetings. Any matter(s) requiring action will be reported to the appropriate parties. The general discussions in these meetings will be reported in the CQA Consultant's daily reports. Specific problems will be addressed in the problem/deficiency report forms.

### **2.3.3 PROBLEM/DEFICIENCY MEETINGS**

Problem/deficiency meetings will be held when a problem or deficiency is present or likely to occur. At a minimum, these meetings will be attended by the CQA Consultant and Contractor. If a problem requires a design modification, the Certifying Engineer and Project Manager will be consulted. The CQA Consultant shall provide MDEQ with notice of the meeting in advance and shall notify MDEQ of any major problems or deficiencies as appropriate.



### **3.0 CONSTRUCTION QUALITY ASSURANCE DOCUMENTATION**

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#### **3.1 DOCUMENT CONTROL**

The CQA Consultant will initiate a project filing system which should include the following types of information:

- File copy of the CQA procedures, updated as necessary.
- Photographic construction documentation.
- Survey measurements.
- Field and laboratory test results.
- Field progress reports.
- Field certification reports including as-built drawings.
- Nonconformance and corrective action reports.

#### **3.2 FIELD REPORTS**

The CQA Consultant will prepare field reports which typically include the following types of information:

- Date, project name, location, and other identification.
- Data on weather conditions.
- Reports of any meetings held and any pertinent results.
- Descriptions and locations of construction underway during the time frame of the daily report.
- Equipment working on site.
- Descriptions of areas of work being tested.
- Description of offsite materials received, including any quality verification documentation.
- Decisions made regarding approval of units of material or of work, and /or corrective actions to be taken in instances of substandard quality.
- Signature of the CQA Consultant or representative.

#### **3.3 TEST RESULTS**

Test results will be reported on standard sheets and will include the following types of information:

- Description or title of testing activity.
- Location of the field testing activity or the location from which the sample was obtained.
- Type of testing activity and procedure used (reference standard method when appropriate).
- Recorded observation or test data, with necessary calculations.
- Results of testing activity and comparison with project requirements.
- Signature of test performer and CQA Consultant.

#### **3.4 FINAL REPORTING AND DOCUMENTATION**

After the completion of each testing area i.e. Structural Fill, Constructed Buffer, Clay Liner, Geosynthetic Liner etc., the Construction Quality Assurance Consultant will submit a final report to the Certifying Engineer summarizing all observations, testing, and an overall assessment of



each area of testing.

At the completion of the project, a Construction Quality Assurance report will be prepared by the Certifying Engineer and transmitted to the Company. This document will include the following type of information:

- Scope of work.
- Daily field reports.
- Laboratory and field test results.
- Test methods.
- Evaluation of test results with respect to project requirements.
- Any non-conformance reports and corrective action reports.
- Personnel involved with the project and their respective qualifications.
- Construction record drawings.
- Certification of construction as meeting or exceeding project requirements. This certification will be signed and sealed by an independent, registered professional engineer.



## **4.0 PRECONSTRUCTION MATERIALS TESTING**

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Preconstruction testing of constructed buffer soils, structural fill, test pad, clay liner soils, infiltration layer soils, and drainage layer soils; CQA procedures for the construction and evaluation of test pad soils; and CQA testing of drainage layer materials which will be performed during all phases of landfill construction is described in this section.

### **4.1 CONSTRUCTION SOILS**

#### **4.1.1 SOIL BORROW AREA**

Geotechnical boring data from previous site investigation work indicates adequate low permeability soils for clay liner construction is present. Therefore, it is anticipated Greenway will secure clay soils for clay liner and infiltration layer construction from onsite borrow areas. Greenway will secure structural fill from onsite areas for establishment of the subgrade over the bottom of the landfill, perimeter levee, and areas where surface elevations are below subgrade elevations. Borrow soils will be evaluated to determine their suitability for use in construction of the landfill.

Prior to excavating soils, the borrow area will be stripped of vegetation. The soils will be visually inspected for limbs, roots, and other materials that would be considered deleterious to a properly constructed buffer, clay liner, structural fill layer, or infiltration layer. Quality control soil tests will be performed at the frequencies specified in Tables 2, 3, 4, 5, and 6.

Proctor testing will be performed to establish a compaction curve relating to moisture content, density, Atterberg Limits and grain size. Once the above-described relationships have been established, then future confirmatory laboratory (Proctor) testing can be reduced to confirmatory classification testing. At least one Proctor test will be performed on approximately every 5,000 cubic yards of liner construction.

Laboratory permeability testing will be performed on the borrow area soil samples to determine a minimum relative compaction and range of moisture contents which will result in the soils exhibiting a permeability equal to or less than  $1.0 \times 10^{-7}$  cm. per second for constructed buffer and clay liner soils and  $1.0 \times 10^{-5}$  cm. per second or less for infiltration layer soils. The results of this permeability testing will be used to determine the project requirements for construction of the test pad and liner or cap components (clay liner, constructed buffer, and infiltration layer.)

#### **4.1.2 SOIL TEST PAD CONSTRUCTION AND TESTING**

A 100' wide x 100' long soil test pad will be constructed under the direction of the Certifying Engineer and CQA Consultant in accordance with the project requirements developed from preconstruction laboratory testing of borrow area soils. In addition to CQA observations, permeability, moisture content, and density tests will be performed on the test pad soils. Test results will be used to judge whether the test pad construction techniques and CQA procedures will result in permeability values meeting the project requirements for construction of the test pad and clay liner. If the test pad soils testing results are acceptable, the soils will be incorporated into the clay liner.

The CQA Consultant will observe and document construction of the test pad so that successful construction procedures can be repeated during construction of the clay liner. Construction





evaluations will be performed in accordance with the project requirements and this CQA plan. The CQA Consultant will perform the following activities:

- Confirm that subgrade elevations are within acceptable tolerances.
- Confirm that stable subgrade conditions are present.
- Record the number and type of construction equipment.
- Confirm that roots, rubbish, or other similar materials have been removed.
- Evaluate the soil compaction and moisture conditioning procedures.
- Confirm soil moisture content and uniformity of moisture.
- Evaluate lift thickness.
- Determine the number of passes over the lift by each type of construction equipment, especially compaction equipment.
- Direct and perform CQC and CQA testing of the soil and record results.
- Approve lift construction and authorize additional lift placement.
- Verify lift layer bonding.
- Determine and record atmospheric conditions.
- Inform the Project Manager in the event that materials, placement, and/or testing do not meet project requirements.

Additional testing may be performed at the discretion of the CQA Consultant and/or the Project Manager when visual observations indicate a possible deviation from the project requirements. This testing will be considered when:

- Borrow area soils are non-uniform in appearance or inconsistent moisture.
- Compactor wheels/feet slip during compaction operation.
- Lift thickness is greater than specified.
- Soils are at improper and/or highly variable moisture content.
- Less than the specified number of passes are made.
- Wheels/feet of compactor are dirt-clogged.
- During construction, the frequency of testing may be increased in the following situations:
  - Adverse weather conditions.
  - Breakdown of equipment.
  - At the start and finish of earthwork construction.
  - After removal of materials failing to meet project requirements.
  - The work area is increased in size.

## **4.2 GEOSYNTHETIC MATERIALS**

Preconstruction testing will be performed on geosynthetic materials by the material supplier, who will transmit the test results to the CQA consultant, or his representative, in accordance with this plan. The types of geosynthetic materials that will be used on this project are 60-mil HDPE geomembrane for the bottom geomembrane liner and 40-mil LDPE geomembrane liner, geosynthetic clay liner, geocomposite drainage net for the cap, leachate collection system piping, and 8 ounces per square yard of nonwoven geotextile fabric. Geosynthetic materials testing is further described in section 9.4.



#### 4.2.1 HIGH DENSITY POLYETHYLENE & LOW-DENSITY POLYETHYLENE

Pre-shipping tests will be performed on the HDPE and LLDPE geomembrane sheet material. A copy of the manufacturers' quality control program will typically be furnished to the CQA Consultant prior to the production of the sheet.

The manufacturer's test results will be submitted to the CQA Consultant prior to shipment of the HDPE and LLDPE rolls. Additional testing may be conducted by the CQA Consultant, or his representative, prior to approving shipment of the HDPE and LLDPE material. The geomembrane material shall be tested in accordance with the following requirements.

| GEOMEMBRANE TESTING  |                                                                                                                                                                     |                                                                                   |              |
|----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|--------------|
| Material             | Type of Test                                                                                                                                                        | Standard                                                                          | Frequency    |
| Smooth Geomembrane   | Thickness, (minimum average) mil (mm)                                                                                                                               | ASTM D 5199                                                                       | Every Roll   |
|                      | Density, g/cm <sup>3</sup>                                                                                                                                          | ASTM D 1505                                                                       | 200,000 lbs. |
|                      | Tensile Properties (each direction)<br>Strength at Break, lb/in-width (N/mm) Strength at Yield, lb/in-width (N/mm) Elongation at Break, %<br>Elongation at Yield, % | ASTM D 6693, Type IV Dumbbell, 2 ipm<br>G.L. 2.0 in (51mm)<br>*G.L. 1.3 in (33mm) | 20,000 lbs.  |
|                      | Tear Resistance, lb (N)                                                                                                                                             | ASTM D 1004                                                                       | 45,000 lbs.  |
|                      | Puncture Resistance, lb (N)                                                                                                                                         | ASTM D 4833                                                                       | 45,000 lbs.  |
|                      |                                                                                                                                                                     |                                                                                   |              |
| Textured Geomembrane | Thickness, (minimum average) mil (mm)                                                                                                                               | ASTM D 5994                                                                       | Every Roll   |
|                      | Density, g/cm <sup>3</sup>                                                                                                                                          | ASTM D 1505                                                                       | 200,000 lbs. |
|                      | Tensile Properties (each direction)<br>Strength at Break, lb/in-width (N/mm) Strength at Yield, lb/in-width (N/mm) Elongation at Break, %<br>Elongation at Yield, % | ASTM D 6693, Type IV Dumbbell, 2 ipm<br>G.L. 2.0 in (51mm)<br>*G.L. 1.3 in (33mm) | 20,000 lbs.  |
|                      | Tear Resistance, lb (N)                                                                                                                                             | ASTM D 1004                                                                       | 45,000 lbs.  |
|                      | Puncture Resistance, lb (N)                                                                                                                                         | ASTM D 4833                                                                       | 45,000 lbs.  |
|                      |                                                                                                                                                                     |                                                                                   |              |

#### 4.2.2 GEOTEXTILES

Geotextiles will meet the requirements on the drawings for type, unit weight, and location. Geotextiles will be a minimum of eight ounces per square yard and will be nominally 100 mils thick. During installation of the geotextile, a sample 5 feet by 4 feet will be archived for every 100,000 square feet of material installed.

#### 4.2.3 GEOCOMPOSITE DRAINAGE NET

Geocomposite drainage nets will meet the requirements on the drawings for type, flow capacity, unit weight, strength, and location. During installation of the geocomposite drainage net, a sample (5 ft. by 4 ft.) will be archived for every 100,000 square feet of material installed.



#### **4.2.4 GEOSYNTHETIC CLAY LINER**

Geosynthetic clay liner (GCL) will meet the requirements on the drawings for type, permeability, unit weight, strength, and location. During installation of the GCL, a sample (5 ft. by 4 ft.) will be archived for every 100,000 square feet of material installed.

#### **4.3 LEACHATE COLLECTION SYSTEM COARSE SAND**

The leachate collection system consists of a layer of coarse sand with an interbedded with a geotextile and gravel wrapped pipe. Coarse grained sand leachate collection system materials will be evaluated by reviewing analytical testing results of physical properties. Locally available clean sand of sub-rounded, rounded or well-rounded particle shape may be suitable for use in the leachate collection system. The project requirements of the coarse sand are shown in Table 7.

#### **4.4 LEACHATE COLLECTION SYSTEM GRAVEL**

The gravel leachate collection system materials will be evaluated by reviewing analytical testing results of physical properties. Locally available clean gravel of sub-rounded, rounded or well-rounded particle shape may be used. The project requirements of the medium gravel materials are shown in Table 7.



## **5.0 QUALITY CONTROL/QUALITY ASSURANCE TESTING**

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The CQA procedures and testing to be implemented during construction of the landfill is described in this section. The components of the liner and the leachate collection system will be constructed in accordance with the construction drawings and project requirements included in this plan. Compliance with the drawings and project requirements will be confirmed by checking that the soil and drainage material exhibit the required physical characteristics and that the proper placement techniques are used by the Contractor. The CQA Consultant will provide observations of the construction work, report any problem or deviation from the drawings and/or project requirements on CQA report forms, and will notify the Project Manager of any problems or deviations.

### **5.1 CONSTRUCTION EVALUATION**

The CQA Consultant will perform the following activities:

- Confirm that roots, rubbish, or other similar materials have been removed from the clay liner soils.
- Evaluate general earth fill construction testing results.
- Evaluate clay liner soils testing results.
- Evaluate material stockpiling activities.
- Evaluate construction slopes and bottom subgrade for proper grade and soil condition.
- Evaluate leachate collection system materials installation procedures.
- Evaluate lift thickness and clay liner soil compaction procedures.
- Evaluate and confirm that the equipment used to place soil layers does not damage geosynthetic material(s) and that repair(s), if necessary, are made.
- Determine and record atmospheric conditions.
- Inform the Certifying Engineer and Project Manager in the event that materials, placement and/or testing results do not meet project requirements.

#### **5.1.1 SUBGRADE**

Subgrade will be established in general by excavating down to the top of the minimum required five (5) foot natural buffer and placement of structural fill along the perimeter levee or berm of the landfill. Undisturbed samples of natural buffer shall be collected at a frequency of 1 sample per 2 acres and tested for an in-situ permeability requirement equal to or less than  $1 \times 10^{-6}$  cm/sec for confirmation. Areas that do not meet this requirement or areas that have no natural buffer shall have a 36" constructed buffer installed in-lieu of the unsuitable natural buffer or to reach subgrade elevations.

Quality control and quality assurance testing will be performed on structural fill in accordance with the requirements in Tables 2 and 8. Structural fill installed to facilitate subgrade establishment shall generally be compacted to a minimum relative density of 90 percent and an average density of 95 percent of the maximum dry density as determined by ASTM D698. The final constructed subgrade surface shall provide a stable and unyielding surface suitable for placement of constructed buffer and will provide a stable foundation for construction of the landfill.

Subgrade damage due to moisture (causing softening) or insufficient moisture (causing desiccation), will be identified and repaired prior to placement of constructed buffer soils.



Subgrade repair procedures may consist of scarifying, moisture conditioning and recompaction or diking (for soft subgrade), and recompaction. Soils which cannot be repaired will be excavated and replaced with suitable soils.

If seasonal perched groundwater is encountered during subgrade construction, the area shall be dewatered by allowing the excavated surface to gravity drain to a pumping point until the subgrade is dry and suitable for clay liner placement. Any overexcavation performed during dewatering shall be replaced with constructed buffer. If the perched water is persistent and does not fully drain, a clay ballast will be installed on the sideslope to establish a barrier between the clay liner and perched groundwater. When clay ballast is necessary, the compacted lifts of material shall be placed in 12-inch increments or less. The clay ballast shall tie into the existing buffer soils at least 2-feet on a 2H:1V slope to effectively seal off the perched water from entering the landfill. The ballast shall be inspected frequently until clay liner is installed. Construction should proceed as soon as possible in clay ballast areas to prevent degradation.

Final subgrade elevations will be verified by the CQA consultant from benchmarks placed by a qualified surveyor. The CQA Consultant will confirm that subgrade elevations are within acceptable limits.

#### **5.1.2 COMPACTED LIFTS**

The CQA Consultant will observe compaction procedures to confirm that general embankment, constructed buffer, clay liner, and infiltration layer soils are constructed in accordance with the Engineering Drawings, this CQA Plan, and procedures developed during test pad construction. The CQA Consultant will observe and make recommendations to the Project Manager and Contractor on the following:

- Removal of deleterious material from the soil.
- Identification of changes in soil characteristics which may necessitate altering the processing and compaction requirements.
- Placing of materials to obtain complete coverage and the specified loose lift thickness.
- Incorporation of water to obtain uniform distribution of moisture at the required moisture content.
- Procedures to be followed to adjust the soil moisture content in the event of a significant rainfall during construction.
- Prevention of moisture loss before and after compaction.
- Use of equipment types.
- Use of the equipment speed and number of passes for compaction.
- Uniformity of coverage by compaction equipment, especially at fill edges, equipment turnaround areas, and at the top and bottom of slopes.
- Achievement of the required soil density, moisture content, and compactive effort throughout each lift.
- Repair of liner penetrations or holes.
- Methods to achieve layer bonding of soil lifts.
- Preventative measures to prevent desiccation, during the installation of lifts and upon completion of soil liner.
- Prevention of soil damage by equipment traffic.
- Weather which may affect the construction quality.



The following are general procedures which will be used by the CQA Consultant to judge the acceptability of the construction of a compacted lift:

- Evaluate the following for a given lift or area:
- Relative compaction (density)
- Moisture content
- Lift thickness
- Clod size
- Compare measured results to project requirements and determine the variation.

If dry density is too low:

- Check and adjust moisture content, recompact lift, and retest.
- Compare new test values with project requirements.
- Accept/re-evaluate work.

If moisture content is too low:

- Adjust moisture content upward, recompact, and retest.
- Compare new test values with project requirements.

If lift is too thick:

- Decrease thickness.
- Compact and test lift.
- Evaluate test results and visually inspect the lift for proper bonding.

The CQA Consultant will confirm that layer bonding is adequate. Adequate layer bonding will be determined by visual observations and destructive examinations.

## **5.2 CONSTRUCTED BUFFER**

Quality control and quality assurance testing will be performed on constructed buffer soils in accordance with the requirements in Tables 3 and 9. Buffer soils will be compacted to the minimum dry density and moisture content resulting from preconstruction laboratory evaluation testing. The relative compaction value which is expected to yield acceptable permeability test results is from 90 to 95% of the maximum dry density determined from the Standard Proctor Test, ASTM D698, with a moisture content range between 3% to 9% wet of the optimum moisture content. Generally, if the soil density is less than 90% of the maximum dry density, the area will be recompacted and/or removed and reworked, depending on the moisture content, in accordance with the procedures outlined in section 5.2.3. If the moisture content is on the high side above optimum and at least two previous tests in the same area are passing tests, the soil may be accepted. In cases where soil densities lower than 90% of the maximum dry density provide acceptable permeability test results as shown during test pad construction, the Certifying Engineer, at his discretion, may lower the required minimum density, if the lift proves unyielding to proof-rolling.

Loose lift thickness and initial (before compaction) water content will be tested to confirm that the borrow area soil exhibits the necessary natural moisture. The CQA Consultant will confirm that



before placing the next lift, the surface of the previous lift will be scarified to a depth of one to two inches and has not been allowed to excessively dry. If the previously compacted lift has been allowed to dry, it will be rewetted after being scarified. Each lift will be tested to determine compacted density and water content before subsequent lifts are placed. The CQA Consultant will determine the locations of the compacted density and water content tests generally using a 100 ft grid pattern. The CQA Consultant may require testing, in addition to the grid pattern, of areas believed to not be meeting project requirements.

A thin-walled tube sample of in-place buffer will be obtained at the frequency specified in Table 3 for laboratory permeability testing. The results of the permeability testing will determine the acceptability of the constructed buffer material.

The placement of constructed buffer soil during marginal weather will be at the discretion of the CQA Consultant. Clay soil will not be placed or compacted during sustained periods of temperatures below 30°F. Clay soils may be placed and compacted during periods of early morning freezing temperatures with warming trends during the day. Sampling and testing locations and the lift in which testing occurs will be documented.

- Constructed buffer soils perforations that must be backfilled include the following:
- Nuclear density test probe locations.
- Permeability sampling locations.
- Lift bonding test areas.

Unless otherwise noted in the project requirements, or as directed by the CQA Consultant, perforations of the constructed buffer by nuclear probe or other sampling equipment will be backfilled with soil equivalent to that used to construct the layer, or with bentonite material. The soil shall be broken into a size smaller than the perforation and compacted with a tamping rod, Modified or Standard Proctor hammer, or hand tamper, depending on the size of the perforation, or scarified and recompacted with sheep foot-type compaction equipment. The CQA Consultant will confirm that perforations are repaired.

Additional testing will be performed at the discretion of the CQA Consultant and/or the Project Manager when visual observations indicate a possible deviation from the project requirements. This testing will be considered when:

- Compactor wheels/feet slip during compaction operation.
- Lift thickness is greater than specified.
- Soils are at improper and/or highly variable moisture content.
- Less than specified number of passes are made.
- Wheels/feet of compactor are dirt-clogged.

During construction, the frequency of testing may be increased in the following situations:

- Adverse weather conditions.
- Breakdown of equipment.
- At the start and finish of grading.
- Materials fail to meet specifications.
- The work area is increased in size.





### **5.3 GRANULAR MATERIALS TESTING**

Leachate collection system materials will be tested in accordance with the requirements in Table 7. Sample size will not be less than 50 pounds for sand or gravel. Samples will be tested for full grain size distribution. The percent by dry weight of any size particle present (other than material passing the #200 sieve) in the sample will be representative of a coarse aggregate.

