



Texas Commission on Environmental Quality Waste Permits Division Correspondence Cover Sheet

Date: 6/8/2023

Facility Name: Lacy Lakeview Recycling and Disposal Facility

Permit or Registration No.: MSW-1646B

Nature of Correspondence:

Initial/New

Response/Revision to TCEQ Tracking No.: 27941547 (from subject line of TCEQ letter regarding initial submission)

Affix this cover sheet to the front of your submission to the Waste Permits Division. Check appropriate box for type of correspondence. Contact WPD at (512) 239-2335 if you have questions regarding this form.

Table 1 - Municipal Solid Waste Correspondence

Applications	Reports and Notifications
<input type="checkbox"/> New Notice of Intent	<input type="checkbox"/> Alternative Daily Cover Report
<input type="checkbox"/> Notice of Intent Revision	<input type="checkbox"/> Closure Report
<input type="checkbox"/> New Permit (including Subchapter T)	<input type="checkbox"/> Compost Report
<input type="checkbox"/> New Registration (including Subchapter T)	<input type="checkbox"/> Groundwater Alternate Source Demonstration
<input checked="" type="checkbox"/> Major Amendment	<input type="checkbox"/> Groundwater Corrective Action
<input type="checkbox"/> Minor Amendment	<input type="checkbox"/> Groundwater Monitoring Report
<input type="checkbox"/> Limited Scope Major Amendment	<input type="checkbox"/> Groundwater Background Evaluation
<input type="checkbox"/> Notice Modification	<input type="checkbox"/> Landfill Gas Corrective Action
<input type="checkbox"/> Non-Notice Modification	<input type="checkbox"/> Landfill Gas Monitoring
<input type="checkbox"/> Transfer/Name Change Modification	<input type="checkbox"/> Liner Evaluation Report
<input type="checkbox"/> Temporary Authorization	<input type="checkbox"/> Soil Boring Plan
<input type="checkbox"/> Voluntary Revocation	<input type="checkbox"/> Special Waste Request
<input type="checkbox"/> Subchapter T Disturbance Non-Enclosed Structure	<input type="checkbox"/> Other:
<input type="checkbox"/> Other:	

Table 2 - Industrial & Hazardous Waste Correspondence

Applications	Reports and Responses
<input type="checkbox"/> New	<input type="checkbox"/> Annual/Biennial Site Activity Report
<input type="checkbox"/> Renewal	<input type="checkbox"/> CPT Plan/Result
<input type="checkbox"/> Post-Closure Order	<input type="checkbox"/> Closure Certification/Report
<input type="checkbox"/> Major Amendment	<input type="checkbox"/> Construction Certification/Report
<input type="checkbox"/> Minor Amendment	<input type="checkbox"/> CPT Plan/Result
<input type="checkbox"/> CCR Registration	<input type="checkbox"/> Extension Request
<input type="checkbox"/> CCR Registration Major Amendment	<input type="checkbox"/> Groundwater Monitoring Report
<input type="checkbox"/> CCR Registration Minor Amendment	<input type="checkbox"/> Interim Status Change
<input type="checkbox"/> Class 3 Modification	<input type="checkbox"/> Interim Status Closure Plan
<input type="checkbox"/> Class 2 Modification	<input type="checkbox"/> Soil Core Monitoring Report
<input type="checkbox"/> Class 1 ED Modification	<input type="checkbox"/> Treatability Study
<input type="checkbox"/> Class 1 Modification	<input type="checkbox"/> Trial Burn Plan/Result
<input type="checkbox"/> Endorsement	<input type="checkbox"/> Unsaturated Zone Monitoring Report
<input type="checkbox"/> Temporary Authorization	<input type="checkbox"/> Waste Minimization Report
<input type="checkbox"/> Voluntary Revocation	<input type="checkbox"/> Other:
<input type="checkbox"/> 335.6 Notification	
<input type="checkbox"/> Other:	

2 June 2023

Digital copy submitted via email to: Robert.Pedersen@tceq.texas.gov

Hardcopy via Fedex to:

Robert Pedersen, Bldg. F
Texas Commission on Environmental Quality (TCEQ)
MSW Permits Section, Waste Permits Division (MC-124)
12100 Park 35 Circle
Austin, Texas 78753

**Subject: Supplemental Revisions
Permit Amendment Application, Proposed MSW Permit No. 1646B
Lacy Lakeview Recycling and Disposal Facility
Waco, McLennan County, Texas
Tracking No. 27941547**

Dear Mr. Pedersen:

On behalf of the City of Lacy Lakeview and Waste Management of Texas, Inc. (WMTX), Geosyntec Consultants (Geosyntec) has prepared this letter and accompanying materials as a supplemental submittal requesting minor additional revisions to the above-referenced permit amendment application.

