Weaver Consultants Group

July 5, 2024
Project No. 0086-364-11-19

Hillary Young, P.E.
Land Protection Division
Oklahoma Department of Environmental Quality (ODEQ)
707 N. Robinson Ave.
Oklahoma City, OK 73102

Re: Response to Comments
Tier III Permit Modification
Muskogee Community Recycling and Disposal Facility – Permit No. 3551020
Muskogee County, Oklahoma

Dear Ms. Young:

On behalf of Waste Management of Oklahoma, Inc., please find enclosed replacement pages for the referenced Tier III Permit Modification. The replacement pages were developed to incorporate comments included in your letter dated May 7, 2024. The replacement pages have been developed in redline/strikeout format to facilitate your review.

This response letter contains each item identified in the ODEQ comment letter (in bold) and a response to each item in the same order listed within ODEQ's comment letter.

A response to each of the ODEQ comments follows.

1. **Oath Required – The Verification included as part of DEQ Form 515-020, provided in Volume 1 of the Application is notarized in Texas; however, the county indicated on the form is Muskogee County, Oklahoma. Please resubmit this form with the indicated county as that in which the form is notarized. Please find enclosed a revised Verification for DEQ Form 515-020, that allows the notary to fill in the appropriate county and state.**

Response:

The verification page included as part of DEQ Form 515-202 has been updated to indicate the county in which the form is notarized.

2. **Area Rainfall – Section 3.4.3 in Appendix E, Volume 2A of the Application provides the 25-year mean precipitation from the Oklahoma Climatological Survey. In accordance with OAC 252:515-7-55(b), please revise Section 3.4.3 to provide the 30-year mean precipitation from the climatological station closest to the expansion area.**

Response:

Section 3.4.3 has been updated to show the 30-year mean precipitation from the Muskogee-Davis Regional Airport station.

3. Maps and Drawings

a. General Location Map – Muskogee Airport is shown in the General Site Location Map (Figure 1) in Volume 1 of the Application; however, it is not labeled. In accordance with OAC 252:515-3-52 please revise Figure 1 to identify all airports within six miles of the proposed expansion.

Response:

Figure 1 – General Location Map in Volume 1 has been updated to label the Muskogee-Davis Regional Airport

b. Quadrangle Topographic Map – The USGS Topographic Quadrangle Map (Figure E-1-1) in Appendix E, Volume 2A of the Application does not show homes and buildings within one mile of the proposed expansion. In accordance with OAC 252:515-3-54(b)(3), please revise Figure E-1-1 to clearly depict homes and buildings within one mile of the proposed expansion.

Response:

Figure 2 – Topographic Site Location Map in Volume 1 has been updated to depict residential areas within one mile of the expansion area. Homes and buildings within one mile of the proposed expansion are more clearly depicted on Figure 3- Land Use Map.

c. Site Map – The Site Plan (Drawing 6) in Volume 1 of the Application mentions the buffer zone in Note 5; however, the buffer zone is not shown on the map. In accordance with OAC 252:515-3-56(b)(3), please revise Drawing 6 to depict the buffer zone on the map.

Response:

Drawing 6 – Site Plan in Volume 1 has been revised to show the buffer zone.

d. Groundwater Resources and Usage Map – The Groundwater Resource and Usage Map (Figure E-1-3) in Volume 2A of the Application does not show recharge and discharge areas within a three-mile radius of the expansion area. In accordance with OAC 252:515-3-72(b)(3), please revise Figure

E-I-3 to show recharge and discharge areas within a three-mile radius of the proposed site boundary.

Response:

The groundwater Resources and Usage Map (Figure E-1-3) in Volume 2A has been revised to show recharge and discharge areas within a three-mile radius of the expansion area.

e. Geologic Cross Section Maps – The Geologic Cross-Sections (Attachments E-1-8B through E-1-8D) in Appendix E, Volume 2A of the Application depict geologic cross sections; however, the East and West axes are mislabeled. Please revise the axes in Attachments E-1-8B through E-1-8D to accurately reflect the cross-section orientation.

Response:

The Geologic Cross-Sections (Attachments E-1-8B through E-1-8D) axes have been revised to accurately reflect the cross-section orientation.

f. Potentiometric Surface Maps

i. The Highest Measured Groundwater Potentiometric Head Surface Contour Map (Attachment E-1-12), and October 2022, December 2022, April 2023, July 2023 Potentiometric Head Surface Contour Maps (Figures E-1-13A, Figure E-1-13B, Attachment E-1-13C, and Attachment E-1-13D, respectively) in Appendix E, Volume 2A of the Application depict potentiometric head surface contours at five-foot intervals. In accordance with OAC 252:515-3-75(b)(1), please revise these figures and attachments to depict groundwater elevation contours at two-foot intervals.

Response:

Figures E-1-12 through E-1-13D in Appendix E of Volume 2A have been revised to depict groundwater elevation contours at two-foot intervals.

ii. The Highest Measured Groundwater Potentiometric Head Surface Contour Map (Attachment E-1-12) in Appendix E, Volume 2A of the Application does not include all necessary details. In accordance with OAC 252:515-3-75(b)(2) please revise Attachment E-1-12 to depict the locations of all proposed monitoring wells, boreholes, and piezometers, and the surface elevations of each.

Response:

The highest measured Groundwater Potentiometric Head Surface Contour Map (Attachment E-1-12) in Appendix E, Volume 2A has been revised to depict the locations of all proposed monitoring wells, boreholes, and piezometers, and the surface elevations of each.

g. Fill Cross Section Map – Cross-Sections A and B (Drawing 13) in Volume 1 of the Application mentions in Note 7 that groundwater information is provided in Appendix E; however, initial and static water levels are not depicted in the drawing. In accordance with OAC 252:515-3-77(2), please revise Drawing 13 to depict the recorded initial and static water levels.

Response:

Drawing 13 (Cross-Sections A and B) has been updated to include initial and static potentiometric head groundwater elevations for the boreholes depicted. Please note that with the exception of WCG-19, no groundwater was observed in the borings illustrated in Drawing 13.

h. Completion Map – The Closure Contour and Stormwater Management Plan (Drawing 10) in Volume 1 of the Application does not include the buffer zone. In accordance with OAC 252:515-3-80(b), please revise Drawing 10 to depict the buffer zone.

Response:

Drawing 10 – Closure Contour and Stormwater Management Plan has been revised to depict the buffer zone.

4. Location Restrictions

a. Utility Lines – Section 2.12 in Volume 1 of the Application states that utilities and/or easements will be relocated or abandoned to meet location restrictions prior to the development of affected areas of the proposed expansion. However, there is no indication or note of this in Exhibit A: Easement Exhibit, in Volume 1, Appendix B of the Application. Please note and depict in Exhibit A: Easement Exhibit which utility lines will be relocated or decommissioned prior to development to demonstrate that location restrictions will be met in accordance with OAC 252:515-52(a).

Response:

As shown on Drawing 2, there are no easements located within the disposal footprint. Therefore, no easements need to be relocated to meet location

restrictions. Section 2.12 has been revised to indicate there are no easements located within the disposal footprint and if any utility lines or easements are discovered they will be relocated or abandoned to meet the location restrictions.

b. Fault Areas – Section 2.13 in Volume 1 of the Application describes the procedure used to determine that the proposed expansion area is not within 200 feet of a fault area as required by OAC 252:515-5-52(b)(1). While an evaluation was completed, the referenced maps were not provided. Please provide excerpts of the maps utilized to make the determination (i.e., the OWRB Interactive Database Map and the Tectonic Map of Oklahoma).

Response:

Figure 13 – Fault Areas Map has been added to Volume 1.

5. Subsurface Investigation

a. Section 2.3 in Appendix E, Volume 2A of the Application states that groundwater beneath the proposed expansion area generally flows from the east to the northeast, east, and southeast; however, Section 3.3.4 of Appendix E, Volume 2A of the Application states that groundwater flows from the east to the northwest, west, and southwest according to potentiometric surface contour maps. Please revise Section 2.3 to accurately describe the groundwater flow regime.

Response:

Section 2.3 in Appendix E, Volume 2A has been revised to accurately describe the groundwater flow regime.

b. Section 3.4.2 in Appendix E, Volume 2A of the Application states that "static potentiometric head elevation data have no regulatory implication in evaluating groundwater/waste separation", and thus the engineering design of the proposed expansion area considers the groundwater elevation at the time of drilling to be the highest groundwater for the purpose of evaluating groundwater/waste separation. Additional information is needed to support this interpretation of the highest groundwater. Several proposed excavation depths depicted in Drawing 7: Excavation Plan are less than five feet above contours depicted in Attachment E-1-12: Highest Measured Groundwater Potentiometric Head Surface Contour Map, and therefore do not meet the requirements for separation of waste from the highest groundwater. In accordance with OAC 252:515-11-3(a), please revise the Application to either:

Response:

The referenced Appendix E, Section 3.4.2 discusses the requirement of OAC 252:515-7-54(a) which states "*The minimum distance between the highest groundwater elevation and the lowest elevation at which waste will be placed shall be determined*."

As discussed in Section 3.4.2, the regulatory definition of *"groundwater"* is "*water below the land surface in a zone of saturation*" and the regulatory definition of "*zone of saturation*" is "*a subsurface zone in which essentially all the interstices are filled with water under pressure greater than that of the atmosphere*."

The subsurface investigation data indicate that saturated subsurface conditions are only observed within fractures of the weather shale zone (where present) and that this sole "*zone of saturation*" is bound, both above and below, by unsaturated shale sediments. The only "*groundwater*" present within in-situ sediments is isolated to those intervals where saturated conditions were observed within the fractured weathered shale zone. Therefore, the highest "*groundwater*" elevation is the uppermost saturated fractured weather shale zone elevation observed at time of drilling. No "*groundwater*" was observed above or below the saturated weathered shale zone during subsurface investigation drilling.

Regarding Attachment E-1-12 (Highest Measured Groundwater Potentiometric Head Surface Contour Map), the subsurface investigation data presented in Appendix E show that groundwater contained within the fractured weathered shale zone is present under confined conditions as indicated by the potentiometric head elevation measurement readings from the expansion piezometers. Attachment E-1-12 presents a surface contour created from the highest measured potentiometric head elevation observed in each expansion piezometer. However, the potentiometric head elevations represent the pressure head within the "*zone of saturation*" and are not synonymous with the highest "*groundwater*" elevation.

Regarding compliance with OAC 252:515-11-3(a), this regulatory provision states "*Liner systems shall be designed and constructed to maintain a minimum five-foot vertical separation between the highest groundwater elevation and the lowermost surface on which waste, including leachate, will be placed.*" In accordance with OAC regulatory definitions, the highest measured "*groundwater*" elevation surface contour is synonymous with the top of uppermost aquifer hydrostratigraphic structural contour, which is provided, in conjunction with the proposed excavation contours, on Attachment E-1-11 (Top of Uppermost Aquifer Contour Map). The information provided in Appendix E therefore satisfies the requirement of OAC 252:515-7-54(a) and OAC 252:515-11-3(a). A reference to OAC 252:515-11-3(a) has been added to section 3.4.2 to clearly indicate that the regulatory provision is satisfied by the subsurface investigation provided in Appendix E.

i. **Use data from the existing subsurface investigation including Attachment E-1-12: Highest Measured Groundwater Potentiometric Head Surface Contour Map to revise Drawing 7: Excavation Plan to maintain five-foot separation between the highest groundwater elevation and the lowermost surface on which waste will be placed, considering the highest groundwater to be the highest groundwater elevation ever recorded at each borehole, piezometer, or well across the site.**

Response:

As discussed in the response to the prior comment 5(b), the highest measured "*groundwater*" elevation surface contour is synonymous with the top of uppermost aquifer hydrostratigraphic structural contour, which is provided in conjunction with the proposed excavation contours on Attachment E-1-11 (Top of Uppermost Aquifer Contour Map). The information provided in Appendix E therefore satisfies the requirement of OAC 252:515-7-54(a) and OAC 252:515-11-3(a). A reference to OAC 252:515-11-3(a) has been added to section 3.4.2 to clearly indicate that the regulatory provision is satisfied by the subsurface investigation provided in Appendix E.

ii. **Provide supplemental data to confirm that the suspected aquifer thought to be confined by the weathered shale layer is indeed confined, which may include the installation of additional piezometers screened above the fractured weathered shale zone, a series of borings to ten feet below the proposed excavation depths, and groundwater/waste separation information from existing monitor wells and disposal cell construction data from the existing landfill to the east. The additional piezometer and borehole.**

Response:

The subsurface investigation included the advancement and continuous sampling of 19 expansion boreholes and installation of six groundwater piezometers and was conducted in accordance with the ODEQ-approved Boring Plan and the requirements of OAC 252:515-7. The subsurface investigation data provided in Appendix E sufficiently demonstrate that saturated subsurface conditions are only observed within fractures of the weather shale zone (where present) under confined aquifer conditions and that this zone of saturation is bound, both above and below, by unsaturated shale sediments. The only groundwater present within in-situ sediments is isolated to those intervals where saturated conditions were observed within the fractured weathered shale zone under confined aquifer conditions. None of the subsurface investigation data supports the occurrence of an unconfined or perched aquifer within the proposed expansion area.

6. Groundwater Monitoring – The Proposed Groundwater Monitoring System (Figure E-1-15) in Appendix E, Volume 2A of the Application depicts the proposed groundwater monitoring wells with respect to the proposed expansion area. According to the scale provided in the figure, the wells on the western side of the proposed permit boundary are over six hundred (600) feet from the proposed limits of waste. In accordance with OAC 252:515-9-4(a) please relocate the proposed groundwater monitoring wells to be no more than 150 yards (-500 feet) from the boundaries of waste disposal.

Response:

Figure E-1-15 – Proposed Groundwater Monitoring System has been revised to move the western wells 500 feet from the waste disposal boundary. All drawings depicting monitoring well locations have been revised and included as part of this response.

7. Gas Monitoring – Section 2.1.3 in Volume 1 of the Application states that gas wells will be constructed in accordance with OAC 252:515-7-3; please revise Section 2.1.3 to also reference OAC 252:515-15-4 as this chapter includes specific design details that should be adhered to.

Response:

Section 2.1.3 in Appendix G, Volume 3 has been updated to also reference OAC 252:515-15-4.

8. Liner Design – General

a. Section 6.1 in Appendix K, Volume 3 of the Application lists information to be contained in the daily record of construction progress; however, several necessary details are absent. In accordance with OAC 252:515-11-4(a)(1), please revise Section 6.1 to include that the following will also be recorded:

i. Personnel involved in specific tasks, including subcontractors
ii. Problem identification and any corrective measures taken
iii. Weather; specifically, temperature, precipitation, and cloud cover

Response:

The above information has been added to Section 6.1 in Appendix K.

b. Section 6.2 in Appendix K, Volume 3 of the Application lists information to be contained on observation and test sheets; however, several necessary details are absent. In accordance with OAC 252:515-11-4(a)(1), please revise Section 6.2 to include that the following will also be recorded:

i. Panel number, when testing the flexible membrane liner

ii. Chain of custody for test sheets

Response:

The above information has been added to Section 6.2 in Appendix K.

c. Section 6.5 in Appendix K, Volume 3 of the Application lists information to be contained in the liner installation and testing (LIT) report including the signature of a professional engineer; however, in accordance with OAC 252:515-11-4(a), please revise Section 6.5 to include that the LIT report will be signed by the specific engineer of record.

Response:

After reviewing OAC 252:515-4(a) and the EPA Technical Guidance Document: Quality Assurance and Quality Control for Waste Containment Facilities no reference to "specific engineer of record" could be found. Section 6.5 indicates that the LIT report will include a statement of compliance with the construction contract documents and design intent, signed and sealed by a professional engineer registered in the State of Oklahoma.

9. Liner Design – Clay

a. Table 2-1 in Appendix K, Volume 3 of the Application describes the pre-construction testing schedule for liner material; the table states that ASTM D422 or D1140 will be used for particle size analysis. In accordance with OAC 252:515-11-32, please revise Table 2-1 to state that both ASTM D422 and D1140 tests shall be used for particle-size analysis and percent fines, respectively.

Response:

Table 2-1 has been revised to indicate that both ASTM D422 and D1140 test shall be used for particle-size analysis and percent fines.

b. Table 2-2 in Appendix K, Volume 3 of the Application describes required soil liner material properties; however, the table excludes several required properties. Please revise Table 2-2 to include all required soil liner properties as described by OAC 252:515-11-33.

Response:

Table 2-2 in Appendix K, Volume 3 has been revised to include all required soil liner material properties.

c. Section 2.2.3.2 in Appendix K, Volume 3 of the Application states that the soil liner will be visually inspected during construction; however, the Application does not state that daily certification of the liner will be completed. In accordance OAC 252:515-11-55(b) please revise Section 2.2.3.2 to state that daily certification of the soil liner shall be completed.

Response:

Section 2.2.3.2 in Appendix K, Volume 3 has been revised to indicate that daily certification of the soil liner shall be completed prior to placement of FML.

10. Liner Design - Flexible Membrane Liner

a. Table 3-1 in Appendix K, Volume 3 of the Application describes required testing for geomembranes (FMLs); however, the table does not include EPA Test 9090 for chemical resistivity. In accordance with OAC 252:515-11-51(d), please revise Table 3-1 to include EPA Test 9090 or equivalent.

Response:

Table 3-1 in Appendix K, Volume 3 has been revised to include EPA Test 9090A or equivalent.

b. Section 3.3.3 in Appendix K, Volume 3 of the Application describes CQA for FML installation. In accordance with OAC 252:515-11-52, please revise Section 3.3.3 to include that manufacturer written instructions for FML handling will be included in the FML quality assurance / quality control (QA/QC) procedure once available.

Response:

Section 3.3.3 – Geomembrane Installation in Volume 3 has been revised to indicate that the geosynthetics contractor will review manufactured written instructions for handling geomembrane prior to installation.

c. Section 3.3.3 in Appendix K, Volume 3 of the Application states that FML seams will be overlapped a minimum of three inches. In accordance with OAC 252:515-11-57(f), please revise Section 3.3.3 to state that panels shall have a minimum four-inch finished seam overlap, unless the manufacturer specifies a larger overlap.

Response:

Section 3.3.3 in Appendix K, Volume 3 has been updated to state that panels shall have a minimum four-inch finished seam overlap, unless the manufacturer specifies a larger overlap.

d. Section 3.3.3 in Appendix K, Volume 3 of the Application states that prior to geomembrane welding, each welder and welding apparatus must be tested, at a minimum, at daily start-up and midday break, or any break in which the seaming machine is stopped for more than 30 minutes. In accordance with OAC 252:515-11-58(a), please revise Section 3.3.3 to include that each installer shall make a trial weld at the beginning of every day and every five working hours.

Response:

Section 3.3.3 – Geomembrane Installation in Volume 3 has been updated to indicate that each installer shall make a trial weld at the beginning of every day and every five working hours.

e. Section 3.3.8 in Appendix K, Volume 3 of the Application describes anchor trench construction, and several drawings show anchor trench details; however, supporting details are necessary. In accordance with OAC 252:515-11-54(a), please revise Section 3.3.8 to include supplemental narrative and/or calculations to depict that the length of runout and depth of the anchor trench were designed for the thickness and allowable stress of the FML.

Response:

Anchor trench calculations are provided in Appendix M, Volume 4, Pages M-20-4 through M-20-7. A reference to these calculations has been added to Section 3.3.8 in Appendix K, Volume 3.

f. Section 3.4.3 in Appendix K, Volume 3 of the Application discusses surface preparation prior to geotextile installation. In accordance with OAC 252:515-11-60, please revise Section 3.4.3 to include that geotextile shall not be installed until all destructive and non-destructive testing is completed and approved by the CQA monitor.

Response:

Section 3.4.3 – Geotextile Installation in Volume 3 has been revised to indicate that geotextile shall not be installed until all destructive and non-destructive testing is completed and approved by the CQA monitor.

11. Operating Plan

a. The Waste Exclusion Plan (WEP) attached in Appendix O, Volume 4 of the Application refers to Quarry Recycling & Disposal Facility. Please revise the WEP to refer to the Muskogee Recycling & Disposal Facility.

Response:

The Waste Exclusion Plan (WEP) in Appendix O, Volume 4 has been revised to reference the Muskogee Community Recycling & Disposal Facility (RDF).

b. The WEP in Appendix O, Volume 4 of the Application discusses the rejection of regulated hazardous wastes, regulated polychlorinated biphenyls, radioactive, regulated infectious biomedical wastes, or other unpermitted wastes. In accordance with OAC 252:515-19-31(g), please revise the WEP to specifically mention that baled waste will be rejected.

Response:

The WEP in Appendix O, Volume 4 has been revised to indicate that baled waste will be rejected.

12. Protective Cover

a. Section 8.6 in Volume 1 of the Application discusses cover material requirements; however, this section does not explicitly mention that waste-free earthen material will be used for daily cover. In accordance with OAC 252:515-19-51(b), please revise Section 8.6 to specify that earthen material used for daily cover shall be waste free.

Response:

Section 8.6 in Volume 1 has been revised to specify that earthen material used for daily cover shall be waste free.

b. Section 8.6.3 in Volume 1 of the Application references Waste Connections. Please revise Section 8.6.3 to refer to the Muskogee Recycling & Disposal Facility or Waste Management.

Response:

Section 8.6.3 in Volume 1 has been revised to refer to Waste Management of Oklahoma, Inc.

13. Closure

a. Section 4 in Appendix P, Volume 4 of the Application describes closure procedures; however, several necessary details are excluded. Please revise this section to include detailed plans for all closure activities described by OAC 252:515-25-32(a)(4).

Response:

OAC 252:515-25-32(a)(4) is addressed in multiple sections throughout Appendix P

(A) Addressed in Section 4.3.

(B) A bullet point has been added to Section 4.2.

(C) Addressed in Section 6.2.

(D) Addressed in Section 6.2.

(E) Addressed in Section 4.3.

(F) Information was added to Section 4.3.

(G) Addressed in Section 6.2.7.

(H) Addressed in Section 4.2.

(I) Addressed in Section 8.

(J) Addressed in Section 6.

b. Figure 5-1 in Appendix P, Volume 4 of the Application contains the final closure schedule which includes the submission of the engineering certification of final closure and certified copies of the modified deed to DEQ; however, the contents of the Certification of Final Closure and notification for the county land records notice is not discussed in the narrative of the Application. Please describe in the Application the information to be included in the Certification of Final Closure, and the execution and contents of the county land records notice, in accordance with OAC 252:515-25-34 and OAC 252:515-25-36, respectively.

Response:

The contents of the certification of final closure is addressed in Section 8.2 and is consistent with OAC 252:515-25-34. OAC 252:515-25-36 is addressed in Section 2.

14. Post-Closure

a. Section 6.2 in Appendix P, Volume 4 of the Application states that post-closure inspections will be conducted quarterly during the first three years, semi-annually for the two years following, then annually for the remainder of the post-closure period. In accordance with OAC 252:515-25-53(3), please revise Section 6.2 to state that post-closure inspections shall be conducted quarterly. A request to decrease monitoring frequency may be submitted for DEQ approval following the initial three years of post-closure monitoring.

Response:

Section 6.2 in Appendix P, Volume 4 has been revised to state that postclosure inspections shall be conducted quarterly and that a request to decrease monitoring frequency may be submitted for DEQ approval following the initial three years of post-closure monitoring.

b. Appendix P, Volume 4 of the Application includes the post-closure plan; however, the plan does not demonstrate that the Facility will retain documentation of a legal right to enter, use, maintain, and monitor the facility throughout the post-closure period. In accordance with OAC 252:515-25-53(9), please revise the post-closure plan to indicate that the facility will retain the required documentation.

Response:

This information is addressed in Section 6.2.7 in Appendix P, Volume 4.

During the course of your review, if you need additional information or have any questions, please call.

Sincerely,
Weaver Consultants Group, LLC

Jonathan V. Queen, P.E.
Project Director

Johnna P. Ignaski
Project Manager

Attachments: Attachment 1 – Tier III Replacement Pages

cc: Guy R. Campbell, Waste Management of Oklahoma, Inc.

ATTACHMENT 1

TIER III REPLACEMENT PAGES

MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

TIER III PERMIT MODIFICATION
LANDFILL EXPANSION

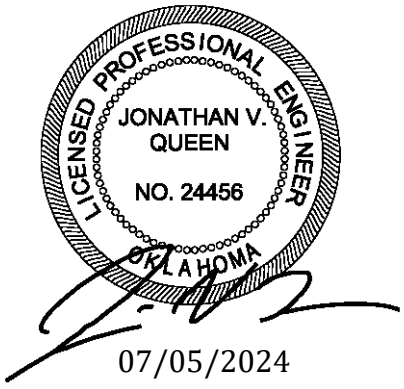
VOLUME 1 OF 4

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024



Prepared by 07/05/2024

Weaver Consultants Group, LLC
CA 3804 PE 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19

VERIFICATION[1]

STATE OF TEXAS)
) ss
COUNTY OF TARRANT)

Guy R. Campbell, of lawful age, being first duly sworn, upon oath state that I have read the foregoing APPLICATION TO MODIFY A SOLID WASTE DISPOSAL FACILITY PERMIT, that I am familiar with the matters set forth therein, and that the same are true to the best of my information and belief.

Guy R Campbell
Applicant

Subscribed and sworn to before me this 3rd day of July, 2024,

by Guy R. Campbell (Applicant or legal representative).

Stacy M. Wilson
Notary Public

My commission expires:

August 11, 2026

STACY M. WILSON
Notary Public, State of Texas
Comm. Expires 08-11-2026
Notary ID 133903285

[1] This Verification is required for a Tier III modification application.

MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

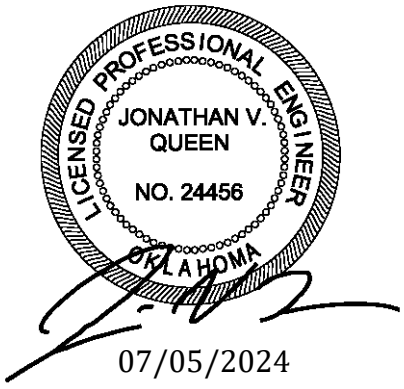
TIER III PERMIT MODIFICATION
LANDFILL EXPANSION

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024



Prepared by 07/05/2024

Weaver Consultants Group, LLC
CA 3804 PE 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19

FIGURES

In accordance with OAC 252-515-1-4(b) and 252-515-3-51(e), figures/drawings have been provided in an alternative scale. The alternative scales are clearly identified on each figure/drawing.

Additionally, review of the online Geological Survey Earthquake Catalog of Oklahoma (www.ou.edu/ogs/research/earthquakes/catalogs), which catalogs earthquakes in the State of Oklahoma since 1882, indicated that within the past 10 years, no earthquakes with more than 4.0 on the Richter Scale or a number V on the modified Mercalli Scale have occurred within a 5-mile radius of the site. Lastly, pseudo-static method was used during stability analysis to account for seismic loads, (refer to Appendix M for more information). Therefore, the proposed expansion complies with the earthquake epicenter area location restriction.

2.11 Asbestos Monofills

OAC 252:515-5-51(d) prohibits the location of new asbestos monofills within 500 yards of an occupied residence or 3 miles of a municipally incorporated area. According to 27A Oklahoma Statute 2-10-103(11), a monofill is a landfill which is used to dispose of a single type of specified non-hazardous industrial solid waste, except for other non-hazardous industrial solid wastes which are not readily separable from the specified waste. This location restriction does not apply to the Muskogee Community RDF because it is an existing municipal solid waste facility and not an asbestos monofill (nor is the proposed expansion area). However, as noted in Section 8.4, the Muskogee Community RDF is approved to accept asbestos and materials containing asbestos.

2.12 Utility/Transmission Lines

OAC 252:515-5-52(a) requires a minimum of 25 feet between the active disposal area and any above ground or underground pipeline or transmission line. There are several known above ground utilities on site, including the overhead easements that cross near the expansion landfill footprint. Additional utilities service Muskogee Community RDF and allow for the operation of the scalehouse/office, maintenance shop, sanitary sewer utilities, leachate systems, and landfill gas systems. Additional discussion on site easements is included in Appendix B. There are currently no easements onsite that need to be relocated and/or abandoned to meet the location restriction. If ~~necessary~~an easement or utility line is discovered, these utilities and/or easements for the utilities will be relocated and/or abandoned to meet the location restriction before the waste disposal area is developed in these areas. Documentation of all utility line and easement relocations will be maintained in the Site Operating Record.

2.13 Fault Areas

OAC 252:515-5-52(b) requires that new MSWLFs and expansions shall not be located within 200 feet of a fault that has had displacement in Holocene (most recent 11,000 years) time. Based on the OWRB Interactive Database Map, there are no mapped faults within 200 feet of the proposed permit boundary.

8.4 Asbestos

Muskogee Community RDF is approved to accept asbestos and materials containing asbestos in compliance with all the requirements set forth in OAC 252:515-19-36, all regulations set forth in 252:100 and 380:50. These requirements are stated in the Waste Exclusion Plan included in Appendix O.

8.5 Litter Control

Blowing litter will be controlled in accordance with OAC 252:515-19-35. The site operations will conduct unloading of waste in such a matter to reduce the blowing of waste from outside the active disposal area. The working face will be covered at the end of each day as well as when necessary during the operational day to help minimize the scattering of waste. In addition, litter fencing will be placed downwind of the active area during windy weather periods. The entire landfill site and the approaching roadways within 1/2 mile will be cleaned by landfill personnel at least once a week or whenever the site or surrounding area deems necessary. In addition, signage will be posted advising customers to adequately cover their loads to prevent blowing litter.

8.6 Cover Material Requirements

A daily cover with at least 6 inches of earthen material or an approved Alternative Daily Cover (ADC) will be placed over the exposed solid waste at the end of each operating day or more frequently, if needed. The earthen material shall be free of garbage, trash, or other unsuitable material. The cover is used to prevent and control disease vectors, fires, odors, blowing litter and scavenging at the facility. The material will be compacted sufficiently to minimize washout and keep any rainfall from exiting the active disposal area.

As part of this Tier III Permit Modification, ~~Oklahoma Landfill~~ Muskogee Community RDF proposes to use spray-type ADCs (e.g., ConCover, AIRTROL® Plaster, Second Nature®, Refiber, BioCover, or an approved equivalent), a tarp ADC (e.g., DURASHIELD, Fabrisoil, HDPE flexible membrane liner materials, or an equivalent material), contaminated material ADC, wood chip ADC, or tire chip ADC. In accordance with Section 252:515-19-51(d) of the ODEQ Municipal Solid Waste Regulations, material characteristics, operation methods and inspection procedures are discussed below.

8.6.1 Spray Type ADC

- General Material Description – The spray type ADC materials that will be used at this site are composed of the following materials.
    - Wood fiber, corrugated fiber, and/or recycled paper

  - The perimeter of the tarps will be anchored appropriately with tires, dirt, sandbags, or similar material.
  - The tarps will be removed the following morning by pulling across itself (to reduce drag) and stored in an inactive area.

- ADC Verification and Inspection Procedures – At the end of each working day, site personnel will visually inspect the working face to verify that the approved ADC has been placed over the exposed wastes. Site personnel will also routinely assess the effectiveness of the ADC in controlling vectors, fires, odors, and windblown waste.

8.6.3 Contaminated Material

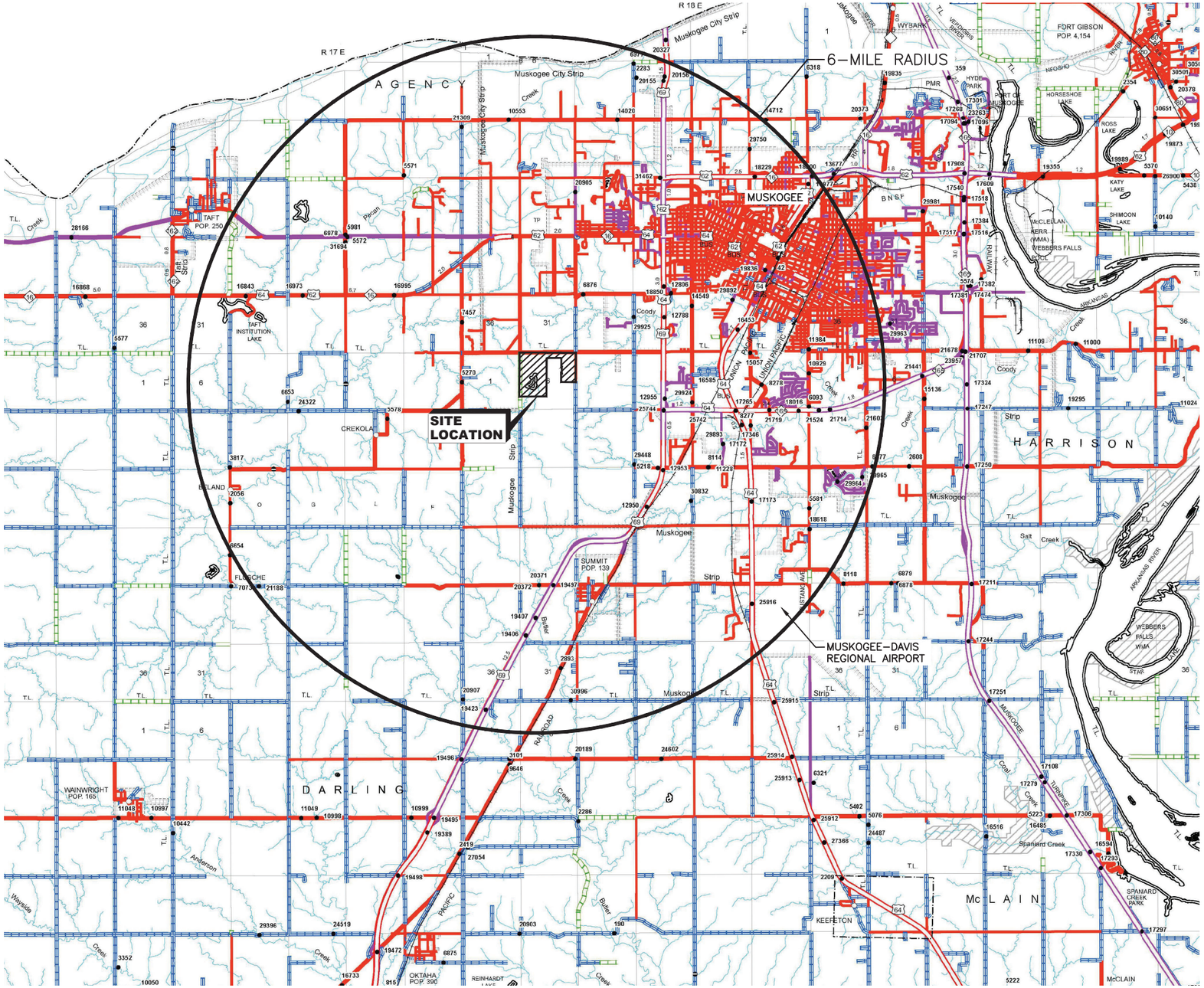
- General Material Description – The contaminated materials that will be used at this site will meet the sampling standards included in the Waste Exclusion Plan. Each contaminated material generator will provide a laboratory analysis indicating compliance with the site Waste Exclusion Plan for each specific contaminated material. Waste Management of Oklahoma, Inc. ~~Connections~~ will request ODEQ approval for each contaminated generator and specific contaminated material prior to use as an ADC.
- Operational Method – The contaminated material ADC operational method includes the following:
  - At least 6 inches of contaminated material will be placed over the working face.
  - The working area will be surrounded by a contaminated water containment berm and stormwater diversion berm.
  - The contaminated material will be covered with waste within a 24-hour period.
- ADC Verification and Inspection Procedures – At the end of each working day, site personnel will visually inspect the working face to verify that the approved ADC has been placed over the exposed wastes. Site personnel will also routinely assess the effectiveness of the ADC in controlling vectors, fires, odors, and windblown waste.