### **5.4 CLAY LINER TESTING AND PROJECT REQUIREMENTS**

Quality control and quality assurance testing will be performed on test pad and clay liner soils in accordance with the requirements in Tables 4, 5, 10, and 11. Clay liner soils will be compacted to the minimum dry density and moisture content resulting from preconstruction laboratory evaluation testing. The relative compaction value which is expected to yield a permeability of  $1.0 \times 10^{-7}$  cm. per second or less is from 90 to 95% of the maximum dry density determined from the Standard Proctor Test, ASTM D698, with a moisture content range between 3% to 9% wet of the optimum moisture content. Generally, if the soil density is less than 90% of the maximum dry density, the area will be recompacted and/or removed and reworked, depending on the moisture content, in accordance with the procedures outlined in section 5.2.3. If the moisture content is on the high side above optimum and at least two previous tests in the same area are passing tests, the soil may be accepted. In cases where soil densities lower than 90% of the maximum dry density provide acceptable permeability test results as shown during test pad construction, the Certifying Engineer, at his discretion, may lower the required minimum density, proving an unyielding proof-roll.

Construction of the clay liner in the areas of the sumps shall be performed by excavating these areas to the lines and grades of the sump subgrade. Once subgrade is achieved, the clay liner shall be installed to four lifts to reach final clay liner sump elevations. To prevent softening due to excessive moisture, additional lifts of clay liner may be temporarily added directly above the sump. These additional lifts shall be removed and clay liner grades certified prior to geomembrane placement.

Loose lift thickness and initial (before compaction) water content will be tested to confirm that the borrow area soil exhibit the necessary natural moisture. The CQA Consultant will confirm that before placing the next lift, the surface of the previous lift will be scarified to a depth of one to two inches and has not been allowed to excessively dry. If the previously compacted lift has been allowed to dry, it will be rewetted after being scarified. Each lift will be tested to determine compacted density and water content before subsequent lifts are placed. The CQA Consultant will determine the locations of the compacted density and water content tests generally using a 100 ft grid pattern. The CQA Consultant may require testing, in addition to the grid pattern, of areas believed to not be meeting project requirements.

The CQA Consultant will confirm that the clay liner was constructed in four lifts having an average after compaction thickness of six inches.

A thin-walled tube sample of in-place clay liner will be obtained at the frequency specified in Tables 4 and 5 for laboratory permeability testing. The results of the permeability testing will determine the acceptability of the clay liner.

The placement of clay liner soil during marginal weather will be at the discretion of the CQA Consultant. Clay liner soil will not be placed or compacted during sustained periods of





temperatures below 30°F. Clay liner soils may be placed and compacted during periods of early morning freezing temperatures with warming trends during the day. Sampling and testing locations and the lift in which testing occurs will be documented.

Clay liner perforations that must be backfilled include the following:

- Nuclear density test probe locations.
- Permeability sampling locations.
- Lift bonding test areas.

Unless otherwise noted in the project requirements, or as directed by the CQA Consultant, perforations of the liner by nuclear probe or other sampling equipment will be backfilled with soil equivalent to that used to construct the liner or with bentonite material. The soil shall be broken into a size smaller than the perforation and compacted with a tamping rod, Modified or Standard Proctor hammer, or hand tamper, depending on the size of the perforation, or scarified and recompacted with sheep foot-type compaction equipment. The CQA Consultant will confirm that perforations are repaired.

Additional testing will be performed at the discretion of the CQA Consultant and/or the Project Manager when visual observations indicate a possible deviation from the project requirements. This testing will be considered when:

- Compactor wheels/feet slip during compaction operation.
- Lift thickness is greater than specified.
- Soils are at improper and/or highly variable moisture content.
- Less than specified number of passes are made.
- Wheels/feet of compactor are dirt-clogged.

During construction, the frequency of testing may be increased in the following situations:

- Adverse weather conditions.
- Breakdown of equipment.
- At the start and finish of grading.
- Materials fail to meet specifications.
- The work area is increased in size.

## **5.5 INFILTRATION LAYER TESTING AND PROJECT REQUIREMENTS**

Quality control and quality assurance testing will be performed on infiltration layer soils in accordance with the requirements in Tables 6 and 12. Infiltration layer soils will be compacted to the minimum dry density and moisture content resulting from preconstruction laboratory evaluation testing. The relative compaction value which is expected to yield acceptable permeability results of  $1.0 \times 10^{-5}$  cm per second, is from 90 to 95 percent of the maximum dry density determined from the Standard Proctor Test, ASTM D698, with a moisture content wet of the optimum moisture content. Generally, if the soil density is less than 90 percent of the maximum dry density, the area will be recompacted and/or removed and reworked.

Loose lift thickness and initial (before compaction) water content will be tested to confirm that the borrow area soil exhibits the necessary natural moisture. The CQA Consultant will confirm that before placing the next lift, the surface of the previous lift will be scarified to a depth of one to two



inches and has not been allowed to excessively dry. If the previously compacted lift has been allowed to dry, it will be rewetted after being scarified. Each lift will be tested to determine compacted density and water content before subsequent lifts are placed. The CQA Consultant will determine the locations of the compacted density and water content tests generally using a 100 ft grid pattern. The CQA Consultant may require testing, in addition to the grid pattern, of areas believed to not be meeting project requirements.

A thin-walled tube sample of in-place infiltration layer will be obtained at the frequency specified in Table 6 for laboratory permeability testing. The results of the permeability testing will determine the acceptability of the infiltration layer soils.

The placement of infiltration layer soil during marginal weather will be at the discretion of the CQA Consultant. Infiltration layer soil will not be placed or compacted during sustained periods of temperatures below 30°F. Infiltration layer soils may be placed and compacted during periods of early morning freezing temperatures with warming trends during the day. Sampling and testing locations and the lift in which testing occurs will be documented.

Infiltration layer perforations that must be backfilled include the following:

- Nuclear density test probe locations.
- Permeability sampling locations.
- Lift bonding test areas.

Unless otherwise noted in the project requirements, or as directed by the CQA Consultant, perforations of the layer by nuclear probe or other sampling equipment will be backfilled with soil equivalent to that used to construct the liner or with bentonite material. The soil shall be broken into a size smaller than the perforation and compacted with a tamping rod, Modified or Standard Proctor hammer, or hand tamper, depending on the size of the perforation, or scarified and recompacted with sheep foot-type compaction equipment. The CQA Consultant will confirm that perforations are repaired.

Additional testing will be performed at the discretion of the CQA Consultant and/or the Project Manager when visual observations indicate a possible deviation from the project requirements. This testing will be considered when:

- Compactor wheels/feet slip during compaction operation.
- Lift thickness is greater than specified.
- Soils are at improper and/or highly variable moisture content.
- Less than specified number of passes are made.
- Wheels/feet of compactor are dirt-clogged.

During construction, the frequency of testing may be increased in the following situations:

- Adverse weather conditions.
- Breakdown of equipment.
- At the start and finish of grading.
- Materials fail to meet specifications.
- The work area is increased in size.



## **6.0 TEST EQUIPMENT CALIBRATION**

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Field test equipment will be kept under control of CQA personnel. CQA personnel will be fully trained in the use of equipment, test procedures, and interpretation of results for each type of test equipment. The type of test equipment to be used to measure the relative compaction and moisture content of clay soils is a nuclear gauge. Calibration of the nuclear density gauge will conform to the frequencies and methods outlined in ASTM D2922-78 and D3017-78. Unstable or erratic gauges will not be used for density testing and will be removed from the site. The nuclear gauge equipment will be calibrated for the borrow area soils as described below.

The laboratory determination of moisture content test, ASTM D2216, will be used to calibrate the nuclear gauge moisture content (ASTM D3017) test. Periodic density checks using the tube-sample method (ASTM D2937) for samples collected for permeability analysis will be used to check the nuclear gauge density (ASTM D2922) test. The sand cone method (ASTM D1556) will be used to check the nuclear gauge density results of test pad lifts and as a referee test during construction of the constructed buffer or clay liner if ASTM D2937 density results differ significantly from ASTM D2922 results. The laboratory determination of moisture content method (ASTM D2216) from the sample collected for permeability analysis also will be used to verify the ASTM D3017 test.



## **7.0 NONCONFORMING TEST RESULTS**

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### **7.1 DENSITY AND MOISTURE CONTENT**

Recompacted clay liner and infiltration layer soils which fail to meet the minimum construction requirements for density and moisture content will be reworked. The boundaries of the area to be reworked will be the closest test locations which meet density and moisture content requirements. The nonconforming area will be reworked, dried or wetted as necessary, and retested. A nonconformance report will be written for areas which do not meet construction requirements after reworking and retesting.

### **7.2 LABORATORY PERMEABILITY TEST**

Recompacted clay liner and infiltration layer laboratory permeability test results which demonstrate permeability greater than  $1.0 \times 10^{-7}$  cm. per second and  $1.0 \times 10^{-5}$  cm. per second, respectfully, are nonconforming test results. Non-conforming permeability test results will trigger an immediate re-evaluation of construction procedures and compaction criteria for the failing area and a review of construction procedures and compaction criteria for previous passing permeability results. Any procedures and criteria which differ from previous passing areas will be incorporated into reworking of the failing test area. If a possible laboratory error is suspected, an additional sample may be collected for permeability testing.

### **7.3 NONCONFORMANCE REPORTS**

Nonconformance reports will be prepared if either or both of the conditions described in sections 7.1 or 7.2 are encountered at the site. A nonconformance report will be promptly brought to the attention of the Company by the CQA Consultant and will be documented in the CQA files.



## **8.0 SURVEY CONTROL**

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### **8.1 EXCAVATION/SUBGRADE**

The completed excavation surface will be surveyed to ensure that actual depths and grades are in accordance with engineering plans. A minimum of one cross-section every 100 linear feet of area length and width will be surveyed. At a minimum, survey points will be established at the top, middle, and toe of each slope and at the midpoint of the cell bottom if less than 100 feet wide.

Acceptable tolerances on survey coordinates will be 0.2 feet on elevations and 1.0 feet on coordinates. The quality assurance representative certifying the survey results shall be a registered land surveyor or professional engineer. The Contractor shall not provide survey data or surveying equipment to be utilized for certification surveys.

The Certifying Engineer will certify that the area excavation meets the requirements in the drawings and submit the documentation to the Company.

### **8.2 CONSTRUCTED BUFFER**

The constructed buffer surface will be surveyed before the placement of clay liner to ensure that actual thickness and grades are in accordance with the drawings. A minimum of one cross-section for every 100 linear feet of cell length and width will be surveyed. At a minimum, survey points will be established at the top, middle, and toe of each slope and at the midpoint of the cell bottom if less than 100 feet wide. These survey points will coincide with those of the previous cross-section lines.

Acceptable tolerances on survey coordinates shall be 0.1 feet on elevations and 1.0 feet on coordinates. The quality assurance representative certifying the survey results will be a registered land surveyor or professional engineer. The Contractor shall not provide survey data or surveying equipment to be utilized for certification surveys.

The Certifying Engineer will certify that the clay liner meets the requirements in the drawings and submit the documentation to the Company.

### **8.3 CLAY LINER**

The recompacted completed clay liner surface will be surveyed before the placement of a geosynthetic to ensure that actual thickness and grades are in accordance with the drawings. A minimum of one cross-section for every 100 linear feet of cell length and width will be surveyed. At a minimum, survey points will be established at the top, middle, and toe of each slope and at the midpoint of the cell bottom if less than 100 feet wide. These survey points will coincide with those of the previous cross-section lines.

Acceptable tolerances on survey coordinates shall be 0.1 feet on elevations and 1.0 feet on coordinates. The clay liner will be greater than or equal to 24 inches, the thickness specified on the engineering drawings. The quality assurance representative certifying the survey results will be a registered land surveyor or professional engineer. The Contractor shall not provide survey data or surveying equipment to be utilized for certification surveys.

The Certifying Engineer will certify that the clay liner meets the requirements in the drawings and



submit the documentation to the Company.

#### **8.4 LEACHATE COLLECTION SYSTEM**

The completed leachate collection system surfaces will be surveyed to ensure that actual thickness and grades are in accordance with the drawings.

A minimum of one cross-section for every 100 linear feet of area length and width will be surveyed. At a minimum, survey points will be established at the top, middle, and toe of each slope and at the midpoint of the cell bottom if less than 100 feet wide. These survey points will coincide with those of the excavation cross-section lines.

Acceptable tolerances on survey coordinates will be 0.2 feet on elevations and 1.0 feet on coordinates. The leachate collection system materials will be greater than or equal to 18 inches, the thickness specified on the engineering drawings. The quality assurance representative certifying the survey results will be a registered land surveyor or professional engineer. The Contractor shall not provide survey data or surveying equipment to be utilized for certification surveys.

The Certifying Engineer will certify that the leachate collection system meets the requirements in the drawings and submit the documentation to the Company.

#### **8.5 INFILTRATION LAYER**

The infiltration layer area shall be surveyed or measured before and after placement of the layer to ensure that actual thickness and grades are in accordance with the drawings. Survey or measurement cross-sections will be performed every 100 linear feet of area width and length. At a minimum, data points will be established at the top, middle, and toe of each exterior slope.

Acceptable tolerances on survey coordinates or measurements shall be 0.1 feet on elevations and 1.0 feet on coordinates. The erosion layer will be equal to the thickness specified on the drawings. The quality assurance representative certifying the survey results will be a registered land surveyor or professional engineer. The Contractor shall not provide survey data or surveying equipment to be utilized for certification surveys.

The Certifying Engineer will certify that the infiltration layer meets the requirements in the drawings and submit the documentation to the Company.

#### **8.6 EROSION LAYER**

The completed erosion layer will be surveyed or measured to ensure that actual thickness and grades are in accordance with the drawings. Survey or measurement cross-sections will be performed every 100 linear feet of area width and length. At a minimum, data points will be established at the top, middle, and toe of each exterior slope.

Acceptable tolerances on survey coordinates or measurements shall be 0.2 feet on elevations and 1.0 feet on coordinates. The erosion layer will be equal to the thickness specified on the drawings. The quality assurance representative certifying the survey results will be a registered land surveyor or professional engineer. The Contractor shall not provide survey data or surveying equipment to be utilized for certification surveys.



The Certifying Engineer will certify that the erosion layer meets the requirements in the drawings and submit the documentation to the Company.



## **9.0 GEOSYNTHETIC INSTALLATION**

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Geosynthetic materials will be used in construction of the bottom liner system, and in the leachate collection system and in the final cap. The HDPE geomembrane liner will be placed over a compacted clay liner to form the liner system. The leachate collection and removal system consists of a sand layer with gravel wrapped high density polyethylene (HDPE) piping. Additional geosynthetic materials may be added or deleted to accommodate construction operations as approved by the Certifying Engineer. All geotextiles, geocomposite drainage nets, GCL, etc. which are not welded must be overlapped and sewed together according to the drawings during installation.

### **9.1 MATERIALS**

The HDPE geomembrane material and leachate collection piping will meet the project requirements for type and thickness and will be handled to prevent damage prior to installation. The geotextile material will be handled and installed in accordance with the specifications to prevent damage to the material. An LLDPE geomembrane will be used to cap the infiltration layer.

### **9.2 CONSTRUCTION EVALUATION**

Construction evaluations of the geosynthetic materials consist of supervision of the installation to confirm that the materials were installed in accordance with the project requirements. General procedures which will be followed include:

- Removal of rubbish, organic matter, or other deleterious material.
- Installation of the material to the lines and grades shown on the drawings.
- Inspection, testing and documentation of installation.

### **9.3 CQC AND CQA TESTING OF HDPE AND LLDPE GEOMEMBRANE**

The HDPE and LLDPE geomembrane sheets and seams will be tested and the test results will be evaluated by the CQA Consultant and the Company prior to acceptance. In general, CQC testing of the sheet will be performed by the manufacturer. Testing of the seams will be performed by the Contractor under the observation of the CQA Consultant. The CQA Consultant may perform additional testing, using an independent geosynthetics testing laboratory, as required by the Company or in the judgement of the CQA Consultant to verify that the sheet and seams meet the project requirements.

#### **9.3.1 TEST SEAMS**

The Contractor will maintain and use equipment and personnel at the site to perform testing of the test seams. Test seams will be made each day prior to commencing field seaming. These seams will be made on fragment pieces of the HDPE or LLDPE material to verify that seaming conditions are adequate. Test seams will be made at the beginning of each seaming period, at the discretion of the CQA Consultant, and/or at least every four hours during continuous operation of each welding machine. In addition, each seamer will make at least one test seam each day.

The test seam sample will be at least three feet long and one foot wide with the seam centered lengthwise. Six adjoining specimens, each one inch wide, will be die cut from the test seam sample. Three of these specimens will be tested in the field with a tensometer for shear and three





for peel. Test seams will be tested by the Contractor under the supervision of the CQA Consultant. The specimens should not fail in the weld.

The Contractor will supply the necessary knowledgeable personnel and testing equipment. No strain measurements will be collected in the field. A passing machine or hand welded test seam will be achieved when the criteria described in section 9.3.2 is satisfied with the exclusion of strain measurements. If the test seam fails, the entire operation will be repeated. If the additional test seams fail, the seaming apparatus or seamer will not be accepted and will not be used for seaming until the deficiencies are corrected and two successful test seams are achieved. Test seam failure is defined as failure of any one of the specimens tested in shear or peel.

The CQA Consultant will observe all test seam welding procedures. The remainder of the successful test seam sample will be assigned a number and marked accordingly by the CQA Consultant, who will also log the date, hour, ambient temperature, number of seaming unit, name of seamer, and pass or fail description. The sample itself should be retained in the Company's archives. In addition, at least one tested specimen from each test as selected by the CQA Consultant will be retained by the CQA Consultant. The CQA Consultant will transmit these specimens to the Company following acceptance of the geomembrane materials and installation by the company.

### **9.3.2 PRODUCTION SEAMS**

Production seams will be tested by the contractor continuously using non-destructive techniques and at intervals using destructive tests. All testing of seams will be performed under the supervision of the CQA Consultant. Requirements for non-destructive and destructive tests are described below. The Contractor will maintain and use the equipment and personnel at the site to perform continuous vacuum box testing on all single weld seams. The system will be capable of applying a vacuum of at least three pounds per square inch (psi) which will be held for a minimum of 15 seconds for each section of seam.

The Contractor will maintain and use equipment and personnel to perform air pressure testing of double weld seams. The system will be capable of applying a pressure of at least 30 psi for not less than five minutes. Pressure loss tests will be conducted in accordance with the procedures outlined in "Pressurized Air Channel Test for Dual Seamed Geomembranes" Geosynthetic Research Institute Test Method GM-6. As outlined by the test method, following a two minute pressurized stabilization period pressure losses over a five minute measurement period will not exceed three psi.

Destructive testing will be performed on an average of every 500 linear feet of production seam per welder per day. The destructive testing shall include a sample of a production seam welded by each operator. The locations will be selected by the CQA Consultant. Sufficient samples will be obtained by the Contractor for field testing, laboratory testing, and archiving. Each sample will be large enough to test five specimens in peel and five specimens in shear. The average values of each of five specimens must meet the specification, and four of the five specimen tests must meet the specification for the seam to be considered a passing seam. If the average peel strength of the five specimens is adequate, but one of the specimens is failing, values for the failing specimen must be at least 90 percent of the strength value required and exhibit less than 50% peel incursion for the sample to pass. All samples must fail in film tear bond (FTB) and locus of failure must happen within an 1/8 inch from the edge of sheet.



If unresolved discrepancies exist between the CQA Consultants' and the Contractors' test results, the archived sample may be tested by the CQA Consultant. Samples which do not pass the shear and peel tests will be re-sampled from locations at least 10 feet on each side of the original test location. These two re-test samples must pass both shear and peel testing. If these samples do not pass, additional samples will continue to be collected until the questionable seam area is defined. Seams identified as failing will be capped between passing destructive test sample locations.

Tests will be performed in peel and shear using a calibrated tensiometer. No strain measurements from field tests of production seams will be accepted. Field tests will be evaluated in accordance with the criteria presented in this section with the exclusion of any strain requirements.

The CQA Consultant will observe all production seam welding procedures. The remainder of the successful production seam sample will be assigned a number and marked accordingly by the CQA Consultant, who will also log the date, hour, ambient temperature, identification number of seaming unit, name of seamer, and pass or fail description. The sample itself should be retained in the company's archives. In addition, at least one tested specimen from each test as selected by the CQA Consultant will be retained by the CQA Consultant. The CQA Consultant will transmit these specimens to the Company following acceptance of the geomembrane materials and installation by the company. Shear and peel testing of the seams shall be conducted according to ASTM D6392.

#### Definition of Pass/Fail Criteria for HDPE/LLDPE:

- Fusion Weld
  - o A passing seam produced by the fusion weld will be achieved in peel when no greater than 25% of the seam width peels at any point.
  - o The required minimum peel incursion must be achieved for four out of the five test specimens in the peel test mode. The fifth test specimen must exhibit less than or equal to 50% peel incursion and achieve 90% of the required strength.
  - o A passing seam in shear will elongate and have strength equal to or greater than its strength requirement.
  - o Five out of five test specimens in shear mode must achieve their strength requirement
- Extrusion Weld
  - o A passing seam produced by the extrusion weld will be achieved in peel when no greater than 25% of the seam width peels at any point.
  - o The required minimum peel incursion must be achieved for four out of the five test specimens in peel test mode. The fifth test specimen must exhibit less than or equal to 50% peel incursion and achieve 90% of the required strength.
  - o A passing seam in shear will elongate and have strength equal to or greater than its strength requirement.
  - o Five out of five test specimens in shear mode must achieve their strength requirement

#### **9.3.3 REPAIR OF DAMAGED AND SAMPLED AREAS**

Damaged and sampled coupon areas of geomembrane will be repaired by the Contractor by construction of a cap strip. No repairs will be made to seams by application of an extrusion bead to a seam edge previously welded by extrusion or fusion methods. Repaired areas will be tested



for seam integrity as described in section 9.3.2. Damaged materials are the property of the contractor and will be removed from the site at the Contractors' expense. The Contractor will retain all ownership and responsibility for the geomembrane until acceptance by the Company. The geomembrane will be accepted by the Company after the installation and repairs are completed and after the Company has received documentation for the installation from the CQA Consultant.