SUPPLEMENTAL REQUESTED REVISIONS

We are requesting the following additional revisions:

- Change to the first waste filling sequence, affecting Part I/II, Appendix I/IIA, Drawings I/IIA-24 and 25; and Part III, Attachment 3A, Drawing 3A-4. The requested revision is to include the allowance to conduct waste filling (placement) in selected areas of the top-deck of the existing landfill during the first interim filling stage (i.e., after approval and issuance of Permit No. 1646B). The waste placement area would be in areas designed with a 100-ft (min) set-back from the future overlay area and the leachate sump tie-in excavation limits, so as not to interfere with or affect associated construction in those areas. A filling plan (grading and layout) for this revision has been designed accordingly, adhering to these work-area set-backs and compatible with the final grading geometry, stormwater management, and stability – with these grades added to Drawing I/IIA-25. Also for consistency of the described waste placement activities, the last column of the first row of the table on Drawings I/IIA-24 and 3A-4 has been revised with the descriptor of this filling area. This requested change will help maintain continuity of waste placement after issuance of Permit No. 1646B by providing disposal capacity during the time when the first expansion area cell is being constructed.
- Part III, Attachment 3E.1 (HELP Model Calculations), affecting Pages 3E.1-1, 3E.1-14, and 3E.1-65 through 73. The revision is based on a discrepancy that was discovered with HELP Model run

Mr. Robert Pedersen
2 June 2023
Page 2

“NF_05”, necessitating correction of the waste thickness to use the intended value. The re-run of the HELP model for this scenario revealed very negligible changes in the results for this case (for most parameters, no changes to the results); hence not affecting the critical cases used to design other aspects of the leachate collection system and/or drainage layer design. As such, the revision only affects the aforementioned pages in Attachment 3E.1 of the application.

UPDATED SIGNATURE PAGE (APPLICANT’S CERTIFICATION STATEMENT)

An updated Part I Application Form cover page and signature page (Pages 1 and 11 of the Form) accompany this submittal. Page 11 of the Part I Form includes the applicant’s signed and notarized certification statement for this submittal.

INTERNET POSTING OF PERMIT APPLICATION REVISIONS

An electronic copy of this submittal, including the permit application revisions, has been posted to the internet at the same URL as the initial online posting of the application.

CLOSING

One original and two (2) copies of this submittal are being provided to the TCEQ MSW Permits Section in Austin. A copy is also being sent directly to the TCEQ Region 9 Office as indicated in the copy to list below. Additionally, a copy of this submittal is being placed in the City of Lacy Lakeview City Hall for public viewing and copying, to accompany the initial application already placed at that location. Geosyntec trusts that the above responses to TCEQ’s comments provide the necessary information requested by TCEQ to complete their technical review of the permit amendment application. If you have any questions regarding the information presented in this letter, please do not hesitate to contact the undersigned by telephone at (512) 451-4003, or by E-mail at sgraves@geosyntec.com.

Sincerely,



Scott M. Graves, P.E.
Senior Principal
Geosyntec Consultants, Inc.

Copy to: Mr. Calvin Hodde, City of Lacy Lakeview
Mr. James Smith, WMTX
Waste Section Manager, TCEQ Region 9 Office
Ms. Falen Bohannon, Heart of Texas Council of Governments (HOTCOG)