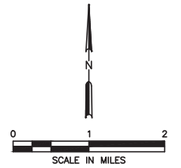
8.6.4 Wood Chips ADC

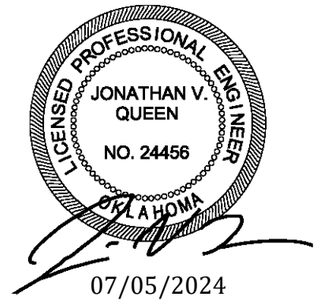
- General Material Description – The wood chips (mixed with 50% soil) that will be used at this site will be the chippings of clean wood material, brush, and/or leaves.
- Operational Methods – The wood chip material ADC operational method includes the following:

FIGURES

In accordance with OAC 252-515-1-4(b) and 252-515-3-51(e), figures/drawings have been provided in an alternative scale. The alternative scales are clearly identified on each figure/drawing.







07/05/2024

Legend

- Interstate Highway
- US Highway
- State Highway
- Divided Highway - Asphalt
- Divided Highway - Concrete
- Asphalt
- Concrete
- Gravel
- Grade & Drain
- Unimproved
- Railroad
- State Line
- County Line
- Section Line
- Corporate Limit
- Wildlife Management Area
- Wildlife Refuge
- River or Stream
- Lake or Reservoir
- Bridges
- Low Water Crossing
- Natural Elevation Point
- Natural Elevation Point

NOTES:

1. REPRODUCED FROM GENERAL HIGHWAY MAPS, MUSKOGEE COUNTY, OKLAHOMA, (OK DOT STRATEGIC ASSET AND PERFORMANCE MANAGEMENT DIVISION OCTOBER 2018).
2. REFER TO FIGURE 11 FOR WASTE DISPOSAL AREAS AND BUFFERING ZONE.

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: FIG 1-SITE LOCATION MAP.DWG

DRAWN BY: RAA
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE-06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

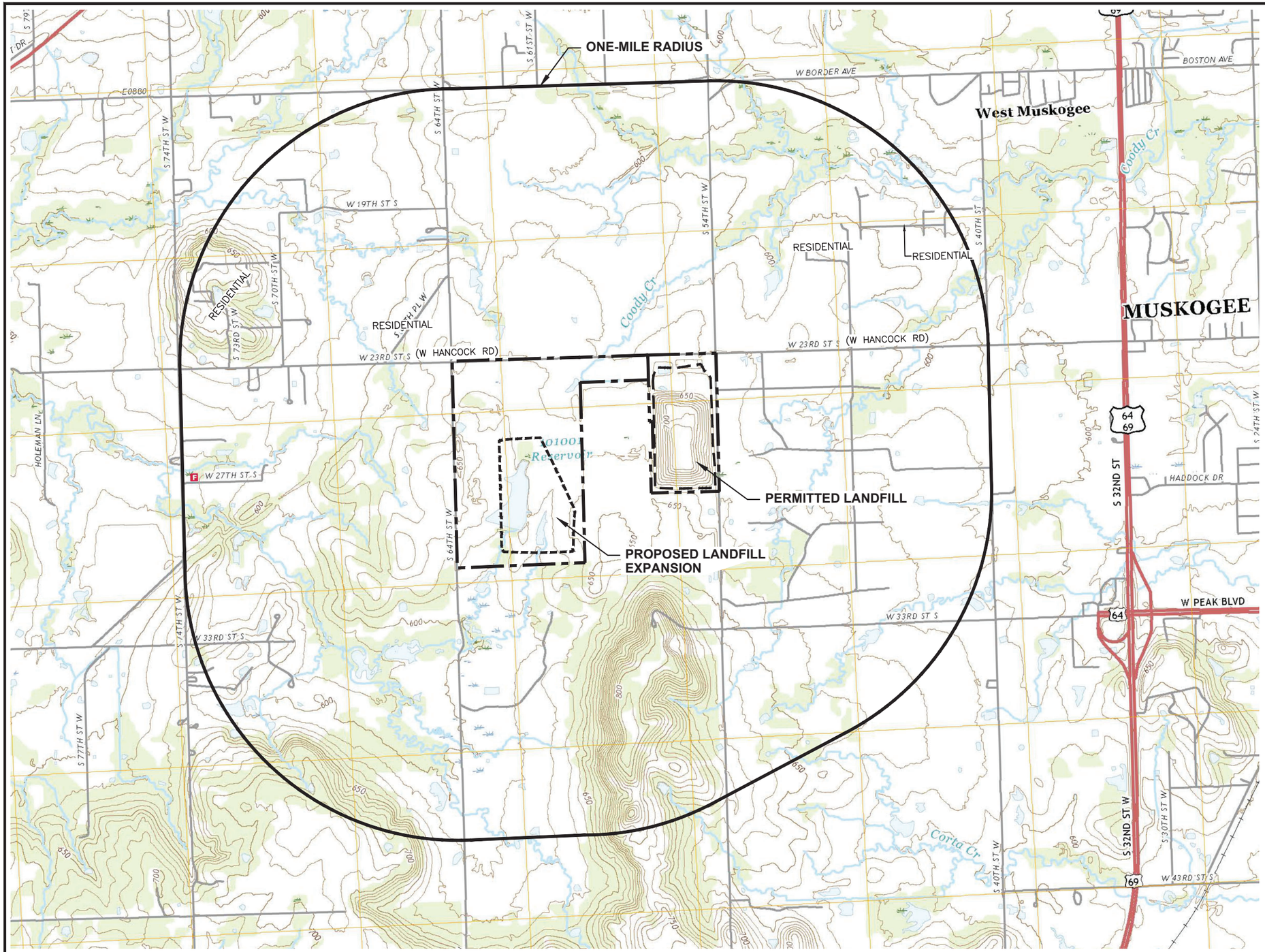
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	ADDED MUSKOGEE AIRPORT CALLOUT

TIER III PERMIT MODIFICATION GENERAL SITE LOCATION MAP

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE 1



0 1000 2000
SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD
Interstate Route	US Route
State Route	

NOTES:

1. ADAPTED FROM USGS 7.5 MINUTE QUADRANGLE TOPOGRAPHIC MAP (MUSKOGEE COUNTY, OKLAHOMA, 2018).
2. THE MAP AREA SHOWN IS WITHIN TOWNSHIP 14 NORTH, RANGE 18 EAST.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

SOUTHWEST MUSKOGEE, OK

2018

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: FIG 2-TOPO. SITE LOCATION MAP.DWG

DRAWN BY: RAA
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE-06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS

NO.	DATE	DESCRIPTION
1	07/2024	ADDED RESIDENTIAL AREAS

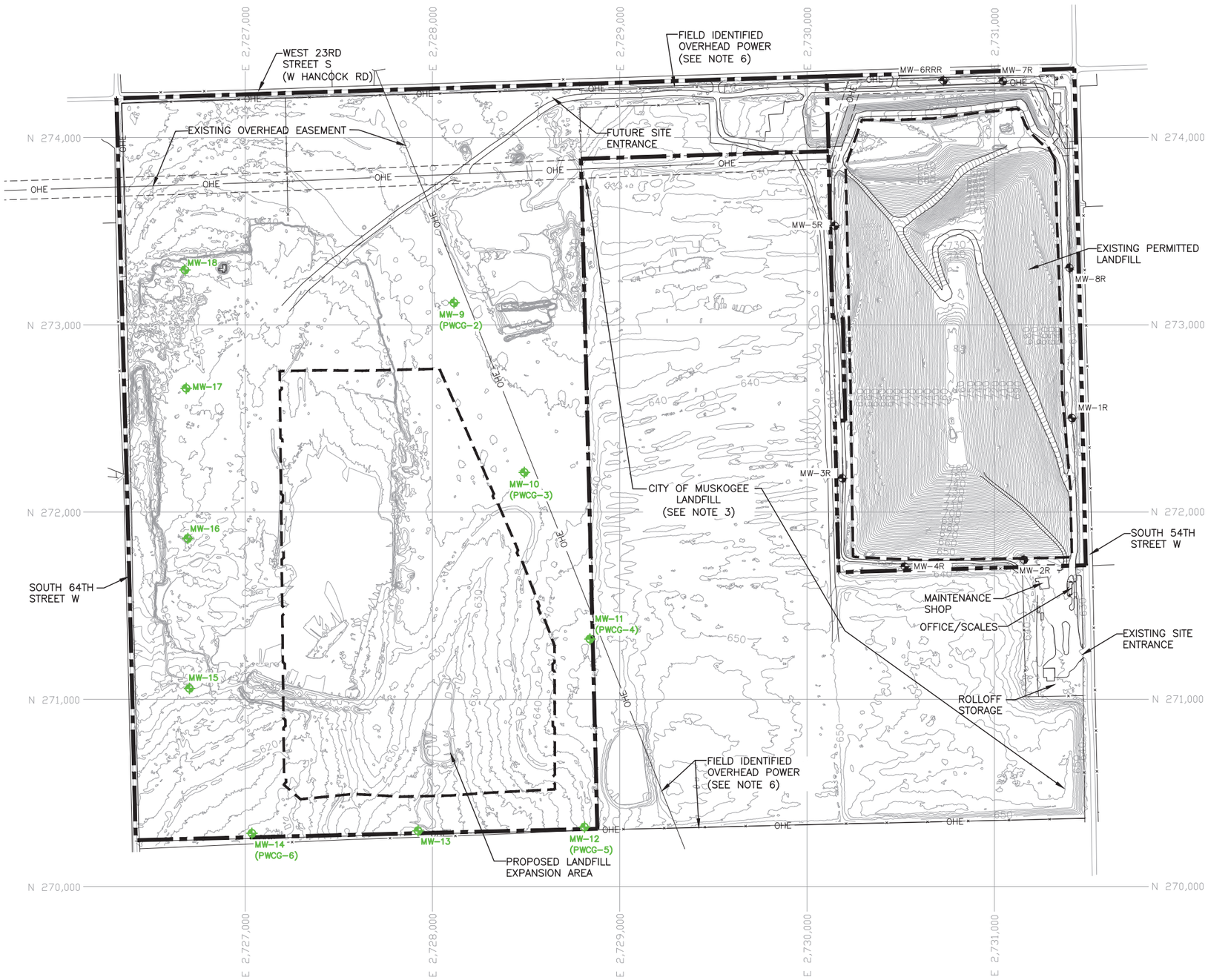
TIER III PERMIT MODIFICATION
TOPOGRAPHIC SITE LOCATION MAP

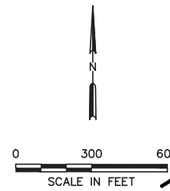
MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

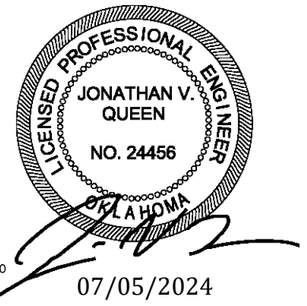
WWW.WCGRP.COM

FIGURE 2

O:\0086\364\EXPANSION 2022\INTRO TEXT\FIG 2-TOPOGRAPHIC SITE LOCATION MAP.dwg, jpnhr, 1:2







LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- APPROXIMATE OG&E POWER LINE EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. FORMER PIEZOMETER DESIGNATION IS SHOWN IN PARENTHESES WHERE APPLICABLE.
5. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. A WASTE FREE BUFFER ZONE OF AT LEAST 100-FEET OFFSET FROM THE PROPOSED PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.

O:\0086\364\EXPANSION 2022\INTRO TEXT\FIG 11-EXISTING AND PROPOSED MW.dwg, jpohr, 1:2

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: FIG 11-EXIST. AND PROP. MW.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JBP

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

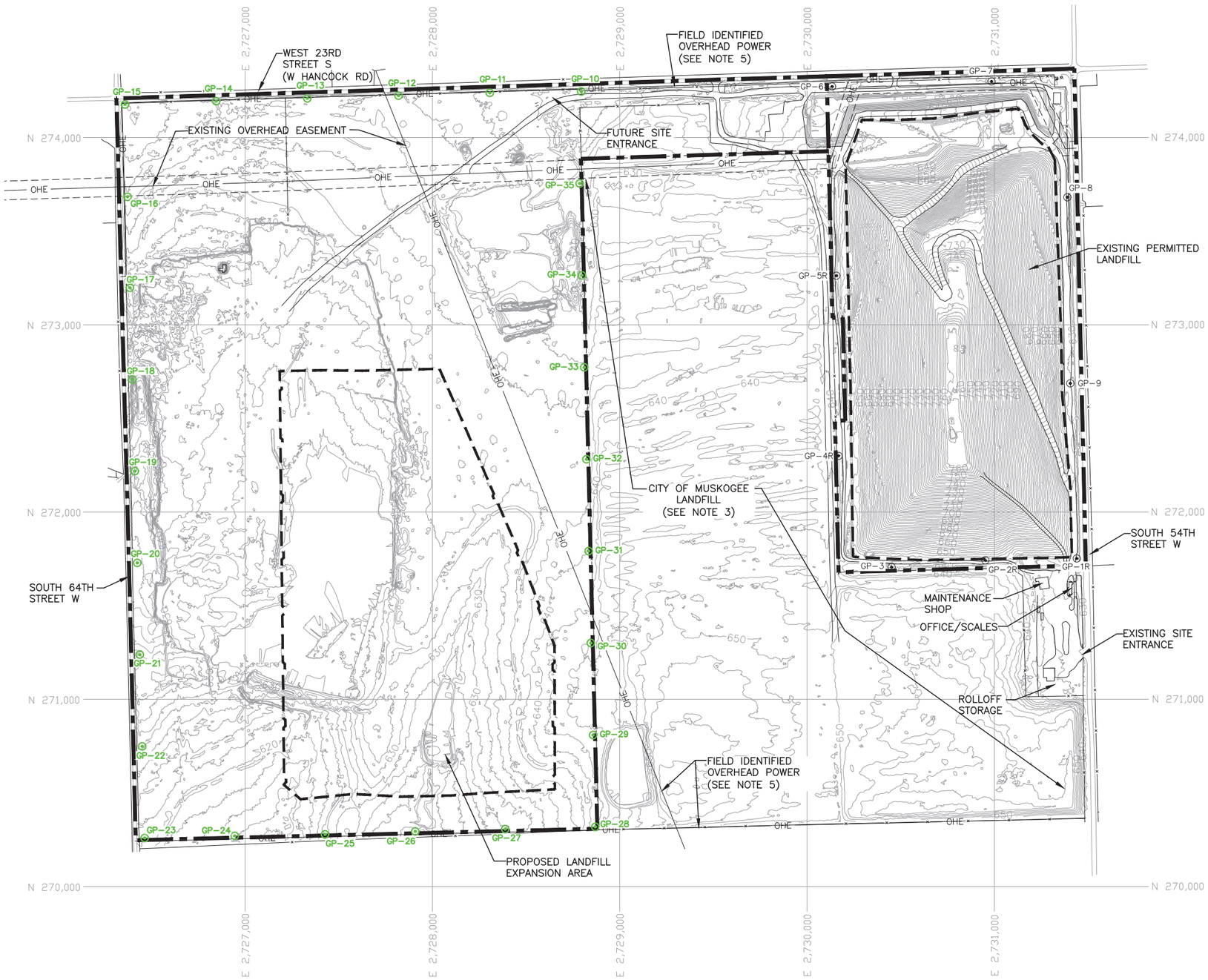
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

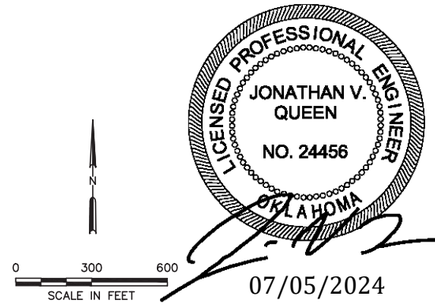
TIER III PERMIT MODIFICATION EXISTING AND PROPOSED MONITORING WELL LOCATIONS

MUSKOGEE COMMUNITY RDF
OKLAHOMA COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE 11





N

0 300 600
SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- OHE — EXISTING OVERHEAD EASEMENT
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.

- [ ] DRAFT
- [X] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: FIG 12-EXIST. AND PROP. PROBES.DWG
DRAWN BY: SRF
DESIGN BY: MB
REVIEWED BY: JBP

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED PROPOSED LANDFILL GAS MONITORING PROBE LEGEND

TIER III PERMIT MODIFICATION
EXISTING AND PROPOSED LANDFILL GAS PROBE LOCATIONS

MUSKOGEE COMMUNITY RDF
OKLAHOMA COUNTY, OKLAHOMA

WWW.WCGRP.COM

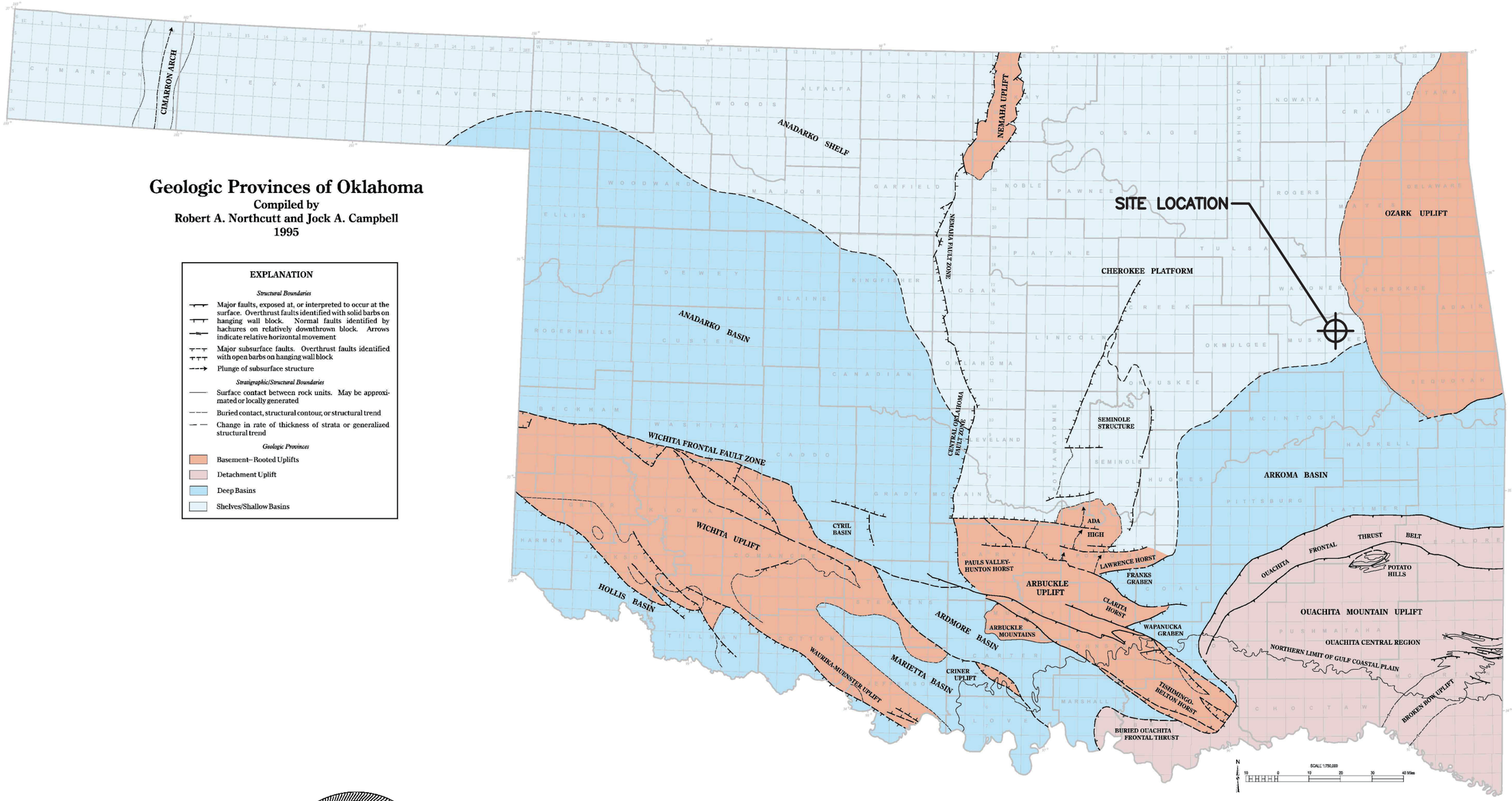
FIGURE 12

O:\0086\364\EXPANSION 2022\INTRO TEXT\FIG 12-EXISTING AND PROPOSED GAS PROBES.dwg, jpuhr, 1:2

OKLAHOMA GEOLOGICAL SURVEY
Charles J. Mankin, *Director*

Geologic Provinces of Oklahoma

Compiled by
Robert A. Northcutt and Jock A. Campbell
1995



EXPLANATION

Structural Boundaries

- Major faults, exposed at, or interpreted to occur at the surface. Overthrust faults identified with solid barbs on hanging wall block. Normal faults identified by hachures on relatively downthrown block. Arrows indicate relative horizontal movement
- Major subsurface faults. Overthrust faults identified with open barbs on hanging wall block
- Plunge of subsurface structure

Stratigraphic/Structural Boundaries

- Surface contact between rock units. May be approximated or locally generated
- Buried contact, structural contour, or structural trend
- Change in rate of thickness of strata or generalized structural trend

Geologic Provinces

- Basement–Rooted Uplifts
- Detachment Uplift
- Deep Basins
- Shelves/Shallow Basins

NOTE:

1. GEOLOGIC PROVINCES OF OKLAHOMA MAP REPRODUCED FROM THE OKLAHOMA GEOLOGIC SURVEY.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

0:\0086\364\EXPANSION 2022\INTRO TEXT\FIG 13-FAULT AREA MAP.dwg, jpuhr, 1:1

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 07/2022
FILE: 0086-356-11
CAD: FIG 13-FAULT AREAS MAP.DWG
DRAWN BY: RAA
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE-06/30/2023

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	NEW DRAWING

TIER III PERMIT MODIFICATION
FAULT AREAS MAP

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE 13

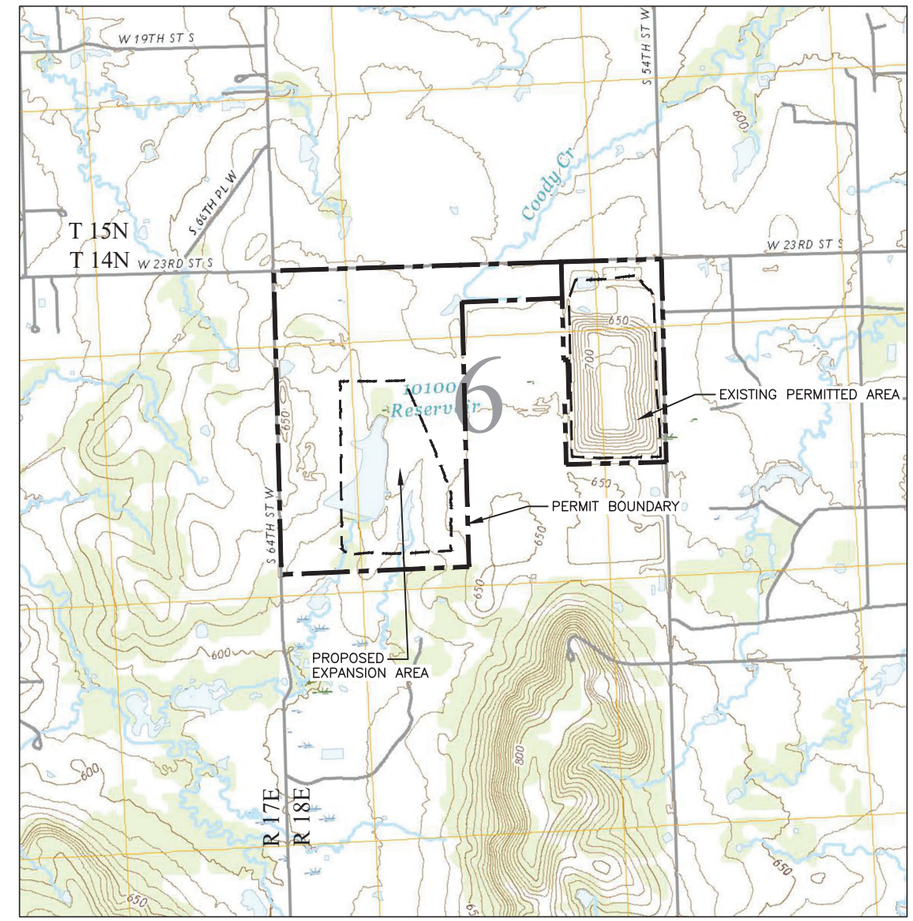
WASTE MANAGEMENT OF OKLAHOMA, INC.
MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
LANDFILL EXPANSION

INDEX TO DRAWINGS

OCTOBER 2023
REVISED JULY 2024

PREPARED FOR

WASTE MANAGEMENT OF OKLAHOMA, INC.



VICINITY MAP
U.S. GOVERNMENTS LOTS 3, 4, 5, 6, AND PART OF
U.S. GOVERNMENT LOTS 1 AND 2, SE1/4 NE1/4, AND NE1/4 SW1/4
T 14N, R 18E, SECTION 6
MUSKOGEE COUNTY, STATE OF OKLAHOMA

N

0 1000 2000
SCALE IN FEET

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

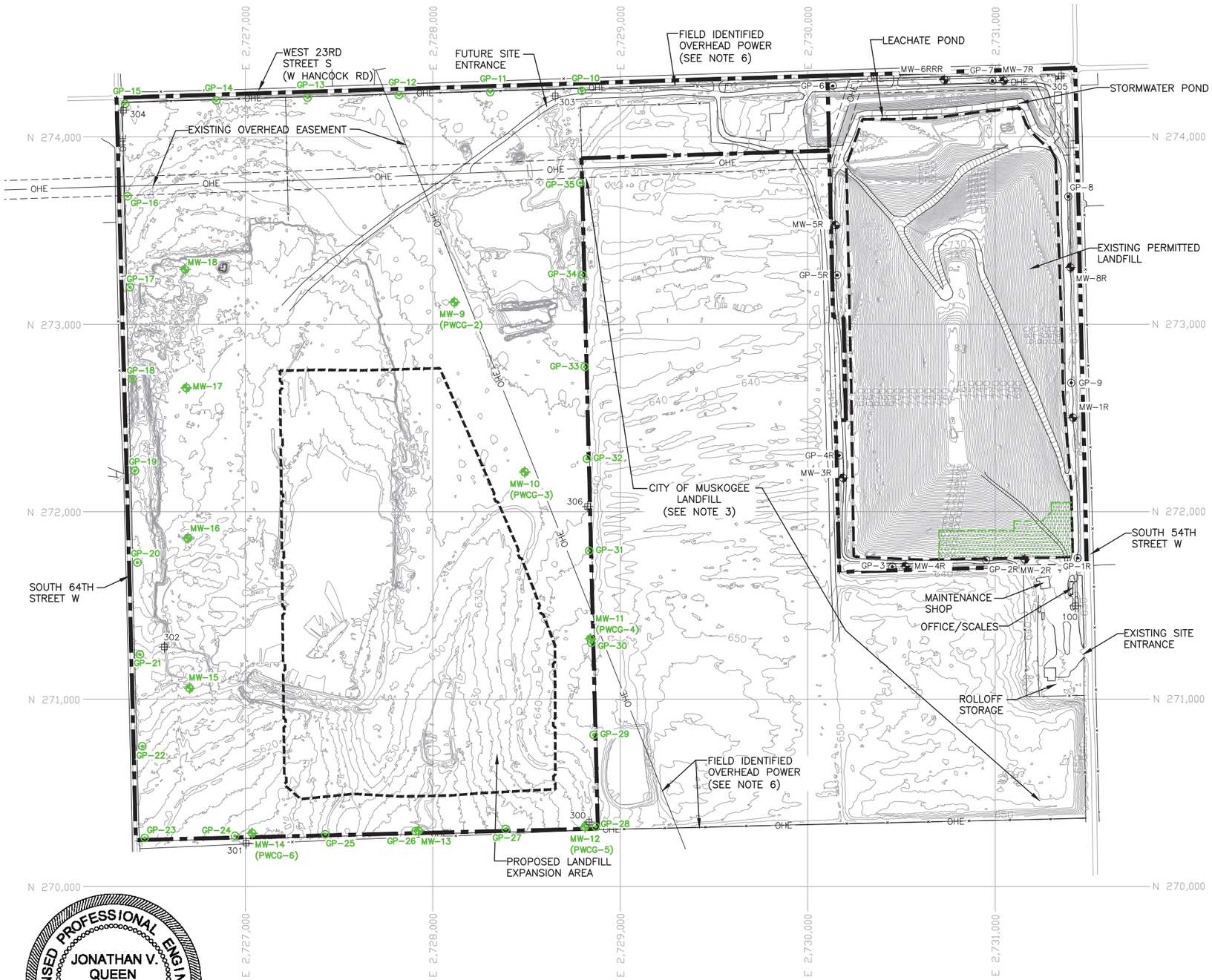
PREPARED BY

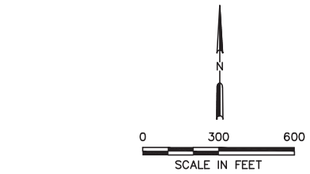
Weaver Consultants Group

6420 SOUTHWEST BLVD., SUITE 206
FORT WORTH, TEXAS 76109
(817) 735–9770
(817) 735–9775 (FAX)
CA 3804 PE – 06/30/2025

FOR PERMITTING PURPOSES ONLY

0:\0006\364\EXPANSION 2022\PERMIT DRAWINGS\1-COVER.dwg, jpuhr, 1:2





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- OHE — EXISTING OVERHEAD EASEMENT
- IN-PLACE FINAL COVER
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE
- 301 — CONTROL POINT (SEE NOTES 7 AND 8)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE-FREE BUFFER ZONE AT LEAST 100-FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. GEODETIC COORDINATES SHOWN HEREON RELATIVE TO WGS84. COORDINATES SHOWN HEREON ARE A LOCAL SITE DERIVATION FROM THE OKLAHOMA COORDINATE SYSTEM OF 1983, NORTH AMERICAN DATUM OF 1983 (NAD83), NORTH ZONE IN U.S. SURVEY FEET, AND DETERMINED TO BE INCONSISTENT WITH GRID VALUES OF KNOWN NAD83 ADJUSTMENTS AS EVIDENCED BY EXISTING LOCAL SITE CONTROL PROVIDED TO WEAVER CONSULTANTS GROUP, LLC (WCG). ELEVATIONS SHOWN HEREON ARE RELATIVE TO A LOCAL SITE VERTICAL DATUM AS EVIDENCED BY EXISTING SITE CONTROL PROVIDED TO AND RECOVERED BY WCG.
8. CONTROL POINTS 300-306 SHOWN HEREON (AT RIGHT) SET BY WCG ON OCTOBER 19, 2022. PIEZOMETERS SHOWN HEREON (TOP RIGHT) LOCATED DURING FIELD SURVEY ON OCTOBER 19, 2022.