**TABLE 1**  
**GREEN MEADOW LANDFILL**  
**PHYSICAL PROPERTIES FOR CLAY SOILS**

| Property                                                                                                                                 | Test Method | Clay Liner                          |
|------------------------------------------------------------------------------------------------------------------------------------------|-------------|-------------------------------------|
| Unified Soil Classification System                                                                                                       | ASTM 2488   | SC/CL/CH Type                       |
| Maximum Particle Size                                                                                                                    | ASTM D422   | 1 inch                              |
| Soil Particle Size Smaller than the U.S. No. 4 (1/4 inch) Sieve (Minimum)                                                                | ASTM D422   | 95%                                 |
| Soil Particle Size Smaller than the U. S. No. 200 Sieve (Minimum)                                                                        | ASTM D1140  | 50%                                 |
| Liquid Limit (Minimum)                                                                                                                   | ASTM D4318  | 30%                                 |
| Plasticity Index of Soil (Minimum)                                                                                                       | ASTM D4318  | 10%                                 |
| Moisture Density Relationships of Soils and Soil Aggregate Mixtures Using 5.5 pound Rammer and 12-inch Drop (Standard Proctor) (Minimum) | ASTM D 698  | 90%                                 |
| Hydraulic Conductivity Test <sup>1, 2, 3</sup> (Back Pressure, Saturated) (Maximum)                                                      | ASTM D5084  | $1.0 \times 10^{-7}$ cm. per second |

NOTES:

<sup>1</sup> Hydraulic conductivity for constructed and natural buffer shall be less than or equal to  $1.0 \times 10^{-6}$  cm. per second.

<sup>2</sup> Hydraulic conductivity for infiltration layer shall be less than or equal to  $1.0 \times 10^{-5}$  cm. per second.

<sup>3</sup> Hydraulic conductivity for clay liner shall be less than or equal to  $1.0 \times 10^{-7}$  cm. per second.



**TABLE 2**  
**GREEN MEADOW LANDFILL**  
**TESTING FREQUENCY FOR CONSTRUCTION QUALITY CONTROL**  
**STRUCTURAL FILL SOILS**

| Location                  | Type of Test                              | Frequency of Test                                  |
|---------------------------|-------------------------------------------|----------------------------------------------------|
| Borrow Area               | Compaction Curve <sup>1</sup>             | 1 per 10,000 cubic yards or<br>1 per material type |
|                           | Atterberg Limits <sup>2</sup>             | 1 per material type                                |
|                           | Soil Particle size (% Fines) <sup>3</sup> | 1 per material type                                |
| Subgrade<br>(constructed) | Soil Density <sup>4</sup>                 | 1 per 500 cubic yards                              |
|                           | Moisture Content <sup>5</sup>             | 1 per 500 cubic yards                              |
|                           | Shear Strength <sup>6</sup>               | 1 per 10,000 cubic yards                           |

NOTES:

<sup>1</sup> ASTM D698 Moisture -Density Relations for Soils Using 5.5 lb. Rammer with a 12 in. drop.

<sup>2</sup> ASTM D4318 Liquid Limit, and Plasticity Index of Soils.

<sup>3</sup> ASTM D1140 Soil Particle Size Smaller than U.S. No. 200 Sieve

<sup>4</sup> ASTM D2922 Density of Soil by Nuclear Methods.

<sup>5</sup> ASTM D3017 Moisture Content of Soil by Nuclear Methods.

<sup>6</sup> ASTM D2166-85 Unconfined Compression Strength of Soil by Unconfined Compression Test.



**TABLE 3**  
**GREEN MEADOW LANDFILL**  
**TESTING FREQUENCY FOR CONSTRUCTION QUALITY CONTROL**  
**CONSTRUCTED BUFFER SOILS**

| Location           | Type of Test                  | Frequency of Test                                   |
|--------------------|-------------------------------|-----------------------------------------------------|
| Borrow Area        | Compaction Curve <sup>1</sup> | 1 per 10,000 cubic yards or<br>1 per material type  |
|                    | Atterberg Limits <sup>2</sup> | 1 per material type                                 |
| Constructed Buffer | Soil Density <sup>3</sup>     | 1 per 500 cubic yards                               |
|                    | Moisture Content <sup>4</sup> | 1 per 500 cubic yards                               |
|                    | Permeability <sup>5</sup>     | 1 per 1500 cubic yards or 1 per lift per<br>2 acres |
|                    | Shear Strength <sup>6</sup>   | 1 per 10,000 cubic yards                            |

NOTES:

<sup>1</sup> ASTM D698 Moisture -Density Relations for Soils Using 5.5 lb. Rammer with a 12 in. drop.

<sup>2</sup> ASTM D4318 Liquid Limit, and Plasticity Index of Soils.

<sup>3</sup> ASTM D2922 Density of Soil by Nuclear Methods.

<sup>4</sup> ASTM 3017 Moisture Content of Soil by Nuclear Methods.

<sup>5</sup> ASTM D5084 or EPA9100 Permeability Core Sample. Permeability requirement of  $1.0 \times 10^{-7}$  cm. per second.

<sup>6</sup> ASTM D2166-85 Unconfined Compression Strength of Soil by Unconfined Compression Test.



**TABLE 4**  
**GREEN MEADOW LANDFILL**  
**TESTING FREQUENCY FOR CONSTRUCTION QUALITY CONTROL**  
**OF TEST PAD SOILS**

| Location      | Material                      | Frequency of Test                               |
|---------------|-------------------------------|-------------------------------------------------|
| Borrow Area   | Compaction Curve <sup>1</sup> | 1 per 200 cubic yards<br>or 1 per material type |
|               | Atterberg Limits <sup>2</sup> | 1 per 200 cubic yards<br>or 1 per material type |
| Test Pad Area | Soil Density <sup>3</sup>     | 5 per lift                                      |
|               | Moisture Content <sup>4</sup> | 5 per lift                                      |
|               | Permeability <sup>5</sup>     | 1 per lift (4 total)                            |
|               | Shear Strength <sup>6</sup>   | 1 per ASTM D5084 Test                           |

NOTES:

<sup>1</sup> ASTM D698 Moisture-Density Relations for Soils Using 5.5 lb. Rammer with an 12 in. Drop.

<sup>2</sup> ASTM D4318 Liquid Limit, Plastic Limit and Plasticity Index of Soil.

<sup>3</sup> ASTM D2922 Density of Soil by Nuclear Methods.

<sup>4</sup> ASTM D3017 Moisture Content of Soil by Nuclear Methods.

<sup>5</sup> ASTM D5084 EPA 9100 D Measurement of Hydraulic Conductivity (Permeability).

<sup>6</sup> ASTM D2166-85 Unconfined Compression Strength of Soil by Unconfined Compression Test.



**TABLE 5**  
**GREEN MEADOW LANDFILL**  
**TESTING FREQUENCY FOR CONSTRUCTION QUALITY CONTROL**  
**OF CLAY LINER SOILS**

| Location    | Material                      | Frequency of Test                                          |
|-------------|-------------------------------|------------------------------------------------------------|
| Borrow Area | Compaction Curve <sup>1</sup> | 1 per 5,000 cubic yards or<br>1 per material type          |
|             | Atterberg Limits <sup>2</sup> | 1 per 2,000 cubic yards or<br>1 per material type          |
| Clay Liner  | Soil Density <sup>3</sup>     | 1 per 200 cubic yards or<br>1 per lift if <200 cubic yards |
|             | Moisture Content <sup>4</sup> | 1 per 200 cubic yards or<br>1 per lift if <200 cubic yards |
|             | Permeability <sup>5</sup>     | 1 per acre per lift                                        |

NOTES:

<sup>1</sup> ASTM D698 Moisture-Density Relations for Soils Using 5.5 lb. Rammer with an 12 in. Drop.

<sup>2</sup> ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

<sup>3</sup> ASTM D2922 Density of Soil by Nuclear Methods (Lift is defined as the size of the work area).

<sup>4</sup> ASTM D3017 Moisture Content of Soil by Nuclear Methods (Lift is defined as the size of the work area.).

<sup>5</sup> ASTM D5084 or EPA 9100 Permeability (core sample to be collected from equally spaced area from each lift). Permeability requirement of  $1.0 \times 10^{-7}$  cm. per second





**TABLE 6**  
**GREEN MEADOW LANDFILL**  
**TESTING FREQUENCY FOR CONSTRUCTION QUALITY CONTROL**  
**OF INFILTRATION LAYER SOILS**

| Location           | Type of Test                  | Frequency of Test                                          |
|--------------------|-------------------------------|------------------------------------------------------------|
| Borrow Area        | Compaction Curve <sup>1</sup> | 1 per 5,000 cubic yards or<br>1 per material type          |
|                    | Atterberg Limits <sup>2</sup> | 1 per 2,000 cubic yards or<br>1 per material type          |
| Infiltration Layer | Soil Density <sup>3</sup>     | 1 per 200 cubic yards or<br>1 per lift if <200 cubic yards |
|                    | Moisture Content <sup>4</sup> | 1 per 200 cubic yards or<br>1 per lift if <200 cubic yards |
|                    | Permeability <sup>5</sup>     | 1 per 2 acres per lift                                     |

**NOTES:**

<sup>1</sup> ASTM D698 Moisture -Density Relations for Soils Using 5.5 lb. Rammer with a 12 in. drop.

<sup>2</sup> ASTM D4318 Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

<sup>3</sup> ASTM D2922 Density of Soil by Nuclear Methods (Lift is defined as the size of the work area).

<sup>4</sup> ASTM D3017 Moisture Content of Soil by Nuclear Methods (Lift is defined as the size of the work area).

<sup>5</sup> ASTM D5084 or EPA 9100 Permeability (core sample to be collected from equally spaced area from each lift). Permeability requirement of  $1.0 \times 10^{-5}$  cm./sec



**TABLE 7**

**GREEN MEADOW LANDFILL**

**TESTING FREQUENCY FOR CONSTRUCTION QUALITY ASSURANCE  
OF LEACHATE COLLECTION SYSTEM MATERIALS**

| Property     | Type of Test   | Frequency of Test                      |
|--------------|----------------|----------------------------------------|
| Passing #200 | Sieve Analysis | 1 per 2,000 cubic yards                |
| Grain Size   | Sieve Analysis | 1 per 5,000 cubic yards <sup>1,2</sup> |
| Permeability | ASTM D2434     | 2 per material type <sup>3</sup>       |

**NOTES:**

<sup>1</sup> A minimum of one test to be performed on medium gravel.

<sup>2</sup> A minimum of three tests to be performed on fine gravel. Additional tests may be performed as directed by the CQA Consultant depending on the variability of grain sizes.

<sup>3</sup> A minimum permeability of  $1.0 \times 10^{-2}$  cm. per second is required for service conditions.



**TABLE 8**

**GREEN MEADOW LANDFILL**

**TESTING FREQUENCY FOR CONSTRUCTION QUALITY ASSURANCE  
OF STRUCTURAL FILL SOILS**

| <b>Location</b>           | <b>Type of Test</b>              | <b>Frequency of Test</b> |
|---------------------------|----------------------------------|--------------------------|
| Borrow Area               | Visual Observations <sup>1</sup> | Continuous               |
| Subgrade<br>(constructed) | Visual Observations <sup>2</sup> | Continuous               |
|                           | Surveys <sup>3</sup>             | Periodic                 |
|                           | Lift Bonding <sup>4</sup>        | 2 per lift               |
|                           | Thickness <sup>5</sup>           | 1 per 2 acres            |

**NOTES:**

<sup>1</sup> ASTM D2488 Description and Identification of Soils (Visual – Manual Method).

<sup>2</sup> Observation of equipment operating procedures, number of passes of compaction equipment, and lift thickness.

<sup>3</sup> Surveys will be conducted to locate subgrade, monitor lift location and thickness, and to locate soil tests.

<sup>4</sup> Observations for separation of soil layer.

<sup>5</sup> 5 foot minimum thickness of in-situ buffer to be verified by soil borings and visual classification



**TABLE 9**

**GREEN MEADOW LANDFILL**

**TESTING FREQUENCY FOR CONSTRUCTION QUALITY ASSURANCE  
OF CONSTRUCTED BUFFER SOILS**

| <b>Location</b>    | <b>Type of Test</b>              | <b>Frequency of Test</b> |
|--------------------|----------------------------------|--------------------------|
| Borrow Area        | Visual Observations <sup>1</sup> | Continuous               |
| Constructed Buffer | Visual Observations <sup>2</sup> | Continuous               |
|                    | Surveys <sup>3</sup>             | Periodic                 |
|                    | Lift Bonding <sup>4</sup>        | 2 per lift               |
|                    | Thickness <sup>5</sup>           | 1 per 2 acres            |

**NOTES:**

<sup>1</sup> ASTM D2488 Description and Identification of Soils (Visual – Manual Method).

<sup>2</sup> Observation of equipment operating procedures, number of passes of compaction equipment, and lift thickness.

<sup>3</sup> Surveys will be conducted to locate subgrade, monitor lift location and thickness, and to locate soil tests.

<sup>4</sup> Observations for separation of soil layer.

<sup>5</sup> 5 foot minimum thickness of in-situ buffer to be verified by soil borings and visual classification



TABLE 10

GREEN MEADOW LANDFILL

TESTING FREQUENCY FOR CONSTRUCTION QUALITY ASSURANCE  
OF TEST PAD SOILS

| Location    | Material                         | Frequency of Test                  |
|-------------|----------------------------------|------------------------------------|
| Borrow Area | Visual Observation <sup>1</sup>  | Continuous                         |
|             | Moisture Content <sup>2</sup>    | 1 per 500 cubic yards              |
| Test Pad    | Density <sup>3</sup>             | 1 per lift minimum                 |
|             | Moisture Content <sup>2</sup>    | 1 per ASTM D3017 Test <sup>4</sup> |
|             | Surveys <sup>5</sup>             | Periodic                           |
|             | Lift Bonding <sup>6</sup>        | 1 per lift                         |
|             | Visual Observations <sup>7</sup> | Continuous                         |

NOTES:

<sup>1</sup> ASTM D2488 Description and Identification of Soils (Visual-Manual Method).

<sup>2</sup> ASTM D2216 Laboratory Determination of Moisture Content.

<sup>3</sup> ASTM D1556 Soil Density by Sand-Cone Method (if necessary to resolve ASTM D2937 and ASTM D2922 discrepancies).

<sup>4</sup> ASTM D2216 tests to be conducted at ASTM D3017 test locations.

<sup>5</sup> Surveys will be conducted to locate subgrade, monitor lift thickness, verify as-built location of test pad, and to locate soil tests.

<sup>6</sup> Observation of separation of soil layer.

<sup>7</sup> Observation of equipment operating procedures, number of passes of compaction equipment, and lift thickness



TABLE 11

GREEN MEADOW LANDFILL

TESTING FREQUENCY FOR CONSTRUCTION QUALITY ASSURANCE  
OF CLAY LINER SOILS

| Location    | Material                         | Frequency of Test                                  |
|-------------|----------------------------------|----------------------------------------------------|
| Borrow Area | Visual Observation <sup>1</sup>  | Continuous                                         |
|             | Moisture Content <sup>2</sup>    | 1 per 5,000 cubic yards                            |
| Clay Liner  | Visual Observations <sup>3</sup> | Continuous                                         |
|             | Soil Density <sup>4</sup>        | 1 per 10 ASTM D2922 Tests or<br>5 per lift minimum |
|             | Moisture Content <sup>2</sup>    | 1 per 5 ASTM D3017 Tests                           |
|             | Surveys <sup>5</sup>             | Periodic                                           |
|             | Lift Bonding <sup>6</sup>        | 2 per lift                                         |

NOTES:

<sup>1</sup> ASTM D2488 Description and Identification of Soils (Visual-Manual Method).

<sup>2</sup> ASTM D2216 Laboratory Determination of Moisture Content.

<sup>3</sup> Observation of equipment operating procedures, number of passes of compaction equipment, and lift thickness.

<sup>4</sup> ASTM D2937 Soil Density by Standard Field Drive Cylinder.

<sup>5</sup> Surveys will be conducted to locate subgrade, monitor lift location and thickness, and to locate soil tests.

<sup>6</sup> Observation of separation of soil layer.



TABLE 12

GREEN MEADOW LANDFILL

TESTING FREQUENCY FOR CONSTRUCTION QUALITY ASSURANCE  
OF INFILTRATION LAYER SOILS

| Location           | Material                         | Frequency of Test                                  |
|--------------------|----------------------------------|----------------------------------------------------|
| Borrow Area        | Visual Observation <sup>1</sup>  | Continuous                                         |
|                    | Moisture Content <sup>2</sup>    | 1 per 5,000 cubic yards                            |
| Infiltration Layer | Visual Observations <sup>3</sup> | Continuous                                         |
|                    | Soil Density <sup>4</sup>        | 1 per 10 ASTM D2922 Tests or<br>5 per lift minimum |
|                    | Moisture Content <sup>2</sup>    | 1 per 5 ASTM D3017 Tests                           |
|                    | Surveys <sup>5</sup>             | Periodic                                           |
|                    | Lift Bonding <sup>6</sup>        | 2 per lift                                         |

NOTES:

<sup>1</sup> ASTM D2488 Description and Identification of Soils (Visual-Manual Method).

<sup>2</sup> ASTM D2216 Laboratory Determination of Moisture Content.

<sup>3</sup> Observation of equipment operating procedures, number of passes of compaction equipment, and lift thickness.

<sup>4</sup> ASTM D2937 Soil Density by Standard Field Drive Cylinder.

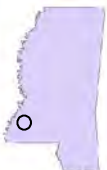
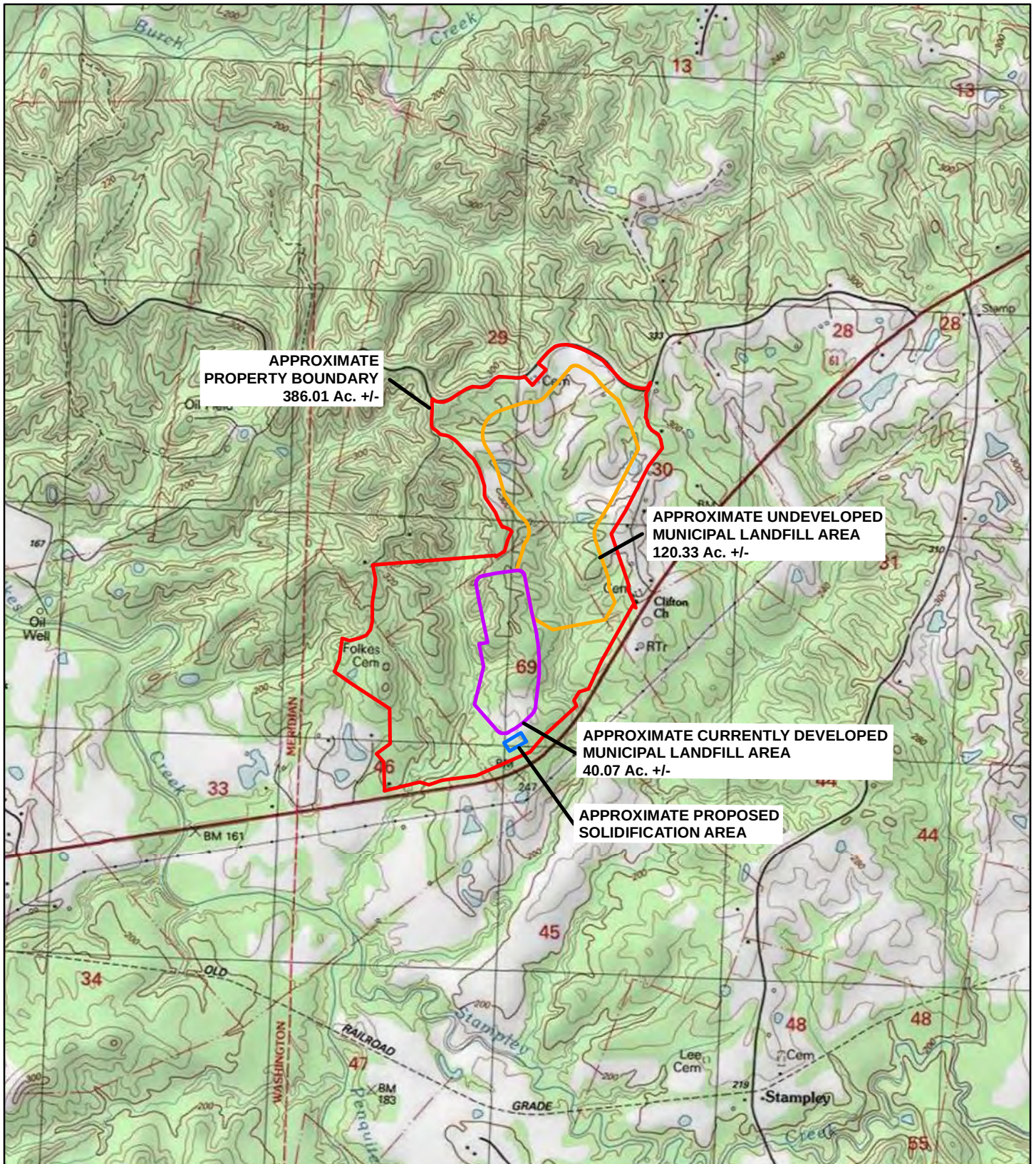
<sup>5</sup> Surveys will be conducted to locate subgrade, monitor lift location and thickness, and to locate soil tests.