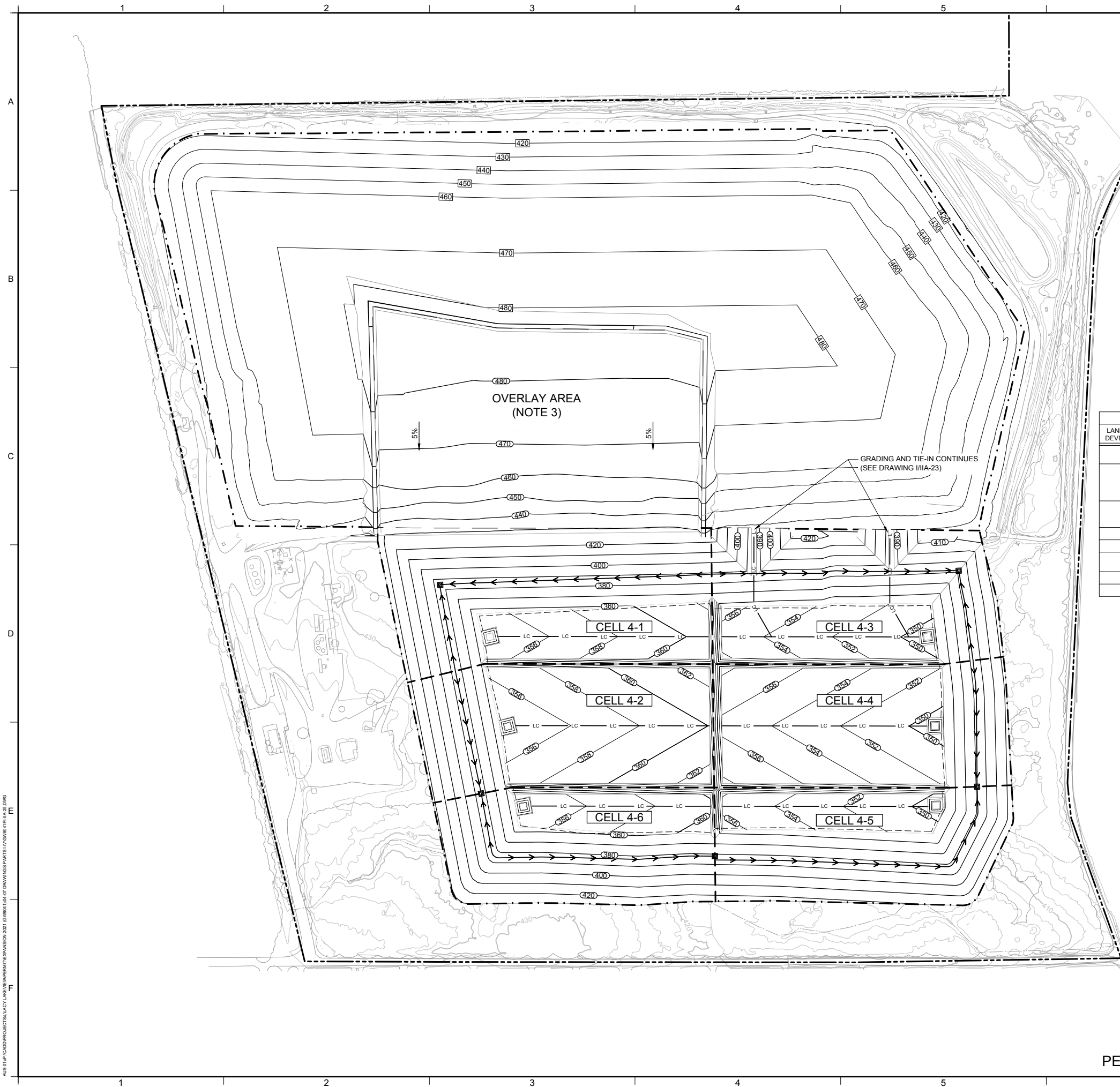
**REDLINE/STRIKETHROUGH
(i.e., “MARKED”) PAGES**

To facilitate TCEQ’s review, the attached pages present a redline/strikethrough “marked” version of the proposed revisions to the permit amendment application. Note that due to re-pagination of the redline/strikethrough version, the page numbers may not match the final page numbers in the “clean” (replacement page) version.