CONTROL POINT INFORMATION (SEE NOTES 7 & 8)

POINT	NORTHING	EASTING	ELEVATION	DESCRIPTION
100	271496.99	2731428.573	634.83	SET MAG NAIL NEAR SCALE
300	270343.28	2728833.62	638.97	1/2" IR WITH RED CAP "WCG"
301	270232.00	2727003.91	612.73	1/2" IR WITH RED CAP "WCG"
302	271278.11	2726567.96	641.74	1/2" IR WITH RED CAP "WCG"
303	274219.05	2728653.24	626.92	1/2" IR WITH RED CAP "WCG"
304	274142.87	2726349.73	630.25	1/2" IR WITH RED CAP "WCG"
305	274325.27	2731352.46	622.59	1/2" IR WITH RED CAP "WCG"
306	272027.50	2728825.41	637.69	1/2" IR WITH RED CAP "WCG"

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR INFORMATIONAL PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: 2-BOUNDARY MAP.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

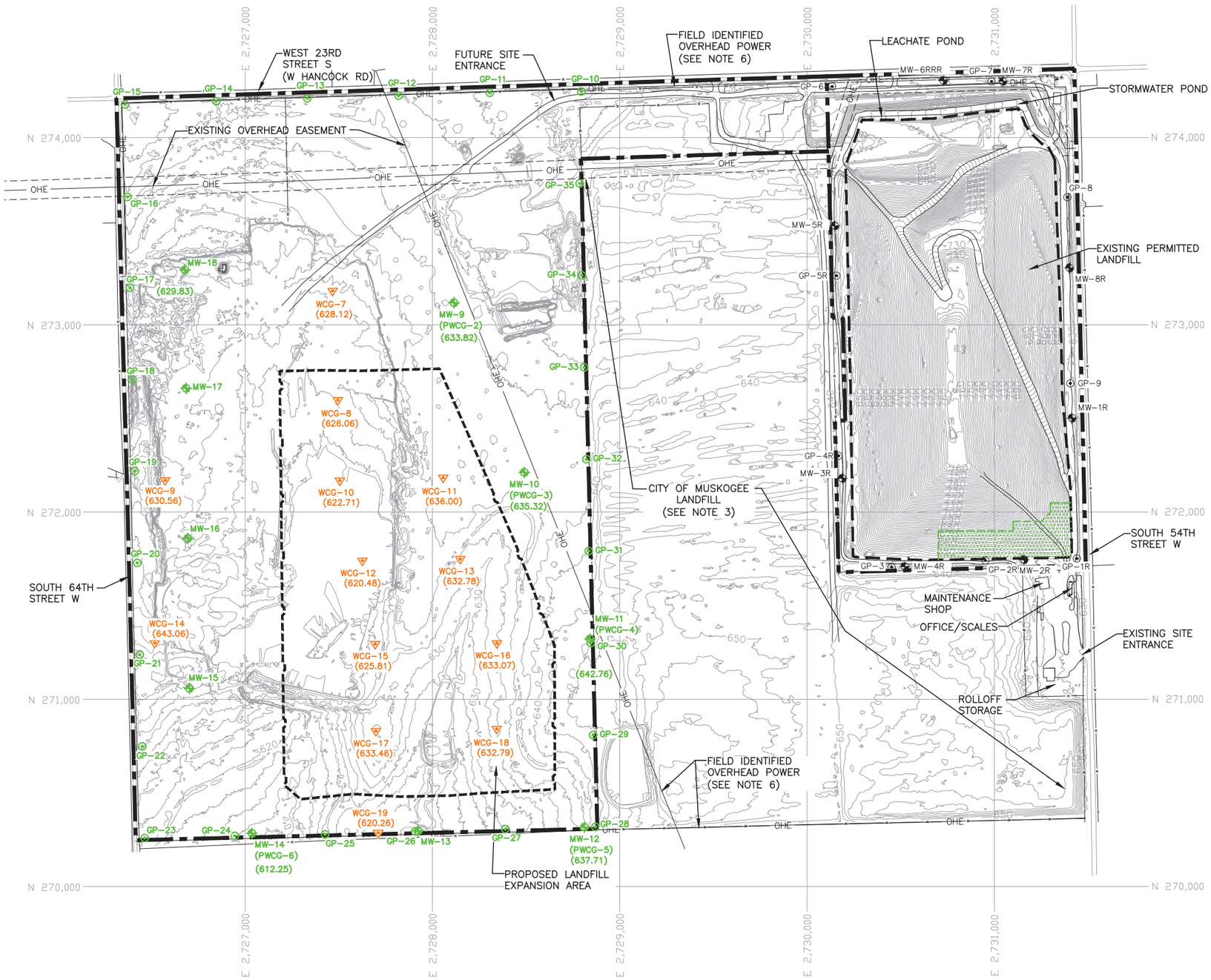
TIER III PERMIT MODIFICATION LOCATION AND BOUNDARY MAP

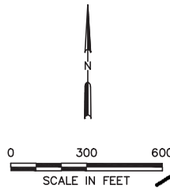
MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

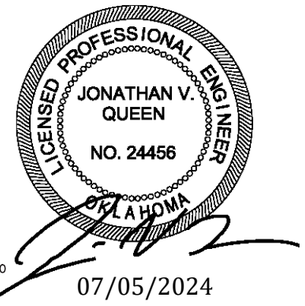
WWW.WCGRP.COM

DRAWING 2

0:\0086\364\EXPANSION 2022\PERMIT DRAWINGS\2-BOUNDARY MAP.dwg, jpuhr, 1:2







LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- OHE — EXISTING OVERHEAD EASEMENT
- IN-PLACE FINAL COVER
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) (629.83) — PROPOSED GROUNDWATER MONITORING WELL (EXISTING WCG 2022 PIEZOMETER LOCATIONS)
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE
- WCG-7 (628.12) — WCG 2022 BOREHOLE LOCATION (SURFACE ELEVATION IN FT-MSL)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE-FREE BUFFER ZONE AT LEAST 100-FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. REFER TO SECTION 2.5 FOR WETLANDS INFORMATION.
8. REFER TO DRAWING 4 AND 5 FOR THE LOCATION AND QUANTITIES OF SURFACE DRAINAGE ENTERING AND EXITING THE FACILITY.
9. SURFACE ELEVATIONS FOR WCG 2022 BORINGS AND EXISTING PIEZOMETER LOCATIONS SURVEYED BY WCG AND POSTED AT PIEZOMETER/BORING LOCATIONS IN FT-MSL.

- [ ] DRAFT
- [x] FOR INFORMATIONAL PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: 3-EXISTING CONTOUR MAP.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

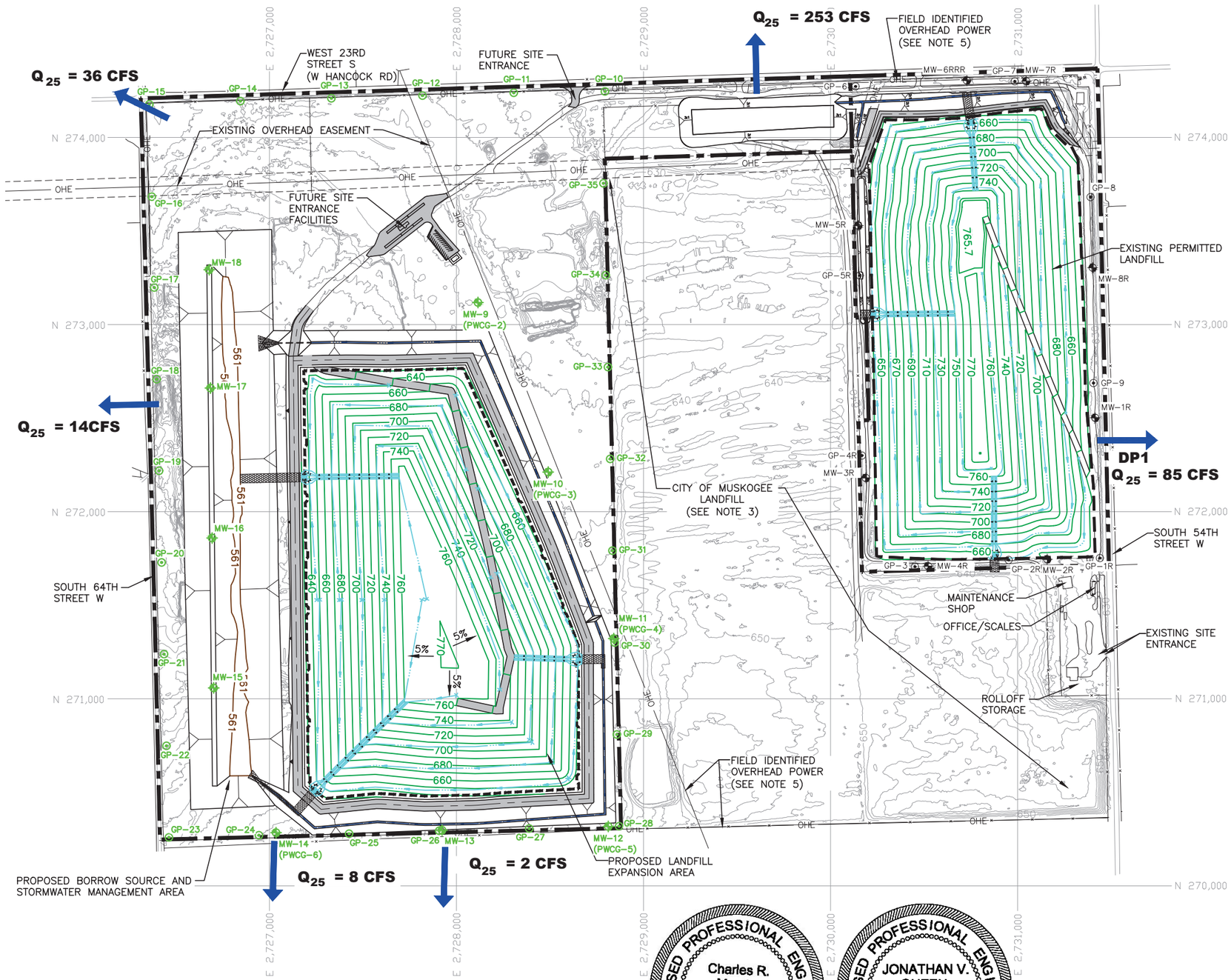
TIER III PERMIT MODIFICATION EXISTING GROUND CONTOUR MAP

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 3

O:\0086\364\EXPANSION 2022\PERMIT DRAWINGS\3-EXISTING CONTOUR MAP.dwg, jpuhr, 1:2



0 300 600
SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- STATE PLANE COORDINATE GRID
- EXISTING CONTOUR
- BORROW AREA CONTOUR
- FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE CHUTE
- PROPOSED DRAINAGE CHANNEL
- RIPRAP/GABIONS
- EXISTING OVERHEAD EASEMENT
- EXISTING GROUNDWATER MONITORING WELL
- PROPOSED GROUNDWATER MONITORING WELL
- EXISTING LANDFILL GAS MONITORING PROBE
- PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01–25–2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
6. REFER TO APPENDIX H FOR ADDITIONAL DRAINAGE INFORMATION.
7. PERMITTED FINAL COVER CONTOURS AND DRAINAGE REPRODUCED FROM THE TIER I PERMIT MODIFICATION PREPARED BY WEAVER CONSULTANTS GROUP, LLC IN NOVEMBER 2021 AND APPROVED BY ODEQ ON JANUARY 24, 2022.

POST–DEVELOPMENT DRAINAGE SUMMARY
THE PROPOSED LANDFILL EXPANSION DOES NOT AFFECT THE EXISTING PERMITTED DRAINAGE PATTERNS. STORMWATER FLOWS REMAIN CONSISTENT WITH PERMITTED DRAINAGE PATTERNS.

LICENSED PROFESSIONAL ENGINEER
Charles R. Marsh
24599
OKLAHOMA
07/05/2024

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA
07/05/2024

- [ ] DRAFT
- [X] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086–364–11
CAD: 5–POST DEV. DRAINAGE.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE – 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

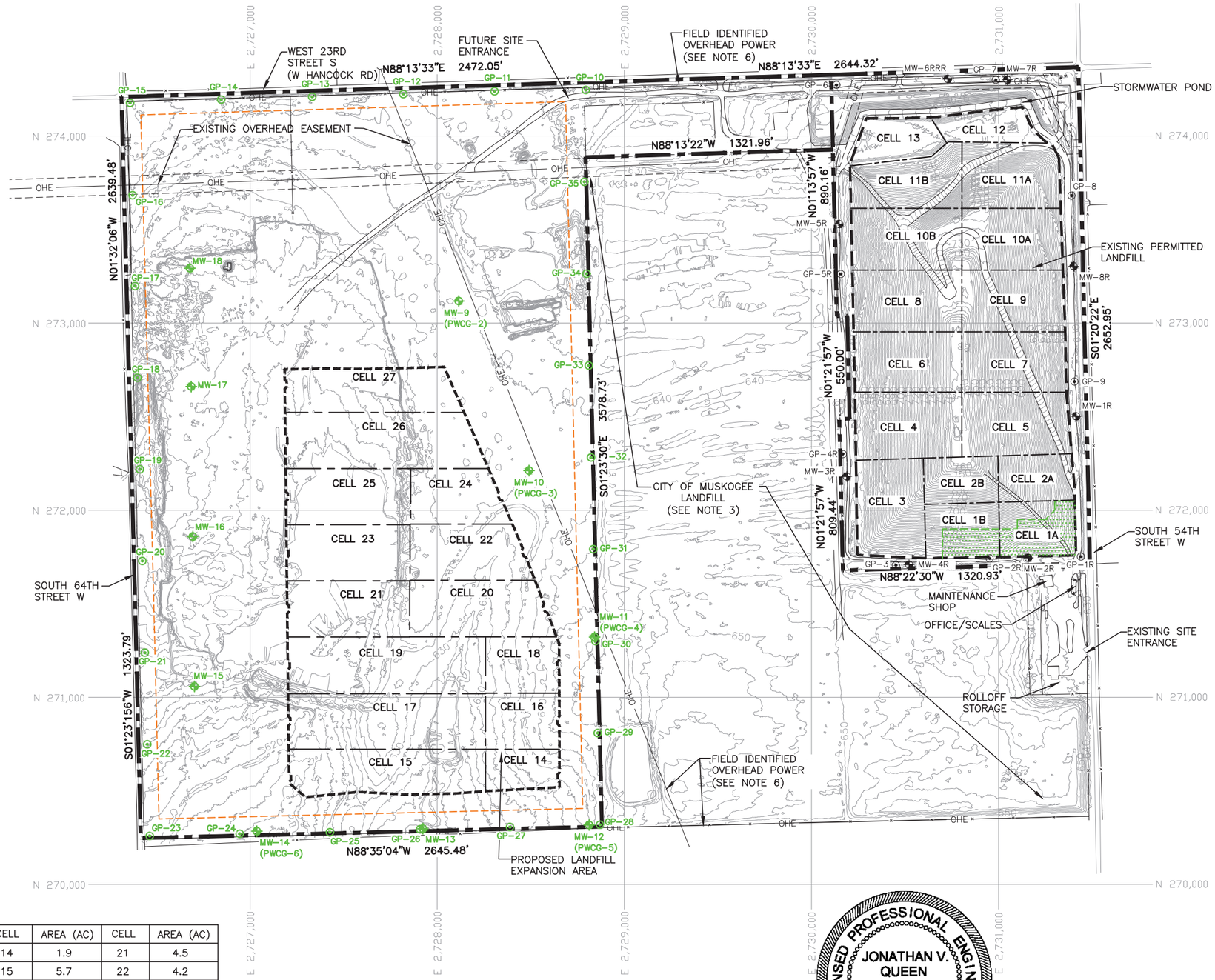
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

TIER III PERMIT MODIFICATION
POST–DEVELOPMENT DRAINAGE PLAN

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 5



CELL	AREA (AC)	CELL	AREA (AC)
14	1.9	21	4.5
15	5.7	22	4.2
16	2.7	23	4.5
17	7.2	24	3.3
18	2.7	25	4.6
19	7.3	26	7.0
20	5.0	27	4.9

* CELLS NOT REFERENCED REMAIN UNCHANGED.

0 300 600
SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- OHE — EXISTING OVERHEAD EASEMENT
- IN-PLACE FINAL COVER
- CELL BOUNDARY
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE
- BUFFER ZONE (SEE NOTE 5)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE-FREE BUFFER ZONE AT LEAST 100-FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. REFER TO APPENDIX H FOR DRAINAGE INFORMATION.
8. EASEMENT RELATED INFORMATION IS DISCUSSED IN SECTION 2.3 IN APPENDIX B-3.
9. AVAILABLE SURFACE AND TOP OF CASING ELEVATIONS ARE PROVIDED IN APPENDIX E AND APPENDIX G-3.
10. CELL CONSTRUCTION SEQUENCE MAY VARY BASED ON SITE OPERATIONS DURING DEVELOPMENT. FOR EXAMPLE, CONSTRUCTION MAY INITIATE ON THE NORTH END (CELL 27) PRIOR TO THE SOUTH END (CELL 14/15) OF THE WESTERN UNIT OR CONSTRUCTION MAY INITIATE ON THE SOUTHWEST END (CELL 15) PRIOR TO THE SOUTHEAST END (CELL 14) OF THE WESTERN UNIT. ANY SEQUENCE CHANGE WILL BE SUBMITTED TO THE ODEQ FOR APPROVAL DURING THE REVIEW OF THE CONSTRUCTION PLANS FOR EACH CELL.
11. THE LANDFILL AREA IS CONTROLLED BY A PERIMETER FENCE, NATURAL BARRIERS, AND/OR GATES. PUBLIC ACCESS CONTROL IS DISCUSSED IN SECTION 8.2 PUBLIC ACCESS CONTROL.
12. UTILITY/TRANSMISSION LINES ARE DISCUSSED IN SECTION 2.3 UTILITY/TRANSMISSION LINES.
13. A SECTION 404 INDIVIDUAL PERMIT IS CURRENTLY UNDER REVIEW BY THE USACE. THE EXPANSION AREA WILL NOT BE DEVELOPED UNTIL THE SECTION 404 INDIVIDUAL PERMIT IS APPROVED BY USACE.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR INFORMATIONAL PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: 6-SITE PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	ADDED BUFFER ZONE
2	07/2024	REVISED WESTERN MONITORING WELL LOCATION

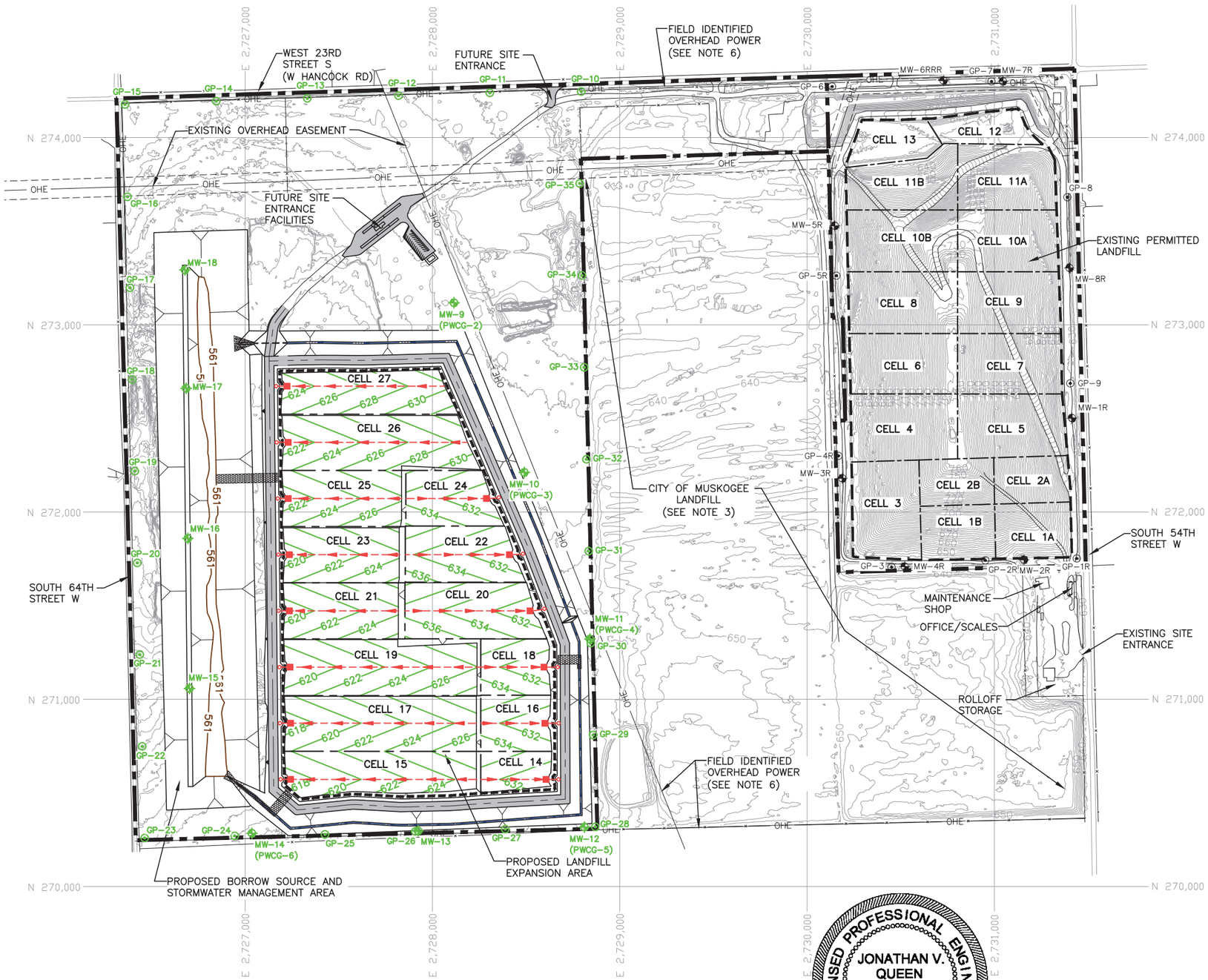
TIER III PERMIT MODIFICATION SITE PLAN

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 6

0:\0086\364\EXPANSION 2022\PERMIT DRAWINGS\6-SITE PLAN.dwg, jpubr, 1:2



0 300 600
SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 636 — EXCAVATION CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED LEACHATE CLEANOUT RISER
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01–25–2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE–FREE BUFFER ZONE AT LEAST 100–FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. ALL PROPOSED EXCAVATION SIDESLOPES ARE 3(HORIZONTAL):1(VERTICAL).
8. LOCATION AND DEPTHS OF BOREHOLES CAN BE FOUND IN APPENDIX E.
9. A SECTION 404 INDUSTRIAL PERMIT IS CURRENTLY UNDER REVIEW BY THE USACE. THE EXPANSION AREA WILL NOT BE DEVELOPED UNTIL THE 404 PERMIT IS APPROVED.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086–364–11
CAD: 7–EXCAVATION PLAN.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE – 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

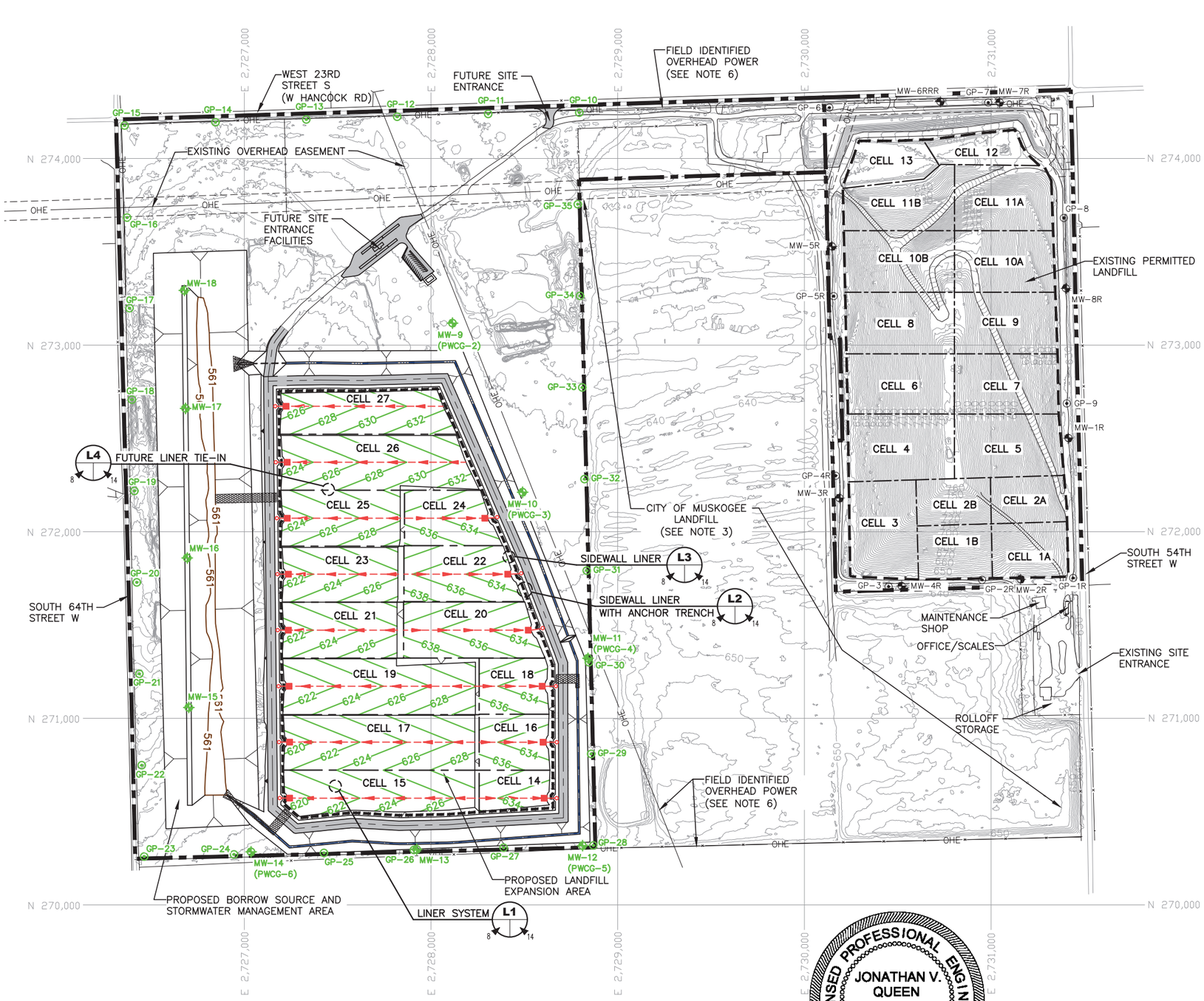
TIER III PERMIT MODIFICATION EXCAVATION PLAN

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 7

0:\0086\364\EXPANSION 2022\PERMIT DRAWINGS\7–EXCAVATION PLAN.dwg, jpuhr, 1:2



LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 638 — TOP OF LINER CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE-FREE BUFFER ZONE AT LEAST 100-FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. ALL PROPOSED EXCAVATION SIDESLOPES ARE 3(HORIZONTAL):1(VERTICAL).
8. LOCATION AND DEPTHS OF BOREHOLES CAN BE FOUND IN APPENDIX E.
9. A SECTION 404 INDUSTRIAL PERMIT IS CURRENTLY UNDER REVIEW BY THE USACE. THE EXPANSION AREA WILL NOT BE DEVELOPED UNTIL THE 404 PERMIT IS APPROVED.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: 8-LINER PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

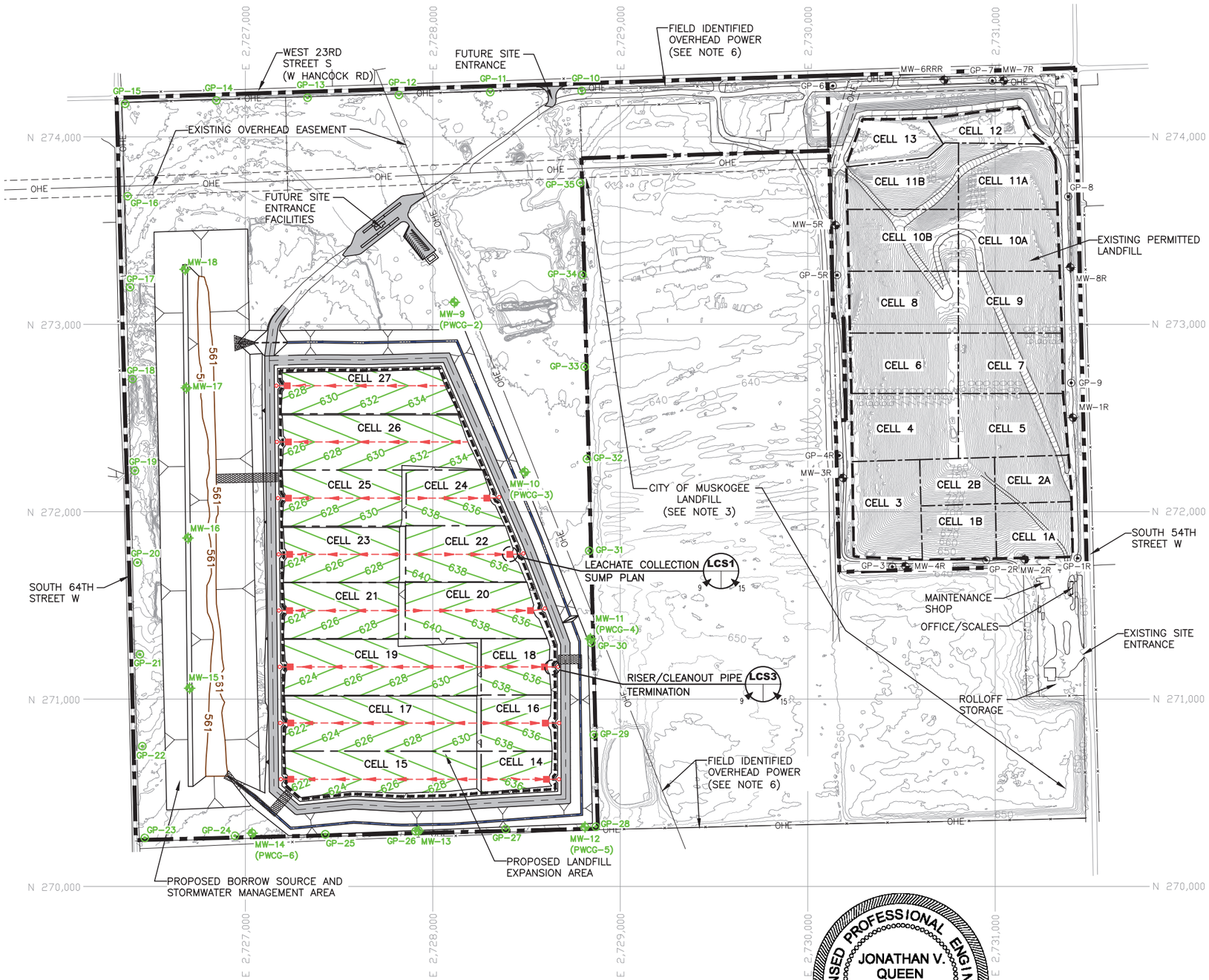
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

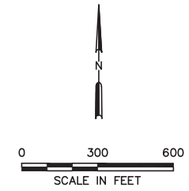
TIER III PERMIT MODIFICATION
TOP OF LINER PLAN

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 8





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 640 — TOP OF PROTECTIVE COVER CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01–25–2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE–FREE BUFFER ZONE AT LEAST 100–FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. ALL PROPOSED EXCAVATION SIDESLOPES ARE 3(HORIZONTAL):1(VERTICAL).
8. LOCATION AND DEPTHS OF BOREHOLES CAN BE FOUND IN APPENDIX E.
9. A SECTION 404 INDUSTRIAL PERMIT IS CURRENTLY UNDER REVIEW BY THE USACE. THE EXPANSION AREA WILL NOT BE DEVELOPED UNTIL THE 404 PERMIT IS APPROVED.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: 9-TOP OF PROT COVER PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE – 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

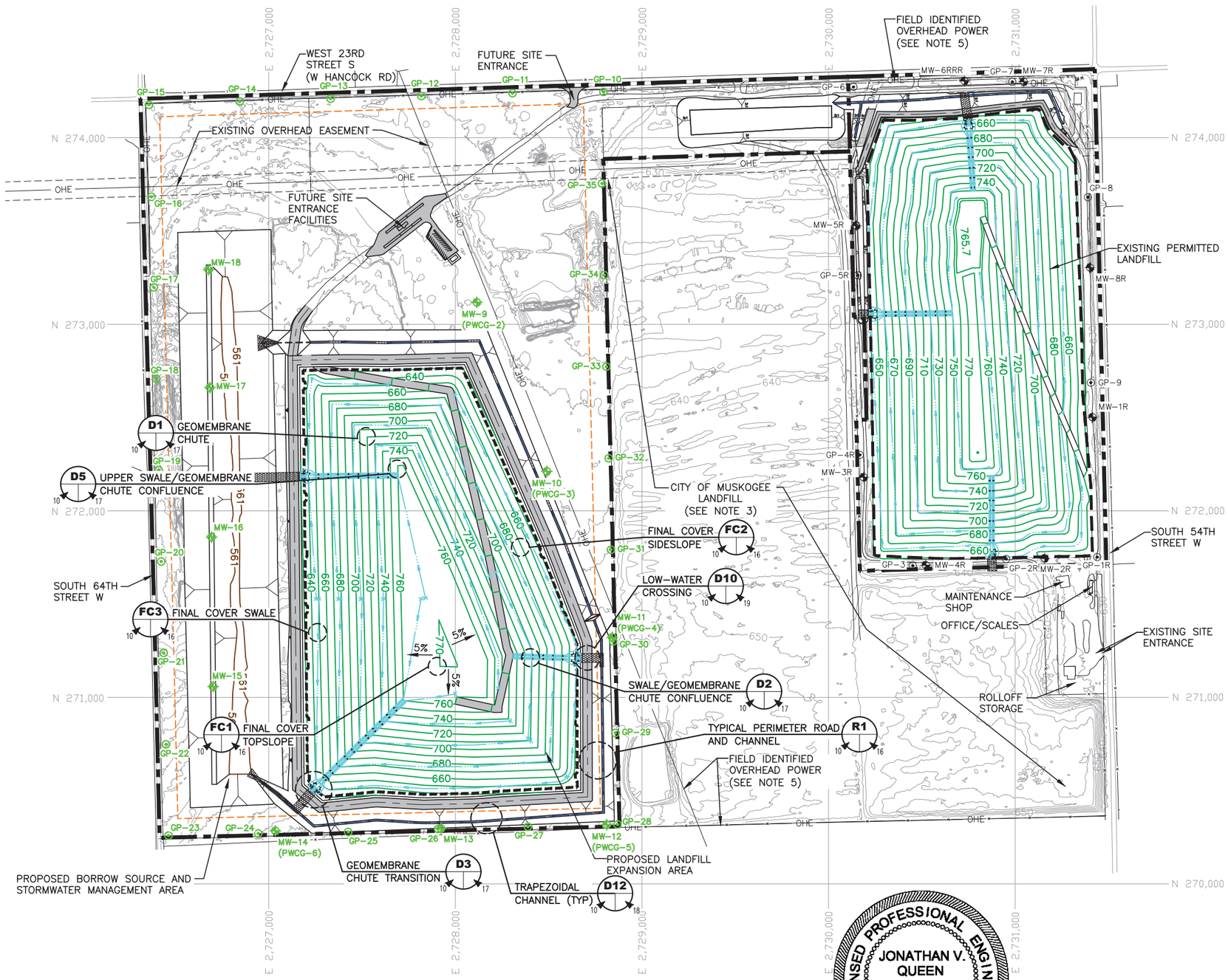
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

TIER III PERMIT MODIFICATION
TOP OF PROTECTIVE COVER PLAN

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 9



0 300 600
SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 561 — BORROW AREA CONTOUR
- 770 — FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE CHUTE
- PROPOSED DRAINAGE CHANNEL
- RIPRAP/GABIONS
- OHE — EXISTING OVERHEAD EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE
- BUFFER ZONE (SEE NOTE 10)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
6. REFER TO APPENDIX H FOR ADDITIONAL DRAINAGE INFORMATION.
7. REFER TO APPENDIX I FOR USACE ADDITIONAL INFORMATION.
8. PERMITTED FINAL COVER CONTOURS AND DRAINAGE REPRODUCED FROM THE TIER I PERMIT MODIFICATION PREPARED BY WEAVER CONSULTANTS GROUP, LLC IN NOVEMBER 2021 AND APPROVED BY ODEQ ON JANUARY 24, 2022.
9. LEACHATE REMOVAL LOCATIONS ARE SHOWN ON DRAWINGS 6-9. ADDITIONAL LEACHATE HANDLING INFORMATION IS INCLUDED IN APPENDIX L.
10. A WASTE-FREE BUFFER ZONE AT LEAST 100-FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [X] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: 10-CLOSURE PLAN.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