<sup>6</sup> Observation for separation of soil layer.



**Waste Solidification Plan  
Figures (Appendix K)**



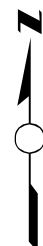


**PROJECT LOCATION**  
31.654872 , -91.143489

**LEGEND**

- Approximate Property Boundary - 386.01 Ac. +/-
- Approximate Currently Developed Municipal Landfill Area - 40.07 Ac. +/-
- Approximate Undeveloped Municipal Landfill Area - 120.33 Ac. +/-
- Approximate Proposed Solidification Area

Source: ESRI Basemap - USA Topo Maps



**GREEN MEADOWS  
SUSTAINABLE SOLUTIONS  
FAYETTE, MISSISSIPPI**

**ALLEN** ENGINEERING AND SCIENCE

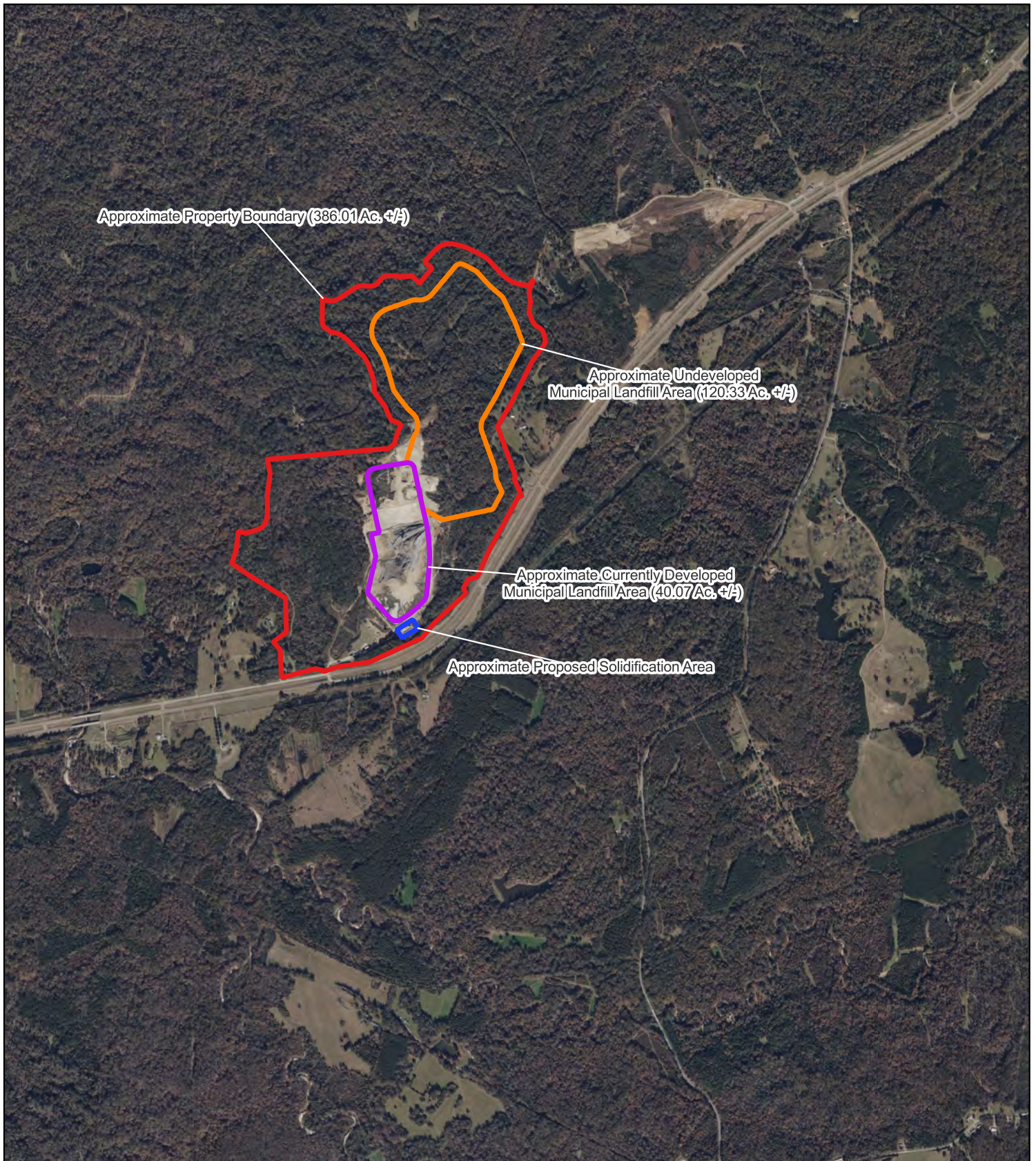
|                     |               |                  |
|---------------------|---------------|------------------|
| SCALE:<br>1"=2,000' | DRAWN BY: PML | DATE: 10-28-2025 |
|                     | CHKD BY: JW   | DATE: 10-28-2025 |

|                      |                                            |
|----------------------|--------------------------------------------|
| PROJECT NO.<br>24051 | FILE<br>24051 102825 FIG01 R00 D Site Loc. |
|----------------------|--------------------------------------------|

**SITE LOCATION MAP**

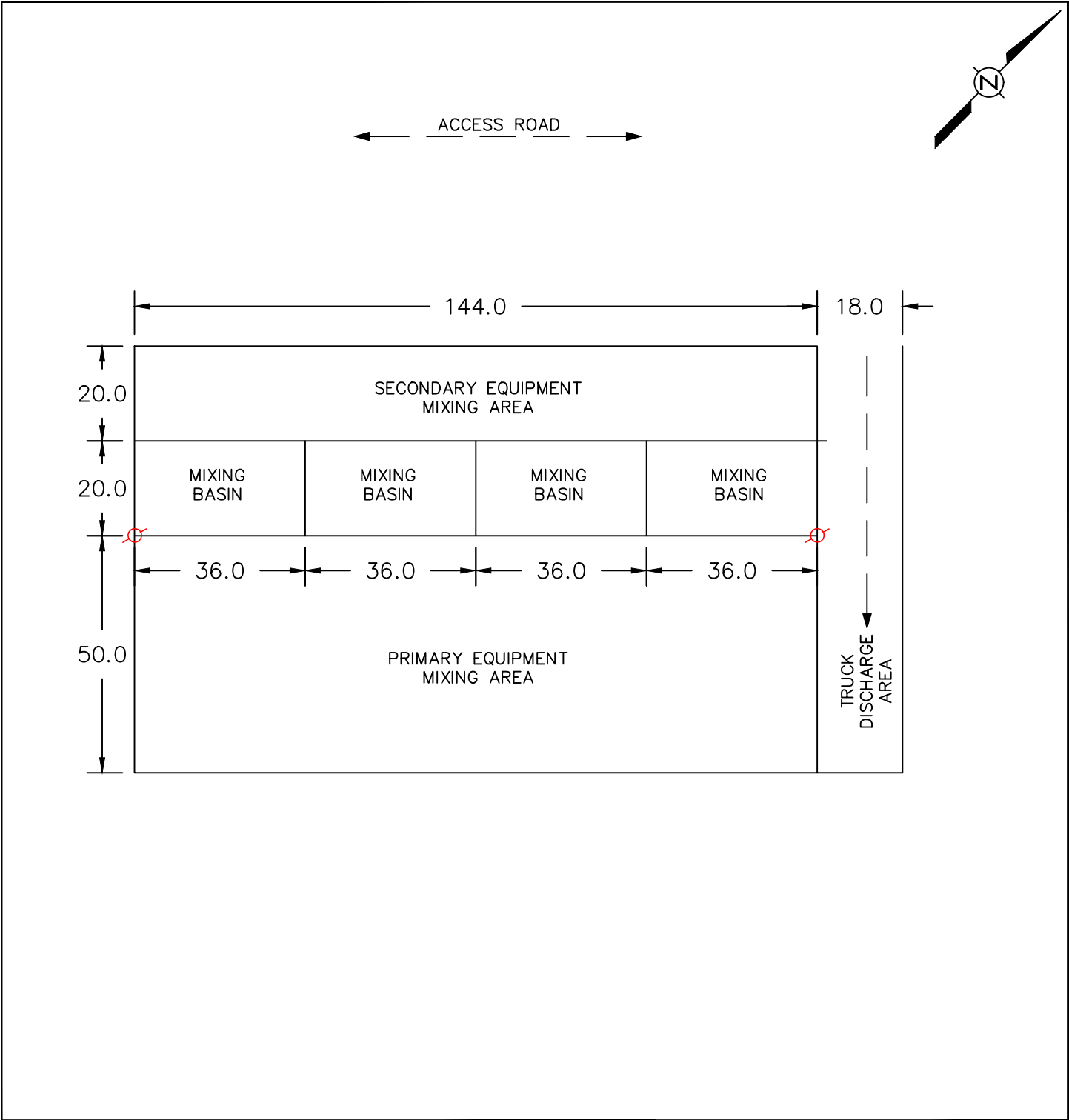
**FIGURE  
1**





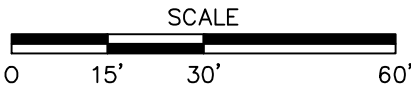
|                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                       |                                             |                                          |
|------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------------------------------------|------------------------------------------|
|  <p>31.654872, -91.143489</p> | <p><b>LEGEND</b></p> <ul style="list-style-type: none"> <li><span style="border: 2px solid red; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Approximate Property Boundary (386.01 Ac. +/-)</li> <li><span style="border: 2px solid purple; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Approximate Currently Developed Municipal Landfill Area (40.07 Ac. +/-)</li> <li><span style="border: 2px solid orange; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Approximate Undeveloped Municipal Landfill Area (120.33 Ac. +/-)</li> <li><span style="border: 2px solid blue; display: inline-block; width: 15px; height: 10px; margin-right: 5px;"></span> Approximate Proposed Solidification Area</li> </ul> <p>Source: Bing Satellite</p> | <p>GREEN MEADOWS<br/>SUSTAINABLE SOLUTIONS<br/>FAYETTE, MISSISSIPPI</p>               |                                             |                                          |
|                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |  |                                             |                                          |
|                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>Scale:<br/>1" = 2000'</p>                                                          | <p>DRAWN BY: JK<br/>CHKD BY: JW</p>         | <p>DATE: 12/15/25<br/>DATE: 12/15/25</p> |
|                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>PROJECT NO.<br/>24051</p>                                                          | <p>CAD FILE:<br/>24051 FIG02 AIM 121625</p> |                                          |
| <p>AERIAL OVERVIEW MAP</p>                                                                                       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | <p>FIGURE<br/>2</p>                                                                   |                                             |                                          |





**LEGEND**

 APPROXIMATE LIGHT POLE LOCATION



SOURCE: AUTOCAD AERIAL, 2023

**GREEN MEADOW  
SUSTAINABLE SOLUTIONS**



|                  |                    |                |
|------------------|--------------------|----------------|
| SCALE:<br>1"=30' | DRAWN BY: W.COLEY  | DATE: 10/28/25 |
|                  | CHKD. BY: J.WILSON | DATE: 10/28/25 |

|                      |                                 |
|----------------------|---------------------------------|
| PROJECT NO.<br>24051 | CAD FILE<br>FIG03 R00 102825 SA |
|----------------------|---------------------------------|

**SOLIDIFICATION AREA**

**FIGURE  
3**



**Appendix L**  
**Supplemental Information for**  
**Revision No. 1 - December 2025**



**MOLO Certification**

**The State of Mississippi**  
**Department of Environmental Quality**  
**Nonhazardous Waste Division Program**

***Landfill Operator Certification***

In accordance with Mississippi Code Annotated, Section 21-27-211 (1972, as amended) and the Regulations for the Certification of Operators of Solid Waste Disposal Facilities regarding landfill operator certification,

Be it known that

**Jesse Stallone**

Having submitted evidence of qualifications, is hereby certified by the Mississippi Department of Environmental Quality to operate a non-hazardous waste landfill within the State of Mississippi until expiration or revocation.

Certificate No: LF-02-95-003  
Issued: October 1, 2024  
Expires: September 30, 2027

  
Mississippi Department of Environmental Quality



**Commission on Environmental Quality  
June 22, 2025 Meeting Minutes  
Natural Buffer Siting Criteria Variance**

MISSISSIPPI COMMISSION ON ENVIRONMENTAL QUALITY 2573  
OFFICIAL MINUTES  
JUNE 26, 2025

The regular monthly meeting of the Commission on Environmental Quality was held on Thursday, June 26, 2025, in-person in the Commission Hearing Room at the offices of the Mississippi Department of Environmental Quality, 515 East Amite Street, Jackson, Mississippi, beginning at 9:00 a.m.

Commissioners present were: Patrick Johnson, Jr., Kent Parrish, Jr., Chat Phillips, and Jack Winstead.

Commissioners Brenda Lathan and Billy VanDevender were not present.

Others present were: Chris Wells, Executive Director, Trent Jones, Eric James, James Matheny, Roy Furrh, Tad Campbell, staff of MDEQ; and other staff members and visitors whose names appear elsewhere in these minutes.

After the meeting was called to order by Chair Patrick Johnson, Mr. Winstead led the invocation, and the following business was transacted:

Approval of Minutes

On motion made by Mr. Phillips and seconded by Mr. Parrish, the minutes of the April 24, 2025, meeting were approved and adopted by the Commission as the Official Minutes.

Request from the Greenway Environmental Services, LLC for a Variance to State Siting Criteria for the Proposed Modification of the Green Meadow Sustainable Solution (Green Meadow) Landfill

Mr. Trent Jones informed the Commission that Greenway Environmental Services, LLC (Greenway) would be making a presentation requesting a variance to one of the siting criteria of the Mississippi Nonhazardous Solid Waste Management Regulations (11 Miss. Admin. Code Pt. 4, R.1.3.L(1).), which states that "New landfills shall be located where there are adequate naturally occurring geological materials present of low permeability to act as a buffer between the base of the landfill liner and the top of the uppermost aquifer. Such materials shall generally consist of clays, silty clays, clayey silts, or other soils which have an average hydraulic conductivity of  $1 \times 10^{-6}$  cm/sec or less. The thickness, or depth, of these materials shall extend to at least five feet immediately beneath the base of the landfill liner." Greenway's variance request is related to their proposed renewal and modification of the Green Meadow Landfill, which is owned and operated by Greenway. Greenway has made plans and submitted a permit application to modify the permitted disposal area for their existing landfill. These documents were previously forwarded to the Commission for review. In reviewing the submitted permit application for this modification, MDEQ staff determined that the proposed action did not fully meet the natural geology siting criteria in the regulations as related to the presence of naturally occurring geological materials below the proposed disposal area. Mr. Jones provided the Commission with some historical information, additional information on the siting criteria, and procedural information. Mr. Jones reminded the Commission and Greenway, that the Commission's granting of the variance to the siting criteria does not guarantee the issuance of the permit. The ultimate decision to issue the permit would be rendered by the Environmental Quality Permit Board. Mr. Jones stated that should the Commission grant Greenway's request for a variance, staff will develop a draft permit and conduct a public participation process, which will include a public hearing, to gather comments. Any comments or concerns received will be presented to the Environmental Quality Permit Board for consideration, if applicable. Mr. Jones introduced Jesse Stallone, CEO of Greenway Environmental Services, to address the Commission. Mr. Stallone then introduced Jeff Allen with Allen Engineering, Jim McNaughton, consultant for Greenway, and John Brunini, Greenway's Attorney with Butler Snow. Mr. Allen presented details of Greenway's proposed redesign plans and relative information regarding the proposed variance request. Greenway requested to supplement disposal areas that may not have naturally occurring geological materials present or immediately beneath the liner system of the landfill by constructing a comparable buffer at least as, or more protective than, the naturally occurring geological material. Mr. Brunini addressed the Commission by stating that due to the topography of the area, there are no economically viable alternatives to constructing a buffer. The Commission had a couple of questions which were addressed. Following staff presentation and deliberation, on motion made by Mr. Phillips and



seconded by Mr. Parrish, the Commission unanimously voted to approve Greenway's request for the proposed variance to the siting criteria of the Mississippi Nonhazardous Solid Waste Management Regulations.

Commission Approval of Brownfield Consulting Firms

Mr. Eric James stated that MDEQ staff reviewed applications from consulting firms requesting to be listed as Brownfield Consulting Firms and determined them to be complete and acceptable. Therefore, on behalf of staff, Mr. James recommended that the Commission approve the following firms as Brownfield Consulting Firms:

Hart & Hickman, P.C.  
3921 Sunset Ridge Rd, Ste 301  
Raleigh, NC 27607

S&ME INC.  
360D Quality Circle NW, Ste 450  
Huntsville, AL 35806

Following staff presentation and deliberation, on motion made by Mr. Winstead and seconded by Mr. Parrish, the Commission unanimously voted to approve Hart & Hickman, P.C. from Raleigh, NC, and S&ME Inc. from Huntsville, AL, as Brownfield Consulting Firms.

Commission Approval of Environmental Response Action Contractor (ERAC)

Mr. Eric James stated that MDEQ staff reviewed an application from a consulting firm requesting to be listed as an Environmental Response Action Contractor (ERAC) and determined it to be complete and acceptable. Therefore, on behalf of staff, Mr. James recommended that the Commission approve the following firm as an ERAC:

Crawford Environmental Services, LLC  
1701 Shenandoah Avenue NW  
Roanoke, VA 24017

Following staff presentation and deliberation, on motion made by Mr. Phillips and seconded by Mr. Winstead, the Commission unanimously voted to approve Crawford Environmental Services, LLC from Roanoke, VA, as an Environmental Response Action Contractor (ERAC).

Establishment of the Lignite Fee for Liberty Fuels Company LLC for the Liberty Mine in Kemper County for State Fiscal Years 2025 and 2026;

Establishment of the Lignite Fee for the Mississippi Lignite Mining Company for the Red Hills Mine in Choctaw County for State Fiscal Years 2025 and 2026

On behalf of staff, Mr. James Matheny recommended that the Liberty Fuels Company LLC Lignite Mining Fee for the 2025 and 2026 state fiscal years be set at \$75,000 per year. This site is no longer actively mined and is being reclaimed. Mr. Matheny also recommended that the Mississippi Lignite Mining Company Lignite Mining Fee for the 2025 and 2026 state fiscal years be set at \$175,000. Concurrent reclamation continues on this permit. These amounts will cover approximately 50% of the anticipated costs of administering the federally-approved coal mining program in Mississippi; the remaining approximately 50% of the cost will be covered by a federal Office of Surface Mining, Reclamation and Enforcement grant. These fees will cover 100% of the anticipated cost of administering the program above the amount of the federal OSMRE grant. Following staff presentation and deliberation, on motion made by Mr. Winstead and seconded by Mr. Phillips, the Commission unanimously voted to set the Liberty Fuels Company LLC Lignite Mining Fee for the 2025 and 2026 state fiscal years at \$75,000 per year and to set the Mississippi Lignite Mining Company Lignite Mining Fee for the 2025 and 2026 state fiscal years at \$175,000 per year.

Mississippi Commission on Environmental Quality v. Superior Pallet Company, Jackson, Hinds County -  
Hearing Officer Designation and Evidentiary Hearing

On behalf of MDEQ legal staff, Mr. Roy Furrh requested that the Commission consider designating Ellen O’Neal as the hearing officer in this proceeding to assist the Commission in conducting the evidentiary hearing and to oversee the hearing process pursuant to Miss. Code Ann. § 49-17-33. Ms. O’Neal works at the Mississippi Attorney General’s office. On motion made by Mr. Phillips and seconded by Mr. Parrish, the Commission unanimously voted to designate Ellen O’Neal as the hearing officer in this matter. Executive Director, Chris Wells, stepped down from the dais and Ms. O’Neal took his place.

MDEQ was represented by its General Counsel Roy Furrh and attorneys Tad Campbell and Jessica Schaub. Representatives for Superior Pallet did not attend the hearing despite being informed of the hearing date, and acknowledging, in writing, that they had been notified and would not be participating. On behalf of MDEQ legal staff, Mr. Campbell addressed some preliminary matters and provided opening statements on behalf of MDEQ. Mr. Campbell stated this evidentiary hearing was scheduled related to an enforcement action against Superior Pallet Company for four (4) alleged violations: 1) The open burning of solid wastes in violation of Miss. Code Ann. §17-17-9 and 11 Miss. Admin. Code Pt. 2, R.1.3 G.; 2) The formation of an unauthorized dump in violation of Miss. Code Ann. §17-17-17; 3) Refusing Mississippi Department of Environmental Quality (MDEQ) personnel access to the site to perform an inspection in violation of Miss. Code Ann. §49-17-21; and, 4) The unauthorized operation of an industrial facility without the required permit coverage under Mississippi’s Industrial Storm Water General Permit for Industrial Activities in violation of Miss. Code Ann. §49-17-29. MDEQ on behalf of the Commission pre-filed direct testimony through the affidavits of Will Watts, Charlie Bock, Ethan Mayeu, Dr. Yang Li, Geoffrey Martin, and Jill Bailey. Mr. Watts, Mr. Bock, Mr. Mayeu, Dr. Li and Mr. Martin all testified through their own pre-filed testimony affidavits. At the evidentiary hearing, MDEQ’s recommendation to the Commission included monetary penalties against Superior Pallet Company related to the alleged violations pursuant to Miss. Code Ann. §49-17-43 (Rev. 2003). After the conclusion of the evidence presented related to the alleged violations, Mr. Campbell made closing arguments. The matter was then presented to the Commission for its decision.