APPENDIX I/IIA

GENERAL LOCATION MAPS

LIST OF DRAWINGS		
Drawing No.	Title	Drawing Date (latest revision)
I/IIA-1	General Location Highway Map	October 2022
I/IIA-2	Detailed Highway Map	October 2022
I/IIA-3	General Topographic Map	April 2023
I/IIA-4	Current Aerial Photograph of Surroundings	October 2022
I/IIA-5	2010 Aerial Photograph of Surroundings	October 2022
I/IIA-6	2003 Aerial Photograph of Surroundings	October 2022
I/IIA-7	1995 Aerial Photograph of Surroundings	October 2022
I/IIA-8	1982 Aerial Photograph of Surroundings	October 2022
I/IIA-9	2022 Site Aerial Photograph	October 2022
I/IIA-10	General Land Use Map	October 2022
I/IIA-11	Detailed Land Use Map	April 2023
I/IIA-12	Zoning Map – City of Waco	October 2022
I/IIA-13	Zoning Map – City of Bellmead	October 2022
I/IIA-14	Population Growth Trends – 5 Miles	October 2022
I/IIA-15	Airport Map	October 2022
I/IIA-16	Structures and Inhabitable Buildings Map	October 2022
I/IIA-17	Map of Area Wells	October 2022
I/IIA-18	FEMA Floodplain Map	October 2022
I/IIA-19	Drainage, Pipeline, and Utility Easement Map	October 2022
I/IIA-20A	Proposed Facility Expansion Plan	April 2023
I/IIA-20	Facility Layout Plan	October 2022
I/IIA-21	Facility Access Control Features Plan	October 2022
I/IIA-22	Groundwater and Landfill Gas Monitoring Plan	April 2023
I/IIA-23	Cell Layout Plan – Base Liner Grades	April 2023
I/IIA-24	Cell Layout Plan – Showing Overlay Area	June April 2023
I/IIA-25	Interim Filling Sequence at Development Stage 2	June April 2023
I/IIA-26	Interim Filling Sequence at Development Stage 6	April 2023
I/IIA-27	Interim Filling Sequence at Development Stage 7	April 2023
I/IIA-28	Landfill Completion Plan	October 2022



LEGEND

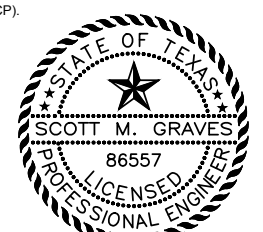
- 580 EXISTING GROUND ELEVATION CONTOUR (FT, MSL) (NOTES 1, 2)
- EXISTING ROAD
- EXISTING VEGETATION / TREE
- EXISTING FENCE
- EXISTING BUILDING
- EXISTING WATER LINE
- SITE GRID
- PERMIT BOUNDARY
- LIMIT OF WASTE
- CELL BOUNDARY
- CURRENT LANDFILL COVER GRADES
- PROPOSED BASE AND OVERLAY LINER GRADES
- SIDESLOPE UNDERDRAIN DEWATERING PIPE (NOTE 6)
- LOW POINT

SCALE IN FEET: 0, 150, 300

- NOTES:**
- TOPOGRAPHIC BASE MAP OF EXISTING SITE CONDITIONS WAS GENERATED BY PHOTOGRAMMETRIC METHODS BASED ON AN AERIAL SURVEY FLOWN ON 01 FEBRUARY 2022 BY HYDREX ENVIRONMENTAL. EXISTING TOPOGRAPHY IN OBSCURED AREAS AND / OR OUTSIDE OF PROPERTY WHERE SHOWN SUPPLEMENTED WITH THE UNITED STATES GEOLOGIC SURVEY (USGS) 3DEP PROGRAM, 3 METER RESOLUTION LIDAR FLOWN IN 2011.
 - ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (FT, MSL), AS DEFINED BY THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988. COORDINATE GRID OF NORTHINGS AND EASTINGS IS A LOCAL COORDINATE GRID BASED ON A TRANSLATION FROM STATE PLANE COORDINATES, THAT HAS BEEN USED FOR HISTORICAL SURVEY ACTIVITIES AT THE SITE.
 - LINER OVERLAY AREA IS A PROPOSED SUBTITLE D LINER AREA ONTO WHICH NEW (FUTURE) TYPE I MSW WILL BE PLACED AND DISPOSED. LINER OVERLAY IS APPROXIMATELY 13.3 ACRES, WITH MAXIMUM DIMENSIONS OF 960 FT BY 650 FT.
 - THE OVERALL STAGES OF LANDFILL EXPANSION DEVELOPMENT AND DESCRIPTION OF OTHER PLANNED ACTIVITIES AT EACH STAGE ARE TABULATED BELOW.