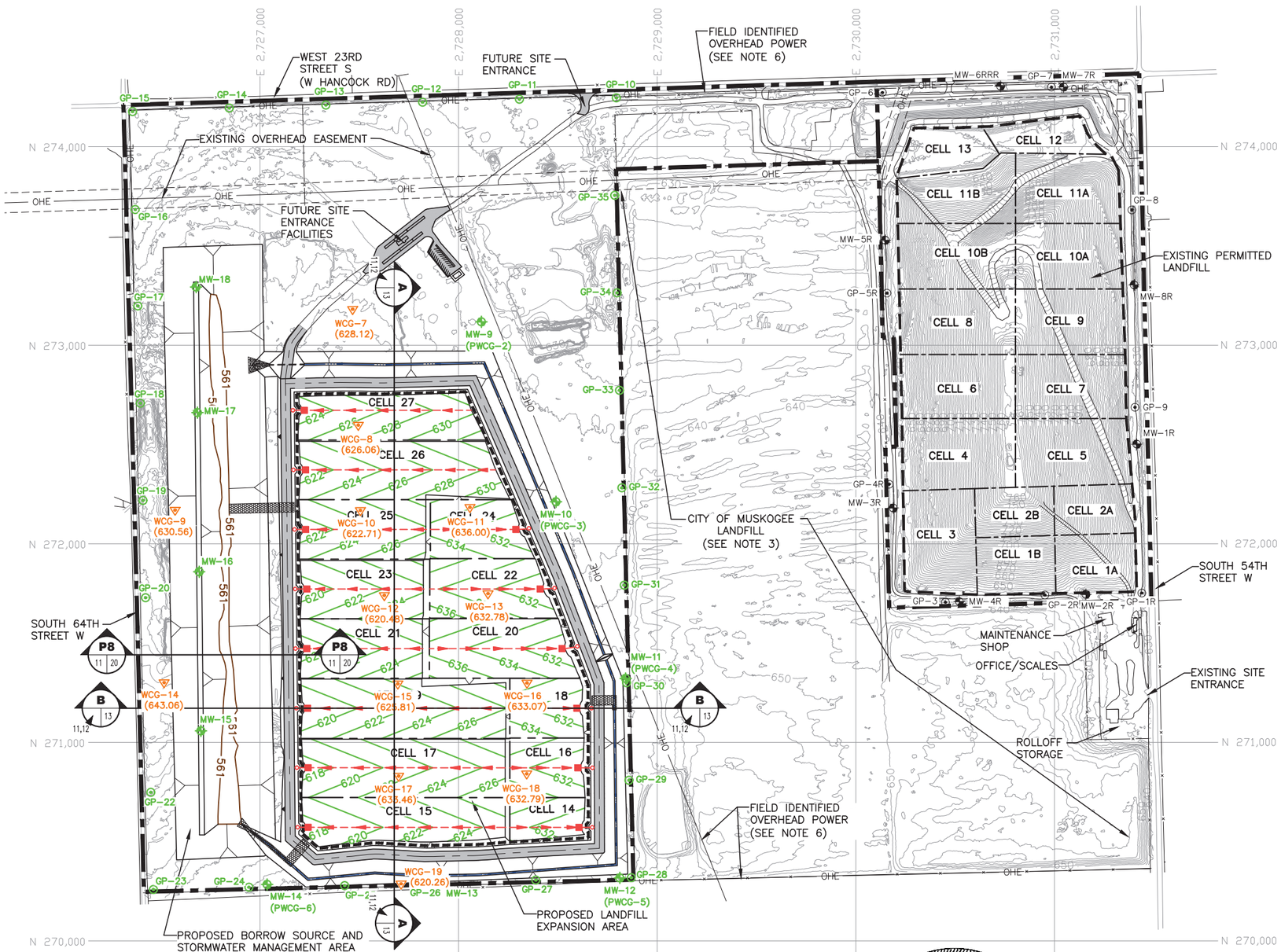
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	ADDED BUFFER ZONE AND NOTE 10.
2	07/2024	REVISED WESTERN MONITORING WELL LOCATION

TIER III PERMIT MODIFICATION CLOSURE CONTOUR AND STORMWATER MANAGEMENT PLAN

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 10



0 300 600
SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 636 — EXCAVATION CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE
- WCG-7 (628.12) — WCG 2022 BOREHOLE LOCATION (SURFACE ELEVATION IN FT-MSL)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE-FREE BUFFER ZONE AT LEAST 100-FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. ALL PROPOSED EXCAVATION SIDESLOPES ARE 3(HORIZONTAL):1(VERTICAL).
8. LOCATION AND DEPTHS OF BOREHOLES CAN BE FOUND IN APPENDIX E.
9. A SECTION 404 INDUSTRIAL PERMIT IS CURRENTLY UNDER REVIEW BY THE USACE. THE EXPANSION AREA WILL NOT BE DEVELOPED UNTIL THE 404 PERMIT IS APPROVED.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [X] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: 11-EXCAVATION SECTION LOC.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

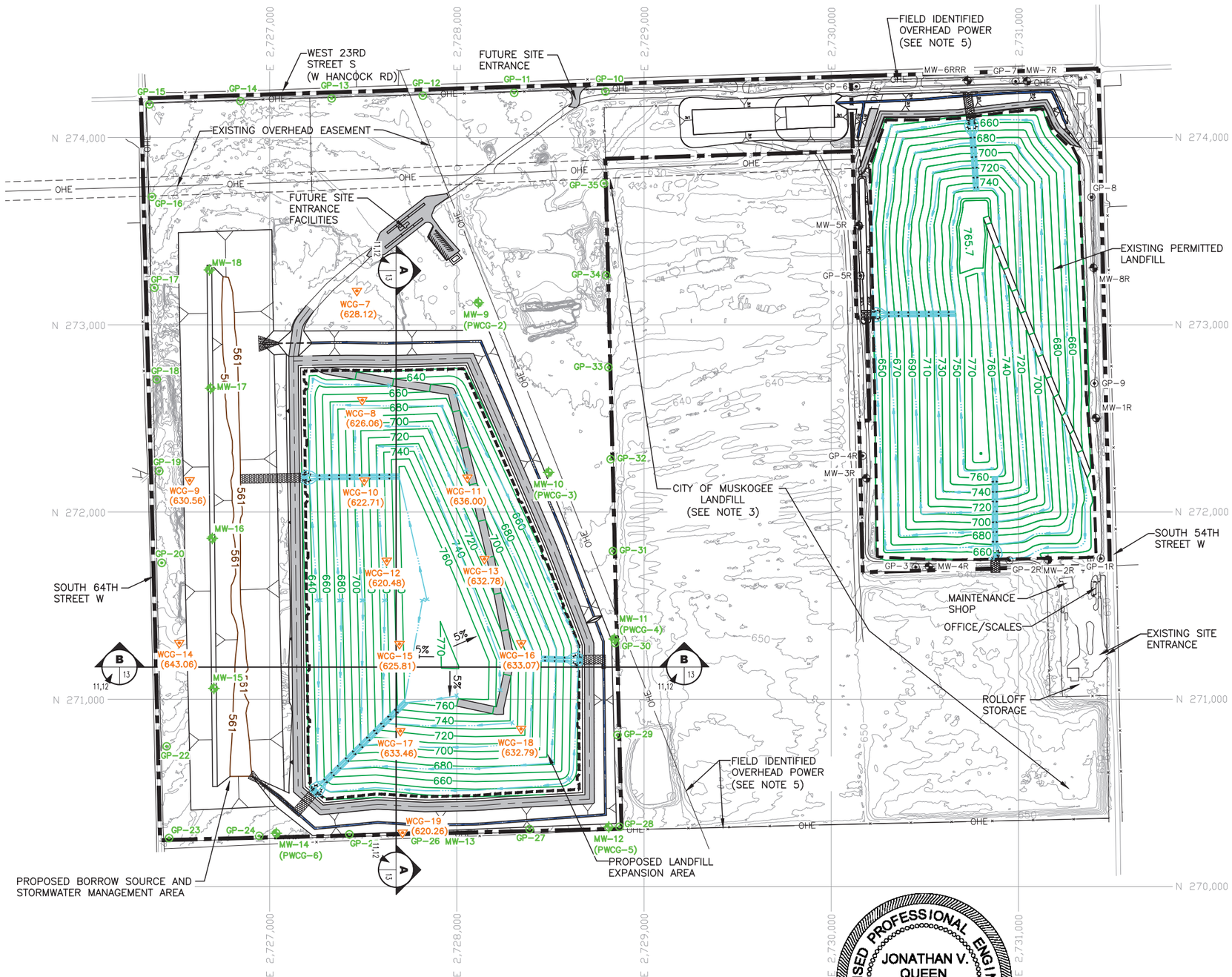
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

TIER III PERMIT MODIFICATION
CROSS-SECTION LOCATION MAP-OPEN PHASES

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 11



0 300 600
SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 561 — BORROW AREA CONTOUR
- 770 — FINAL COVER CONTOUR
- PROPOSED DRAINAGE SWALE
- PROPOSED DRAINAGE CHUTE
- PROPOSED DRAINAGE CHANNEL
- RIPRAP/GABIONS
- OHE — EXISTING OVERHEAD EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE
- WCG-7 (628.12) — WCG 2022 BOREHOLE LOCATION (SURFACE ELEVATION IN FT–MSL)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01–25–2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
6. REFER TO APPENDIX H FOR ADDITIONAL DRAINAGE INFORMATION.
7. REFER TO APPENDIX I FOR USACE ADDITIONAL INFORMATION.
8. PERMITTED FINAL COVER CONTOURS AND DRAINAGE REPRODUCED FROM THE TIER I PERMIT MODIFICATION PREPARED BY WEAVER CONSULTANTS GROUP, LLC IN NOVEMBER 2021 AND APPROVED BY ODEQ ON JANUARY 24, 2022.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086–364–11
CAD: 12–FINAL COVER SEC LOC.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE – 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

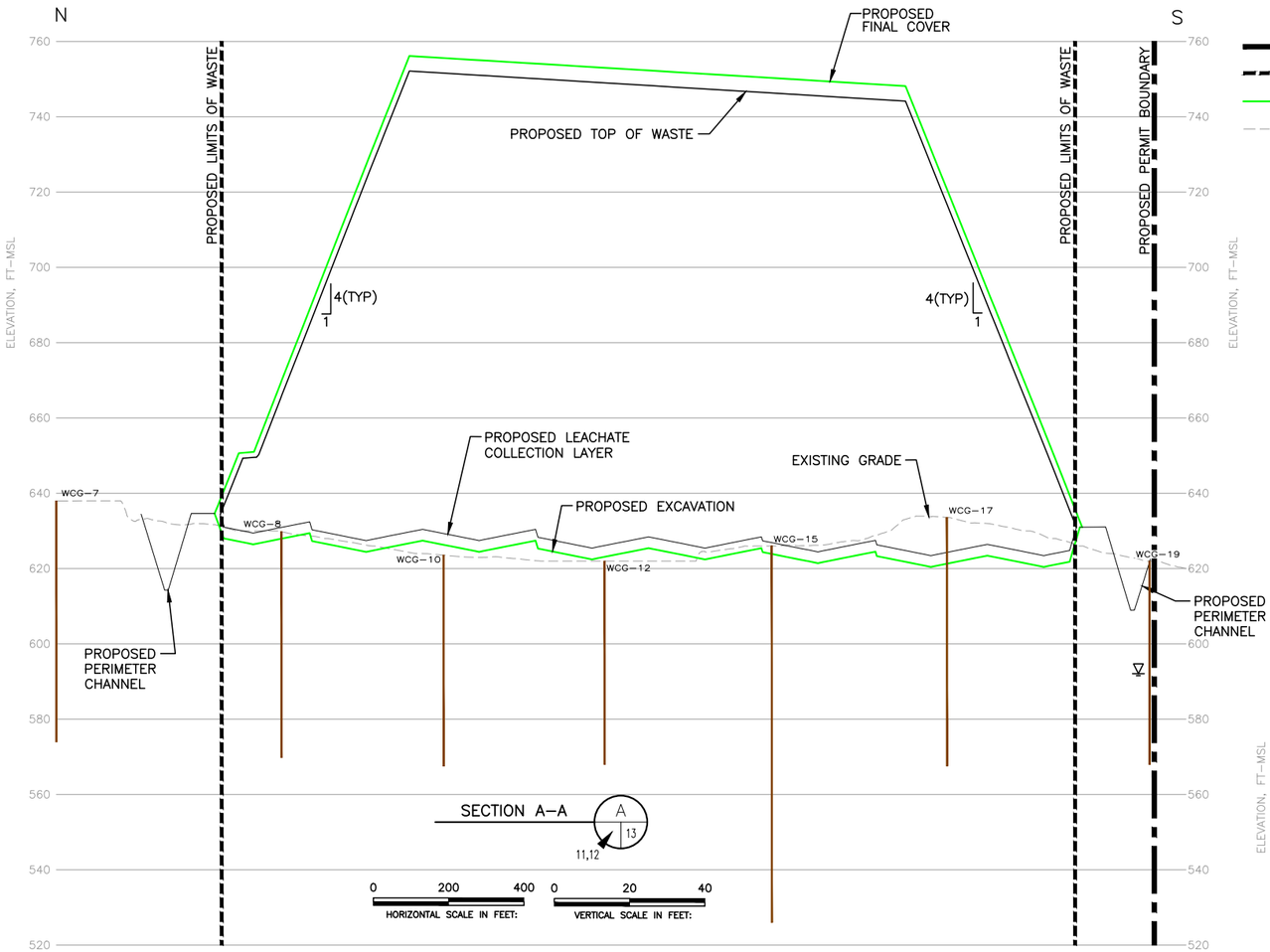
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

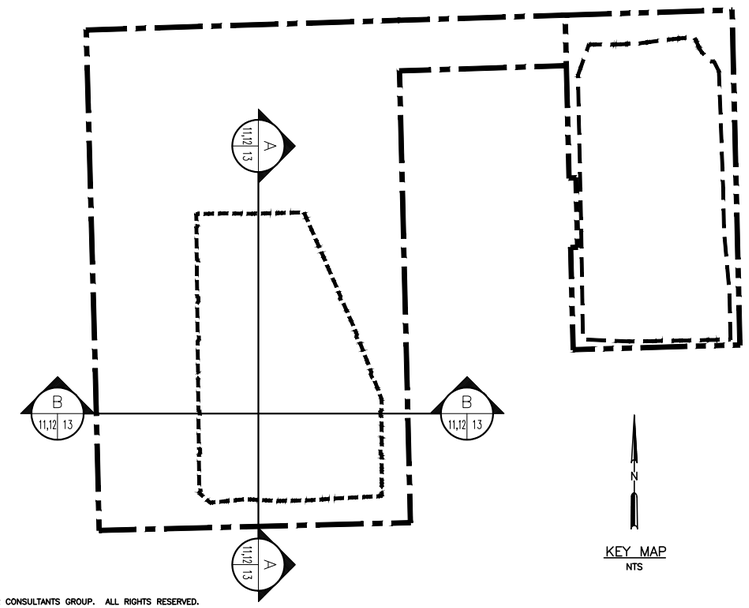
TIER III PERMIT MODIFICATION
CROSS–SECTION LOCATION MAP–CLOSED PHASES

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 12





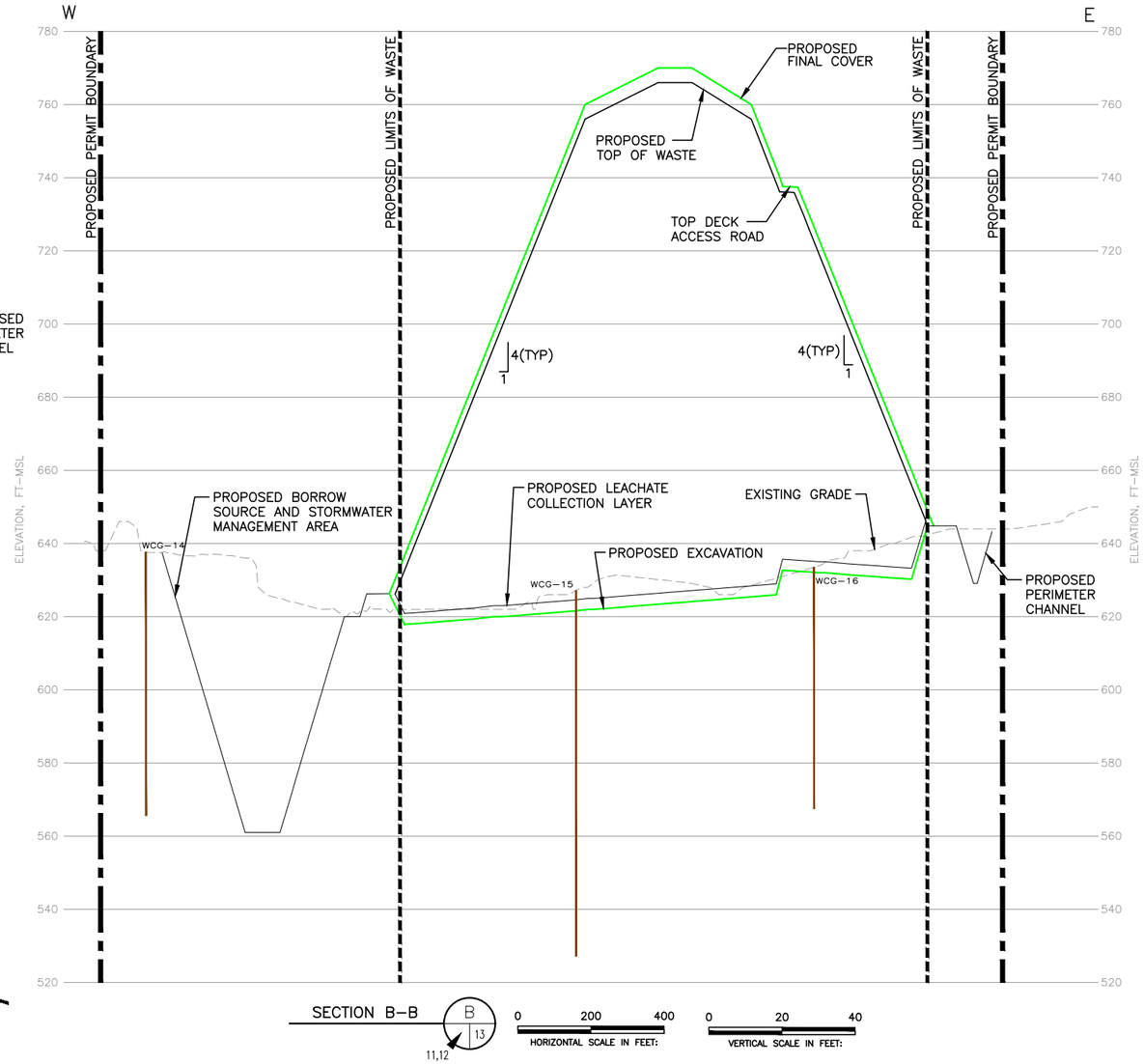
KEY MAP
NTS

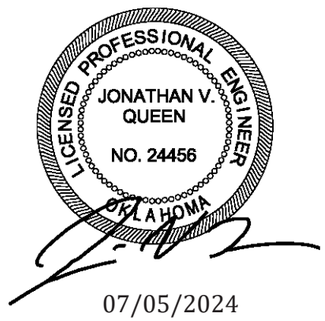
LEGEND

- PROPOSED PERMIT BOUNDARY
- PROPOSED LIMITS OF WASTE
- PROPOSED FINAL COVER
- EXISTING GRADE
- TOP OF UPPERMOST AQUIFER GROUNDWATER OBSERVED AT TIME OF DRILLING (TOP OF ZONE OF SATURATION, SEE NOTE 8)
- STATIC POTENTIOMETRIC GROUNDWATER SURFACE (CONFINED AQUIFER POTENTIOMETRIC HEAD, SEE NOTE 8)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL FROM AERIAL PHOTOGRAPHY FLOWN 01-24-2022.
2. REFER TO DRAWING 14 FOR LINER SYSTEM DETAILS.
3. REFER TO DRAWING 15 FOR LEACHATE COLLECTION SYSTEM DETAILS.
4. REFER TO DRAWING 16 FOR PERIMETER ROAD AND CHANNEL DETAILS.
5. REFER TO DRAWING 16 FOR FINAL COVER DETAILS.
6. POST DEVELOPMENT AND EXCAVATION GRADES ARE SHOWN ON DRAWINGS 11 AND 12.
7. ADDITIONAL BORING AND GROUNDWATER INFORMATION IS PROVIDED IN APPENDIX E.
8. TOP OF UPPERMOST AQUIFER GROUNDWATER ELEVATION OBSERVED AT TIME OF DRILLING INDICATED FOR BORING WCG-19, ALL OTHER BORINGS DEPICTED WERE DRY AT TIME OF DRILLING. THERE IS NO STATIC GROUNDWATER ELEVATION DATA FOR THE DEPICTED BORINGS WHICH WERE NOT COMPLETED AS GROUNDWATER PIEZOMETERS.





07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: 13-CROSS SECTION A.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS

NO.	DATE	DESCRIPTION
1	07/2024	ADDED GROUNDWATER ELEVATION SYMBOL TO LEGEND AND WCG-19 AND ADDED NOTE 8

TIER III PERMIT MODIFICATION
CROSS-SECTIONS A AND B

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

DRAWING 13

MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

TIER III PERMIT MODIFICATION
LANDFILL EXPANSION

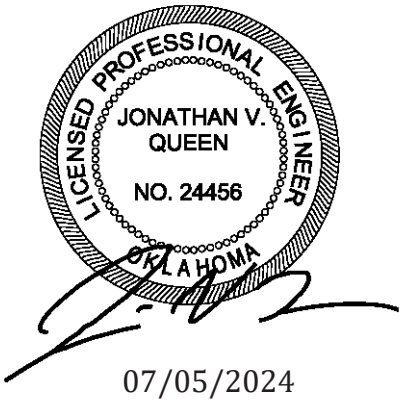
VOLUME 2A OF 4

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024



Prepared by 07/05/2024

Weaver Consultants Group, LLC
CA 3804 PE 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19

MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY

MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

APPENDIX E

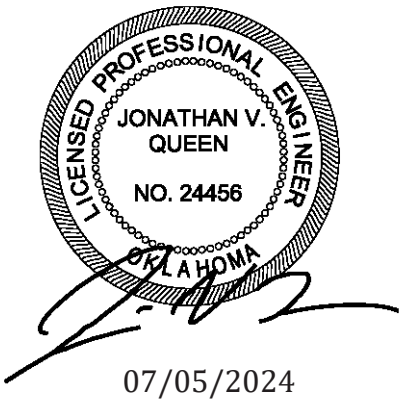
SUBSURFACE INVESTIGATION AND GROUNDWATER STUDY

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024



07/05/2024

Prepared by
Weaver Consultants Group, LLC
CA 3804 PE – 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19

According to ODEQ and OWRB online databases, water wells are not present in the landfill area. According to these databases, there are no public water supply wells located within two miles of the proposed permit boundary. The OWRB water well database indicates there are six private (domestic) water wells within three miles of the proposed permit boundary (see Attachment E-1-3). None of these wells are located on the landfill property. As noted in Attachments E-1-13A, E-1-13B, E-1-13C, and E-1-13D (Potentiometric Head Surface Contour Maps) in the Groundwater Study, groundwater beneath the western expansion area generally flows from the east and toward the northwest ~~east~~, west ~~east~~, and southwest ~~east~~. Based on this flow regime, none of the private water supply wells are located immediately down gradient from the landfill.

3.4.2 Highest Groundwater Elevation Determination

Pursuant to OAC 252:515-7-54(a) and OAC 252:515-11-3(a), the highest groundwater elevations beneath the western expansion area were determined. As discussed in Section 3.3.2, groundwater was observed within fractured weathered shale in seven of the 2022 expansion borings (PWCG-1 through PWCG-6, and WCG-19).

Groundwater within the zone of saturation is isolated by the bounding unsaturated shale strata. Unsaturated sediments located above the zone of saturation form an aquitard that confines groundwater contained within the underlying uppermost aquifer. The unsaturated shale sediments located immediately below the zone of saturation form an aquitard comprising the lower confining unit to groundwater contained within the overlying uppermost aquifer.

The top of uppermost saturated zone elevations and corresponding highest gauged static potentiometric head elevations are presented in Table 3-2. These data indicate that confined groundwater exhibits a potentiometric head ranging from about 11 to 36 feet higher than the top of the uppermost saturated zone.

According to OAC 252:515-1-2 (Definitions), "groundwater" is defined as "*water below the land surface in a zone of saturation*" and "Zone of Saturation" is defined as "*a subsurface zone in which essentially all the interstices are filled with water under pressure greater than that of the atmosphere*". Therefore, the top of the uppermost saturated zone observed at time of drilling constitutes the highest groundwater elevation for evaluating groundwater/waste separation pursuant to OAC 252:515-7-54(a) and OAC 252:515-11-3(a). Consequently, this means the static potentiometric head elevation data have no regulatory implication in evaluating groundwater/waste separation. Therefore, the continued collection of groundwater potentiometric head elevation data from the expansion piezometers serves solely to provide ancillary information for groundwater gradient and flow assessment for the confined uppermost groundwater present within the fractured porosity shale.

A summary of field observations, groundwater study, and hydrologic interpretations is provided in Section 3.5.

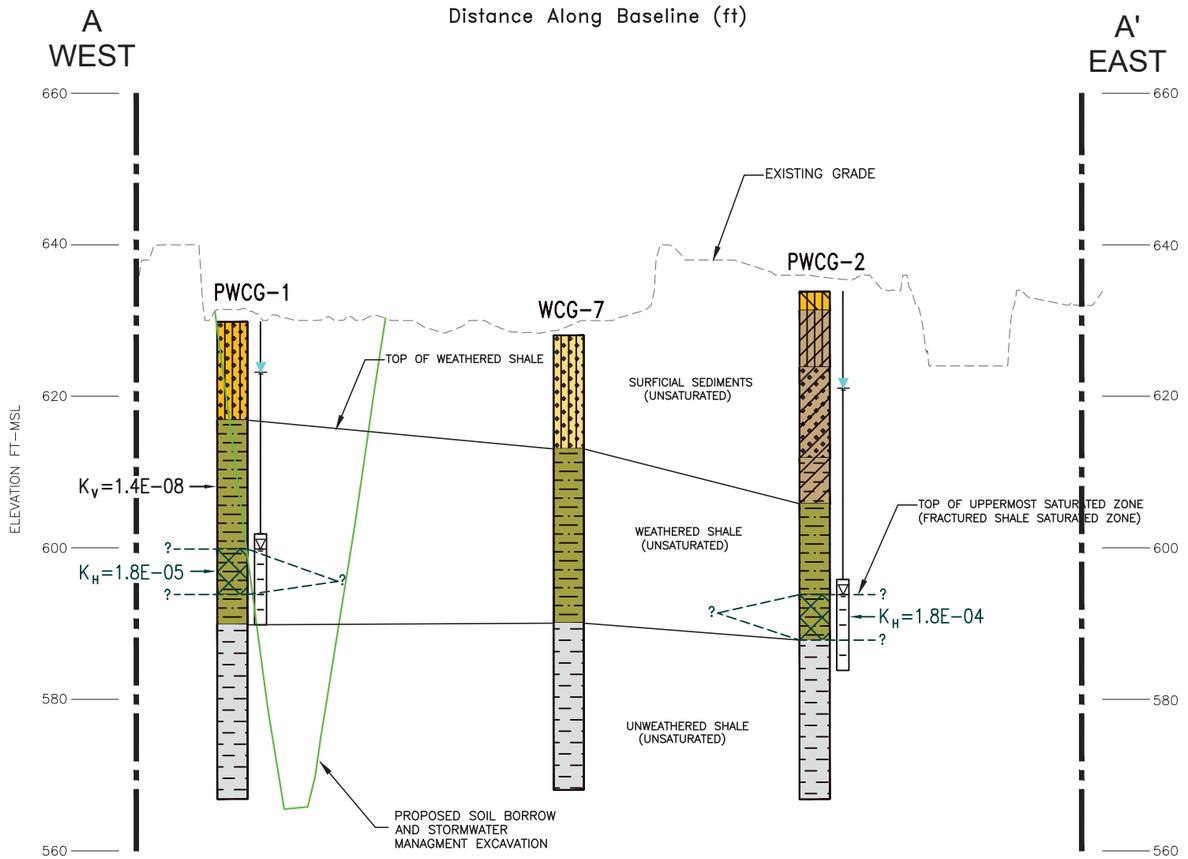
Table 3-2
Highest Groundwater Elevation Determination

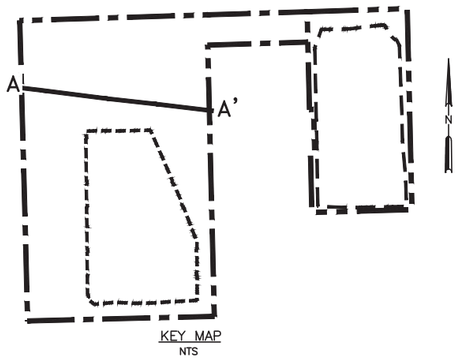
Boring Number	Highest Observed Groundwater Elevation (Top of the Uppermost Saturated Zone) (ft-msl)	Highest Measured Static Potentiometric Head Elevation (ft-msl)	Potentiometric Head Differential (vertical separation in feet)
PWCG-1	599.8	626.14	26.34
PWCG-2	593.8	622.61	28.81
PWCG-3	600.3	629.51	29.21
PWCG-4	602.8	639.02	36.22
PWCG-5	597.7	625.71	28.01
PWCG-6	598.3	609.84	11.54
WCG-7	Not Observed	Not Observed	Not Observed
WCG-8	Not Observed	Not Observed	Not Observed
WCG-9	Not Observed	Not Observed	Not Observed
WCG-10	Not Observed	Not Observed	Not Observed
WCG-11	Not Observed	Not Observed	Not Observed
WCG-12	Not Observed	Not Observed	Not Observed
WCG-13	Not Observed	Not Observed	Not Observed
WCG-14	Not Observed	Not Observed	Not Observed
WCG-15	Not Observed	Not Observed	Not Observed
WCG-16	Not Observed	Not Observed	Not Observed
WCG-17	Not Observed	Not Observed	Not Observed
WCG-18	Not Observed	Not Observed	Not Observed
WCG-19*	592.1*	Not Observed*	Not Observed*

Highest observed groundwater elevations are commensurate with top of uppermost saturated zone.
Highest measured static potentiometric head elevations based on piezometer readings by WCG.
* No piezometer installed in borehole WCG-19.

3.4.3 Regional Precipitation Data

Table 3-3 presents the daily and monthly precipitation data from August 2021 through September 2023 as recorded at the Muskogee-Davis Regional Airport. The airport is located about seven miles south-southeast of the landfill and is the closest climatological station. According to the Oklahoma Climatological Survey (OCS) the average annual rainfall over the last ~~25~~30 years at the Muskogee-Davis Regional Airport is about ~~42.5~~39.7 inches, and total rainfall during 2022 was about 46-inches.





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

LITHOLOGIC UNITS

- SILTY CLAY
- SANDY CLAY
- SHALEY CLAY
- CLAYEY **SILT**
- SANDY **SILT**
- CLAYEY SAND
- SILTY SAND
- SAND **or** SANDSTONE
- WEATHERED SHALE (UNSATURATED)
- WEATHERED SHALE (SATURATED)
- UNWEATHERED SHALE
- LIMESTONE
- COAL
- GROUNDWATER PIEZOMETER AS-BUILT RISER (TOP) AND SCREEN (BOTTOM)
- TOP OF UPPERMOST AQUIFER GROUNDWATER OBSERVED AT TIME OF DRILLING (TOP OF ZONE OF SATURATION)
- STATIC POTENTIOMETRIC GROUNDWATER SURFACE (CONFINED AQUIFER POTENTIOMETRIC HEAD)

0 200 400
SCALE IN FEET
HORIZONTAL

0 10 20
SCALE IN FEET
VERTICAL

NOTES:

1. CROSS SECTION INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS SECTION LOCATION SHOWN ON FIGURE E-1-7.
3. HYDRAULIC CONDUCTIVITY VALUES FROM RISING HEAD SLUG TESTS (K_H) AND GEOTECHNICAL LABORATORY MEASUREMENTS (K_V) LISTED IN CM/S.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA
07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-8 CROSS-SECTION.DWG
DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

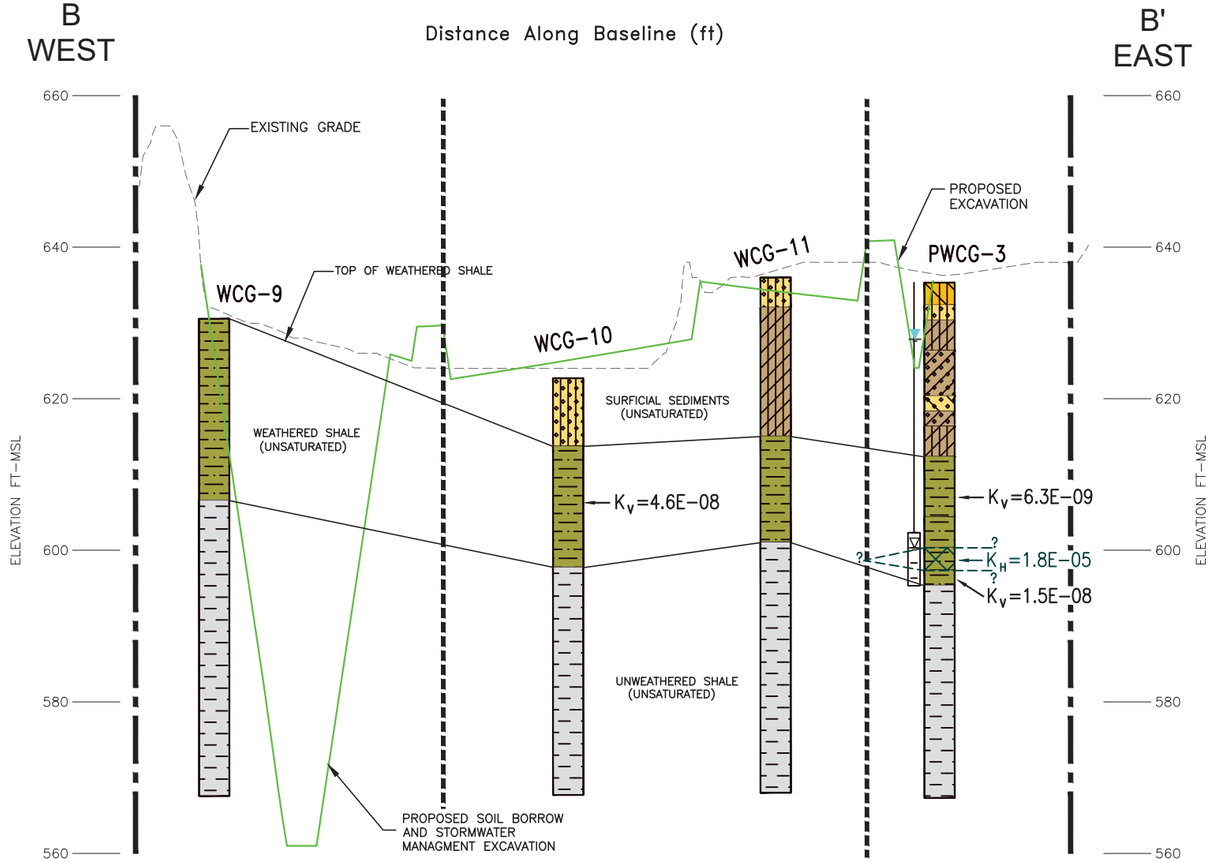
REVISIONS		
NO.	DATE	DESCRIPTION

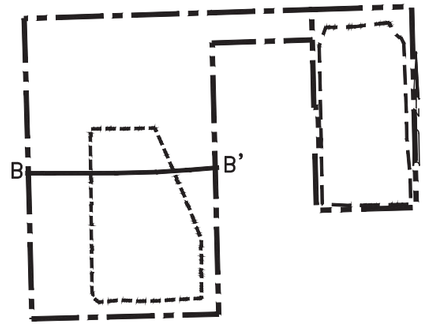
TIER III PERMIT MODIFICATION
GEOLOGIC CROSS-SECTION A-A'

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

ATTACHMENT E-1-8A





KEY MAP
NTS

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

LITHOLOGIC UNITS

- SILTY CLAY
- SANDY CLAY
- SHALEY CLAY
- CLAYEY **SILT**
- SANDY **SILT**
- CLAYEY SAND
- SILTY SAND
- SAND **or** SANDSTONE
- WEATHERED SHALE (UNSATURATED)
- WEATHERED SHALE (SATURATED)
- UNWEATHERED SHALE
- LIMESTONE
- COAL
- GROUNDWATER PIEZOMETER AS-BUILT RISER (TOP) AND SCREEN (BOTTOM)
- TOP OF UPPERMOST AQUIFER GROUNDWATER OBSERVED AT TIME OF DRILLING (TOP OF ZONE OF SATURATION)
- STATIC POTENTIOMETRIC GROUNDWATER SURFACE (CONFINED AQUIFER POTENTIOMETRIC HEAD)

0 200 400
SCALE IN FEET
HORIZONTAL

0 10 20
SCALE IN FEET
VERTICAL

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

NOTES:

1. CROSS SECTION INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS SECTION LOCATION SHOWN ON FIGURE E-1-7.
3. HYDRAULIC CONDUCTIVITY VALUES FROM RISING HEAD SLUG TESTS (K_H) AND GEOTECHNICAL LABORATORY MEASUREMENTS (K_V) LISTED IN CM/S.