After a brief discussion led by Hearing Officer Ellen O’Neal, Mr. Winstead moved to close the meeting to discuss whether to go into executive session to deliberate on the penalty assessment for Superior Pallet. Mr. Parrish seconded the motion. The Commission voted unanimously to close the meeting. Ms. O’Neal requested the public and MDEQ staff clear the Commission hearing room, other than the Commission members. The Commission, on motion by Mr. Winstead and second by Mr. Phillips, voted unanimously to go into executive session to discuss the matter. Executive Director Chris Wells was subsequently asked to return to the meeting room during executive session to answer some procedural questions for the Commission. After discussion, Mr. Winstead moved to end executive session and return to open session and Mr. Parrish seconded the motion. The Commission unanimously voted in favor of the motion. Executive Director Chris Wells invited the public to return to the Commission hearing room as the Commission returned to open session. Ms. O’Neal stated that the Mississippi Commission on Environmental Quality had reached a decision to assess a \$125,000 civil penalty against Superior Pallet Company, LLC, located at 4955 Methodist Home Road in Jackson, for multiple violations of state environmental laws. The Commission determined that the company had illegally burned industrial waste, created an unauthorized dump, operated without required industrial stormwater permit coverage, and denied access to MDEQ personnel when they attempted to investigate alleged violations. The Commission’s decision also included a directive to the company to perform corrective actions to address the violations and prevent future occurrences. An Order memorializing the Commission’s decision will be prepared by MDEQ legal counsel to be executed by the Commission.

Solid Waste Assistance and Waste Tire Grants

On previous authority delegated to the MDEQ Executive Director, the Commission was provided a listing by staff of the following solid waste assistance grants that have been awarded to local governments:

| <u>County/Municipality</u>          | <u>Grant Amount</u> |
|-------------------------------------|---------------------|
| City of Meridian                    | \$ 50,000.00        |
| City of McComb                      | \$ 50,000.00        |
| Desoto County Board of Supervisors  | \$ 51,114.64        |
| Grenada County Board of Supervisors | \$ 25,000.00        |

|                                        |              |
|----------------------------------------|--------------|
| Grenada County Board of Supervisors    | \$ 14,279.74 |
| Hancock County Board of Supervisors    | \$ 15,902.87 |
| Harrison County Board of Supervisors   | \$ 25,029.02 |
| Hinds County Board of Supervisors      | \$ 27,239.50 |
| Hinds County Board of Supervisors      | \$ 75,000.00 |
| Holmes County Board of Supervisors     | \$ 28,123.70 |
| Humphreys County Board of Supervisors  | \$ 13,692.38 |
| Itawamba County Board of Supervisors   | \$ 20,027.00 |
| Lafayette County Board of Supervisors  | \$ 20,614.36 |
| Lamar County Board of Supervisors      | \$ 19,433.33 |
| Lauderdale County Board of Supervisors | \$ 55,906.18 |
| Leake County Board of Supervisors      | \$ 33,610.69 |
| Lee County Board of Supervisors        | \$ 22,824.85 |
| Marshall County Board of Supervisors   | \$ 21,201.72 |
| Monroe County Board of Supervisors     | \$ 21,940.65 |
| Noxubee County Board of Supervisors    | \$ 20,027.00 |
| Panola County Board of Supervisors     | \$ 38,382.85 |
| Pike County Board of Supervisors       | \$ 50,000.00 |
| Perry County Board of Supervisors      | \$ 18,113.35 |
| Prentiss County Board of Supervisors   | \$ 16,932.32 |
| Quitman County Board of Supervisors    | \$ 13,837.64 |
| Scott County Board of Supervisors      | \$ 18,258.61 |
| Smith County Board of Supervisors      | \$ 20,317.52 |
| Stone County Board of Supervisors      | \$ 14,385.71 |
| Sunflower County Board of Supervisors  | \$ 26,058.47 |
| Tate County Board of Supervisors       | \$ 50,000.00 |
| Tate County Board of Supervisors       | \$ 20,983.83 |
| Tunica County Board of Supervisors     | \$ 48,494.41 |
| Union County Board of Supervisors      | \$ 17,077.58 |
| Walthall County Board of Supervisors   | \$ 17,519.68 |
| Warren County Board of Supervisors     | \$ 21,940.65 |
| Washington County Board of Supervisors | \$ 5,432.22  |
| Yazoo County Board of Supervisors      | \$ 25,325.85 |

On previous authority delegated to the MDEQ Executive Director, the Commission was provided a listing by staff of the following waste tire grants that have been awarded to local governments:

| <u>County/Municipality</u>              | <u>Grant Amount</u> |
|-----------------------------------------|---------------------|
| Grenada County Board of Supervisors     | \$ 20,000.00        |
| Hancock County Board of Supervisors     | \$ 50,000.00        |
| Hinds County Board of Supervisors       | \$ 80,000.00        |
| Pearl River County Board of Supervisors | \$ 40,000.00        |
| Washington County Board of Supervisors  | \$ 51,500.00        |

Asbestos Certifications

On previous authority delegated to the Head, Office of Pollution Control, the staff reported that 270 asbestos certifications had been issued since the last report.

Lead Paint Certifications

On previous authority delegated to the Head, Office of Pollution Control, the staff reported that 99 lead paint certifications had been issued since the last report.

Underground Storage Tank (UST) Certifications

On previous authority delegated to the Head, Office of Pollution Control, the staff reported that 3 new and 9 renewed certifications to those who install, alter, or remove underground storage tanks had been issued since the last report.

Wastewater Operator Certifications

On previous authority delegated to the Head, Office of Pollution Control, the staff reported that 5 new and 31 renewed wastewater operator certificates had been issued since the last report.

Emergency Clean-Up Expenses

On previous authority delegated to the MDEQ Executive Director, the staff reported the Emergency Clean-Up Expenses incurred since the Commission's last meeting. A list of these expenses is made a part of these minutes and is filed in the Official Minutes File.

Administrative Orders

On previous authority delegated to the MDEQ Executive Director, the staff reported that 35 Administrative Orders have been issued since the Commission's meeting on April 24, 2025. A list of these orders is made a part of these minutes and is filed in the Official Minutes File.

Other Business

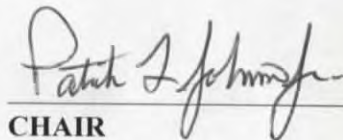
Executive Director Chris Wells recognized MDEQ's longest serving General Counsel, Roy Furrh, who will be retiring from the agency at the end of June.

Setting of Meeting

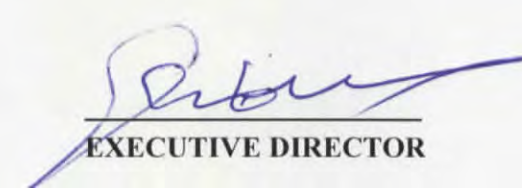
The Commission decided to meet next on Thursday, July 24, 2025, beginning at 9:00 a.m.

Adjournment

There being no further business to come before the Commission, on motion made by Mr. Winstead and seconded by Mr. Phillips, the meeting was adjourned.

  
\_\_\_\_\_  
CHAIR

ATTEST:

  
\_\_\_\_\_  
EXECUTIVE DIRECTOR

EMERGENCY CLEAN-UP EXPENSES

|         |                                                                                                                                                    |                              |
|---------|----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------|
| To:     | E3 Environmental                                                                                                                                   | Date of Response: 01/31/2025 |
| Amount: | \$3,135.14                                                                                                                                         |                              |
| For:    | Costs associated with providing supervision, labor, equipment and materials to respond to and clean up a diesel spill in Rankin County.            |                              |
| To:     | E3 Environmental                                                                                                                                   | Date of Response: 03/02/2025 |
| Amount: | \$1,857.71                                                                                                                                         |                              |
| For:    | Costs associated with providing supervision, labor, equipment and materials to respond to and pick up an abandoned drum in Harrison County.        |                              |
| To:     | E3 Environmental                                                                                                                                   | Date of Response: 03/05/2025 |
| Amount: | \$10,943.27                                                                                                                                        |                              |
| For:    | Costs associated with providing supervision, labor, equipment and materials to respond to and mitigate a vehicle scrap yard.                       |                              |
| To:     | E3 Environmental                                                                                                                                   | Date of Response: 03/30/2025 |
| Amount: | \$1,015.58                                                                                                                                         |                              |
| For:    | Costs associated with providing supervision, labor, equipment and materials to respond to an abandoned drum in Hancock County.                     |                              |
| To:     | E3 Environmental                                                                                                                                   | Date of Response: 04/10/2025 |
| Amount: | \$2,528.42                                                                                                                                         |                              |
| For:    | Costs associated with providing supervision, labor, equipment, and materials to respond to and clean up a hydraulic fluid spill in Jackson County. |                              |

(Attachment 2)  
6/26/2025

## ADMINISTRATIVE ORDERS

|   | <b>Respondent</b>                                                         | <b>Order No.</b>                                                                                  | <b>Summary</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|---|---------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1 | Shiv Kanwar Singh<br>Rankin Co., MS                                       | <b>Agreed Order: 7478 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$750.   | Respondent owns/operates USTs at 760 Highway 49 South, Richland, MS. Respondent failed to inspect overfill devices once every twelve (12) months. {280.30 (d)}.                                                                                                                                                                                                                                                                                                                                    |
| 2 | Alowdi Enterprises LLC<br>Lafayette Co., MS                               | <b>Agreed Order: 7479 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$875.   | Respondent owns/operates USTs at 1455 South Lamar Boulevard, Oxford, MS. Respondent failed to provide adequate release detection method / records for a UST system. {280.44 (a)}. Owner did not install a new automatic line leak detector within ninety (90) days if test records indicate that one failed a functionality test.                                                                                                                                                                  |
| 3 | Alshami Investment LLC<br>Hinds Co., MS                                   | <b>Agreed Order: 7480 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$500.   | Respondent owns/operates USTs at 1141 Terry Road, Jackson, MS. Respondent failed to pay tank fees in a timely manner pursuant to Mississippi Code Annotated § 49-17-421 (Rev. 2023).                                                                                                                                                                                                                                                                                                               |
| 4 | Varinder Arora<br>Pearl River Co., MS                                     | <b>Agreed Order: 7481 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$500.   | Respondent owns/operates USTs at 24961 Highway 43, Picayune, MS. Respondent failed to maintain / provide records for inspection by DEQ {280.35}.                                                                                                                                                                                                                                                                                                                                                   |
| 5 | Tawfik Tom Abdullah (Owner)<br>Thind Bros LLC (Operator)<br>Hinds Co., MS | <b>Agreed Order: 7482 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$1,435. | Respondent owns/operates USTs at 602 Beasley Road Jackson, MS. Respondent failed to test pressurized piping shear valves within the previous twelve (12) months {280.35}, failed to test spill prevention integrity once every twelve (12) months {280.30 (c)}, failed to inspect overfill devices once every twelve (12) months. {280.30 (d)}, failed to test automatic line leak detectors once every twelve (12) months {280.44 (a)} and failed to designate a UST Compliance Manager. {280.37} |
| 6 | Federal Express Corporation<br>De Soto Co., MS                            | <b>Agreed Order: 7483 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$2,275. | Respondent owns/operates USTs at 8505 Nail Road, Olive Branch, MS. Respondent failed to report a suspected or confirmed release {280.50} and failed to ensure that electronic sump sensors were positioned properly {280.45 (b)}.                                                                                                                                                                                                                                                                  |
| 7 | Hardip Singh Sood<br>Ronnie Sood<br>Hinds Co., MS                         | <b>Agreed Order: 7484 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$1,320. | Respondent owns/operates USTs at 4449 West Northside Drive, Jackson, MS. Respondent failed to inspect impressed current cathodic protection system once every sixty (60) days. {280.32 (c)} failed to perform annual inspection of temporarily out of use UST systems and applicable site assessment {280.70} and failed to maintain / provide records for inspection by DEQ {280.35}.                                                                                                             |



|    |                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 8  | Jagir Singh (Owner)<br>Robinjit Singh (Operator)<br>Pike Co., MS | <b>Agreed Order: 7485 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$1,800.                                                                                                                                                                                                                                                                                                                                                | Respondent owns/operates USTs at 503 North Broadway, McComb, MS. Respondent failed to test pressurized piping shear valves within the previous twelve (12) months {280.35}, failed to test spill prevention integrity once every twelve (12) months {280.30 (c)}, failed to inspect overfill devices once every twelve (12) months. {280.30 (d)}, failed to test automatic line leak detectors once every twelve (12) months {280.44 (a)} |
| 9  | Mohammad Azmeer<br>Harrison Co., MS                              | <b>Agreed Order: 7486 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$500.                                                                                                                                                                                                                                                                                                                                                  | Respondent owns/operates USTs at 1103 Pass Road, Gulfport, MS. Respondent failed to maintain / provide records for inspection by DEQ {280.35}.                                                                                                                                                                                                                                                                                            |
| 10 | Triangle Chemical Company<br>Hinds Co., MS                       | <b>Order No. 7487 25</b><br>Respondent agrees to join the MDEQ Voluntary Evaluation Program (VEP)                                                                                                                                                                                                                                                                                                                                                | Respondent operates an agricultural chemical storage/handling facility at 1485 Industrial Drive, Bolton, MS. Respondent applied to enter the VEP after a site investigation affirmed site conditions that warrant oversight by MDEQ.                                                                                                                                                                                                      |
| 11 | Shepco, LLC<br>Panola Co., MS                                    | <b>Order No. 7488 25</b><br>Respondent agreed to pay MDEQ a penalty in the amount of \$10,000.00. Respondent also agreed to submit the following to MDEQ: (1) a Surface Mining Permit Application, (2) a Notice of Intent for coverage under the Large Construction Storm Water General NPDES Permit and/or the Mining Storm Water, Dewatering, and No Discharge General Permit, as well as a (3) Storm Water Pollution Prevention Plan (SWPPP). | Respondent was in violation of Miss. Code Ann. § 53-7-1 et seq. and 11 Miss. Admin. Code Pt. 8, Ch 1 regarding the operation of a surface mine without a Mining Permit, and Miss. Code Ann. § 49-17-29, 11 Miss. Admin. Code Pt. 6, Ch. 1, and the Code of Federal Regulations at 40 CFR 122.26(b)(14)(iii), regarding land disturbing activities without the required Storm Water Permit coverage.                                       |
| 12 | McIngvale Square, LLC<br>DeSoto Co., MS                          | <b>Amendment to Order No. 7378 24</b>                                                                                                                                                                                                                                                                                                                                                                                                            | This Brownfield Agreement Amendment is for the purpose of modifying the Corrective Action Plan and remedial actions at the site to include excavation of soil and soil vapor contamination.                                                                                                                                                                                                                                               |
| 13 | East Side Jersey Dairy Inc.<br>Attala Co., MS                    | <b>Order No. 7489 25</b><br>Respondent agreed to pay MDEQ a penalty in the amount of \$25,500.00.                                                                                                                                                                                                                                                                                                                                                | Respondent was in violation of the discharge limitations required by Pretreatment Permit No. MSP090691 during the April 2023 through January 2025 monitoring periods.                                                                                                                                                                                                                                                                     |
| 14 | Hankins Lumber Company Inc.<br>Grenada Co., MS                   | <b>Order No. 7490 25</b><br>Respondent agreed to pay MDEQ a penalty in the amount of \$20,250.00.                                                                                                                                                                                                                                                                                                                                                | Respondent was in violation of Condition 3.B.7 of Title V Operating Permit No. 0960-00010 for exceeding the Filterable Particulate Matter (PM) limitation of 0.44 pounds per one million British thermal units during stack tests of Emission Points AA-001 and AA-002 on March 26-27, 2024.                                                                                                                                              |
| 15 | Calgon Carbon Corporation<br>Hancock Co., MS                     | <b>Order No. 7491 25</b><br>Respondent agreed to pay MDEQ a penalty in the amount of \$56,000.00.                                                                                                                                                                                                                                                                                                                                                | Respondent was in violation of Conditions 3.14 and 3.18 of Permit to Construct Air Emissions Equipment No. 1000-00015 for exceeding the Nitrous Oxides (Nox) limitation of 4.19 pounds per hour (lb/hr) during a                                                                                                                                                                                                                          |

|    |                                                                                |                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----|--------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                                                |                                                                                               | stack test of Emission Point AA-035 on August 13, 2024, and during a stack test of Emission Point AA-034 on August 14, 2024.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| 16 | Amit Benerjee (Owner)<br>Ahmed Elnaham (Operator)<br>Hinds Co., MS             | <b>Order No. 7492 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$1,000. | Respondent owns/operates USTs at 418 Savannah Street, Jackson, MS. Respondent failed to test pressurized piping shear valves within the previous twelve (12) months {280.35}, failed to test spill prevention integrity once every twelve (12) months {280.30 (c)}, failed to inspect overfill devices once every twelve (12) months. {280.30 (d)}, failed to test automatic line leak detectors once every twelve (12) months {280.44 (a)} and failed to maintain / provide records for inspection by DEQ {280.35}. Annual testing is 60 days past due.                                                                                                       |
| 17 | Terry Texaco Food & Gas LLC<br>Hinds Co., MS                                   | <b>Order No. 7493 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$500.   | Respondent owns/operates USTs at 511 west Cunningham Avenue, Terry, MS. Respondent failed to repair and retest cathodic protection system within 90 days of failure. {280.32 (b)(1)}                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 18 | Jaswinder Singh<br>Pike Co., MS                                                | <b>Order No. 7494 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$2,500. | Respondent owns/operates USTs at 300 Old Industrial Parkway & Old Highway 24, McComb, MS. Respondent failed to test pressurized piping shear valves within the previous twelve (12) months {280.35}, failed to test spill prevention integrity once every twelve (12) months {280.30 (c)}, failed to inspect overfill devices once every twelve (12) months. {280.30 (d)}, failed to test automatic line leak detectors once every twelve (12) months {280.44 (a)}, failed to perform annual inspection of temporarily out of use UST systems and applicable site assessment {280.70} and failed to maintain / provide records for inspection by DEQ {280.35}. |
| 19 | J & R International XV LLC<br>Rankin Co., MS                                   | <b>Order No. 7495 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$2,660. | Respondent owns/operates USTs at 690 Grants Ferry Road, Flowood, MS. Respondent failed to test pressurized piping shear valves within the previous twelve (12) months {280.35}, failed to test spill prevention integrity once every twelve (12) months {280.30 (c)}, failed to inspect overfill devices once every twelve (12) months. {280.30 (d)}, failed to test automatic line leak detectors once every twelve (12) months {280.44 (a)}, and failed to provide adequate release detection methods / records for a UST system. {280.40 – 280.45}                                                                                                          |
| 20 | Tunica Xpress LLC (Owner)<br>Dees Oil Company Inc (Operator)<br>Tunica Co., MS | <b>Order No. 7496 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of          | Respondent owns/operates USTs at 2515 Highway 4 East, Tunica, MS. Respondent failed to test                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |



|    |                                                     |                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|----|-----------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|    |                                                     | \$1,350.                                                                                                                                                                                                                      | cathodic protection system within six (6) months of installation / repair and /or once every three (3) years thereafter {280.32 (b)(1)} and failed to maintain / provide records for inspection by DEQ {280.35}.                                                                                                                                                                                                                                                                                                                                                   |
| 21 | IMTAA LLC<br>Harrison Co., MS                       | <b>Order No. 7497 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$1,500.                                                                                                                                 | Respondent owns/operates USTs at 10166 Lorraine Road, Gulfport, MS. Respondent failed to meet UST system spill prevention requirements {280.20 (c)}, Premium spill bucket failed testing on 8/29/2022 and was not corrected within 90 days.                                                                                                                                                                                                                                                                                                                        |
| 22 | Surjit Singh (Operator)<br>Hinds Co., MS            | <b>Order No. 7498 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$2,000.                                                                                                                                 | Respondent owns/operates USTs at 5555 Highway 18, Jackson, MS. Respondent failed to provide adequate release detection methods / records for a UST system. {280.40 280.45}                                                                                                                                                                                                                                                                                                                                                                                         |
| 23 | Gautam M Patel<br>Lowndes Co., MS                   | <b>Order No. 7499 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$500.                                                                                                                                   | Respondent owns/operates USTs at 2230 Military Road, Columbus, MS. Respondent failed to pay tank fees in a timely manner pursuant to Mississippi Code Annotated § 49-17-421 (Rev. 2023).                                                                                                                                                                                                                                                                                                                                                                           |
| 24 | Coahoma County Utility District<br>Coahoma Co., MS  | <b>Order No. 7500 25</b><br>Respondent agreed to pay MDEQ a penalty in the amount of \$1,312.50. A penalty of \$1,312.50 will be held in abeyance, pending Respondent's compliance with the requirements of the Agreed Order. | Respondent was in violation of 11 Miss. Admin. Code Pt. 6, R. 1.1.1.B(2)(a) for operating without a valid NPDES Permit and Condition No. S-3 of NPDES Permit Nos. MS0045187 and MS0045179 for failing to timely submit annual Discharge Monitoring Reports.                                                                                                                                                                                                                                                                                                        |
| 25 | Gluckstadt Crossing<br>Madison Co., MS              | <b>Order No. 7501 25</b><br>Respondent agreed to pay MDEQ a penalty in the amount of \$16,500.00.                                                                                                                             | Respondent was in violation of the Large Construction Storm Water General Permit for Land Disturbing Activities of Five (5) or More Acres at its construction project in Madison County.                                                                                                                                                                                                                                                                                                                                                                           |
| 26 | Challenger Deepwell Services, Inc.<br>Jones Co., MS | <b>Order No. 7502 25</b><br>Respondent agrees to join the MDEQ Voluntary Evaluation Program (VEP)                                                                                                                             | Respondent owns a vacant lot that was previously operated as an oilfield at 422 Avenue C, Laurel, MS. Respondent applied to enter the VEP after site investigations affirmed diesel contamination that warrants oversight by MDEQ.                                                                                                                                                                                                                                                                                                                                 |
| 27 | Shuqualak Lumber Company, Inc.<br>Noxubee Co., MS   | <b>Order No. 7503 25</b><br>Respondent agreed to pay MDEQ a penalty in the amount of \$122,815.00.                                                                                                                            | Respondent was in violation of 11 Miss. Admin. Code Pt. 2, R. 1.3.C for allowing an unnecessary amount of wood-waste and dust to become airborne; Condition Nos. 6.2 and 6.3 of PSD Permit to Construct No. 2000-00013 for failing to timely submit an Initial Notification and Notification of Compliance Status for Emission Point AA-111; and 40 CFR Part 63.7525(c) & (d) for failing to install the required Continuous Opacity Monitoring System or an approved alternative on four wood-waste boilers. Emissions Points AA-101, AA-102, AA-107, and AA-108. |