OVERALL STAGES OF LANDFILL EXPANSION DEVELOPMENT			
LANDFILL EXPANSION DEVELOPMENT STAGE	CELL BEING CONSTRUCTED	OTHER PLANNED CONSTRUCTION ACTIVITIES	GENERAL LOCATION OF WASTE PLACEMENT (UPON COMPLETION/ APPROVAL OF CELL)
1	CELL 4-1	NONE	PORTIONS OF EXISTING LANDFILL TOP-DECK AREAS PER DRAWING I/IIA-25 BEFORE AND DURING CELL 4-1 CONSTRUCTION; AND CELL 4-1
2	CELL 4-2	- CONSTRUCT DIVERSION CHANNEL; - CONSTRUCT STORMWATER POND 1; - CONSTRUCT LEACHATE EVAPORATION POND 2 (NOTE 5).	CELLS 4-1 AND 4-2
3	CELL 4-3	- TIE-IN AND EXTEND CELL 2-1 AND 2-2 SUMPS INTO CELL 4-3; - CONSTRUCT STORMWATER POND 2.	CELLS 4-1 AND 4-3
4	CELL 4-4	NONE	CELLS 4-3 AND 4-4
5	NONE	NONE	CELLS 2-1, 2-2, AND 4-3
6	OVERLAY AREA	NONE	OVERLAY (LINER) AREA, CELLS 3-1 TO 3-4, CELL 4-1; RAISE OVERALL LANDFILL GRADES
7	CELL 4-5	NONE	CELLS 4-4 AND 4-5; RAISE OVERALL LANDFILL GRADES
8	CELL 4-6	NONE	CELLS 4-3, 4-5, AND 4-6; FILL OVERALL LANDFILL TO FINAL WASTE GRADES

- CONSTRUCTION OF LEACHATE EVAPORATION POND 2 MAY BE DEFERRED TO A LATER STAGE, OR IT MAY NOT NEED TO BE CONSTRUCTED, DEPENDING ON ACTUAL LEACHATE GENERATION QUANTITIES AND THE ABILITY TO PROPERLY MANAGE LEACHATE VIA THE EXISTING STORAGE AREAS.
- REFER TO PART III, ATTACHMENT 3A, DRAWING 3A-17 FOR UNDERDRAIN SYSTEM DESIGN DETAILS. UNDERDRAIN PIPE LOCATION IS APPROXIMATE AND IS ESTIMATED BASED ON THE EXPECTED LOCATION OF THE POTENTIAL WATER-BEARING ZONE ON THE SIDESLOPES. ACTUAL PIPE LOCATION AND CORRESPONDING LOW POINTS (UNDERDRAIN SUMPS) TO BE ESTABLISHED IN THE FIELD DURING CONSTRUCTION BASED ON OBSERVED WATER-BEARING ZONE ELEVATIONS. UNDERDRAIN GEOCOMPOSITE DRAINAGE LAYER IS TO BE PLACED ON SIDESLOPES TO INTERCEPT POTENTIAL GROUNDWATER FLOW IN THE WATER-BEARING ZONE AT ELEVATIONS ABOVE THE UNDERDRAIN PIPE, AS ILLUSTRATED ON DRAWING 3A-17. THE DEWATERING SYSTEM WILL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE PROCEDURES GIVEN IN SECTION 10.4 OF THE LINER QUALITY CONTROL PLAN (LQCP).



FOR PERMIT PURPOSES ONLY

REV	DATE	DESCRIPTION	DRN	APP
2	JUN. 2023	SUBMITTAL OF SUPPLEMENTAL REVISIONS	JJV	SMG
1	APR. 2023	RESPONSE TO TECHNICAL NOD 1	JJV	SMG
-	OCT. 2022	INITIAL SUBMITTAL TO CEC	JJV	SMG

CITY OF LACY LAKEVIEW AND WASTE MANAGEMENT OF TEXAS INC.

Geosyntec consultants
 GEOSYNTEC CONSULTANTS, INC.
 TEXAS ENG. FIRM REGISTRATION NUMBER 1182
 8217 SHOAL CREEK BLVD, SUITE 200
 AUSTIN, TEXAS 78757
 PHONE: 512.451.4003