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-8 CROSS-SECTION.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS

NO.	DATE	DESCRIPTION
1	07/2024	REVISED WEST AND EAST AXIS

TIER III PERMIT MODIFICATION
GEOLOGIC CROSS-SECTION B-B'

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

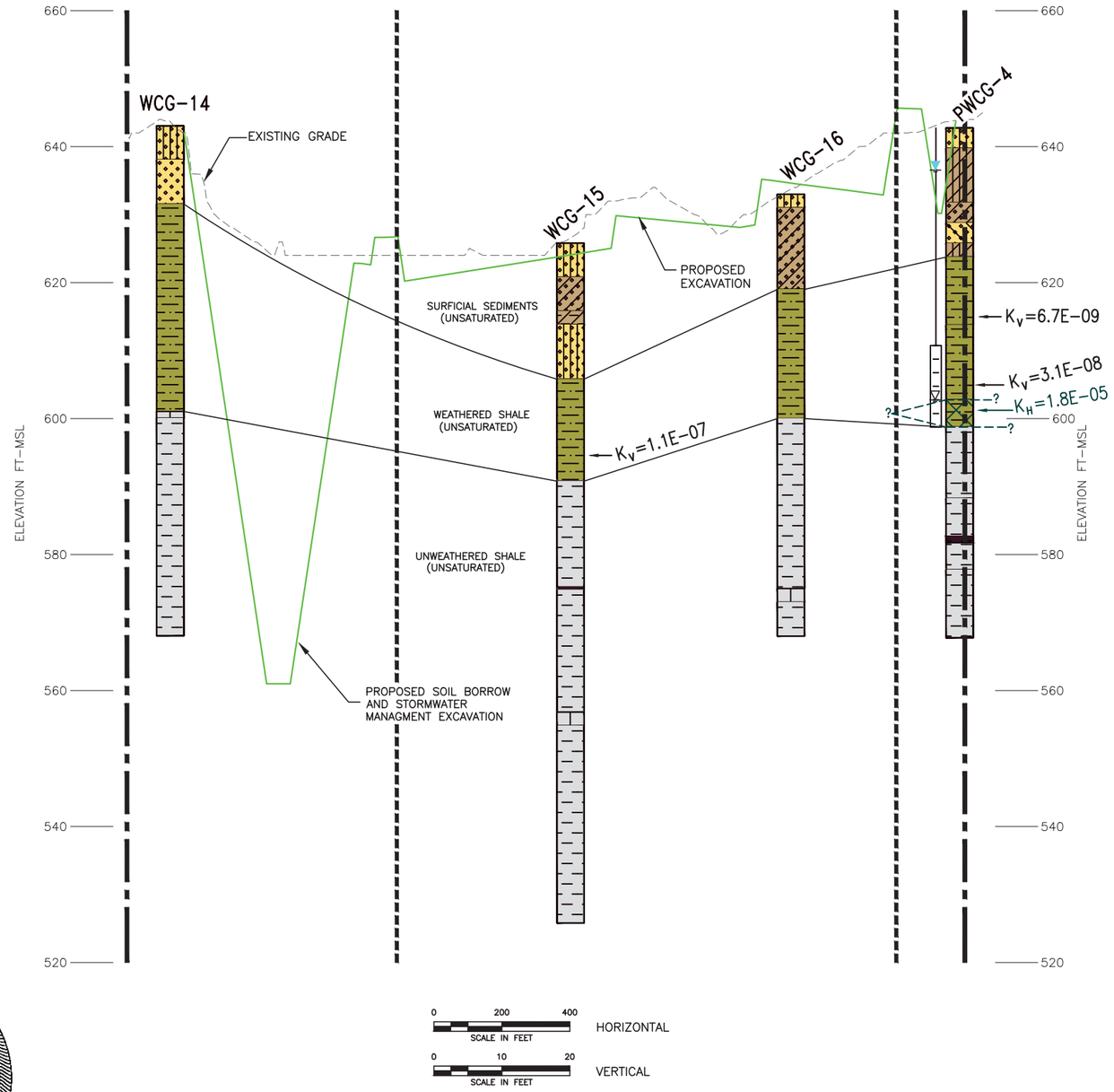
WWW.WCGRP.COM

ATTACHMENT E-1-8B

C
WEST

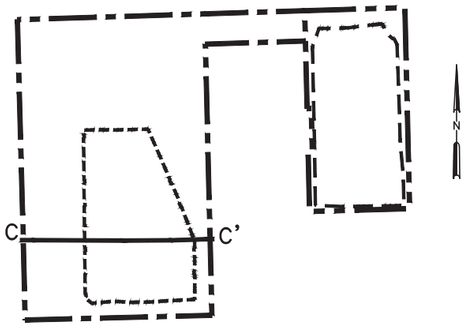
C'
EAST

Distance Along Baseline (ft)



0 200 400
SCALE IN FEET
HORIZONTAL

0 10 20
SCALE IN FEET
VERTICAL



KEY MAP
NTS

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

LITHOLOGIC UNITS

- SILTY CLAY
- SANDY CLAY
- SHALEY CLAY
- CLAYEY SILT
- SANDY SILT
- CLAYEY SAND
- SILTY SAND
- SAND or SANDSTONE
- WEATHERED SHALE (UNSATURATED)
- WEATHERED SHALE (SATURATED)
- UNWEATHERED SHALE
- LIMESTONE
- COAL
- GROUNDWATER PIEZOMETER AS-BUILT RISER (TOP) AND SCREEN (BOTTOM)
- TOP OF UPPERMOST AQUIFER GROUNDWATER OBSERVED AT TIME OF DRILLING (TOP OF ZONE OF SATURATION)
- STATIC POTENTIOMETRIC GROUNDWATER SURFACE (CONFINED AQUIFER POTENTIOMETRIC HEAD)

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

NOTES:

1. CROSS SECTION INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS SECTION LOCATION SHOWN ON FIGURE E-1-7.
3. HYDRAULIC CONDUCTIVITY VALUES FROM RISING HEAD SLUG TESTS (K_H) AND GEOTECHNICAL LABORATORY MEASUREMENTS (K_V) LISTED IN CM/S.

☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-8 CROSS-SECTION.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS

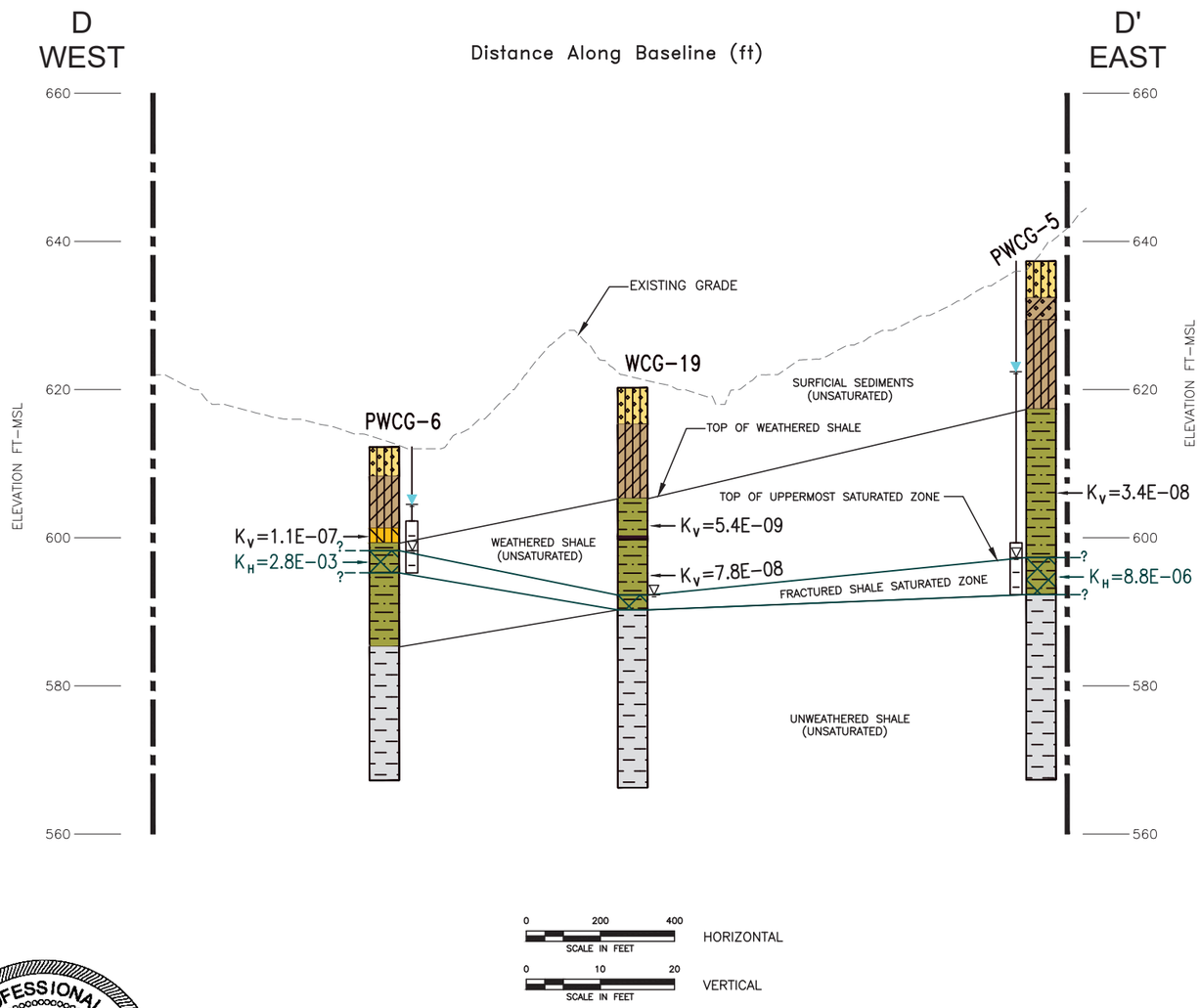
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WEST AND EAST AXIS

TIER III PERMIT MODIFICATION
GEOLOGIC CROSS-SECTION C-C'

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

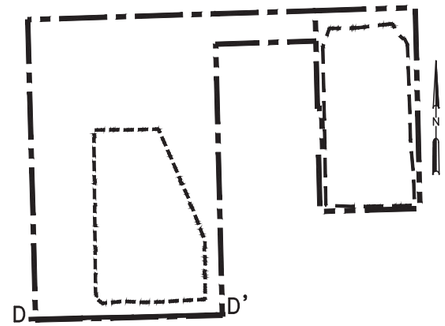
WWW.WCGRP.COM

ATTACHMENT E-1-8C



0 200 400
SCALE IN FEET
HORIZONTAL

0 10 20
SCALE IN FEET
VERTICAL



KEY MAP
NTS

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

LITHOLOGIC UNITS

- SILTY CLAY
- SANDY CLAY
- SHALEY CLAY
- CLAYEY **SILT**
- SANDY **SILT**
- CLAYEY SAND
- SILTY SAND
- SAND **or** SANDSTONE
- WEATHERED SHALE (UNSATURATED)
- WEATHERED SHALE (SATURATED)
- UNWEATHERED SHALE
- LIMESTONE
- COAL
- GROUNDWATER PIEZOMETER AS-BUILT RISER (TOP) AND SCREEN (BOTTOM)
- TOP OF UPPERMOST AQUIFER GROUNDWATER OBSERVED AT TIME OF DRILLING (TOP OF ZONE OF SATURATION)
- STATIC POTENTIOMETRIC GROUNDWATER SURFACE (CONFINED AQUIFER POTENTIOMETRIC HEAD)

NOTES:

1. CROSS SECTION INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS SECTION LOCATION SHOWN ON FIGURE E-1-7.
3. HYDRAULIC CONDUCTIVITY VALUES FROM RISING HEAD SLUG TESTS (K_H) AND GEOTECHNICAL LABORATORY MEASUREMENTS (K_V) LISTED IN CM/S.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-8 CROSS-SECTION.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS

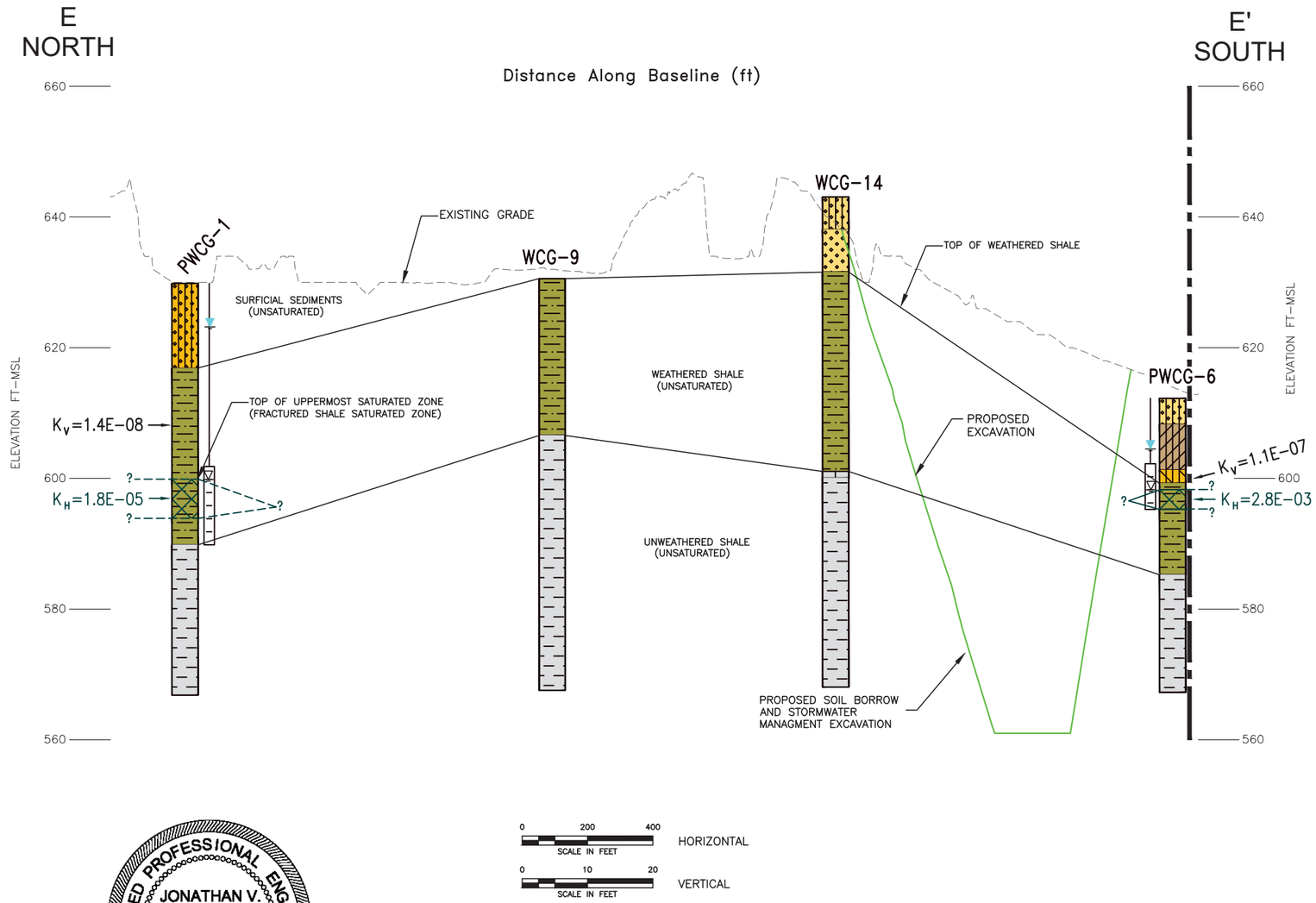
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WEST AND EAST AXIS

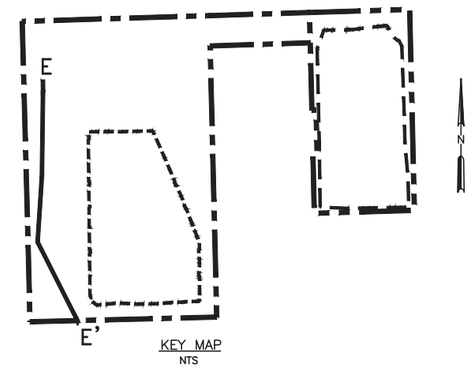
TIER III PERMIT MODIFICATION
GEOLOGIC CROSS-SECTION D-D'

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

ATTACHMENT E-1-8D





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

LITHOLOGIC UNITS

- SILTY CLAY
- SANDY CLAY
- SHALEY CLAY
- CLAYEY **SILT**
- SANDY **SILT**
- CLAYEY SAND
- SILTY SAND
- SAND **or** SANDSTONE
- WEATHERED SHALE (UNSATURATED)
- WEATHERED SHALE (SATURATED)
- UNWEATHERED SHALE
- LIMESTONE
- COAL

- GROUNDWATER PIEZOMETER AS-BUILT RISER (TOP) AND SCREEN (BOTTOM)
- TOP OF UPPERMOST AQUIFER GROUNDWATER OBSERVED AT TIME OF DRILLING (TOP OF ZONE OF SATURATION)
- STATIC POTENTIOMETRIC GROUNDWATER SURFACE (CONFINED AQUIFER POTENTIOMETRIC HEAD)

0 200 400 SCALE IN FEET — HORIZONTAL

0 10 20 SCALE IN FEET — VERTICAL

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

NOTES:

1. CROSS SECTION INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS SECTION LOCATION SHOWN ON FIGURE E-1-7.
3. HYDRAULIC CONDUCTIVITY VALUES FROM RISING HEAD SLUG TESTS (K_H) AND GEOTECHNICAL LABORATORY MEASUREMENTS (K_V) LISTED IN CM/S.

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-8 CROSS-SECTION.DWG
DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION

TIER III PERMIT MODIFICATION
GEOLOGIC CROSS-SECTION E-E'

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

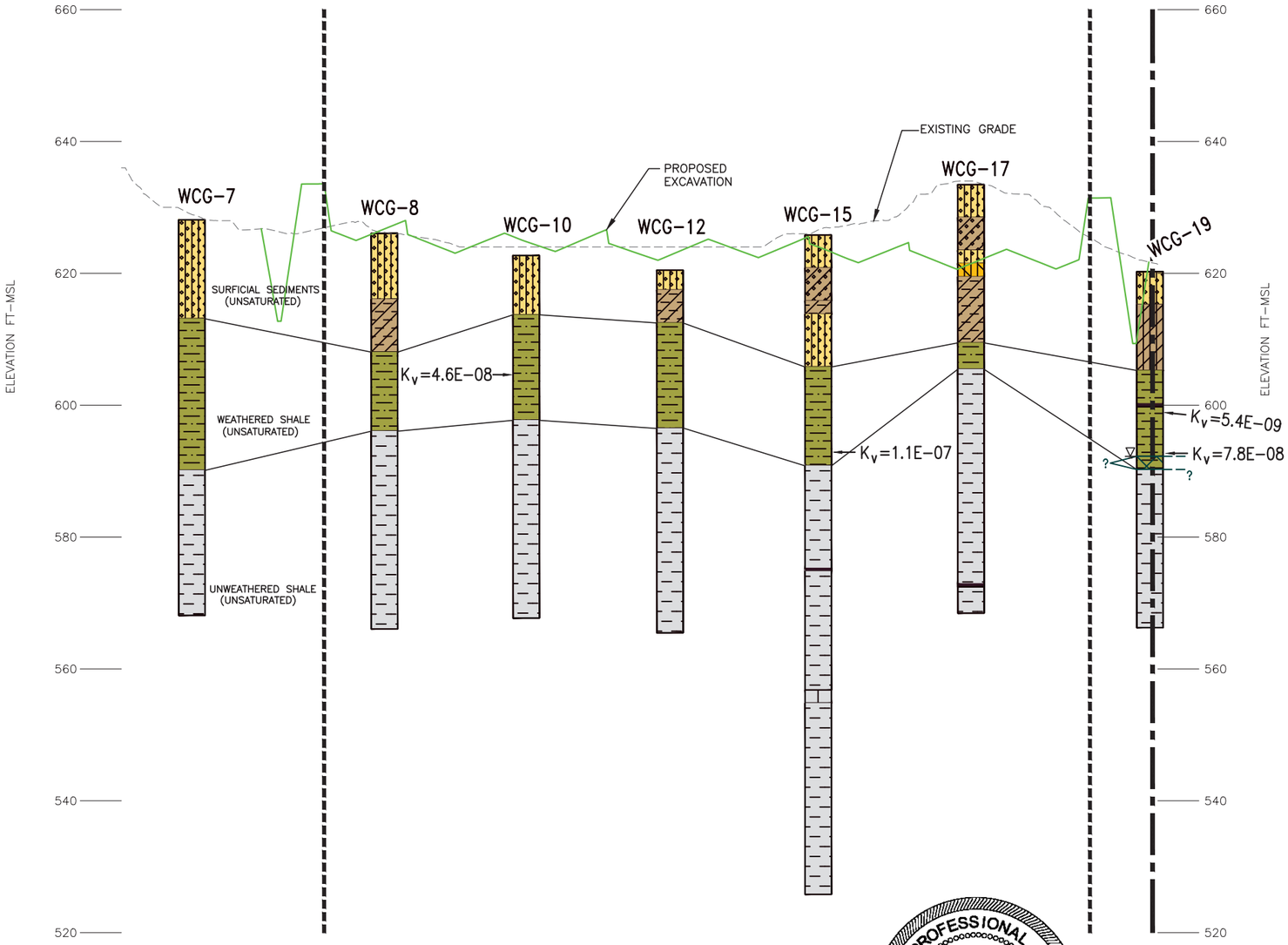
WWW.WCGRP.COM

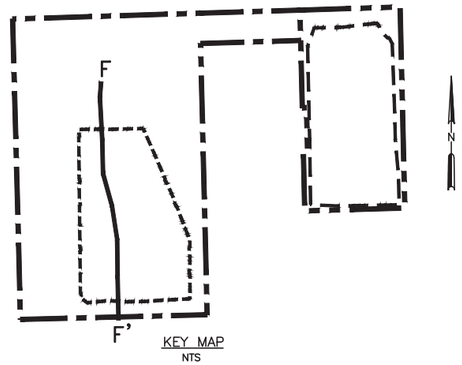
ATTACHMENT E-1-8E

F
NORTH

Distance Along Baseline (ft)

F'
SOUTH





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

LITHOLOGIC UNITS

- SILTY CLAY
- SANDY CLAY
- SHALEY CLAY
- CLAYEY **SILT**
- SANDY **SILT**
- CLAYEY SAND
- SILTY SAND
- SAND **or** SANDSTONE
- WEATHERED SHALE (UNSATURATED)
- WEATHERED SHALE (SATURATED)
- UNWEATHERED SHALE
- LIMESTONE
- COAL
- GROUNDWATER PIEZOMETER AS-BUILT RISER (TOP) AND SCREEN (BOTTOM)
- TOP OF UPPERMOST AQUIFER GROUNDWATER OBSERVED AT TIME OF DRILLING (TOP OF ZONE OF SATURATION)
- STATIC POTENTIOMETRIC GROUNDWATER SURFACE (CONFINED AQUIFER POTENTIOMETRIC HEAD)

0 200 400
SCALE IN FEET
HORIZONTAL

0 10 20
SCALE IN FEET
VERTICAL

NOTES:

1. CROSS SECTION INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS SECTION LOCATION SHOWN ON FIGURE E-1-7.
3. HYDRAULIC CONDUCTIVITY VALUES FROM RISING HEAD SLUG TESTS (K_H) AND GEOTECHNICAL LABORATORY MEASUREMENTS (K_V) LISTED IN CM/S.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-8 CROSS-SECTION.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

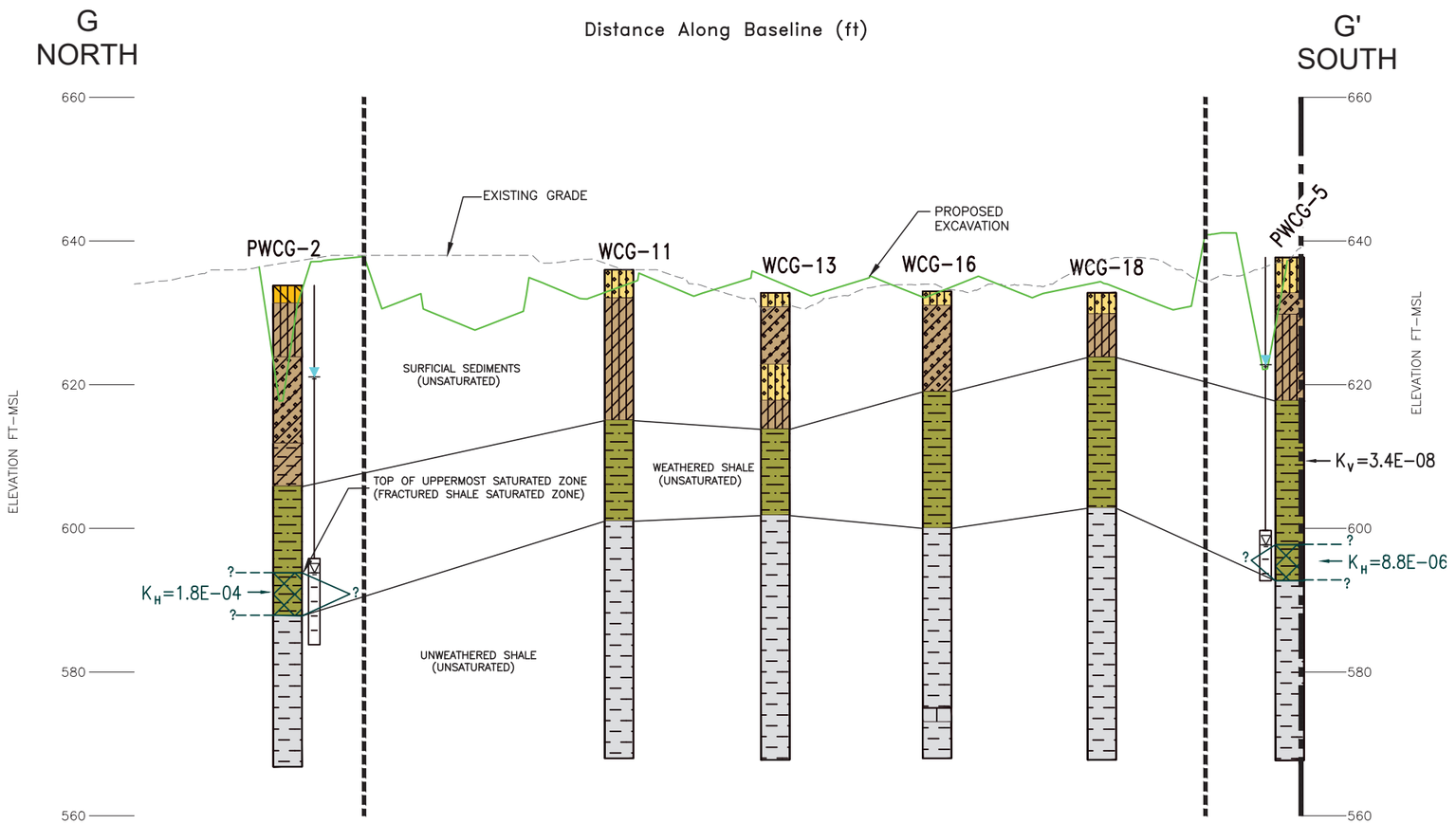
REVISIONS		
NO.	DATE	DESCRIPTION

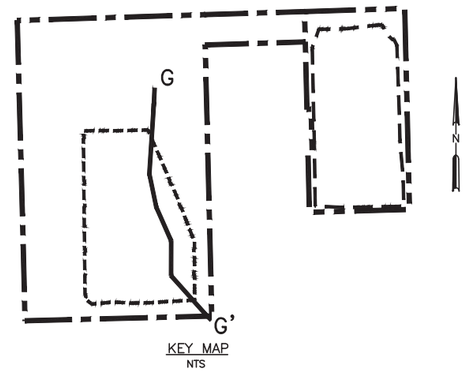
TIER III PERMIT MODIFICATION
GEOLOGIC CROSS-SECTION F-F'

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

ATTACHMENT E-1-8F





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

LITHOLOGIC UNITS

- SILTY CLAY
- SANDY CLAY
- SHALEY CLAY
- CLAYEY SILT
- SANDY SILT
- CLAYEY SAND
- SILTY SAND
- SAND or SANDSTONE
- WEATHERED SHALE (UNSATURATED)
- WEATHERED SHALE (SATURATED)
- UNWEATHERED SHALE
- LIMESTONE
- COAL

- GROUNDWATER PIEZOMETER AS-BUILT RISER (TOP) AND SCREEN (BOTTOM)
- TOP OF UPPERMOST AQUIFER GROUNDWATER OBSERVED AT TIME OF DRILLING (TOP OF ZONE OF SATURATION)
- STATIC POTENTIOMETRIC GROUNDWATER SURFACE (CONFINED AQUIFER POTENTIOMETRIC HEAD)

0 200 400 SCALE IN FEET — HORIZONTAL

0 10 20 SCALE IN FEET — VERTICAL

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

NOTES:

1. CROSS SECTION INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS SECTION LOCATION SHOWN ON FIGURE E-1-7.
3. HYDRAULIC CONDUCTIVITY VALUES FROM RISING HEAD SLUG TESTS (K_H) AND GEOTECHNICAL LABORATORY MEASUREMENTS (K_V) LISTED IN CM/S.