|    |                                                                                                 |                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|----|-------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 28 | New Investment LLC<br>De Soto Co., MS                                                           | <b>Order No. 7504 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$2,500. | Respondent owns/operates USTs at 6780 Holly Springs Road, Hernando, MS. Respondent failed to report a suspected or confirmed release {280.50} and failed to maintain / provide records for inspection by DEQ {280.35}. Premium tank did not pass a 0.2 gph leak test for July 2024 through April 2025. Issue was not reported to MDEQ as suspected release.                                                                                                                                                                                                                                                                                                                                     |
| 29 | Ravinder LLC<br>Hinds Co., MS                                                                   | <b>Order No. 7505 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$2,550. | Respondent owns/operates USTs at 905 Cooper Road, Jackson, MS. Respondent failed to test pressurized piping shear valves within the previous twelve (12) months {280.35}, failed to test spill prevention integrity once every twelve (12) months {280.30 (c)}, failed to inspect overfill devices once every twelve (12) months. {280.30 (d)}, failed to test automatic line leak detectors once every twelve (12) months {280.44 (a)}, failed to designate a UST Compliance manager {280.37} and failed to maintain / provide records for inspection by DEQ {280.35}.                                                                                                                         |
| 30 | Sanjay Kumar (Owner)<br>Dash Oil (Shipper)<br>A.B. Oil Trans LLC (Carrier)<br>Jefferson Co., MS | <b>Order No. 7506 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$7,500. | Respondent owns/operates USTs at 1004 S Main Street, Fayette, MS. Respondent failed to adhere to MDEQ classification as ineligible for delivery, deposit, or acceptance of a regulated substance into an UST {280.36}.                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 31 | Sanjay Kumar (Owner)<br>Jefferson Co., MS                                                       | <b>Order No. 7507 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$3,800. | Respondent owns/operates USTs at 1004 S Main Street, Fayette, MS. Respondent failed to test pressurized piping shear valves within the previous twelve (12) months {280.35}, failed to test spill prevention integrity once every twelve (12) months {280.30 (c)}, failed to inspect overfill devices once every twelve (12) months. {280.30 (d)}, failed to test automatic line leak detectors once every twelve (12) months {280.44 (a)}, and failed to designate a UST Compliance manager {280.37}. No annual testing was provided for the year prior to May 2024. Overfill devices and shear valve failures from September 23, 2024 were not corrected or repaired within ninety (90) days. |
| 32 | Algazali Family Inc<br>Coahoma Co., MS                                                          | <b>Order No. 7508 25</b><br>Respondent agrees to pay MDEQ a penalty in the amount of \$2,750. | Respondent owns/operates USTs at 714 South State Street, Clarksdale, MS. Respondent failed to report a suspected or confirmed release {280.50}, failed to designate a UST Compliance manager {280.37}, and failed to maintain / provide records for inspection by DEQ {280.35}.                                                                                                                                                                                                                                                                                                                                                                                                                 |

|    |                                                                 |                                                                                                     |                                                                                                                                                                                                                                                                    |
|----|-----------------------------------------------------------------|-----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 33 | Yasier Mohammad and Ahmed Jobah<br>Montgomery Co., MS           | <b>Order No. 7509 25</b><br>Respondent agrees to pay MDEQ<br>a penalty in the amount of<br>\$1,000. | Respondent owns/operates UST's<br>at 201 North State Street, Duck<br>Hill, MS and 703 Church Street,<br>Winona, MS. Respondent failed<br>to pay tank fees in a timely<br>manner pursuant to Mississippi<br>Code Annotated § 49-17-421<br>(Rev. 2023).              |
| 34 | City of Natchez<br>Adams Co., MS                                | <b>Order No. 7510 25</b>                                                                            | This Agreed Order is for the<br>purpose of establishing a<br>schedule agreement with the City<br>of Natchez (Brownfield Party)<br>and acknowledges their entry in<br>the Mississippi Brownfield<br>Program for the former Fry<br>Building site.                    |
| 35 | Modification to the Scott County Solid<br>Waste Management Plan | <b>Order No. 7511 25</b>                                                                            | This order approves a<br>modification to the Scott County<br>Solid Waste Management Plan to<br>include in the plan three new<br>land application facilities to be<br>operated by Denali Water<br>Solutions, LLC, for the<br>application of municipal<br>biosolids. |



## **Hydrocarbon Well Official Plug and Abandonment Form**



MISSISSIPPI OIL AND GAS BOARD  
PLUGGING RECORD

Within 30 days after the plugging of any well the owner, operator or producer responsible therefor shall file an affidavit on Form No. 7 with the Board, setting forth in detail the method used in plugging the well and a record of any casing removed.

Producer E. C. Wentworth Field Wildcat  
Pool Dry hole County Adams  
Address all correspondence concerning this form to:  
Street Box 266 City Natchez State Miss.  
Lease Name Jefferson County Board of Supervisors Well No. 1  
Sec. 69 Township 8N Range 1E Date Plugged 9-14-56

Set out in detail the method used in plugging well, showing the interval of cement plugs, weight of mud left in hole, description of plug left at surface, and a record of any casing pulled with notation of any junk left in hole at time of plugging.

From 1500 ft. to 1450 ft. w/19 sx. by Halliburton

From 440 ft. to 380 ft. w/20 sx. by Halliburton

Surface w/3 sx. by hand

## CASING RECORD

(This information to be furnished in full)

CASING SET IN WELL

| Size  | Depth Set | Sacks Cement |
|-------|-----------|--------------|
| 8-5/8 | 400       | 170          |
|       |           |              |
|       |           |              |

CASING PULLED FROM WELL

| Size | Amount Pulled | Date Pulled |
|------|---------------|-------------|
| None |               |             |
|      |               |             |
|      |               |             |

TOTAL DEPTH OF WELL 5720 Ft. BASE OF FRESH WATER STRATA 1485 Ft.  
(This data must be supplied)

(Affidavit)

STATE OF Mississippi  
COUNTY OF Adams

J. R. North, Jr.  
Representative of Operator  
Agent

Title

Before me, the undersigned authority, on this day personally appeared J. R. North, Jr.

known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states that he is authorized to make this report and has knowledge of the facts stated herein and that said report is true and correct.

Subscribed and sworn to before me this the 25th day of September, 19 56

Notary Public In and For Adams County, Miss.

INSTRUCTIONS ON BACK

My Commission Expires Dec. 5, 1958

23-063-00550





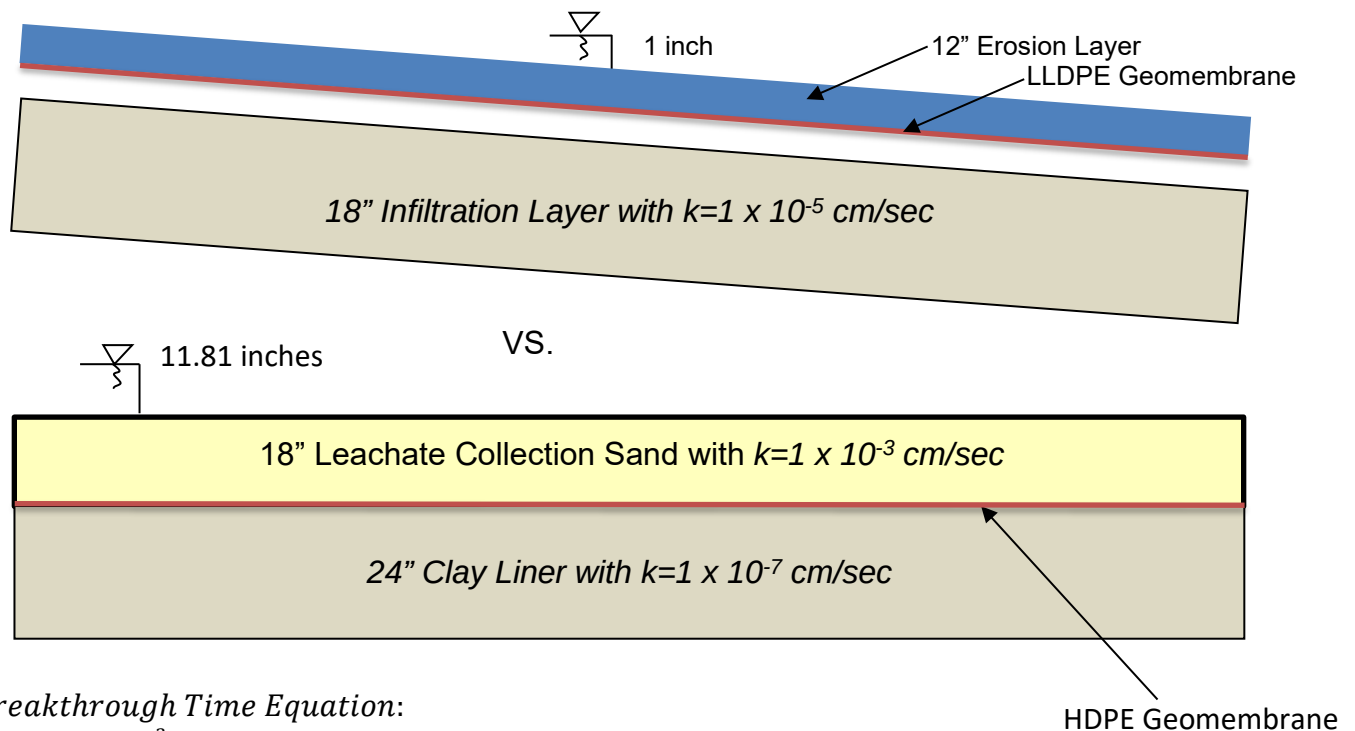
**Breakthrough Time Calculations for Final Cover Option A vs  
Bottom Liner System**



## Determination of Breakthrough Time for Final Cover Option A and Bottom Composite Liner System:

- **Cap Profile**
  - o 12" Erosion Layer ( $k = 1 \times 10^{-5} \text{ cm/sec}$ ) at 4% Slope
  - o 40 mil LLDPE Geomembrane ( $k = 2.73 \times 10^{-13} \text{ cm/sec}$ ) at 4% Slope
  - o 18" Infiltration Layer ( $k = 1 \times 10^{-5} \text{ cm/sec}$ ) at 4% Slope
- **Bottom Liner System**
  - o 18" Leachate Collection Sand ( $k = 1 \times 10^{-3} \text{ cm/sec}$ )
  - o 60 mil HDPE Geomembrane ( $k = 2.73 \times 10^{-13} \text{ cm/sec}$ )
  - o 24" Clay Liner ( $k = 1.0 \times 10^{-7} \text{ cm/sec}$ )

Determination of Final Cover Option A breakthrough time equivalency with the bottom composite liner system of the landfill.



*Breakthrough Time Equation:*

$$t = \frac{d^2 n}{k(d+h)}$$

$t$  = breakthrough time, yr

$d$  = linear thickness, m

$h$  = hydraulic head, m

$k$  = permeability,  $\frac{\text{m}}{\text{yr}}$

$n$  = effective porosity (unitless; Assumes 0.3 for clay material, 1.0 for geomembrane, and 0.1 for leachate collection sand)



### **Final Cover Option A**

- For Erosion Layer at 4% Slope

$$t = \frac{d^2n}{k(d+h)} = \frac{.30m^2(.3)}{3.1536m/yr(.30m + .0254m)} = .026 \text{ years}$$

- For 40 mil LLDPE Geomembrane at 4% Slope

$$t = \frac{d^2n}{k(d+h)} = \frac{.00102m^2(1)}{8.61 \times 10^{-8}m/yr(.00102m + .0254m)} = 457.36 \text{ years}$$

- 18" Infiltration Layer at 4% Slope

$$t = \frac{d^2n}{k(d+h)} = \frac{.457m^2(.3)}{3.15m/yr(.457m + .0254m)} = .041 \text{ years}$$

**Total Breakthrough Time = 447.43 years**

### **Bottom Liner System**

- For Collection Sand

$$t = \frac{d^2n}{k(d+h)} = \frac{.457m^2(.1)}{3.1536m/yr(.457m + .30m)} = .0087 \text{ years}$$

- For 60 mil HDPE Geomembrane

$$t = \frac{d^2n}{k(d+h)} = \frac{.00152m^2(1)}{8.61 \times 10^{-8}m/yr(.00152m + .30m)} = 89.0 \text{ years}$$

- For 24" Clay Liner

$$t = \frac{d^2n}{k(d+h)} = \frac{.610m^2(.3)}{3.15 \times 10^{-2}m/yr(.610m + .30m)} = 3.89 \text{ years}$$

**Total Breakthrough Time = 92.9 years**

Conclusion: The breakthrough time for the Final Cover Option A cap profile, given a scenario of 1" of head, has a longer breakthrough time than the bottom composite liner system with 11.81" of head.





**Additional Support For Fault Areas, Seismic Impact Zones, and Unstable Areas**





## EARTHQUAKES IN MISSISSIPPI

Michael B. E. Bograd, updated by Barbara Yassin

This is a list of earthquakes originating, or with epicenters, within the State of Mississippi. Given are the date, location, whether or not it was felt, maximum intensity (in the Modified Mercalli Intensity scale of I-XII), and magnitude (a relative measure of the energy released).

September 11, 1853 - Biloxi, felt  
March 27, 1923 - Wyattte, Tate Co., intensity IV  
November 13, 1927 - Jackson, intensity IV  
December 16, 1931 - Batesville-Charleston area, intensity VI-VII, mag. 4.7, damage in northern Miss., felt over 65,000 square miles in Miss., Ala., Ark., Tenn., and Mo.  
June 28, 1941 - Vicksburg, intensity III-IV  
February 1, 1955 - Gulfport, intensity V, felt along the Coast  
June 4, 1967 - Greenville, intensity VI, mag. 3.8, felt over 25,000 square miles in Mississippi, Arkansas, Louisiana, and Tennessee  
June 29, 1967 - Greenville, intensity V, mag. 3.4, felt in 3 counties  
January 8, 1973 - Sunflower County, not felt, mag. 3.5  
May 25, 1973 - Bolivar County, felt  
September 9, 1975 - Hancock Co., intensity IV, mag. 2.9  
October 23, 1976 - northern Clarke County, not felt, magnitude 3.0  
May 3, 1977 - southeastern Clarke County, intensity V, magnitude 3.6  
November 4, 1977 - Vardaman, Calhoun Co., intensity V, magnitude 3.4  
January 8, 1978 - Kemper County-Alabama border, not felt, magnitude 3.0  
June 9, 1978 - eastern Clarke County, not felt, mag. 3.3  
December 10, 1978 - southeastern Clarke County, intensity V, magnitude 3.5  
October 12, 1980 - northwestern Pontotoc County, not felt, magnitude 2.1  
February 15, 1981 - Clarke County, not felt, magnitude 2.4  
January 29, 1983 - northeastern Prentiss County, not felt, magnitude 2.4  
February 5, 1983 - northeastern Prentiss County, intensity V, magnitude 2.9  
April 25, 1983 - Tunica County, not felt, magnitude 1.6  
May 30, 1983 - western Clarke County, not felt, mag. 2.4  
March 23, 1984 - Tishomingo County-Alabama border, not felt, magnitude 2.0  
Sept. 24, 1984 - northwestern Yalobusha Co., felt, mag. 2.5  
May 11, 1986 - northeastern Tunica Co., not felt, mag. 1.6  
August 1, 1988 - Quitman County, not felt, magnitude 2.1  
August 23, 1989 (2 events) - Pachuta, Clarke County, felt  
August 25, 1989 - Pachuta, Clarke County, felt  
November 26, 1989 (2 events) - Pachuta, Clarke Co., felt  
February 11, 1991 - Clarksdale, Coahoma Co., not felt, magnitude 2.7  
December 11, 1992 (2 events) - Belzoni, Humphreys County, both felt, first quake was magnitude 2.4  
March 25, 1996 (2 events) - Clarke County, felt in Quitman

and much of Clarke County, mag. 3.5; an after-shock of mag. 2.5 was felt about 30 minutes later  
May 13, 1996 - northern Tishomingo Co., not felt, mag. 2.7  
August 11, 1996 - southern Bolivar Co., not felt, mag. 3.1  
Feb. 24, 1999 - southern Panola County, int. IV, mag. 2.8  
January 28, 2000 - Shubuta, Clarke Co., not felt, mag. 2.7  
October 10, 2000 - northwestern Lauderdale County, not felt, magnitude 2.3  
January 6, 2002 - near Brooksville, Noxubee County, not felt, magnitude 2.2  
August 11, 2002 - western Panola County, felt, mag. 2.8  
October 26, 2002 - northern Bolivar County, felt, mag. 3.1  
February 26, 2003 - Courtland, Panola Co., felt  
January 20, 2008 - southwestern Yalobusha County, not felt, magnitude 1.7  
May 10, 2008 - Belden, Lee Co., int. IV, magnitude 3.1  
June 2, 2008 - near Senatobia, Tate Co., not felt, mag. 2.2  
July 27, 2012 - Meridian Station, Lauderdale Co., felt, magnitude 2.1  
July 29, 2012 - Meridian Station, Lauderdale Co., not felt, magnitude 1.6  
October 9, 2012 - Jonestown, Coahoma Co., not felt, magnitude 2  
August 30, 2013 - near Corinth, Alcorn Co., not felt, magnitude 2.0  
May 2, 2015 (2 events) - S. Madison Co., both felt, magnitude 3.2 and 3.0  
June 29, 2015 - S. Madison Co., felt, magnitude 3.2  
Aug. 17, 2015 - S. Madison Co., felt, magnitude 2.6  
Jan. 8, 2019 - Hollandale, Washington Co., felt, mag. 3.7  
August 9, 2019 - S. Madison Co., felt, magnitude 2.8  
November 21, 2019 - Booneville, Prentiss Co., felt, mag. 2.3  
Feb. 29, 2020 - Booneville, Prentiss Co., not felt, mag. 2.1  
July 20, 2020 - Tunica, Tunica Co., felt, mag. 2.3  
Nov. 18, 2020 - Yalobusha Co., not felt, mag. 2.0  
Dec. 2, 2020 - Hamilton, Monroe Co., not felt, mag. 1.9  
Dec. 7, 2020 - near Marks, Quitman Co., not felt, mag. 2.0  
Jan. 20, 2021 - Collins, Covington Co., felt, magnitude 2.1

### EARTHQUAKE RISK

The map indicates that earthquakes have occurred throughout Mississippi. It is expected that earthquakes of low magnitude will continue to occur. Many earthquakes in neighboring (and distant) states have been felt in parts of Mississippi. However, the greatest risk to Mississippi from earthquakes is from a strong earthquake in the New Madrid Seismic Zone, the southern end of which is about 40 miles from the northwest corner of Mississippi. The great New Madrid earthquake series of 1811-1812 included at least four shocks strong enough to shake northern Mississippi at damaging intensities and be felt throughout the state. The 1843 earthquake at the southern end of the zone shook the northern third of Mississippi strongly enough to cause damage. People in Mississippi should take precautions for another strong earthquake on the New Madrid Seismic Zone.





Fact Sheet 1  
revised January 2021

SOURCES

The listings were compiled from published catalogs of earthquakes. The more recent, instrumentally recorded locations were taken from publications of the U.S. Geological Survey, National Earthquake Information Center, and the Center for Earthquake Research and Information at the University of Memphis.