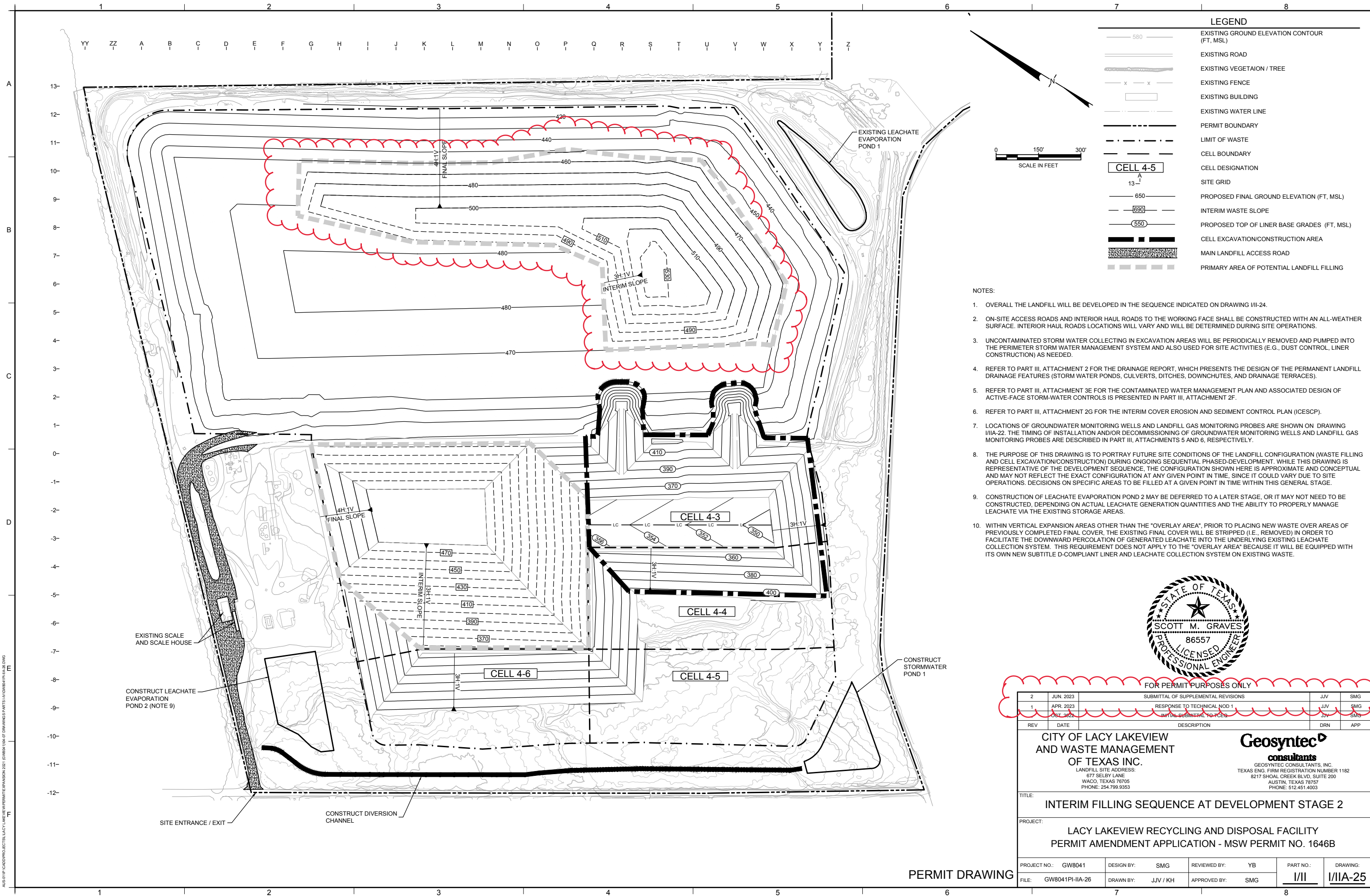
TITLE: **CELL LAYOUT PLAN - SHOWING OVERLAY AREA**

PROJECT: **LACY LAKEVIEW RECYCLING AND DISPOSAL FACILITY PERMIT AMENDMENT APPLICATION - MSW PERMIT NO. 1646B**

PROJECT NO.: GW8041	DESIGN BY: SMG	REVIEWED BY: YB	PART NO.:	DRAWING:
FILE: GW8041PI-IIA-25	DRAWN BY: JJV / KH	APPROVED BY: SMG	I/II	I/IIA-24

PERMIT DRAWING

AUSTIN PROJECT: LACY LAKEVIEW WASTE MANAGEMENT FACILITY EXPANSION 2021 (DRAWING 104-07 DRAWINGS PARTS I-V) DRAWING PARTS I-25 (2023)