☐ DRAFT
☒ FOR PERMITTING PURPOSES ONLY
☐ ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-8 CROSS-SECTION.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS

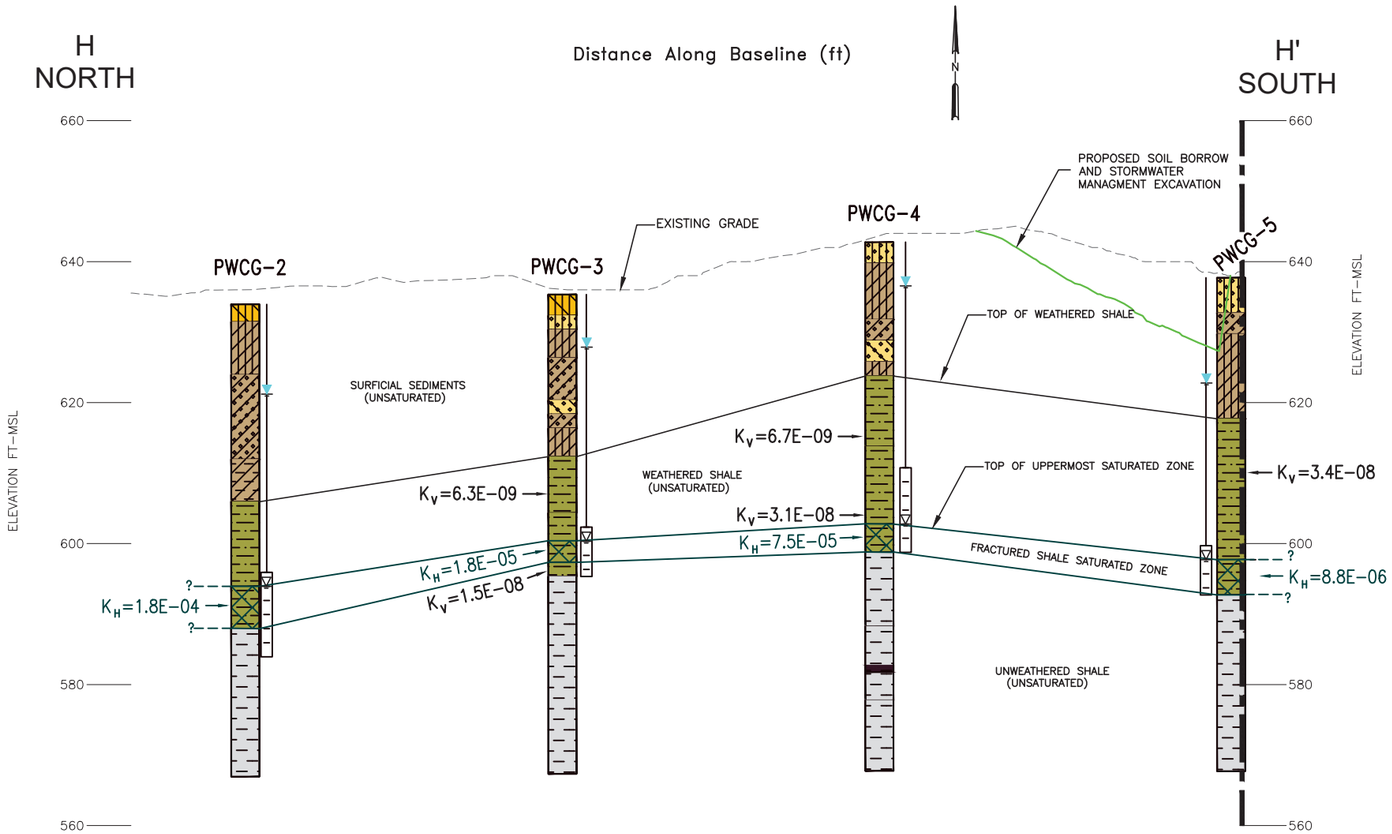
NO.	DATE	DESCRIPTION

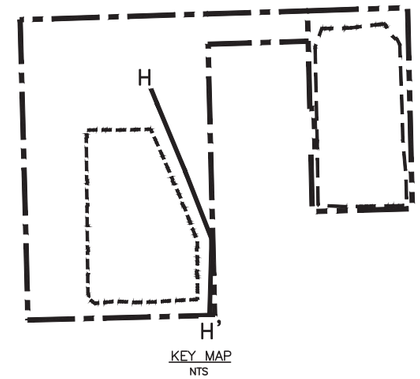
TIER III PERMIT MODIFICATION
GEOLOGIC CROSS-SECTION G-G'

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

ATTACHMENT E-1-8G





KEY MAP
NTS

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE

LITHOLOGIC UNITS

- SILTY CLAY
- SANDY CLAY
- SHALEY CLAY
- CLAYEY **SILT**
- SANDY **SILT**
- CLAYEY SAND
- SILTY SAND
- SAND **or** SANDSTONE
- WEATHERED SHALE (UNSATURATED)
- WEATHERED SHALE (SATURATED)
- UNWEATHERED SHALE
- LIMESTONE
- COAL
- GROUNDWATER PIEZOMETER AS-BUILT RISER (TOP) AND SCREEN (BOTTOM)
- TOP OF UPPERMOST AQUIFER GROUNDWATER OBSERVED AT TIME OF DRILLING (TOP OF ZONE OF SATURATION)
- STATIC POTENTIOMETRIC GROUNDWATER SURFACE (CONFINED AQUIFER POTENTIOMETRIC HEAD)

0 200 400
SCALE IN FEET
HORIZONTAL

0 10 20
SCALE IN FEET
VERTICAL

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

NOTES:

1. CROSS SECTION INTERPOLATED BETWEEN BORINGS. ACTUAL CONDITIONS MAY VARY FROM THOSE ILLUSTRATED.
2. CROSS SECTION LOCATION SHOWN ON FIGURE E-1-7.
3. HYDRAULIC CONDUCTIVITY VALUES FROM RISING HEAD SLUG TESTS (K_H) AND GEOTECHNICAL LABORATORY MEASUREMENTS (K_V) LISTED IN CM/S.

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-8 CROSS-SECTION.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

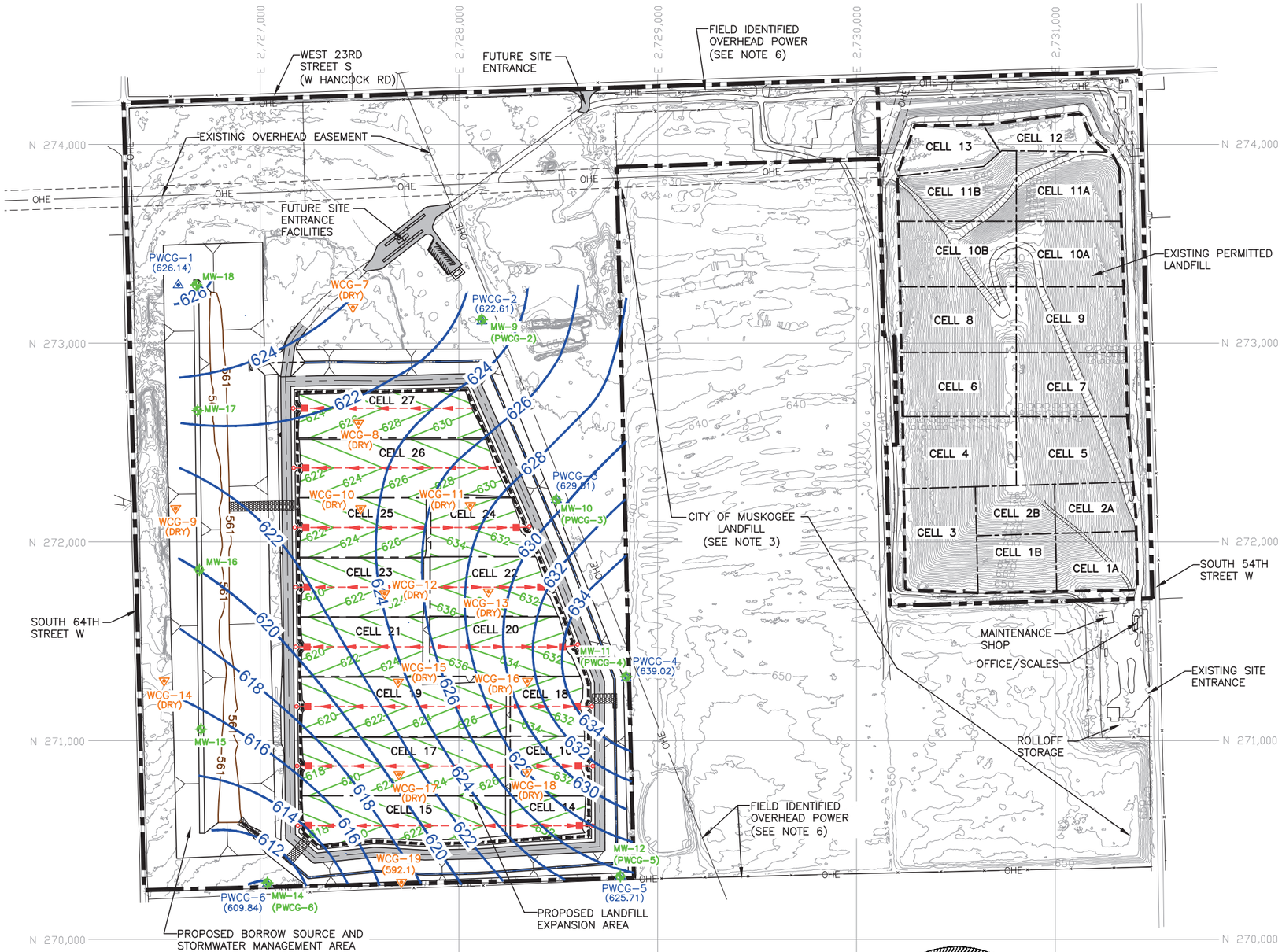
REVISIONS		
NO.	DATE	DESCRIPTION

TIER III PERMIT MODIFICATION
GEOLOGIC CROSS-SECTION H-H'

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

ATTACHMENT E-1-8H



N

0 300 600

SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 636 — PROPOSED EXCAVATION CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- PWCG-1 (626.14) — 2022 PIEZOMETER LOCATION (POTENTIOMETRIC ELEVATION LISTED IN FT-MSL) (SEE NOTE 5 AND 6)
- 620 — HIGHEST MEASURED GROUNDWATER POTENTIOMETRIC HEAD SURFACE CONTOUR (SEE NOTE 5 AND 6)
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL (2022 PIEZOMETER LOCATION)
- MW-16 — PROPOSED GROUNDWATER MONITORING WELL
- WCG-7 (DRY) — 2022 BOREHOLE ONLY LOCATION (TOP OF FIRST SATURATED STRATA ELEVATION LISTED IN FT-MSL)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. POTENTIOMETRIC SURFACE CONTOURS PRODUCED FROM HIGHEST MEASURED ELEVATIONS FROM EACH PIEZOMETER AND DO NOT REPRESENT A SINGLE GROUNDWATER GAUGING EVENT OR ACTUAL GROUNDWATER FLOW.
6. POTENTIOMETRIC SURFACE CONTOURS DEPICT THE POTENTIOMETRIC HEAD ELEVATION OF FRACTURE POROSITY GROUNDWATER UNDER CONFINED CONDITIONS AND ARE NOT SYNONYMOUS WITH THE ELEVATION OF UPPERMOST SATURATED SUBSURFACE SEDIMENTS.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-13C APRIL 2023 POT MAP.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

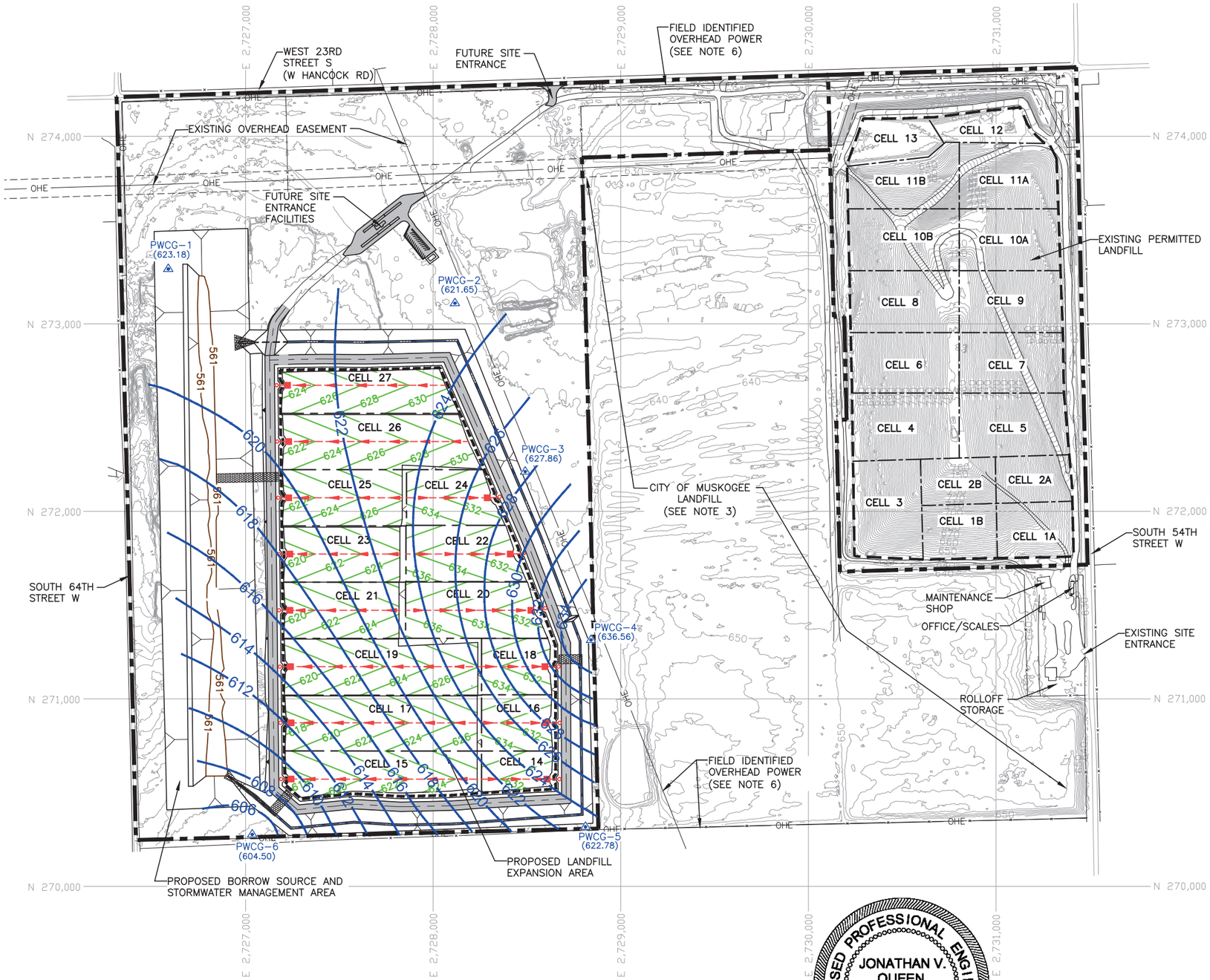
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED GROUNDWATER ELEVATION CONTOURS, AND ADDED PROPOSED MONITORING WELLS, BOREHOLES, AND PIEZOMETERS.
2	07/2024	REVISED WESTERN MONITORING WELL LOCATION

TIER III PERMIT MODIFICATION
HIGHEST MEASURED GROUNDWATER POTENTIOMETRIC HEAD SURFACE CONTOUR MAP

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

ATTACHMENT E-1-12



N

0 300 600

SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 636 — PROPOSED EXCAVATION CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- PWCG-1 (623.18) — 2022 PIEZOMETER LOCATION (POTENTIOMETRIC ELEVATION LISTED IN FT-MSL) (SEE NOTE 5 AND 6)
- 600 — OCTOBER 2022 POTENTIOMETRIC HEAD SURFACE CONTOUR (SEE NOTE 5 AND 6)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. POTENTIOMETRIC SURFACE CONTOURS PRODUCED FROM STATIC GROUNDWATER GAUGING CONDUCTED BY WCG IN OCTOBER 2022.
6. POTENTIOMETRIC SURFACE CONTOURS DEPICT THE POTENTIOMETRIC HEAD ELEVATION OF FRACTURE POROSITY GROUNDWATER UNDER CONFINED CONDITIONS AND ARE NOT SYNONYMOUS WITH THE ELEVATION OF UPPERMOST SATURATED SUBSURFACE SEDIMENTS.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-13A OCT 2022 POT MAP.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

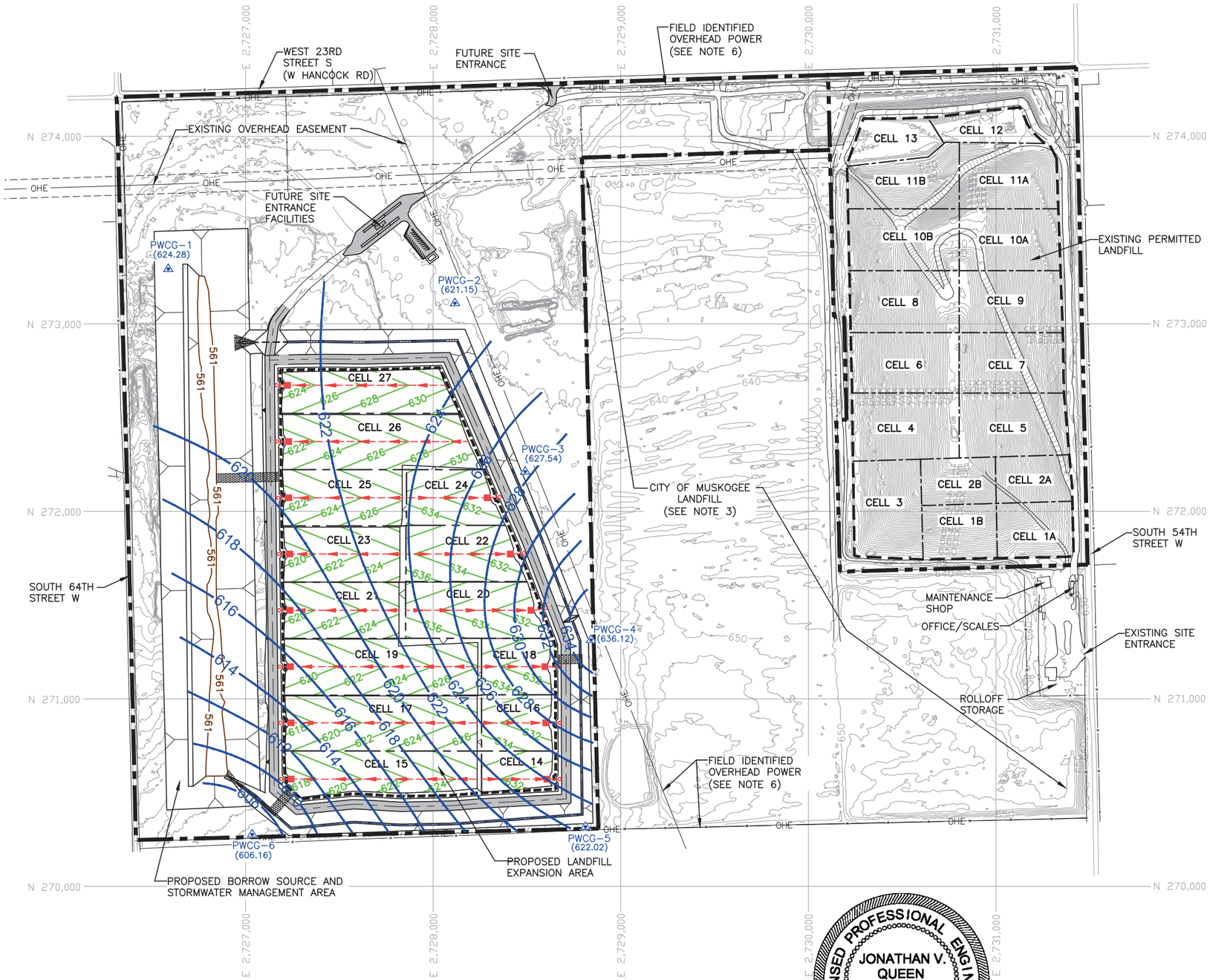
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED GROUNDWATER ELEVATION CONTOURS

TIER III PERMIT MODIFICATION
OCTOBER 2022 POTENTIOMETRIC HEAD SURFACE CONTOUR MAP

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE E-1-13A



N

0 300 600

SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 636 — PROPOSED EXCAVATION CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- PWCG-1 (624.28) — 2022 PIEZOMETER LOCATION (POTENTIOMETRIC ELEVATION LISTED IN FT-MSL) (SEE NOTE 5 AND 6)
- 600 — DECEMBER 2022 POTENTIOMETRIC HEAD SURFACE CONTOUR (SEE NOTE 5 AND 6)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. POTENTIOMETRIC SURFACE CONTOURS PRODUCED FROM STATIC GROUNDWATER GAUGING CONDUCTED BY WCG IN DECEMBER 2022.
6. POTENTIOMETRIC SURFACE CONTOURS DEPICT THE POTENTIOMETRIC HEAD ELEVATION OF FRACTURE POROSITY GROUNDWATER UNDER CONFINED CONDITIONS AND ARE NOT SYNONYMOUS WITH THE ELEVATION OF UPPERMOST SATURATED SUBSURFACE SEDIMENTS.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-13B DEC 2022 POT MAP.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

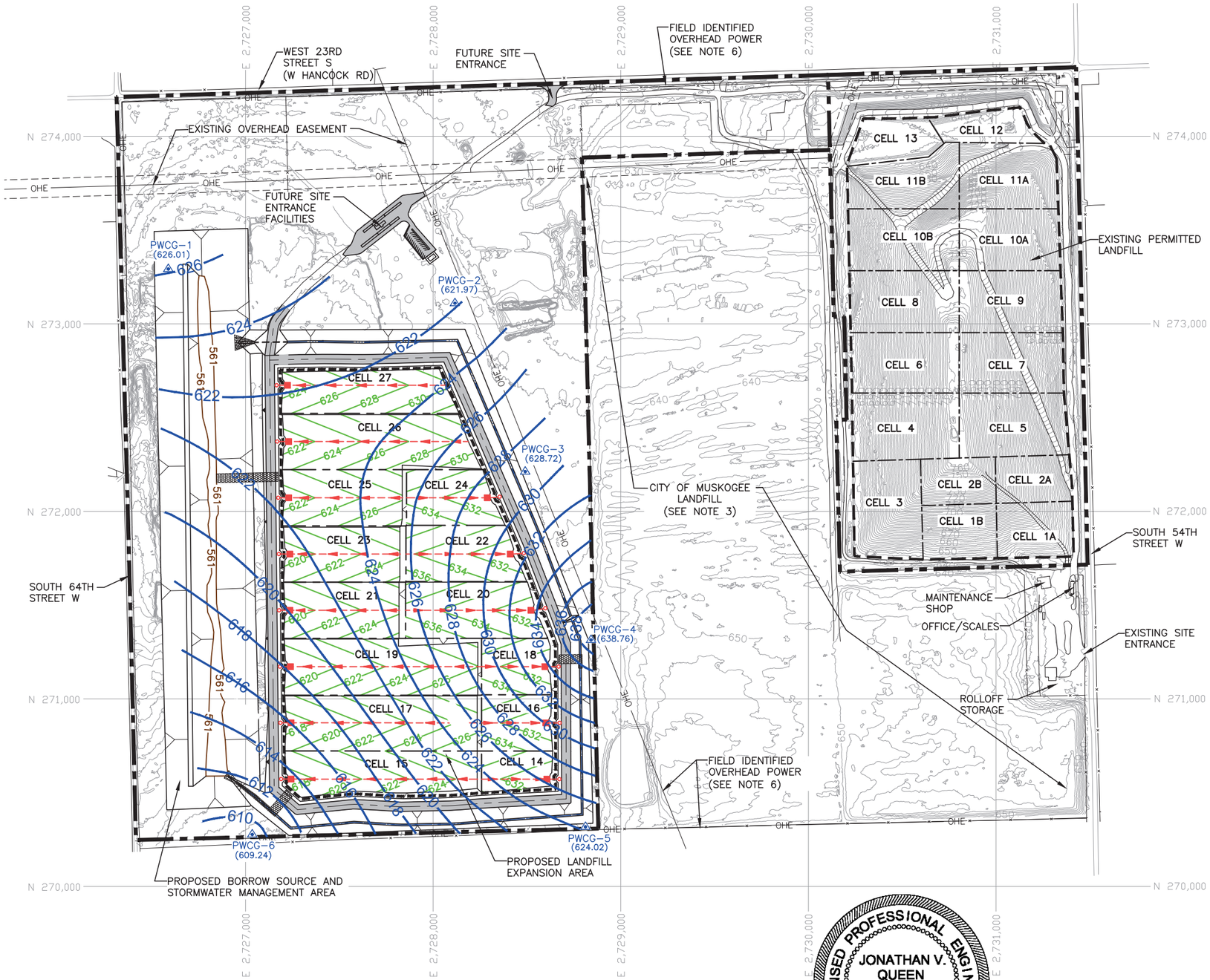
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED GROUNDWATER ELEVATION CONTOURS

TIER III PERMIT MODIFICATION DECEMBER 2022 POTENTIOMETRIC HEAD SURFACE CONTOUR MAP

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE E-1-13B



N

0 300 600

SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 636 — PROPOSED EXCAVATION CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- PWCG-1 (626.01) — 2022 PIEZOMETER LOCATION (POTENTIOMETRIC ELEVATION LISTED IN FT-MSL) (SEE NOTE 5 AND 6)
- 620 — APRIL 2023 POTENTIOMETRIC HEAD SURFACE CONTOUR (SEE NOTE 5 AND 6)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. POTENTIOMETRIC SURFACE CONTOURS PRODUCED FROM STATIC GROUNDWATER GAUGING CONDUCTED BY WCG IN APRIL 2023.
6. POTENTIOMETRIC SURFACE CONTOURS DEPICT THE POTENTIOMETRIC HEAD ELEVATION OF FRACTURE POROSITY GROUNDWATER UNDER CONFINED CONDITIONS AND ARE NOT SYNONYMOUS WITH THE ELEVATION OF UPPERMOST SATURATED SUBSURFACE SEDIMENTS.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-13C APRIL 2023 POT MAP.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

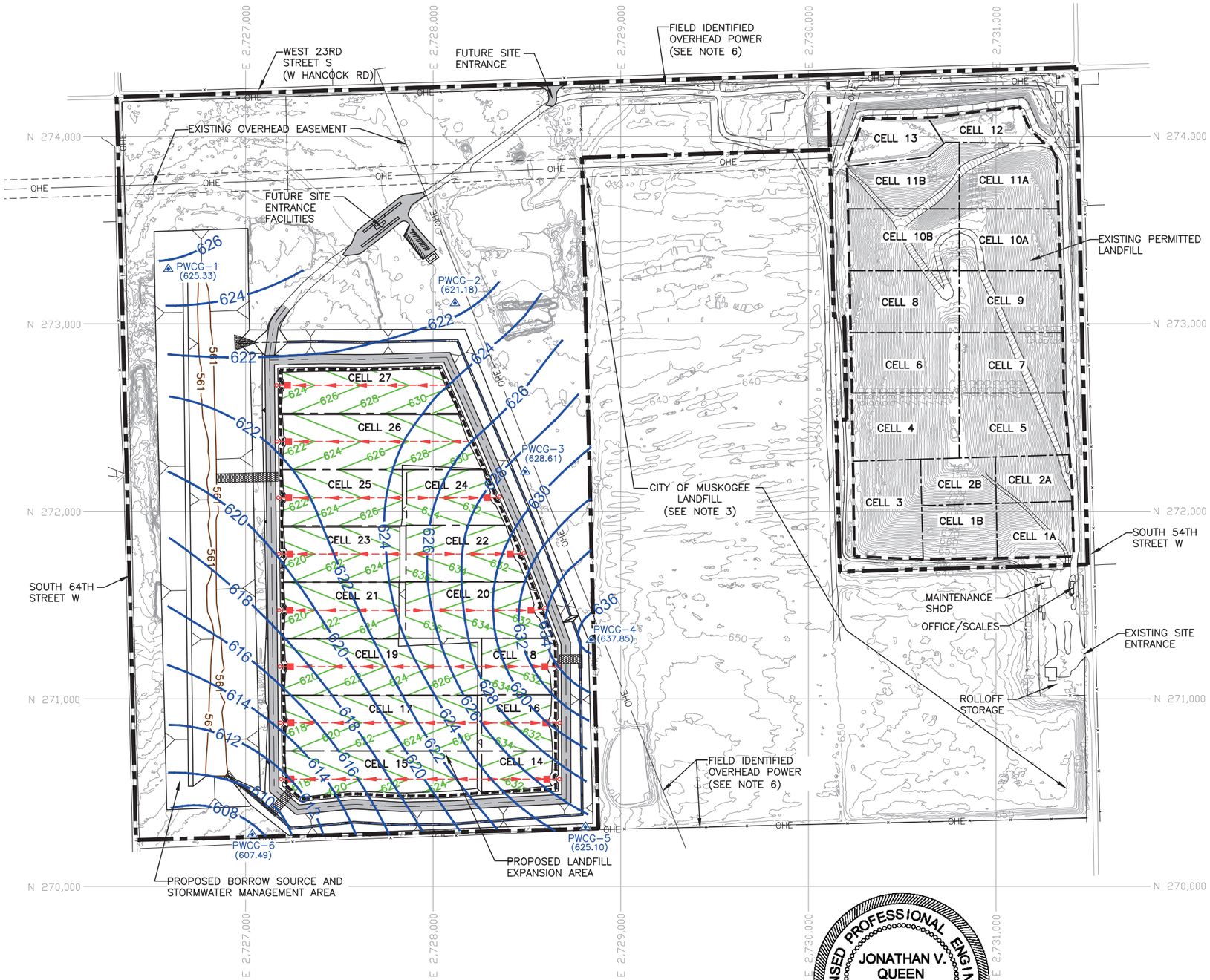
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED GROUNDWATER ELEVATION CONTOURS

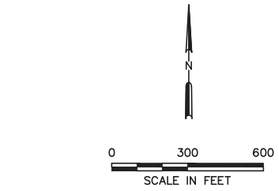
TIER III PERMIT MODIFICATION APRIL 2023 POTENTIOMETRIC HEAD SURFACE CONTOUR MAP

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

ATTACHMENT E-1-13C





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 636 — PROPOSED EXCAVATION CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- PWCG-1 (625.33) — 2022 PIEZOMETER LOCATION (POTENTIOMETRIC ELEVATION LISTED IN FT-MSL) (SEE NOTE 5 AND 6)
- 620 — JULY 2023 POTENTIOMETRIC HEAD SURFACE CONTOUR (SEE NOTE 5 AND 6)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. POTENTIOMETRIC SURFACE CONTOURS PRODUCED FROM STATIC GROUNDWATER GAUGING CONDUCTED BY WCG IN JULY 2023.
6. POTENTIOMETRIC SURFACE CONTOURS DEPICT THE POTENTIOMETRIC HEAD ELEVATION OF FRACTURE POROSITY GROUNDWATER UNDER CONFINED CONDITIONS AND ARE NOT SYNONYMOUS WITH THE ELEVATION OF UPPERMOST SATURATED SUBSURFACE SEDIMENTS.

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: E-1-13D JULY 2023 POT MAP.DWG

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

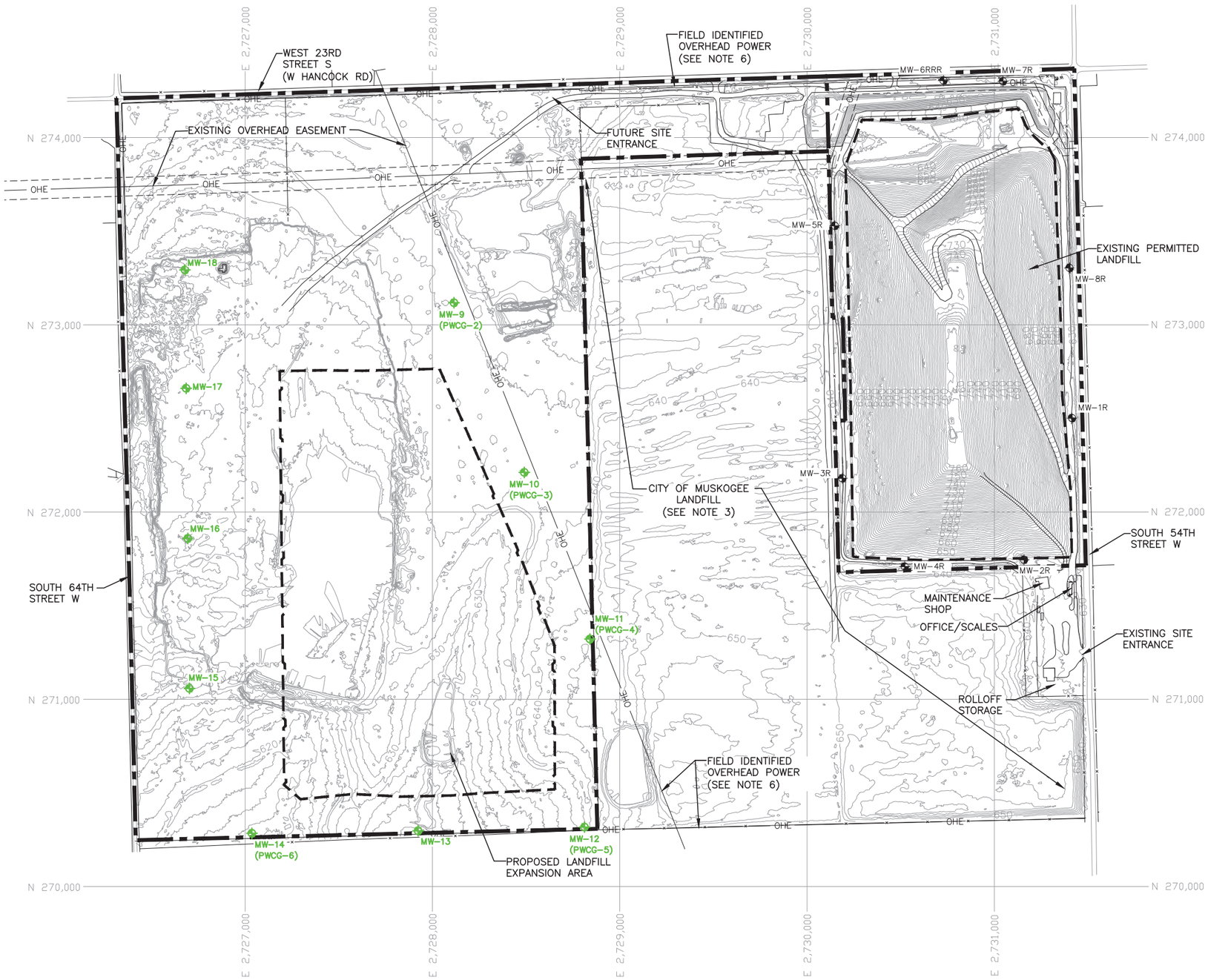
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED GROUNDWATER ELEVATION CONTOURS

TIER III PERMIT MODIFICATION JULY 2023 POTENTIOMETRIC HEAD SURFACE CONTOUR MAP

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

ATTACHMENT E-1-13D



N

0 300 600

SCALE IN FEET

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- APPROXIMATE OG&E POWER LINE EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-2) — PROPOSED GROUNDWATER MONITORING WELL (WITH FORMER PIEZOMETER DESIGNATION LISTED IN PARENTHESIS WHERE APPLICABLE)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. FORMER PIEZOMETER DESIGNATIONS ARE SHOWN IN PARENTHESES WHERE APPLICABLE.
5. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. A WASTE FREE BUFFER ZONE OF AT LEAST 100-FEET OFFSET FROM THE PROPOSED PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.

O:\0086\364\EXPANSION 2022\APPENDIX E\E-1\E-1-15 PROPOSED MW SYSTEM NETWORK.dwg, jpuhr, 1:2

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: FIG E-1-15 PROPOSED GW SYSTEM

DRAWN BY: JDW
DESIGN BY: AKE
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2023

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATIONS

TIER III PERMIT MODIFICATION PROPOSED GROUNDWATER MONITORING SYSTEM

MUSKOGEE COMMUNITY RDF
OKLAHOMA COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE E-1-15

MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

TIER III PERMIT MODIFICATION
LANDFILL EXPANSION

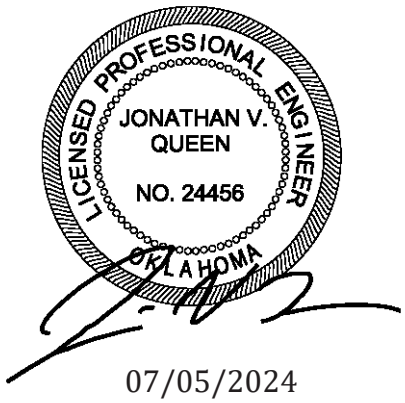
VOLUME 3 OF 4

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024



Prepared by

07/05/2024

Weaver Consultants Group, LLC
CA 3804 PE 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19

MUSKOGEE COMMUNITY
RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

APPENDIX G

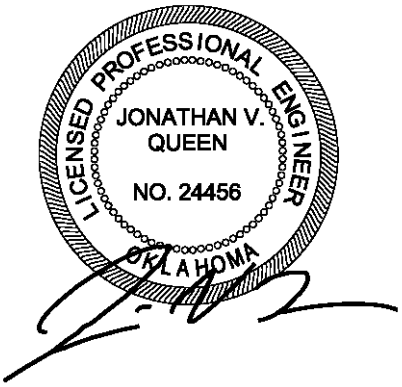
LANDFILL GAS MANAGEMENT PLAN

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024



Prepared by

Weaver Consultants Group, LLC
CA 3804 PE – 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19

2.1.2 Existing LFG Monitoring Probes

Locations of the existing LFG monitoring probes are shown on Figure G-1-1 in Appendix G-1. The as-built boring logs for the existing LFG monitoring probes are included in Appendix G-2.