DISCLAIMERS

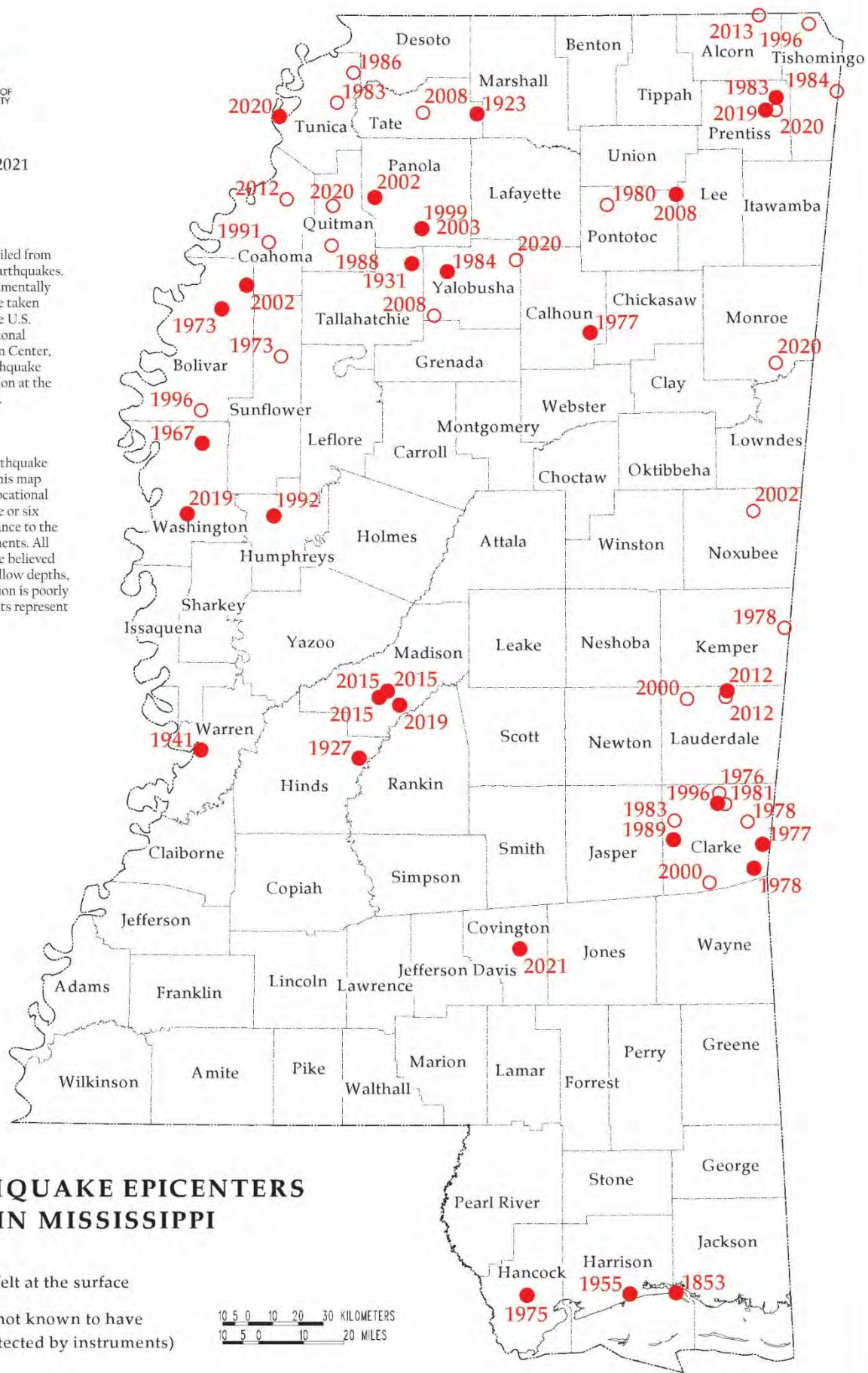
The locations of the earthquake epicenters plotted on this map are approximate. The locational uncertainty of up to five or six miles is due to the distance to the nearest seismic instruments. All of these earthquakes are believed to have occurred at shallow depths, but the depth information is poorly constrained. Some points represent multiple events.



## EARTHQUAKE EPICENTERS IN MISSISSIPPI

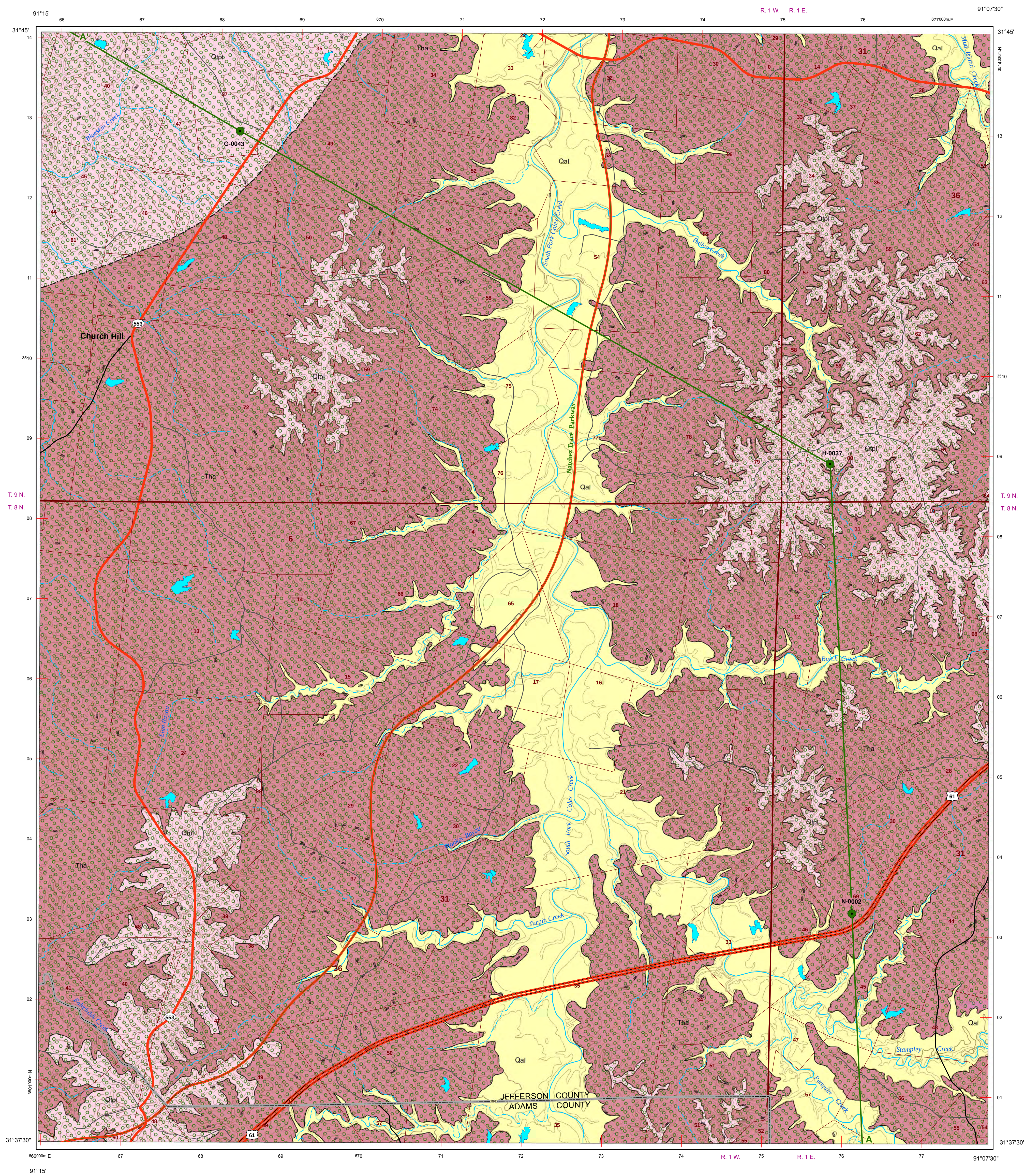
- Earthquake felt at the surface
- Earthquake not known to have been felt (detected by instruments)

10 5 0 10 20 30 KILOMETERS  
10 5 0 10 20 MILES

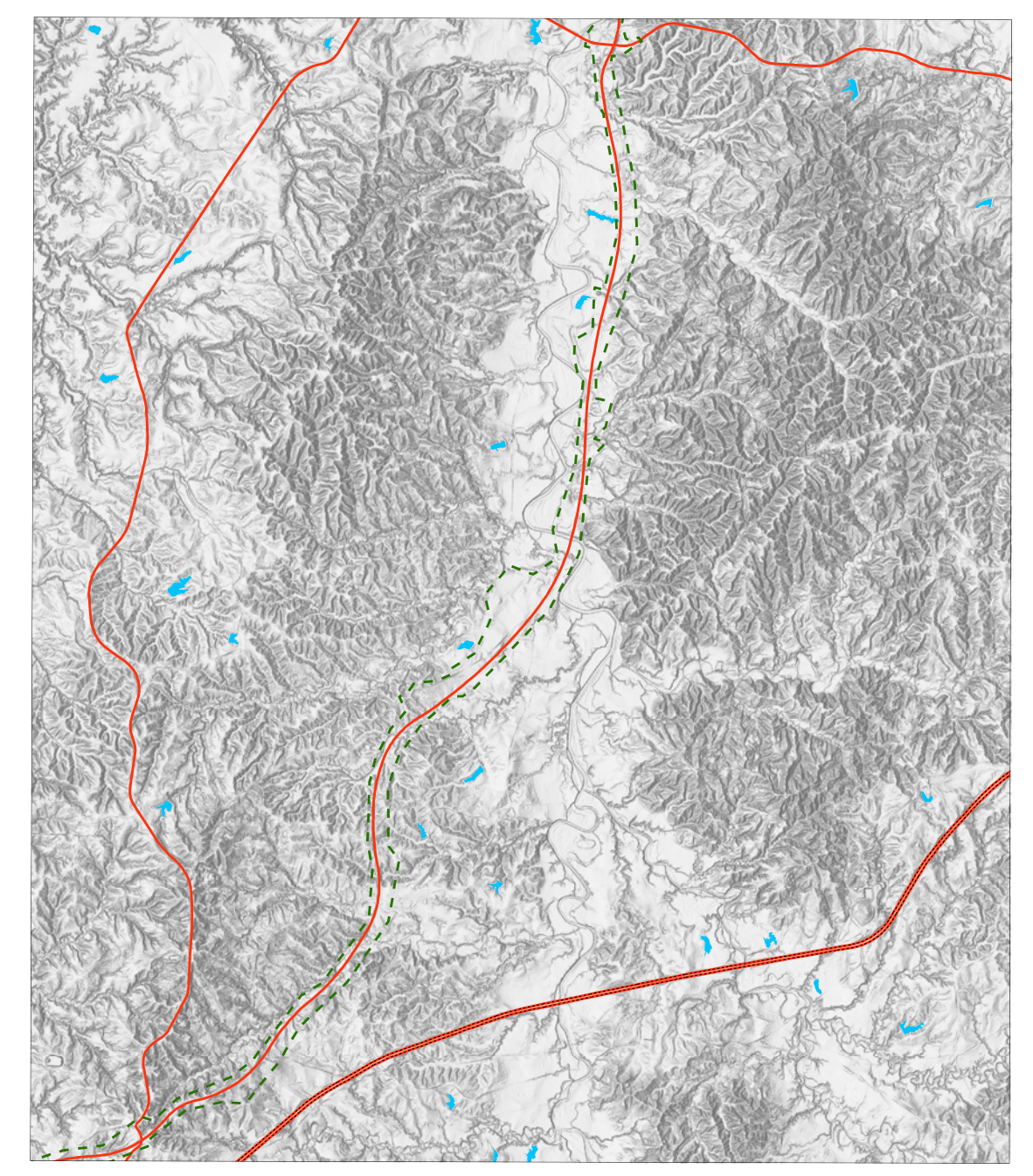


GIS by Barbara Yassin



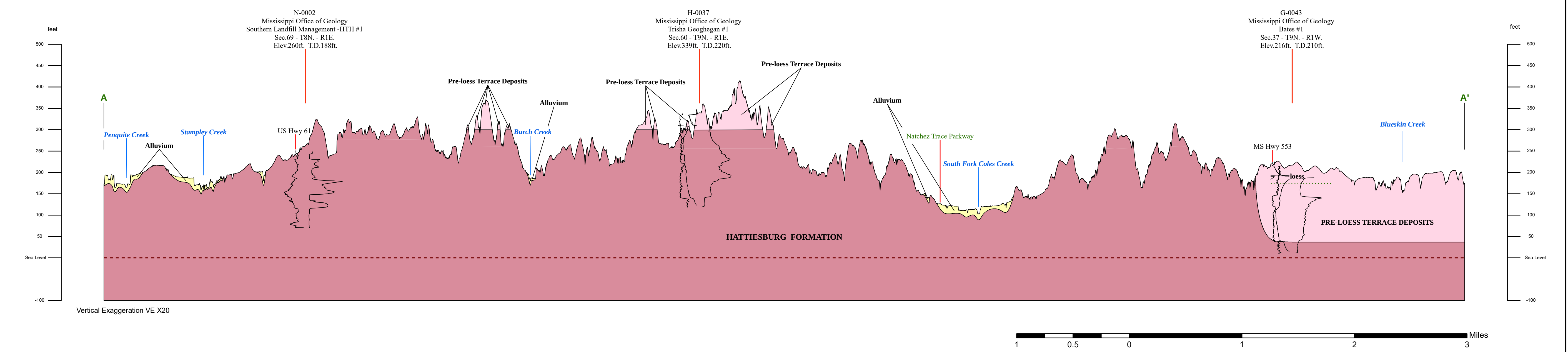


| MISSISSIPPI DEPARTMENT OF ENVIRONMENTAL QUALITY             |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| OFFICE OF GEOLOGY                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| OPEN-FILE REPORT 294                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| GEOLOGIC MAP                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| of the                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| CHURCH HILL QUADRANGLE                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Jefferson and Adams Counties, Mississippi                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| 2019                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Geology by James E. Starnes, RPG and Jonathan R. Leard, GIT |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| CORRELATION OF MAP UNITS                                    | DESCRIPTION OF MAP UNITS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| QUATERNARY<br>PLEISTOCENE                                   | <b>ALLUVIUM</b><br>Flood plain sands, silts, gravels, and clays.<br>Qal                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|                                                             | <b>LOESS</b><br>Silt, buff to tan, pale yellow, red, gray to gray-green wherein anoxic conditions, quartzose to feldspathic. Loess is an eolian deposit derived from glacial outwash. Loess is typically calcareous with dolomite and calcite; however, the upper portion of the loess is highly weathered, leached / noncalcareous, very clayey, and has been referred to as "brown loam". Loess deposits unconformably blanket the Pre-loess topography with substantial local variations in thickness. In places, weathered loess contains secondary deposits of small calcareous concretions (caliche, loess dolls). Loess can be locally and sparingly fossiliferous, commonly containing tests or stinkerns of pulmonate gastropods and less commonly containing fossils of Pleistocene vertebrates.<br>T.9N.<br>T.8N.<br>Qt                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| TERTIARY<br>MIOCENE                                         | <b>PRE- LOESS TERRACE DEPOSITS</b><br>Sand, yellow, orange, purple, red, pink, fine- to coarse-grained, predominantly quartzose, cross-bedded to massive; graveliferous, pea to large cobble size clasts, clasts of sandstone up to boulder size not uncommon. Gravels are predominantly chert with lesser amounts of vein quartz, metaquartzite, agate, sandstone, and rare rhyolite clasts; clay, pink to white, generally occurring as discontinuous lenses and as rip-up clasts up to boulder-size. Conglomeratic ironstone ledges are common in the graveliferous sands at the base of the deposits, which overlies the Hattiesburg Formation unconformably. Two distinct terraces are identified: one heavily eroded terrace perched approximately 300 feet above MSL in elevation and younger, completely preserved terrace beneath the loess adjacent to the Mississippi River alluvium with a base perched between 20-40 feet above MSL with relic alluvial plain surface at approximately 135 feet above MSL. The escarpment between the lower Pre-loess terrace and the adjacent uplands is approximated due to it being masked by a thick mantle of loess. "Head-of-hollow", terrace-derived valley fill deposits are common at lower elevations and are isolated to valley walls adjacent to the erosional remnants of the higher of the two terrace deposits. These small deposits are of such limited extent as not to warrant representation on this map.<br>Tha |
|                                                             | <b>HATTIESBURG FORMATION</b><br>Clay, green, gray, brown, weathers white to brown, silty to sandy, locally lignitic; sand, gray, pale yellow to white, fine- to coarse-grained, cross-bedded to massive with rare thinly-bedded pea gravels (gravels consist of black chert and milky quartz, are highly polished, sub-angular to well rounded), often indurated to sandstones and siltstones at surface, predominantly quartzose with lesser amounts of chert, etauquartzite, mica, and heavy minerals, slightly glauconitic in places, silicified and coalified wood common. The base of the Hattiesburg Formation is designated at the base of a sand unit of regional extent that occurs at the approximate horizon of the base of the Fleming Formation in Louisiana and the middle -Miocene Amos Sand in Alabama.<br>G-0043<br>Indeterminate Boundary                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |



Bare Earth Southwest MS 2016 LIDAR Hillshade of the Church Hill Quadrangle

Structural Cross-Section of the Church Hill 7.5-Minute Geologic Quadrangle





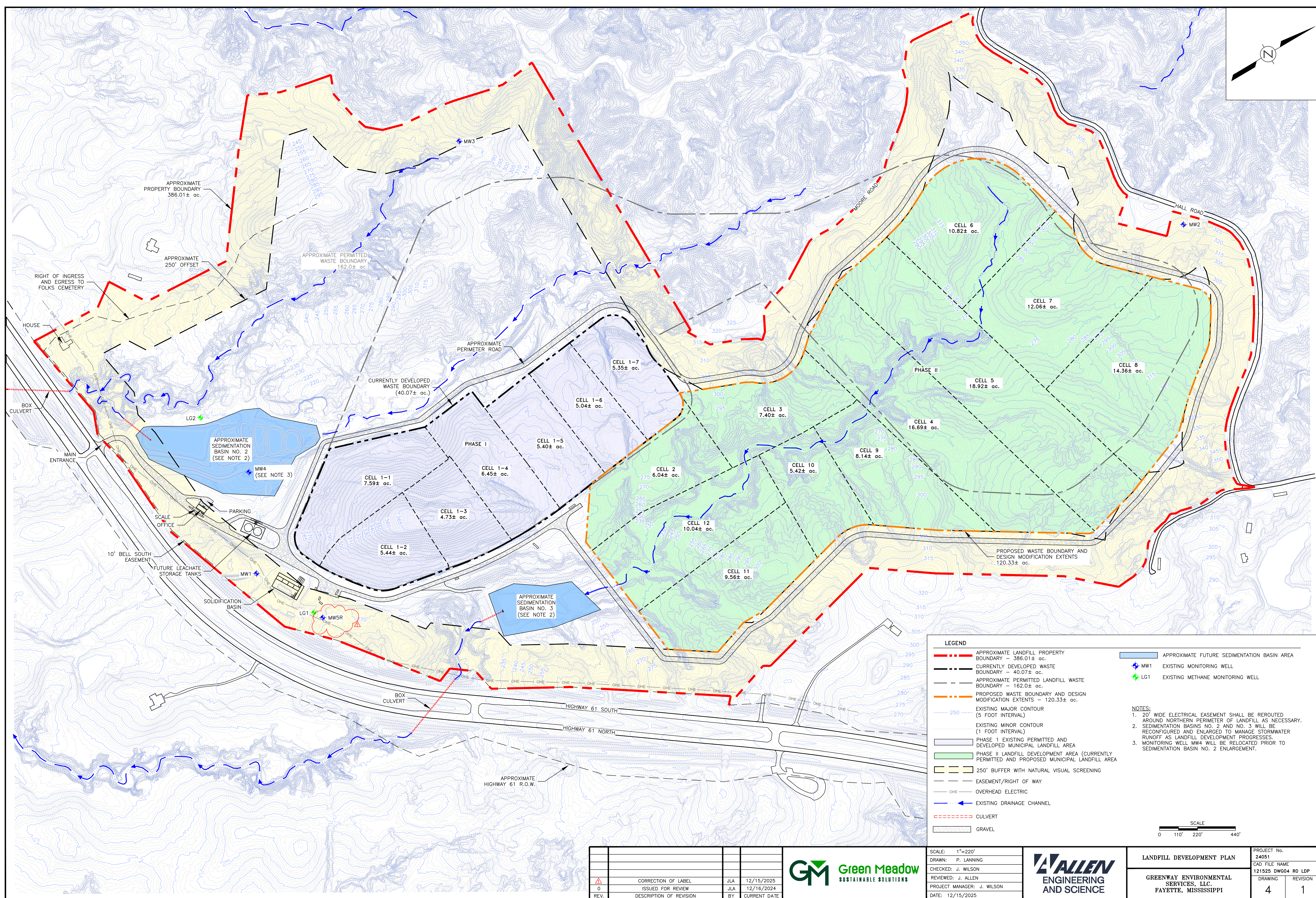


**Revision 01 PAR Drawing 3, Drawing 4, Drawing 6, Drawing 16B and Drawing 19**

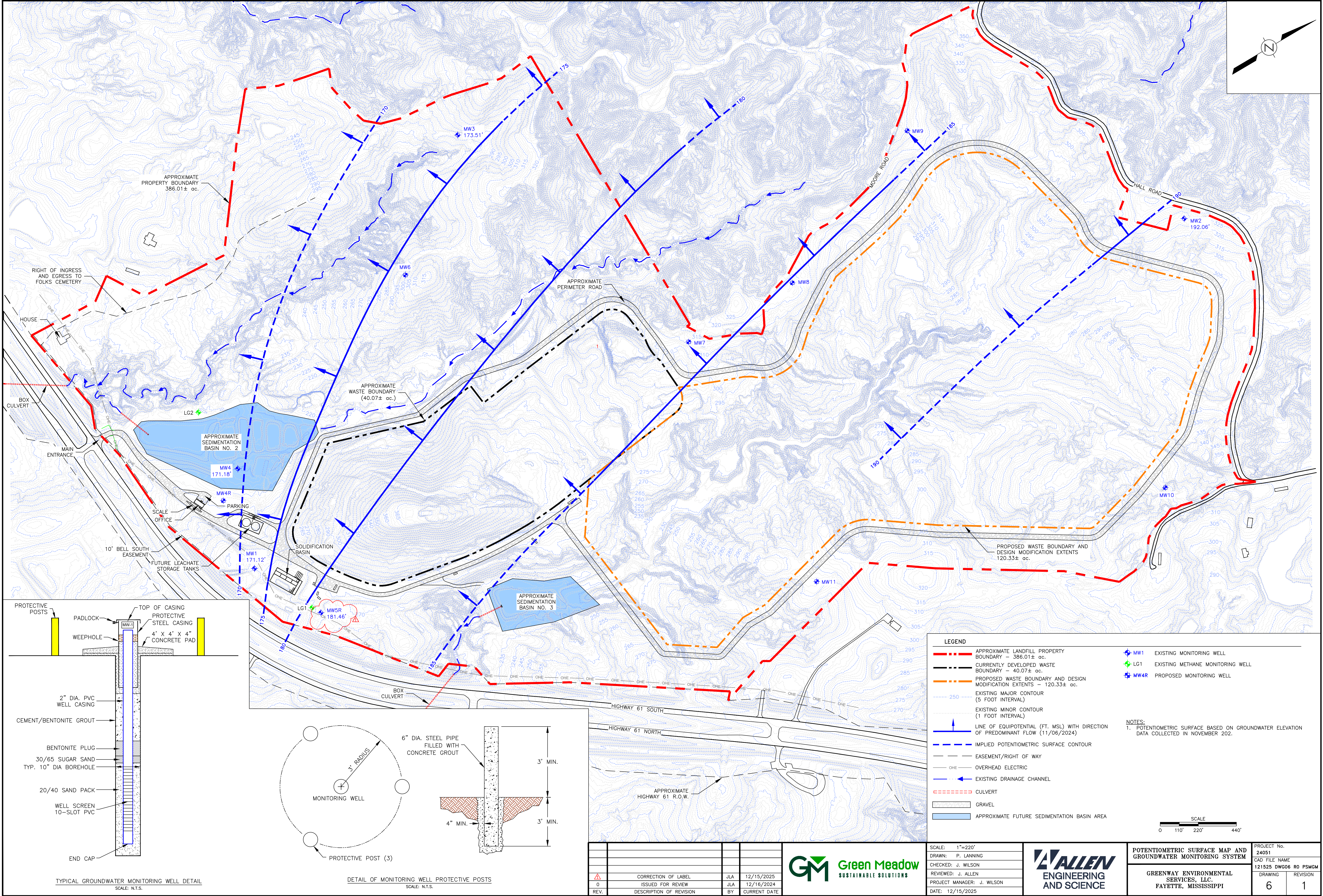




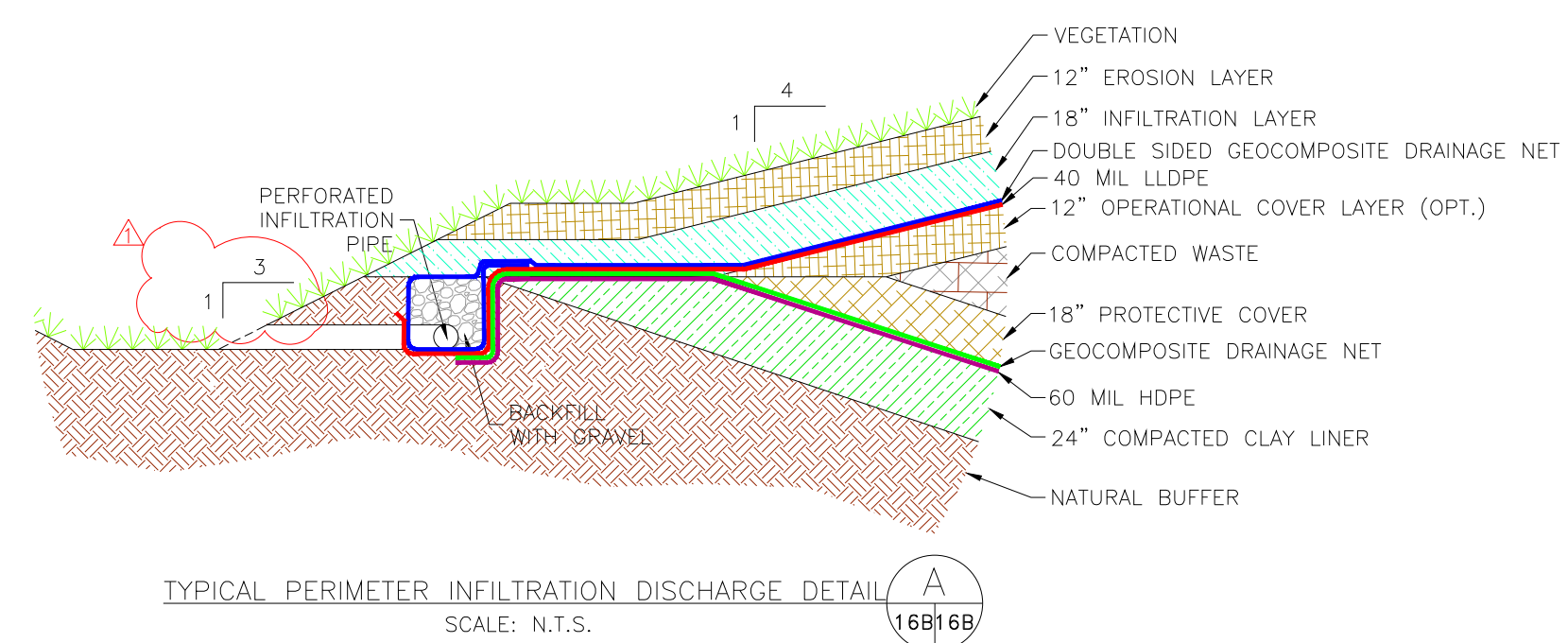
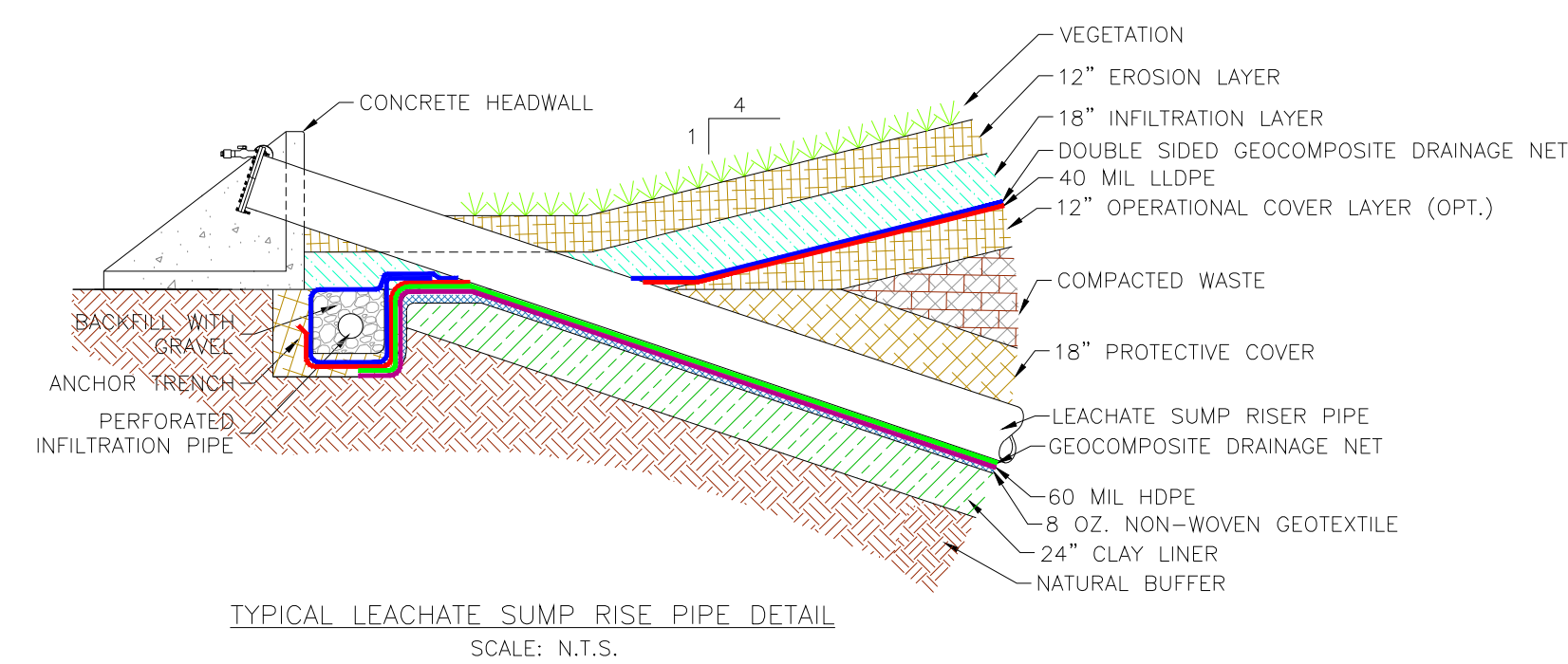
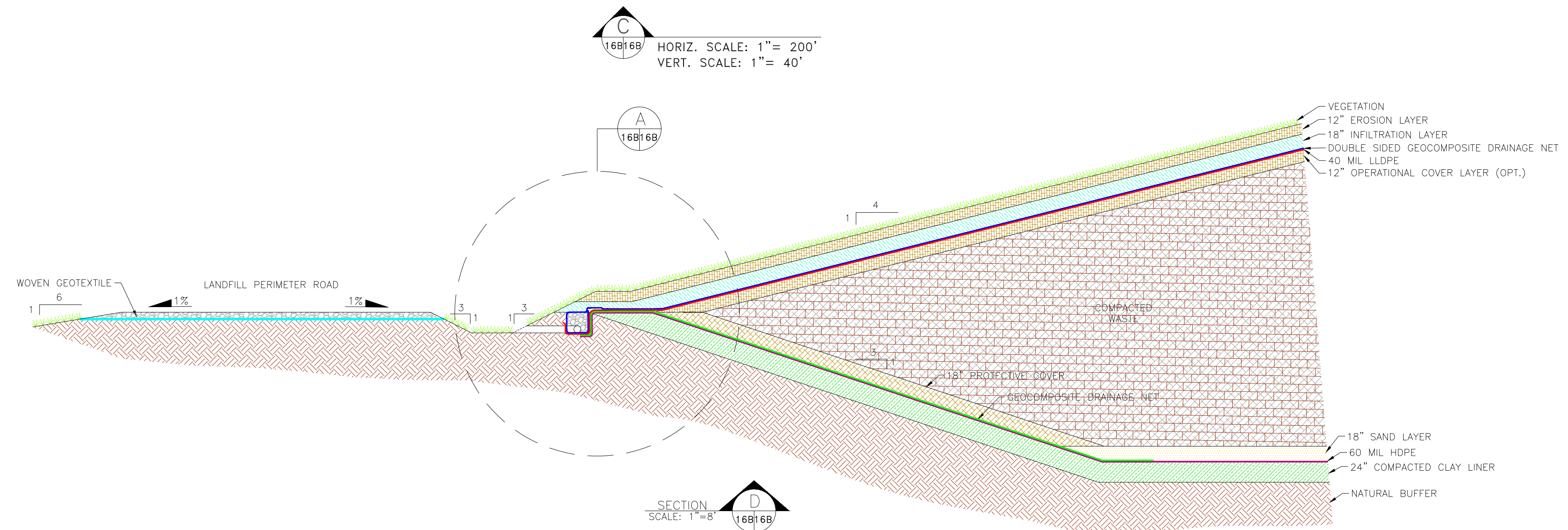
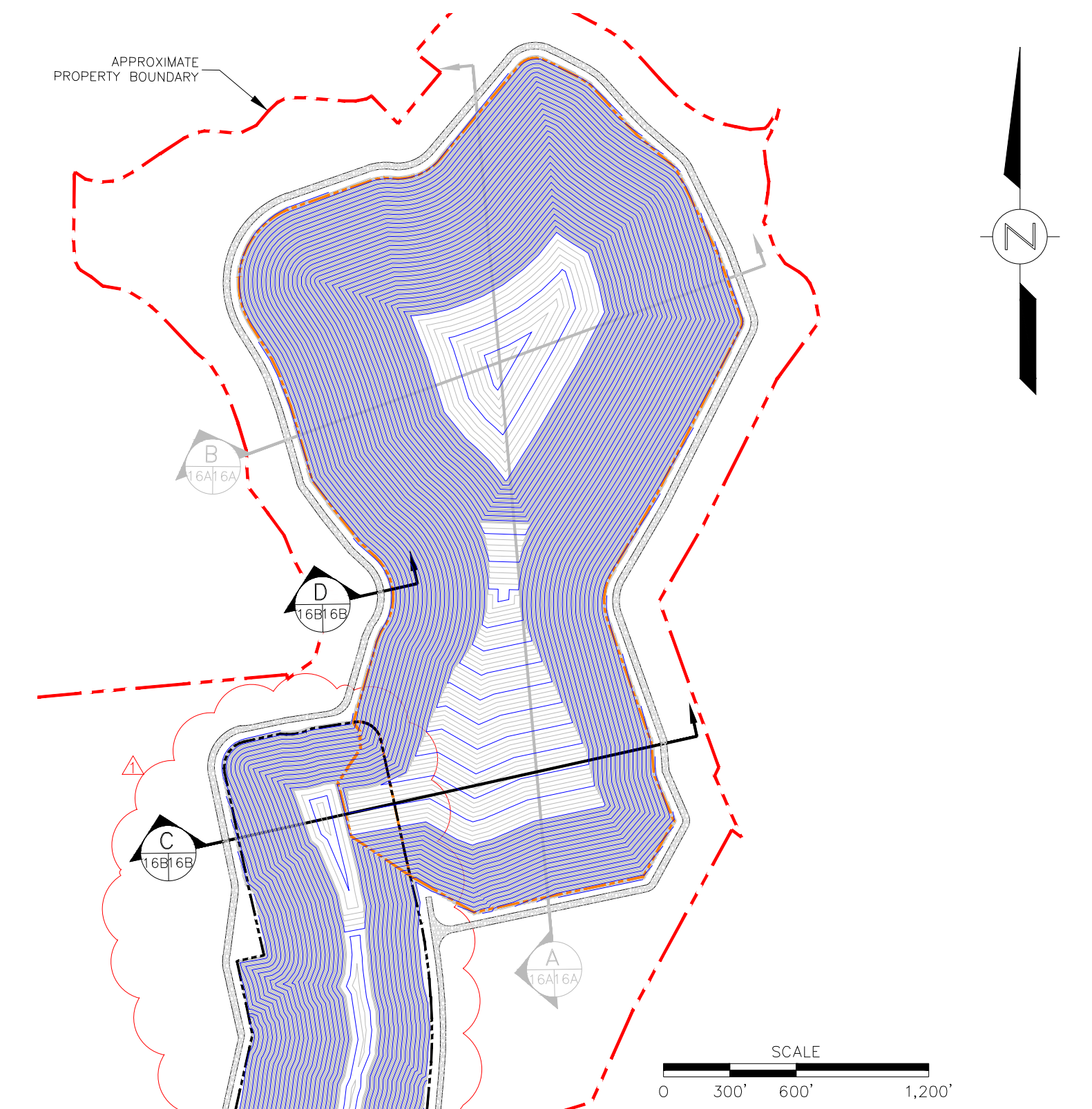
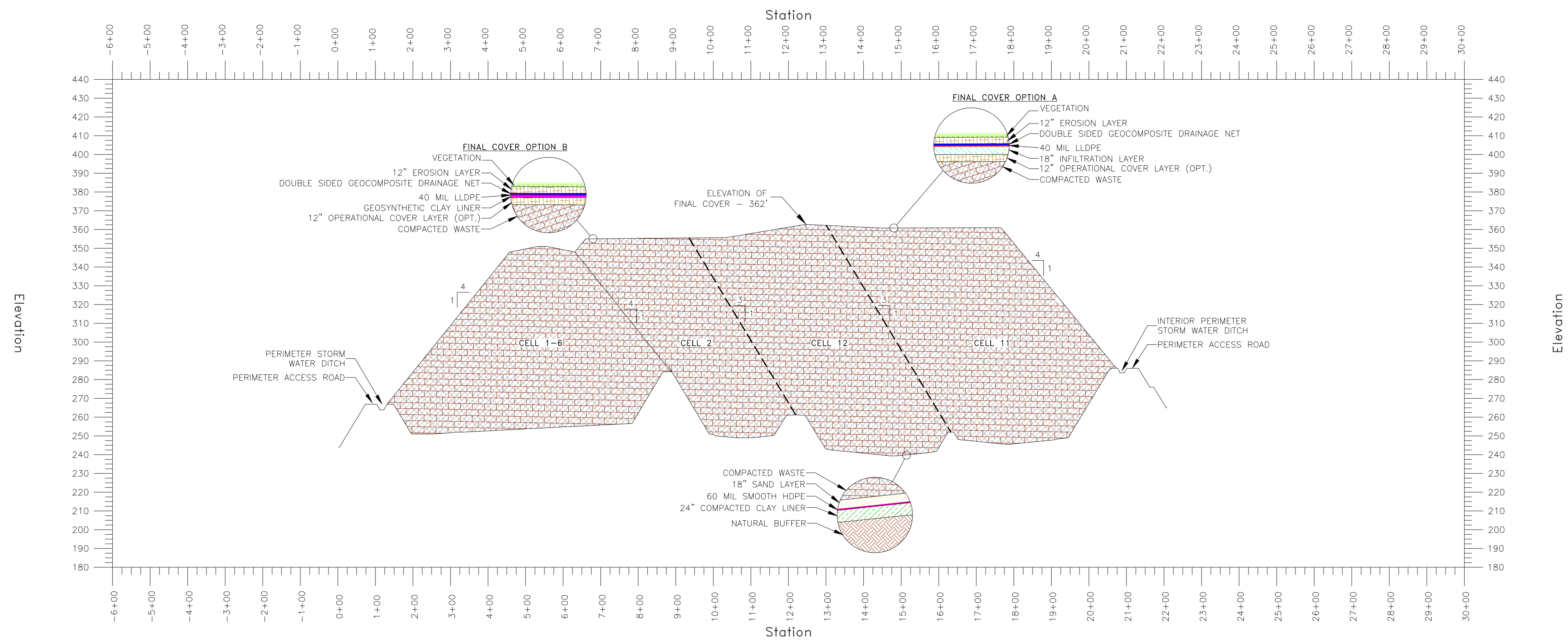




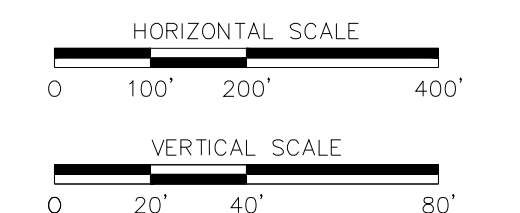








| LEGEND |                                                                                                              |
|--------|--------------------------------------------------------------------------------------------------------------|
|        | SAND LAYER                                                                                                   |
|        | GRAVEL                                                                                                       |
|        | 24" COMPACTED CLAY LINER w/PERMEABILITY $K \leq 1 \times 10^{-7}$ cm/sec OR EQUIVALENT GEOSYNTHETIC MATERIAL |
|        | 18" COMPACTED INFILTRATION LAYER w/PERMEABILITY $K \leq 1 \times 10^{-5}$ cm/sec                             |
|        | NATURAL BUFFER                                                                                               |
|        | COMPACTED WASTE                                                                                              |
|        | PROTECTIVE SOIL, OPERATIONAL COVER AND EROSION LAYER                                                         |
|        | 60 MIL HDPE LINER                                                                                            |
|        | 40 MIL LLDPE LINER                                                                                           |
|        | GEOSYNTHETIC CLAY LINER $K \leq 5 \times 10^{-9}$ cm/sec                                                     |
|        | DOUBLE SIDED GEOCOMPOSITE DRAINAGE NET                                                                       |
|        | GEOCOMPOSITE DRAINAGE NET                                                                                    |
|        | VEGETATION                                                                                                   |



| REV. | DESCRIPTION OF REVISION           | BY  | DATE       |
|------|-----------------------------------|-----|------------|
| 1    | RESPONSE TO 10/2/25 MDEQ COMMENTS | JLA | 10/15/2025 |
| 0    | ISSUED FOR REVIEW                 | JLA | 12/16/2024 |



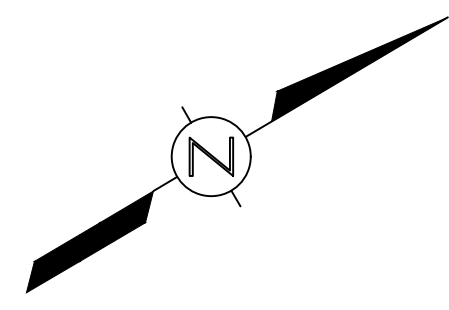
|                  |            |
|------------------|------------|
| SCALE:           | AS SHOWN   |
| DRAWN:           | P. LANNING |
| CHECKED:         | J. WILSON  |
| REVIEWED:        | J. ALLEN   |
| PROJECT MANAGER: | J. WILSON  |
| DATE:            | 10/15/2025 |



|                                                                  |  |
|------------------------------------------------------------------|--|
| FINAL GRADING PLAN<br>CROSS-SECTION AND DETAILS                  |  |
| GREENWAY ENVIRONMENTAL<br>SERVICES, LLC.<br>FAYETTE, MISSISSIPPI |  |

|               |                       |
|---------------|-----------------------|
| PROJECT No.   | 24051                 |
| CAD FILE NAME | 101525 DWG16B R1 FCGC |
| DRAWING       | REVISION              |
| 16B           | 1                     |





- NOTES:  
1 EXACT LOCATIONS OF GAS EXTRACTION WELLS WILL BE IDENTIFIED DURING LANDFILL GAS MANAGEMENT SYSTEM DESIGN.



**ALLEN**  
ENGINEERING  
AND SCIENCE

|                                         |               |
|-----------------------------------------|---------------|
| PROJECT No.<br>24051                    |               |
| CAD FILE NAME<br>101525 DWG19 R1 LGMMSF |               |
| DRAWING<br>19                           | REVISION<br>1 |