The proposed landfill expansion includes a separate unit to the west of the permitted landfill area. No changes are proposed to the permitted landfill area. Therefore, no change is proposed to the currently approved perimeter LFG monitoring network.

2.1.3 Proposed LFG Monitoring Probes

As part of the proposed landfill expansion, twenty-six (26) LFG monitoring probes designated as GP-10 through GP-35 as listed in Table 1 will be installed around the new permit boundary prior to the development of the western landfill unit. The new LFG monitoring probes will be installed in accordance with applicable rules in OAC 252:515-7-3 and OAC 252:515-15-4. After evaluating the site's soil, hydrogeologic, and hydraulic conditions surrounding the facility, the new LFG monitoring probes are designed to be single-completion probes. At a minimum, the new probes will extend from ground surface down to the proposed lowest bottom of waste elevation.

The single-completion probe design was chosen since it assures that all soil layers are monitored, reducing the possibility of undetected gas monitoring through an unsaturated zone. In the event that LFG migration is detected, and knowledge of the specific zone of migration is needed for development of the remediation plan, additional temporary probes may be installed next to the original probe and within the suspected zones of migration.

The new LFG monitoring probes will be installed by an Oklahoma-licensed monitoring well installer. The new boreholes will be logged by a geologist or engineer. Within 90 days of installation, detailed as-built drawings of the probes will be submitted to the ODEQ. Please refer to Figure G-1-3 for the proposed LFG monitoring probe detail.

2.1.4 Monitoring Procedures

Methane concentrations will be measured using a portable gas detection device pre-calibrated against reference methane standard prior to the beginning of each sampling event. The portable gas detection device will be equipped with a suction sampling line. The sampling line will be connected to the top of each probe to

MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

APPENDIX H

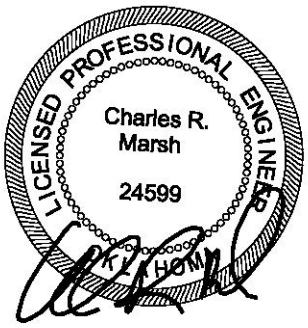
SURFACE WATER MANAGEMENT PLAN

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024

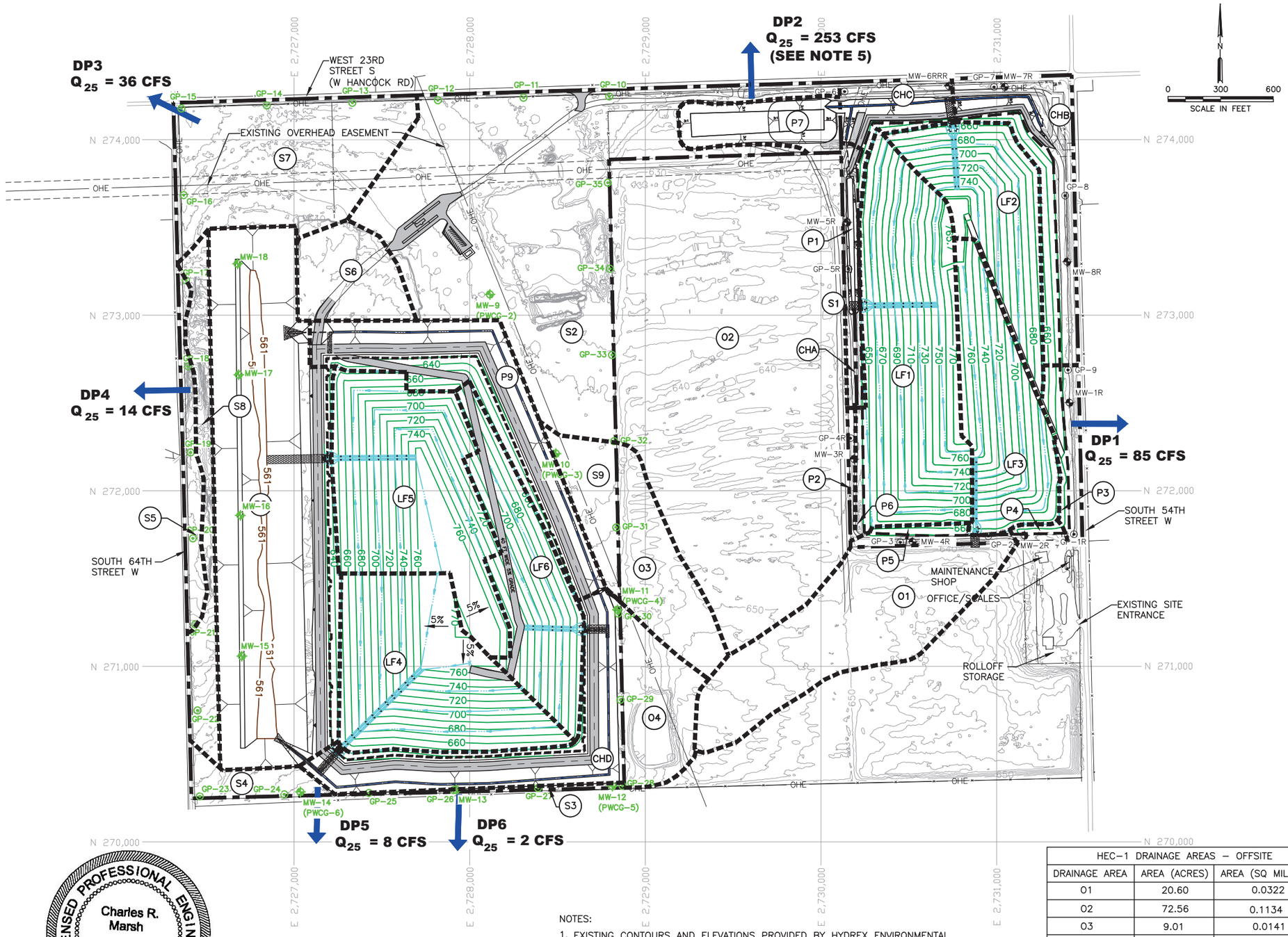


07/05/2024

Prepared by

Weaver Consultants Group, LLC
CA 3804 PE – 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19



HEC–1 DRAINAGE AREAS – ONSITE		
DRAINAGE AREA	AREA (ACRES)	AREA (SQ MILES)
LF1	25.64	0.0401
LF2	13.41	0.0210
LF3	14.29	0.0223
LF4	21.29	0.0333
LF5	23.14	0.0362
LF6	13.63	0.0213
S1	0.69	0.0011
S2	51.48	0.0804
S3	0.62	0.0010
S4	3.02	0.0047
S5	3.79	0.0059
S6	6.97	0.0109
S7	20.69	0.0323
S8	7.57	0.0118
S9	4.77	0.0075
P1	2.22	0.0035
P2	0.60	0.0009
P3	3.52	0.0055
P4	0.68	0.0011
P5	1.96	0.0031
P6	1.34	0.0021
P7	5.84	0.0091
P8	45.30	0.0708
P9	15.54	0.0243
CHA	0.61	0.0010
CHB	10.94	0.0171
CHC	4.52	0.0071
CHD	13.62	0.0213

HEC–1 DRAINAGE AREAS – OFFSITE		
DRAINAGE AREA	AREA (ACRES)	AREA (SQ MILES)
01	20.60	0.0322
02	72.56	0.1134
03	9.01	0.0141
04	7.91	0.0124

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01–25–2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMITTED FINAL COVER CONTOURS AND DRAINAGE REPRODUCED FROM THE TIER I PERMIT MODIFICATION PREPARED BY WEAVER CONSULTANTS GROUP, LLC IN NOVEMBER 2021 AND APPROVED BY ODEQ ON JANUARY 24, 2022.
5. DP2 WAS UPDATED FROM THE TIER I PERMIT MODIFICATION TO INCLUDE UPLAND FLOW FROM THE EXPANDED SITE.

LICENSED PROFESSIONAL ENGINEER
Charles R. Marsh
24599
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: H-1-1-POST DEV. DRAINAGE.DWG
DRAWN BY: JBM
DESIGN BY: MB
REVIEWED BY: CRM

Weaver Consultants Group
CA 3804 PE – 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

TIER III PERMIT MODIFICATION
POST–DEVELOPMENT HEC–1 DRAINAGE AREAS

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE H-1-1

MUSKOGEE COMMUNITY
RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

APPENDIX K

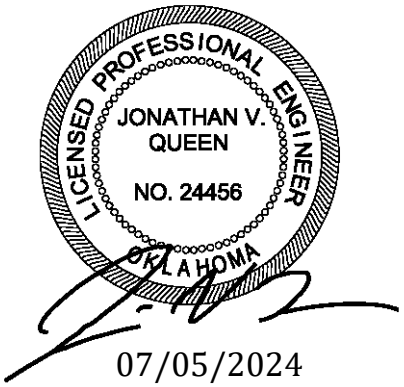
QUALITY ASSURANCE/QUALITY CONTROL PLAN FOR LINER AND LEACHATE COLLECTION SYSTEM INSTALLATION AND TESTING

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024



07/05/2024

Prepared by

Weaver Consultants Group, LLC
CA 3804 PE – 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, TX 76109
817-735-9770

WCG Project No. 0086-364-11-19

Table 2-1
Pre-Construction Testing Schedule for Soil Liner Material

Test	Method Used	Frequency[4]
Soil Classification	ASTM D2487	1 per 10,000 cy
Particle Size Analysis (including % passing No. 200 Sieve)	ASTM D422 ~~or~~ and ASTM D1140	1 per 10,000 cy
Atterberg Limits	ASTM D4318	1 per 10,000 cy
Moisture Content	ASTM D2216 or ASTM D4643	1 per 10,000 cy
Standard Proctor Test or Modified Proctor Test[3]	ASTM D698, if light weight compactor is to be used	1 per 10,000 cy
	ASTM D1557, if heavy weight compactor is to be used	
Hydraulic Conductivity[1]	ASTM D5084[2]	1 per 10,000 cy

[1] Conduct this test on remolded sample that is compacted to 95% of the maximum dry density and at the optimum moisture content, as determined from the Standard Proctor test or compacted to 90% and at optimum moisture content for Modified Proctor test. Allow 1% tolerance for both dry density and moisture content. The sample fabricated with lower-bound density and moisture should represent worst case conditions for hydraulic conductivity results.

[2] Testing procedures in Appendix VII of the Corps of Engineers Manual EM 1110-2-1906, November 30, 1970, Laboratory Soils Testing, is an alternative method.

[3] Soil types or blends proposed for control using alternative moisture-density acceptance criteria shall be tested by both Standard and Modified Proctor methods, along with their corresponding hydraulic conductivity tests.

[4] 1 per 10,000 cubic yard (cy) or a minimum of 1 test per source or soil type, whichever is greater. Cubic yard to be calculated from in-place volumes of certified liner construction. The calculated number of tests shall be rounded up to the nearest whole number.

The Proctor moisture-density curves shall be developed for each type of soil determined suitable as soil liner material and shall be used during the construction phase as a performance reference for compaction and moisture control. However, if soil types vary substantially and cannot or will not be segregated, representative blends of the soil types anticipated to be utilized for soil liner construction should also be sampled and tested. Separate but equivalent portions of the sample should be used if both Standard and Modified Proctor tests are to be performed for a given soil type or soil blend. Samples should not be oven-dried nor dried back more than two to three percent drier than necessary to obtain the desired test point. The zero air voids line shall be computed and included along with the Proctor curves, indicating the specific gravity value used.

An alternative moisture-density acceptance criteria may be established for a particular soil type or blend using both the Standard and Modified Proctor relationships. In this case, both tests must be run for that soil, and an acceptable range of moisture and density may be defined as shown in Figure 2-1. This approach will allow a rational method for accepting or disapproving compaction results when more than one type of compactor or compaction effort is used or when variations in Proctor relationships make choosing the most appropriate curve difficult. The acceptable moisture-density range shall be determined by the POR.

As a general rule, pre-construction tests will be performed at a frequency not less than one test series for every 10,000 cubic yards of soil to be used in soil liner

construction, unless soil types are limited and easily distinguished. As soil is usually made available subsequent to excavation during soil liner construction, additional pre-construction samples should be taken and tests performed when soils vary, or when the initial pre-construction test results appear inappropriate or questionable. If and when the same borrow source is utilized for the soil supply of more than one soil liner area, results from previous tests may be used to supplement the pre-construction data.

Soils used in soil liners will have the following minimum values verified by testing in a soil laboratory prior to liner construction.

Table 2-2
Required Soil Liner Material Properties

Test[1]	Specification
Coefficient of Permeability (Remolded Sample)	1.0×10^{-7} cm/s or less (see Note 2)
Plasticity Index	≥ 10
Liquid Limit, percent	≥ 24
Percent Passing No. 200 Mesh Sieve	≥ 30
Percent Retained on #4 Sieve	≤ 20
Particle size	< 1" diameter
Water Content	=> optimum
Soil Density	95% of the standard proctor density or 90% of the modified proctor density

[1] Testing will be performed in accordance with the test methods included in Section 2.3.
[2] Coefficient of permeability for 1-foot-thick soil liner for the GCL alternative liner system will be less than or equal to 1×10^{-7} cm/s.

2.2.3.2 Liner Construction

The soil liner material will be placed in maximum 9-inch-thick loose lifts to produce compacted lift thickness of approximately 6 inches. The material will be compacted to a minimum of 95 percent of the maximum dry density determined by Standard Proctor (ASTM D698), or 90 percent of the maximum dry density as determined by the Modified Proctor (ASTM D1557) at a moisture content equal to or greater than the optimum moisture content.

The soil liner must be compacted with a pad/tamping-foot. The lift thickness will be controlled so that there is total penetration through the loose lift under compaction into the top of the previously compacted lift; therefore, the lift thickness must not be greater than the pad or prong length. Use of pad/tamping-foot or prong-foot rollers will provide sufficient roughening of liner lifts surface for bonding between lifts. These procedures are necessary to achieve adequate bonding between lifts and reduce seepage pathways. Adequate cleaning devices must be in place and maintained on the compaction roller so that the prongs or pad feet do not become clogged with clay soils to the point that they cannot achieve full penetration during initial compaction. The footed roller is necessary to achieve this bonding and to reduce the individual clods and achieve a blending of the soil matrix through its kneading action. In addition to the kneading action, weight of the compaction equipment is important. Multiple passes are recommended for a vehicle with front

and rear drums. The soil liner will not be compacted with a bulldozer or any track-mobilized equipment unless it is used to pull a pad-footed roller.

Water shall be applied as necessary to the material and worked evenly into the material with the compaction equipment. Water used for the soil liner must be clean and not contaminated by waste or any objectionable material. Collected onsite stormwater may be utilized if it has not come into contact with the solid waste.

Soil liner construction should not be conducted in adverse weather conditions (heavy rain, freezing temperatures, etc.).

The soil liner will be visually inspected to evaluate its integrity during and after construction. CQA testing of the soil liner will also be performed as the soil liner is being constructed. Daily certification of the soil liner will take place prior to placing the FML. Testing of the soil liner is addressed in Section 2.3. Sections of compacted soil liner which do not pass both the density and moisture requirements will be reworked with additional passes of the compactor until the section in question passes. All field density and moisture test results will be incorporated into the LIT Report.

Hydraulic conductivity samples will be obtained by pushing a sampler through the constructed clay liner. The sample from each test location will be sealed and transported to the laboratory. Two samples may be collected at each sample location and labeled the "A" and "B" sample. The sampling holes (e.g., samples for hydraulic conductivity) will be backfilled with bentonite or a bentonite/clay liner soil material mixture consisting of at least 20 percent bentonite.

If the integrity of the "A" sample appears to have been compromised during the transportation of the sample prior to testing, the "B" sample may be tested. In addition, if an "A" sample hydraulic conductivity test does not comply with the minimum allowable value, the "B" sample collected at the same location may be tested to determine compliance with the hydraulic conductivity requirements if during testing of the "A" sample, the ASTM D5084 or EM 1110-2-1906 procedure was not followed or the permeameter malfunctioned.

The POR will provide a detailed justification of the use of the "B" sample, if applicable, in the LIT Report.

If the "B" sample passes, the area will be considered in compliance. If the "B" sample fails (or sample "A" fails in such a way that there is not an option to use the "B" sample), the test interval will be considered unsatisfactory for the area bounded by passing test locations (but not extending past a satisfactory test location). Additional tests may be taken to further define the unsatisfactory area. The area defined unsatisfactory will be reworked and retested in accordance with this section.

Table 3-1
Required Testing for 60-mil-thick Smooth and Textured (Both Sides) HDPE Geomembranes[1]

Test	Type of Test	Standard Test Method	Frequency of Testing (Minimum)
Resin	Specific Gravity/Density	ASTM D792, Method A or ASTM D1505	Every resin lot
	Melt Flow Index	ASTM D1238	Every resin lot
Manufacturer's Quality Control	Thickness	ASTM D5199 (smooth) or ASTM D5994[2] (textured)	Per Roll of Geomembrane
	Specific Gravity/Density	ASTM D1505/D792	Per 200,000 pounds
	Carbon Black Content	ASTM D4218	Per 20,000 pounds
	Carbon Black Dispersion	ASTM D5596	Per 45,000 pounds
	Tensile Properties	ASTM D6693 / Type IV (ASTM D638 may be used as an alternative upon POR's approval)	Per 20,000 pounds
	Tear Resistance	ASTM D1004	Per 45,000 pounds
	Puncture Resistance	ASTM D4833	Per 45,000 pounds
	Stress Crack Resistance	ASTM D5397	Per GRI-GM 10
	Oxidative Induction Time	ASTM D3895 or ASTM D5885	Per 200,000 pounds
	Oven Aging @ 85°C	ASTM D5721	Per each formulation
	Standard OIT (min. avg.) - % retained after 90 days	ASTM D3895	Per each formulation
	UV Resistance[3]	ASTM D7238	Per each formulation
	High Pressure OIT (min. avg.) - % retained after 1,600 hours	ASTM D5885	
	Asperity Height	ASTM D7466	Every 2nd roll[4]
	Chemical Resistivity	EPA 9090A or equivalent	Per Material Type

[1] All tests will conform to the minimum requirements set forth by GRI testing standard GM13 and will meet manufacturer's standards. Required values for the parameters are listed in Table 3-2.

[2] ASTM D1593 may also be used for thickness of textured geomembrane at the option of the POR.

[3] 20 hours of UV cycle at 75°C followed by 4 hours condensation at 60°C.

[4] Measurement side will be alternated for double-sided textured sheet. This testing is specified for textured geomembrane only.

3.3.3 Geomembrane Installation

Surface Preparation. Prior to any geomembrane installation, the installed soil liner or GCL will be inspected by the CQA and geosynthetics contractor. ODEQ shall be notified at least 48 hours before installation of the geomembrane. The POR or CQA monitor must observe the following:

- All lines and grades for the soil liner or GCL have been verified by the surveyor and accepted by the contractor for geosynthetic installation. The POR or his representative, the owner, and geosynthetic installer will certify and accept in writing the finished final lift of the soil liner.

- The soil liner or GCL has been prepared in accordance with the earthwork construction plans and specifications as outlined in Section 2.
- The soil liner or GCL surface is free of surface irregularities and protrusions. The soil liner will be rolled and compacted to ensure a clean surface.
- The soil liner or GCL surface does not contain stones or other objects that could damage the geomembrane and underlying soil liner or GCL . The surface of the soil liner or GCL will be smooth and free of foreign and organic material, sharp objects, exposed soil, aggregate particles greater than 1 inch (or less if recommended by the geosynthetic manufacturer), surface rocks, or other deleterious material.
- The anchor trench dimensions have been checked, and the trenches are free of sharp objects and stones.
- There are no excessively soft areas in the soil liner that could result in geomembrane damage.
- The geomembrane will not be placed over soil liner or GCL during inclement weather such as rain or high winds.
- The soil liner or GCL is not saturated, and no standing water is present above the soil liner or GCL .
- The soil liner has not desiccated (e.g., areas with desiccation cracks).
- All construction stakes and hubs have been removed and the resultant holes have been backfilled. There are no rocks, debris, or any other objects on the soil liner or GCL surface.
- The geosynthetics contractor has certified in writing that the soil liner or GCL surface on which the geomembrane will be installed is acceptable.
- The geosynthetics contractor will review manufacturer written instructions for handling geomembrane prior to installation.

Panel Placement. Prior to the installation of the geomembrane, the contractor must submit drawings showing the panel layout, indicating panel identification number, both fabricated (if applicable) and field seams, as well as details not conforming to the drawings.

The CQA monitor must maintain an up-to-date panel layout drawing showing panel numbers that are keyed to roll numbers on the placement log. The panel layout drawing will also include seam numbers and destructive test locations.

During panel placement, the POR or CQA monitor must:

- Observe that geomembrane is placed in direct and uniform contact with the underlying soil liner or GCL .
- Record roll numbers, panel numbers, and dimensions on the panel or seam logs. Measure and record thickness of leading edge of each panel at 5-foot maximum intervals. No single thickness measurement can be less than 10 percent below the required nominal thickness.

Field Seaming. The contractor must provide the POR with a seam and panel layout drawing and update this drawing daily as the job proceeds. No panels will be seamed until the panel layout drawing has been accepted by the POR. A seam numbering system must provide a unique number for each seam and be agreed to by the POR and contractor prior to the start of seaming operations. One procedure is to identify the seam by adjacent panels. For example, the seam located between Panels 306 and 401 would be Seam No. 306/401.

Prior to geomembrane welding, each welder and welding apparatus (both wedge and extrusion welders), must be tested, at a minimum, at daily start-up and at midday break, or any break that the seaming machine is stopped more than 30 minutes to determine if the equipment is functioning properly. Each installer will be required to make a trial weld at the beginning of every day and every five working hours. The LIT Report will include the names for each seamer and the time and the temperatures for each seaming apparatus used each day. One trial weld will be taken prior to the start of work. The trial weld sample must be 3 feet long and 12 inches wide, with the seam centered lengthwise. The minimum number of specimens per trial weld test must be two coupons for shear and two coupons for peel. Both the inner and outer welds of dual track fusion welds must be tested for each peel test coupon (or additional coupons will be required). Trial weld samples must comply with "Passing Criteria for Welds" included in Section 3.3.4 – Construction Testing. The CQA monitor must observe all welding operations, quantitative testing of each trial weld for peel and shear, and recording of the results on the trial weld form. The trial weld be completed under conditions similar to those under which the panels will be welded. Regarding the locus-of-break patterns of the different seaming methods in shear and peel, the following are unacceptable break codes per their description in ASTM D6392 and GRI-GM19:

Hot Wedge: AD and AD-Brk>25%

Extrusion Fillet: AD1, AD2, AD-WLD (unless strength is achieved)

Additionally, there will be no apparent weld separation (i.e., greater than 1/8 inch). The third party strength tests must meet the manufacturer's specifications for the sample sheets, or the percentage of the manufacturer's parent sheet strength as determined by the manufacturer. For dual-track fusion welds, both sides (the inner and outer weld) must meet the minimum requirements for a satisfactory peel test. If, at any time, the CQA monitor believes that an owner or welding apparatus is not functioning properly, a weld test must be performed. If there are wide changes in temperature (±30° Fahrenheit), humidity, or wind speed, the test weld will be repeated. The test weld must be allowed to cool to ambient temperature before testing. If a welded area fails the shear or peel test, the length of the non-passing weld will be identified at a 10-foot interval and the failed area will be patched. Patching will performed by placing additional geomembrane over the failed area or removing the failed area geomembrane weld and patching it with additional geomembrane per POR's direction. Welding for patches must comply with the welding passing criteria requirements outlined in this section.

Construction quality assurance documentation of trial seam procedures will include, at a minimum, the following:

- Documentation that trial seams are performed by each welder and welding apparatus prior to commencement of welding and prior to commencement of the second half of the workday.
- The welder, the welding apparatus number, time, date, ambient air temperature, and welding machine temperatures.

During geomembrane welding operations, the CQA monitor must observe the following:

- The contractor has the number of welding apparatuses and spare parts necessary to perform the work.
- Equipment used for welding will not damage the geomembrane.
- The extrusion welder is purged prior to beginning a weld until all the heat-degraded extradite is removed (extrusion welding only).
- Seam grinding has been completed less than one hour before seam welding, and the upper sheet is beveled (extrusion welding only).
- The ambient temperature, measured 6 inches above the geomembrane surface, is no less than 32° Fahrenheit unless more stringent limits are required by the manufacturer.
- The end of old welds, more than 5 minutes old, are ground to expose new material before restarting a weld (extrusion welding only).
- The contact surfaces of the sheets are clean, free of dust, grease, dirt, debris, and moisture prior to welding.
- The weld is free of dust, rocks, and other debris.
- The seams are overlapped a minimum of ~~3 inches~~ 4-inches (finished seem overlap) for extrusion and hot-wedge welding, or in accordance with manufacturer's recommendations, whichever is more stringent. Panels will be overlapped (shingled) in the downgrade direction.
- No solvents or adhesives are present in the seam area.
- The procedure used to temporarily hold the panels together does not damage the panels and does not preclude CQA testing.
- The panels are being welded in accordance with the plans and specifications that will be developed in accordance with this section for each liner construction. Seams will be oriented parallel to the line of maximum slope with no horizontal seams on side slopes. In corners and odd-shaped geometric locations, the number of field seams will be minimized.

the morning when temperatures are coolest to reduce bridging of the geomembrane. Anchor trench calculations are provided in Appendix M – Geotechnical Assessment.

3.3.9 Geomembrane Acceptance

The contractor retains all ownership and responsibility for the geomembrane until acceptance by the Operator. In the event the contractor is responsible for placing cover over the geomembrane, the contractor retains all ownership and responsibility for the geomembrane until all required documentation is complete, and the cover material is placed. After panels are placed, seamed, tested successfully, and any repairs are made, the completed installation will be walked by the Operator's and contractor's representatives. Any damage or defect found during this inspection will be repaired properly by the installer. The installation will not be accepted until it meets the requirements of both representatives. In addition, the geomembrane will be accepted by the POR only when the following has been completed:

- The installation is finished.
- All seams have been inspected and verified to be acceptable.
- All required laboratory and field tests have been completed and reviewed.
- All required contractor-supplied documentation has been received and reviewed.
- All as-built record drawings have been completed and verified by the POR. The as-built drawings show the true panel dimensions, the location of all seams, trenches, pipes, appurtenances, and repairs.
- Acceptance of the LIT Report by ODEQ.

3.3.10 Bridging

Bridging must be removed.

3.4 Geotextiles

Geotextiles will be used to prevent clogging of drainage materials and as a cushion to protect the geomembrane. The main usage of geotextiles will be enveloping drainage stone used for chimney drains in the leachate collection system (LCS). Geotextiles for the LCS will meet the design requirements set forth in Table 3-3 of this QA/QC Plan.

3.4.1 Delivery

During delivery the CQA monitor must observe the following:

- Equipment used to unload the rolls will not damage the geotextile.

- Observe that the panels are overlapped a minimum of six inches.
- Examine the geotextile after installation to ensure that no potentially harmful foreign objects are present.
- Observe that seams (where required) are continuously sewn or thermal bonded in accordance with the manufacturer's recommendations and the project specifications outlined in this QA/QC Plan.
- The geotextile will not be installed until all destructive and non-destructive testing is completed and approved by the CQA monitor.

The CQA monitor must inform both the contractor and POR if the above conditions are not met.

3.4.4 Repairs

Repair procedures include:

- Patching – used to repair large holes, tears, large defects, and destructive sample locations.
- Removal – used to replace areas with large defects where the preceding method is not appropriate.

Holes, tears, and defects must be repaired in the following manner. Soil or other material which may have penetrated the defect must be removed completely prior to repair. If located on a slope, the defect must be patched using the same type of geotextile and double-seamed into place. Should any tear, hole, or defect exceed 30 percent of the width of the roll, the roll will be cut off and the defect removed or the roll removed and replaced. If the defect is not located on a slope, the patch must be made using the same type of material seamed into place with a minimum of 24 inches overlap in all directions. Seams will be either thermal bonded or sewn in accordance with the manufacturer's recommendations.

3.5 Geosynthetic Clay Liner (GCL)

An alternative composite liner system consisting of a 1-foot-thick compacted clay liner ($k \leq 1x10^{-7}$ cm/s) overlain by a Geosynthetic Clay Liner (GCL) may be utilized in lieu of the 2-foot-thick compacted clay liner. Material properties based on Geosynthetic Research Institute recommendations described in GRI-GCL3 have been included in Table 3-5 – Required Properties for Reinforced GCL Materials. The GCL used for the alternative liner system will meet or exceed the required properties. Only Reinforced GCL will be utilized. Unreinforced GCL will not be utilized.

3.5.1 Delivery

The GCL will be labeled and shipped in rolls, which are wrapped individually in relatively impermeable and opaque protective covers. GCL must be rolled by the

6 DOCUMENTATION

Documentation will consist of daily recordkeeping, testing and installation reports, nonconformance reports (if necessary), progress reports, photographic records, design and specification revisions, and a Liner Installation and Testing (LIT) Plan as required by OAC 252:515-11-6.

6.1 Daily Record of Construction Progress

The daily field report will summarize ongoing construction activities and will include the following:

- Date, project name, project number, and location
- Weather including temperature, precipitation, and cloud cover
- Summary of daily construction activities including personnel involved in specific tasks, including sub contractors
- Equipment list
- Items discussed and names of parties involved in discussions
- A brief description of tests and observations
- Areas of nonconformance and any corrective actions
- Summary of materials received
- Record of site visitors
- Signature of the CQA monitor
- Signature of the POR
- Any problems identified and corrective measures taken

6.2 Observation and Test Data Sheets

Observation and test data sheets should include the following information:

- Date, project name, and location
- Test equipment calibrations, if applicable
- A summary of test results identified as passing, failing, or in the event of a failed test, retest.

- Signature of the CQA monitor
- Signature of the POR
- Panel numbers for FML
- Chain of custody for test sheets

6.3 Photographs

Construction activities may be photographed by the CQA monitor. Photographs will include any significant problems encountered and corrective actions taken, as well as document construction progress. The photographer should document the subject of the photograph, either on the back of the picture, or in a photograph log.

6.4 Design and Specification Changes

Design and specification changes may be required during construction. Design and specification changes will only be made with written agreement of the ODEQ, design engineer, owner, and contractor. These changes will be made by change order to the contract.

6.5 LIT Report

The POR will submit an LIT Report documenting the construction of the composite liner and leachate collection systems to the ODEQ for approval.

The POR will provide an engineer's certification that the composite liner and leachate collection systems were constructed in accordance with the approved construction drawings and specifications. QA/QC documentation will be included in the LIT Report.

The LIT Report shall be submitted to the ODEQ within 30 days after completion of each phase of composite liner placement. Consistent with OAC 252:515-11-7, the LIT Report shall be placed in the site operating record, and waste shall not be placed within the new phase of composite liner until ODEQ approves the LIT and provides written authorization to commence disposal .

At a minimum, the LIT Report will contain:

- A summary of construction activities.
- A summary of conformance testing.
- A summary of laboratory and field test results.
- Sampling and testing location drawings.
- A summary of repairs and their locations.

MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

TIER III PERMIT MODIFICATION
LANDFILL EXPANSION

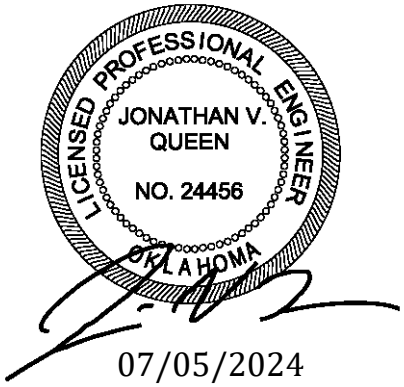
VOLUME 4 OF 4

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024



Prepared by 07/05/2024

Weaver Consultants Group, LLC
CA 3804 PE 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19

MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

APPENDIX L

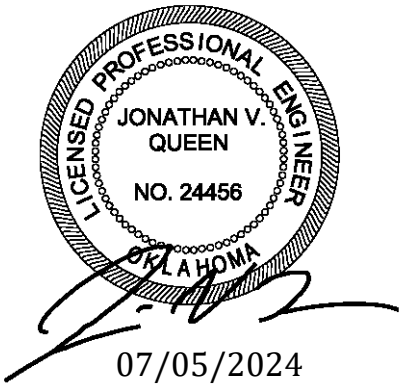
LEACHATE COLLECTION SYSTEM DESIGN

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

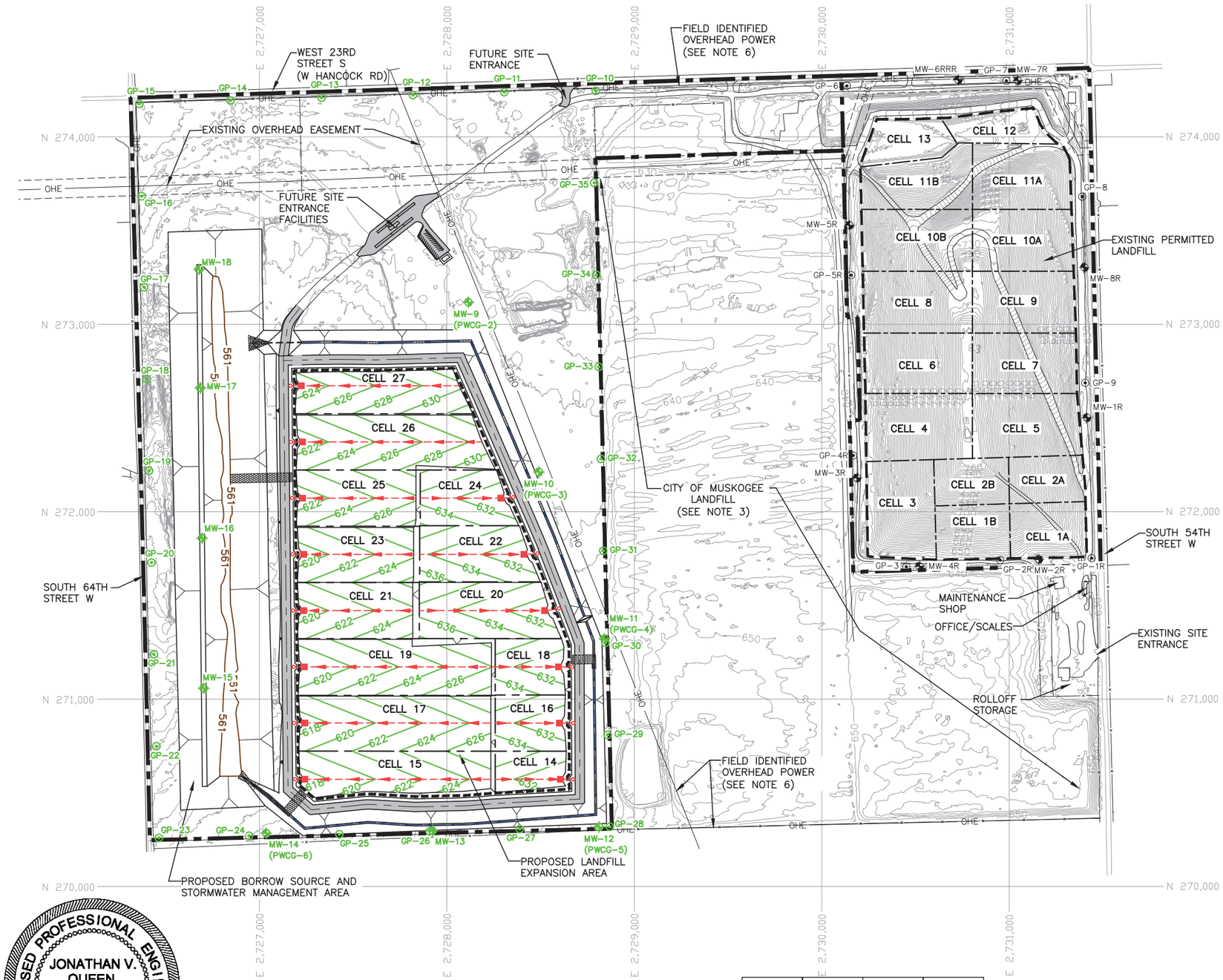
Revised July 2024

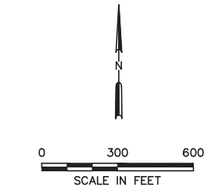


Prepared by 07/05/2024

Weaver Consultants Group, LLC
CA 3804 PE – 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 636 — EXCAVATION CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED LEACHATE CLEANOUT RISER
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
6. ALL PROPOSED EXCAVATION SIDESLOPES ARE 3(HORIZONTAL):1(VERTICAL).
7. FOR LEACHATE COLLECTION/STORAGE INFORMATION SEE APPENDIX L-3 AND L-4.

Cell	Area (AC)	Cell	Area (AC)
14	1.9	21	4.5
15	5.7	22	4.2
16	2.7	23	4.5
17	7.2	24	3.3
18	2.7	25	4.6
19	7.3	26	7.0
20	5.0	27	4.9

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: L-1-1-EXCAVATION PLAN.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

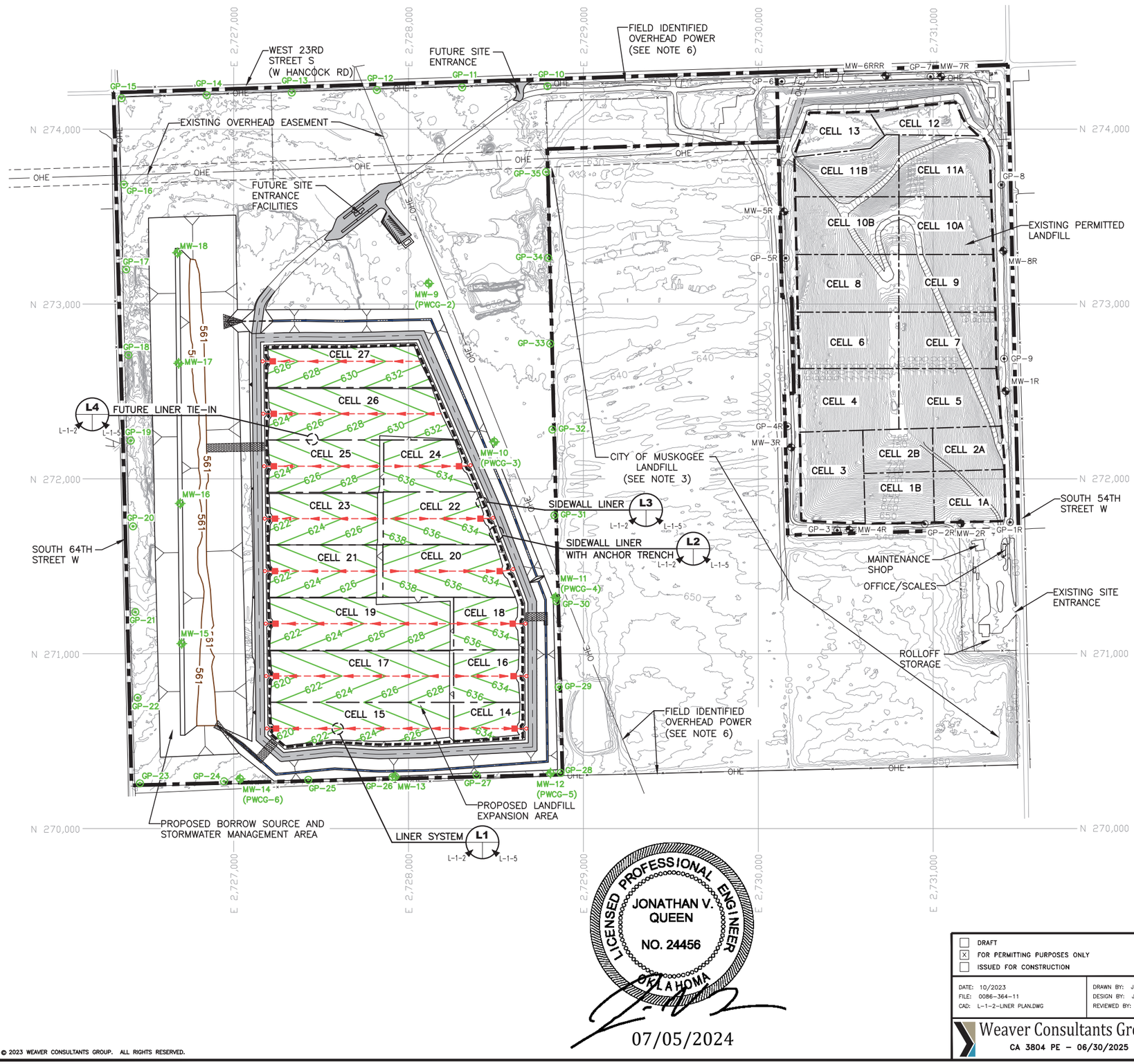
TIER III PERMIT MODIFICATION EXCAVATION PLAN

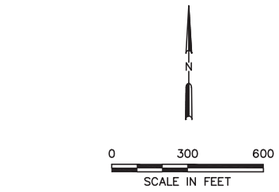
MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE L-1-1

0:\0086\364\EXPANSION 2022\APPENDIX L\L-1-1-EXCAVATION PLAN.dwg, jpuhr, 1:2





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 638 — TOP OF LINER CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED LEACHATE CLEANOUT RISER
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE-FREE BUFFER ZONE AT LEAST 100-FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. ALL PROPOSED EXCAVATION SIDESLOPES ARE 3(HORIZONTAL):1(VERTICAL).
8. THE SITE HAS AN OPTION TO REPLACE THE TOP 1-FOOT OF CLAY LINER WITH GCL.
9. FOR LEACHATE COLLECTION STORAGE INFORMATION SEE APPENDIX L-3 AND L-4.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

0:\0086\364\EXPANSION 2022\APPENDIX L\L-1-2-TOP OF LINER PLAN.dwg, jpuhr, 1:2

- [ ] DRAFT
- [X] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: L-1-2-LINER PLAN.DWG
DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

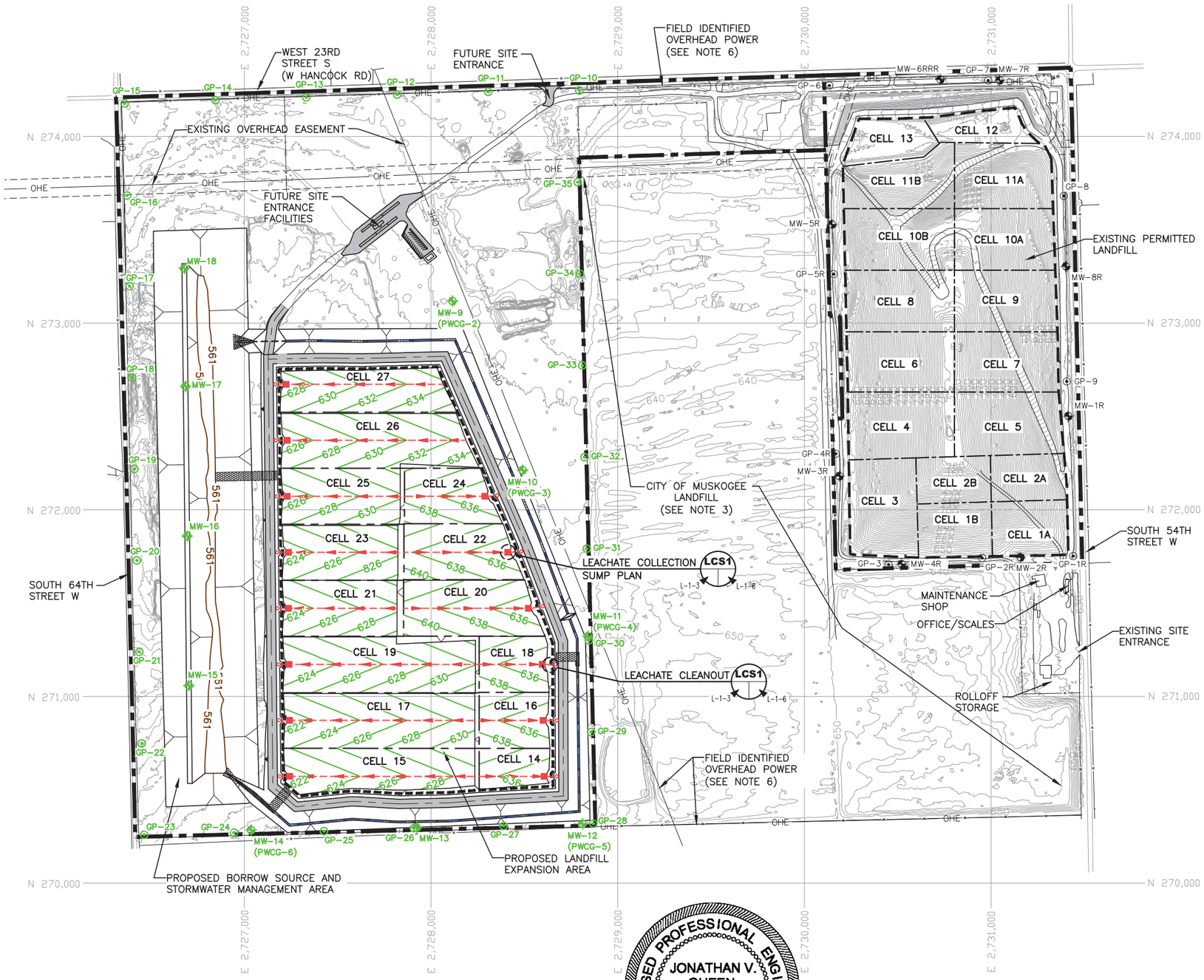
REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

TIER III PERMIT MODIFICATION
TOP OF LINER PLAN

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE L-1-2



0 300 600

SCALE IN FEET

LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 640 — TOP OF PROTECTIVE COVER CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED LEACHATE CLEANOUT RISER
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01–25–2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE–FREE BUFFER ZONE AT LEAST 100–FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. ALL PROPOSED EXCAVATION SIDESLOPES ARE 3(HORIZONTAL):1(VERTICAL).
8. THE SITE HAS AN OPTION TO REPLACE THE TOP 1–FOOT OF CLAY LINER WITH GCL.
9. FOR LEACHATE COLLECTION STORAGE INFORMATION SEE APPENDIX L–3 AND L–4.
10. THE TOP OF PROTECTIVE COVER CONTOURS REPRESENT THE TOP OF THE 24–INCH THICK $K \geq 1X10^{-3}$ CM/S LAYER

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086–364–11
CAD: L–1–3–TOP OF PROT COVER PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE – 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

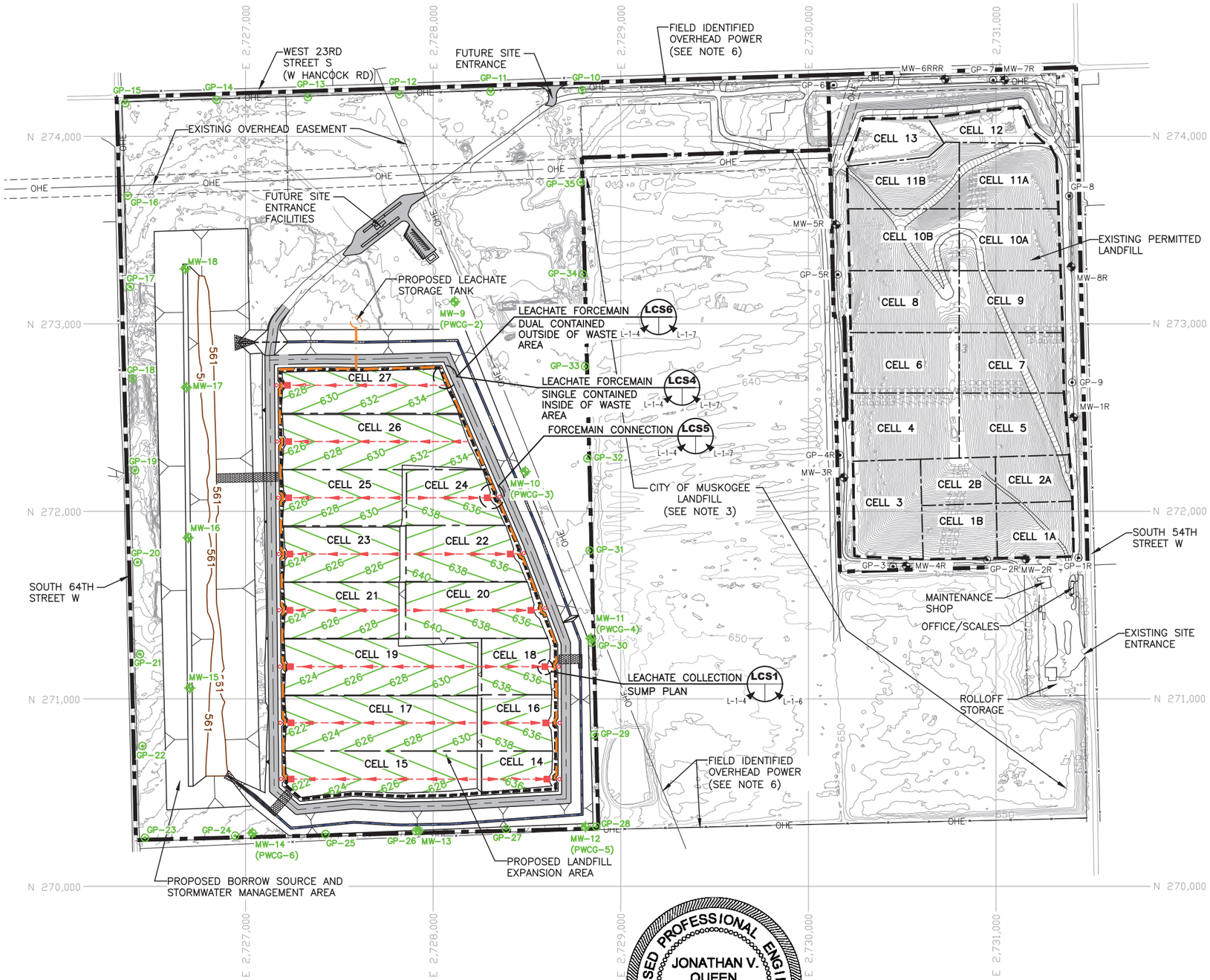
TIER III PERMIT MODIFICATION
TOP OF PROTECTIVE COVER PLAN

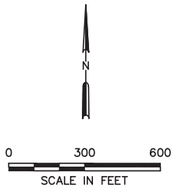
MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE L–1–3

0:\0086\364\EXPANSION 2022\APPENDIX L\L-1-3-PROTECTIVE COVER PLAN.dwg, jpuhr, 1:2





LEGEND

- EXISTING PERMIT BOUNDARY
- PROPOSED PERMIT BOUNDARY
- PERMITTED LIMITS OF WASTE
- PROPOSED LIMITS OF WASTE
- N 273,000 — STATE PLANE COORDINATE GRID
- 640 — EXISTING CONTOUR
- 640 — TOP OF PROTECTIVE COVER CONTOUR
- 561 — SOIL BORROW CONTOUR
- CELL BOUNDARY
- PROPOSED LEACHATE LINE
- PROPOSED LEACHATE SUMP
- PROPOSED LEACHATE CLEANOUT RISER
- PROPOSED DRAINAGE CHANNEL
- OHE — EXISTING OVERHEAD EASEMENT
- PROPOSED LEACHATE FORCEMAIN
- MW-5R — EXISTING GROUNDWATER MONITORING WELL
- MW-9 (PWCG-1) — PROPOSED GROUNDWATER MONITORING WELL
- GP-5 — EXISTING LANDFILL GAS MONITORING PROBE
- GP-10 — PROPOSED LANDFILL GAS MONITORING PROBE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS PROVIDED BY HYDREX ENVIRONMENTAL COMPILED FROM AERIAL PHOTOGRAPHY FLOWN 01-25-2023.
2. THE EXPANSION WILL ADD A SEPARATE UNIT TO THE WEST OF THE EXISTING LANDFILL. NO CHANGES ARE PROPOSED TO THE EASTERN UNIT.
3. THE CITY OF MUSKOGEE LANDFILL IS NOT PART OF THE PROPOSED EXPANSION AND IS SHOWN FOR REFERENCE PURPOSES.
4. PERMIT BOUNDARY AND EXISTING OVERHEAD EASEMENTS WERE REPRODUCED FROM LEGAL DESCRIPTION PREPARED BY WEAVER CONSULTANTS GROUP, SIGNED BY MICHAEL D BYTNER, LLS# 1986.
5. A WASTE-FREE BUFFER ZONE AT LEAST 100-FEET OFFSET FROM THE PERMIT BOUNDARY FOR THE LANDFILL EXPANSION AREA INCLUDED IN THIS MODIFICATION WILL BE MAINTAINED.
6. AN EASEMENT RECORD WAS NOT FOUND OR PROVIDED TO THE SURVEYOR. THE OVERHEAD POWER RUNNING ALONG THE NORTHERN AND SOUTHERN PROPERTY LINE AND NORTHWEST/SOUTHEAST ACROSS THE PROPERTY WAS FIELD IDENTIFIED AND SURVEYED.
7. ALL PROPOSED EXCAVATION SIDESLOPES ARE 3(HORIZONTAL):1(VERTICAL).
8. THE SITE HAS AN OPTION TO REPLACE THE TOP 1-FOOT OF CLAY LINER WITH GCL.
9. FOR LEACHATE COLLECTION STORAGE INFORMATION SEE APPENDIX L-3 AND L-4.
10. THE TOP OF PROTECTIVE COVER CONTOURS REPRESENT THE TOP OF THE 24-INCH THICK $K \geq 1X10^{-3}$ CM/S LAYER.
11. THE LOCATION OF THE PROPOSED LEACHATE FORCEMAIN SHOWN IS APPROXIMATE AND MAY CHANGE BASED ON FIELD CONDITIONS AT THE TIME OF CONSTRUCTION. IF THE PROPOSED LEACHATE FORCEMAIN IS PLACED WITHIN THE WASTE FILL AREA SECONDARY CONTAINMENT WILL NOT BE NEEDED. SEE DETAIL LCS7 ON FIGURE L-1-7 FOR FORCEMAIN LOCATED WITHIN WASTE FILL AREA.

LICENSED PROFESSIONAL ENGINEER
JONATHAN V. QUEEN
NO. 24456
OKLAHOMA

07/05/2024

- [ ] DRAFT
- [x] FOR PERMITTING PURPOSES ONLY
- [ ] ISSUED FOR CONSTRUCTION

DATE: 10/2023
FILE: 0086-364-11
CAD: L-1-4-FORCEMAIN PLAN.DWG

DRAWN BY: JDW
DESIGN BY: JBP
REVIEWED BY: JVQ

Weaver Consultants Group
CA 3804 PE - 06/30/2025

PREPARED FOR
WASTE MANAGEMENT OF OKLAHOMA, INC.

REVISIONS		
NO.	DATE	DESCRIPTION
1	07/2024	REVISED WESTERN MONITORING WELL LOCATION

TIER III PERMIT MODIFICATION
LEACHATE FORCEMAIN PLAN

MUSKOGEE COMMUNITY RDF
MUSKOGEE COUNTY, OKLAHOMA

WWW.WCGRP.COM

FIGURE L-1-4

0:\0086\364\EXPANSION 2022\APPENDIX L\L-1-4-FORCEMAIN PLAN.dwg, jpuhr, 1:2

WASTE MANAGEMENT

Updated Waste Exclusion Plan

For
Muskogee Recycling & Disposal Facility
Muskogee, Oklahoma
Permit # 3551020

June 2004
Revised September 2014

Revised July 2024

Muskogee
September 2014

1.0 Introduction

The purpose of this document is to present an updated Waste Exclusion Plan (WEP) for nonhazardous industrial waste (NHIW) acceptance at ~~Quarry~~ Muskogee Community Recycling & Disposal Facility (RDF) in accordance with Subchapter 29 and 31 of the OAC 252:515. The WEP specifically provides pre-acceptance procedures to determine the acceptability of a waste pursuant to facility permit conditions, operational capabilities, and state and federal regulations. The program sets forth procedures to monitor incoming waste loads and verify that the incoming waste corresponds with the pre-acceptance waste characterization and the provisions of the facility permit.

This WEP additionally sets forth methods as precautions and controls to determine record and monitor incoming wastes to detect and prevent entry or disposal of regulated hazardous wastes, regulated polychlorinated biphenyl's (PCB) wastes, radioactive, regulated infectious biomedical wastes, baled waste, or other unpermitted wastes. Hazardous wastes are wastes defined as hazardous waste in OAC 252:515 and/or by the Federal government under the Resource Conservation and Recovery Act (RCRA) and subsequent amendments. Additionally, this program includes a control and record keeping system for tabulation of information obtained from these procedures. The program sets forth for the notification to the administrative authority of the rejection and removal of any wastes that may be reclassified as an excluded waste subsequent to acceptance and/or disposal.

2.0 Pre-Acceptance Procedures

Pre-acceptance procedures are used to determine the acceptability of a waste into the facility. These procedures reasonably ensure that (1) regulated hazardous wastes, (2) PCB wastes, (3) radioactive wastes, (4) untreated regulated infectious biomedical wastes, and (5) other unpermitted wastes are excluded from disposal at ~~Quarry~~ Muskogee Community RDF. The pre-acceptance procedure is the process by which a decision to accept or reject a particular waste is made prior to its shipment to the facility. The procedure is based on provisions of the facility permit, current state and federal regulations, employee health/safety, and the environment. Pre-acceptance requirements specify what information regarding the waste a generator must provide before a determination can be made pertaining to acceptability for disposal. Pre-acceptance requirements may include, but are not limited to, laboratory analysis and associated quality assurance/quality control data, material safety data sheets, process flow diagrams, and generator process knowledge information. Whether or not the above information is required is based upon type of industrial generator, and characteristics of each individual waste stream. information pertaining to the waste is submitted to Waste Management's (WM) designated Waste Evaluation Program for disposal consideration.

The generator of a NHIW that will be considered for disposal will complete W M's Waste Profile Form, the ODEQ NHIW Certification Form, if applicable, and supply any process knowledge information, material safety data sheets, laboratory results, or other documentation/certifications as required by the Waste Evaluation Program in order to determine the waste is non-hazardous. **Attachment A** contains copies of typical WCDF, ODEQ NHIW Certification Form, and other forms that may be used in the approval process. Based on this information, the Waste Evaluation Program will determine if the waste is acceptable or if additional testing or information is necessary before a decision can be made. Analytical test methods will be consistent with Federal and State approved methods.

As per OAC 252:515:31-2a, 3a, & 3b, the generator who generates waste streams identified in 515:31 Appendix **F, Attachment B,** and generate >10 cubic yards per month are required to complete the ODEQ NHIW Certification form.

Prior to acceptance, the following shall be completed through the Waste Evaluation Program:

- review waste profiles and associated documentation to ensure acceptability of waste into the landfill
- review landfill permits, state, and federal requirements regarding acceptance of NHIW
- issue waste specific approvals after reviewing necessary data and waste is determined to be acceptable NHIW

Waste Evaluation Personnel have experience and/or training in the following areas:

- waste evaluation and approval procedures
- analytical tests necessary for waste determination
- interpreting analytical results and significance of laboratory QA/QC
- definition of hazardous waste and exclusions
- basic chemistry
- definition of NHIW and current regulatory procedures for managing NHIW

4.0 Waste Restrictions

Waste defined as characteristically hazardous or listed hazardous by 40 CFR 261 will not be approved for disposal at the facility. Regulated PCB, untreated infectious biomedical, baled waste, or radioactive wastes will also not be approved for disposal at the facility.

All wastes defined in OAC 252:515-31-2 will be managed with the pre-acceptance approval process described in Section 3.0. The following wastes may not be subject to the pre-acceptance approval process but may require special handling at the landfill:

- uncontaminated asbestos (will still require manifest & waste shipment record)
- slaughterhouse waste, dead animals (may be required to be buried before compacting)

Also, as defined in OAC 252:515-31-1, generators disposing of less than 10 cubic yards of NHIW per calendar month may be excluded from the approval process described in Section 3.0. However, verification that the waste is not hazardous may still be required.

Transporters will be asked to communicate what type of waste they are carrying while at the scalehouse. Any waste requiring special handling will be identified and communication will be made to the disposal area. Operators at the disposal area will view all loads.

Friable asbestos containing waste is managed at the facility in accordance with state and federal regulation. Friable asbestos containing waste will be managed in accordance with all applicable regulations, including OAC 252:515-19-31. See Section 8.0 for further information.

8.0 Asbestos Management

The information in this section discusses proper management of asbestos containing waste that is received by the WM ~~Quarry~~ Muskogee Community RDF Landfill. WM used the ODEQ Guidance on Asbestos Management for this section of the WEP.

The definition of regulated asbestos-containing material (RACM) includes the following:

- Friable asbestos material
- Category I nonfriable asbestos-containing material (ACM) that becomes friable
- Category 1 nonfriable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading
- Category II nonfriable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder

Friable asbestos received at the landfill must be wetted and packaged as described below:

- Double bagged in 6-mil plastic bags: or
- Single bagged in one 6-mil plastic bag and placed in a disposable drum; or
- Contained in any other manner approved in advance, by Air Quality Division director of the DEQ.

Bulk components containing friable asbestos received at the landfill must be:

- Wrapped with at least two layers of 6-mil plastic and duct tape (or other securing medium)

Any time RACM is off-loaded, vehicles or trailers must have the following:

- Warning signs visible from all sides with minimum 20 inches by 14 inches upright format that reads:

DANGER
ASBESTOS DUST HAZARD
CANCER AND LUNG DISEASE HAZARD
Authorized Personnel Only

- U.S. DOT Class 9 placards are required on each side and each end of any vehicle or trailer transporting quantities greater that 3 disposal bags, 1 disposal drum, or any amount of wrapped bulk RACM on public roadways.

The following are disposal procedures to be followed at the landfill:

- Trucks are to approach the disposal locations as closely as possible for unloading of ACM waste;
- Bags, drums, and wrapped components shall be examined as the are off-loaded;
- Bags, drums, and wrapped components shall be placed on the ground at the disposal site, not pushed or thrown out of the trucks; and
- Personnel off-loading containers shall wear protective equipment consisting of head, body and foot protection and, at a minimum, half face-piece, air purifying, and dual-cartridge respirators equipped with high-efficiency filters.

9.0 Oil-Field Waste Management

The information in this section discusses proper receipt of oil-field waste that is received by the WM Muskogee Community RDF ~~Quarry Landfill~~. WM used the July 19, 2014 ODEQ letter for this section of the WEP.

- NHIW certification form, **Attachment A**, must be submitted to the DEQ and WM by the generator and maintained in operating record of the disposal site.
- Each waste stream must have a separate NHIW certification for each type of waste material at each well site or other site from which waste is received.
- Recordkeeping for these wastes will follow Section 7.0 of the WEP
- NHIW certification forms should coincide with generator documentation required by OCC.

MUSKOGEE COMMUNITY RECYCLING AND DISPOSAL FACILITY
MUSKOGEE COUNTY, OKLAHOMA
ODEQ PERMIT NO. 3551020

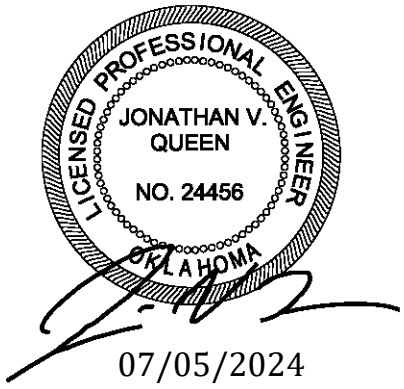
APPENDIX P
CLOSURE AND POSTCLOSURE PLAN

Prepared for

Waste Management of Oklahoma, Inc.

October 2023

Revised July 2024



Prepared by 07/05/2024

Weaver Consultants Group, LLC
CA 3804 PE – 06/30/2025
6420 Southwest Boulevard, Suite 206
Fort Worth, Texas 76109
817-735-9770

WCG Project No. 0086-364-11-19

2 REGULATIONS

This Closure and Postclosure Plan has been prepared pursuant to OAC 252:515-25.

2.1 Closure Requirements

OAC 252:515-25 requires that all municipal solid waste landfills (MSWLF) install a final cover system that is designed to minimize infiltration and erosion. The final cover system will consist of an vegetation layer underlain by an vegetative support layer. The facility will be closed in accordance with the provisions included in this Closure Plan and in a manner that minimizes the need for further maintenance and controls and minimizes post-closure escape of waste and waste constituents into the environment.

Prior to beginning final closure of the landfill, the owner/operator is required to give notice of intent to close the site. Oklahoma Department of Environmental Quality (ODEQ) regulations require closure to begin a minimum of 30 days after final receipt of wastes, and further require 6 months minimum notice prior to beginning closure activities. The site must provide public notice of intent to close no later than 90 days prior to closure. ODEQ requires completion of all closure activities within 180 days following the beginning of closure unless otherwise approved.

OAC 252:515-25-34(c) requires closure to be certified by an independent registered engineer and OAC 252:515-25-36~~(a)~~ requires that a notice be recorded in the deed to the property noting that the land has been used as a solid waste disposal facility.

ODEQ also requires third party closure/postclosure cost estimates to be updated if additional active areas are constructed, if final cover is constructed, or the landfill gas collection and control system (GCCS) is expanded (if applicable). The cost estimates will be updated annually consistent with OAC 252:515-27-34. The facility will maintain financial assurance based on the annual cost updates.

2.2 Postclosure Requirements

For landfills closing after October 9, 1993, OAC 252:515-25-51 requires a 30-year minimum postclosure maintenance period including maintenance of the integrity and effectiveness of the final cover system, maintaining and operating the leachate

- A surface water management system will be constructed to minimize erosion.
- A closure certification will be prepared by an independent registered professional engineer and submitted to ODEQ for approval.
- All proper notices and documentations will be filed with the appropriate agencies.
- Defective groundwater wells, gas wells, and other monitoring equipment will be reworked or replaced as necessary.

4.3 Additional Closure Information

The area for refuse disposal encompasses approximately 126.4 acres excluding the buffer zones, drainage areas, and unsuitable areas. To date, Waste Management of Oklahoma, Inc. ~~Oklahoma Waste Disposal, Inc.~~, has utilized approximately 60.9 acres of the permitted area of the site. Approximately 65.5 acres of the operating area has yet to be developed. The estimated maximum capacity of the landfill units is 13,307,889 cubic yards.

The facility is classified as a MSWLF and accepts residential and commercial waste, construction and demolition waste, non-hazardous "other" industrial waste, encapsulated asbestos waste, vegetative waste, semi-solid waste, and sludges. Special waste is handled under the requirements set forth in this permit. No hazardous, radioactive, or polychlorinated biphenyls waste will be knowingly accepted at this facility.

There are currently two permanent on-site structures, a maintenance shop and a scalehouse. These structures will remain throughout the closure period. All other structures that are on site at the time of final closure will be removed or decommissioned. All equipment used during the operation and closure of the landfill will be removed from the site after final closure has been certified as complete.

The access roads will be maintained throughout the active life and postclosure period of the landfill. Facilities at the site, including the perimeter fencing, will be maintained throughout the postclosure period.

Final wastes or affected soils remaining on-site at the time final closure has been completed will be transported to a facility permitted to handle the wastes and/or affected soils. Currently, only ODEQ approved closure activities have occurred at the site and, therefore, a plan for remedying all former improper closure at the site is not applicable.

Prior to initiating closure, the existing conditions and applicable regulations will be reevaluated to ensure that this Closure Plan is still applicable.

6 POSTCLOSURE ACTIVITIES

6.1 Introduction

This Postclosure Plan has been prepared for the Muskogee RDF consistent with OAC 252:515-25-53. In accordance with OAC 252:515-25-51(b) postclosure care maintenance will commence immediately upon completion of final closure requirements. Postclosure activities will continue for a period of 30 years minimum, unless the ODEQ approves a postclosure period of a different duration or if ODEQ extends the postclosure period (consistent with OAC 252:515-25-52).

6.2 Monitoring and Maintenance

Postclosure inspections shall be performed on a quarterly basis ~~during the first three years of the postclosure period. Subsequent inspections will be performed semi-annually for the next two years and annually for the remainder of the postclosure period.~~ A request to decrease the monitoring frequency may be submitted to DEQ for approval following the initial three years of post-closure monitoring. Additional inspections may be conducted to observe repairs or evaluate problem areas discovered during prior inspections.

The quarterly, semi-annual, and annual postclosure inspections will consist of the inspection and evaluation of the final cover system and vegetative cover, the drainage and erosion control structures, the leachate collection system, and the security system. The frequency and specific inspections associated with the groundwater monitoring and gas monitoring programs are addressed in the LGMP in Appendix G and GWSAP in Attachment F.

6.2.1 Final Cover System

Postclosure care will verify the integrity of the final cover system and its ability to minimize infiltration and erosion. The following conditions should be examined during the inspection:

- Settlement
- Cracking
- Erosion
- Animal burrows