LEGEND

- EXISTING GROUND ELEVATION CONTOUR (FT, MSL)
- EXISTING ROAD
- EXISTING VEGETATION / TREE
- EXISTING FENCE
- EXISTING BUILDING
- EXISTING WATER LINE
- PERMIT BOUNDARY
- LIMIT OF WASTE
- CELL BOUNDARY
- CELL DESIGNATION
- SITE GRID
- PROPOSED FINAL GROUND ELEVATION (FT, MSL)
- INTERIM WASTE SLOPE
- PROPOSED TOP OF LINER BASE GRADES (FT, MSL)
- CELL EXCAVATION/CONSTRUCTION AREA
- MAIN LANDFILL ACCESS ROAD
- PRIMARY AREA OF POTENTIAL LANDFILL FILLING

NOTES:

1. OVERALL THE LANDFILL WILL BE DEVELOPED IN THE SEQUENCE INDICATED ON DRAWING I/II-24.
2. ON-SITE ACCESS ROADS AND INTERIOR HAUL ROADS TO THE WORKING FACE SHALL BE CONSTRUCTED WITH AN ALL-WEATHER SURFACE. INTERIOR HAUL ROADS LOCATIONS WILL VARY AND WILL BE DETERMINED DURING SITE OPERATIONS.
3. UNCONTAMINATED STORM WATER COLLECTING IN EXCAVATION AREAS WILL BE PERIODICALLY REMOVED AND PUMPED INTO THE PERIMETER STORM WATER MANAGEMENT SYSTEM AND ALSO USED FOR SITE ACTIVITIES (E.G., DUST CONTROL, LINER CONSTRUCTION) AS NEEDED.
4. REFER TO PART III, ATTACHMENT 2 FOR THE DRAINAGE REPORT, WHICH PRESENTS THE DESIGN OF THE PERMANENT LANDFILL DRAINAGE FEATURES (STORM WATER PONDS, CULVERTS, DITCHES, DOWNCHUTES, AND DRAINAGE TERRACES).
5. REFER TO PART III, ATTACHMENT 3E FOR THE CONTAMINATED WATER MANAGEMENT PLAN AND ASSOCIATED DESIGN OF ACTIVE-FACE STORM-WATER CONTROLS IS PRESENTED IN PART III, ATTACHMENT 2F.
6. REFER TO PART III, ATTACHMENT 2G FOR THE INTERIM COVER EROSION AND SEDIMENT CONTROL PLAN (ICESCP).
7. LOCATIONS OF GROUNDWATER MONITORING WELLS AND LANDFILL GAS MONITORING PROBES ARE SHOWN ON DRAWING I/IIA-22. THE TIMING OF INSTALLATION AND/OR DECOMMISSIONING OF GROUNDWATER MONITORING WELLS AND LANDFILL GAS MONITORING PROBES ARE DESCRIBED IN PART III, ATTACHMENTS 5 AND 6, RESPECTIVELY.
8. THE PURPOSE OF THIS DRAWING IS TO PORTRAY FUTURE SITE CONDITIONS OF THE LANDFILL CONFIGURATION (WASTE FILLING AND CELL EXCAVATION/CONSTRUCTION) DURING ONGOING SEQUENTIAL PHASED-DEVELOPMENT. WHILE THIS DRAWING IS REPRESENTATIVE OF THE DEVELOPMENT SEQUENCE, THE CONFIGURATION SHOWN HERE IS APPROXIMATE AND CONCEPTUAL AND MAY NOT REFLECT THE EXACT CONFIGURATION AT ANY GIVEN POINT IN TIME, SINCE IT COULD VARY DUE TO SITE OPERATIONS. DECISIONS ON SPECIFIC AREAS TO BE FILLED AT A GIVEN POINT IN TIME WITHIN THIS GENERAL STAGE.
9. CONSTRUCTION OF LEACHATE EVAPORATION POND 2 MAY BE DEFERRED TO A LATER STAGE, OR IT MAY NOT NEED TO BE CONSTRUCTED, DEPENDING ON ACTUAL LEACHATE GENERATION QUANTITIES AND THE ABILITY TO PROPERLY MANAGE LEACHATE VIA THE EXISTING STORAGE AREAS.
10. WITHIN VERTICAL EXPANSION AREAS OTHER THAN THE "OVERLAY AREA", PRIOR TO PLACING NEW WASTE OVER AREAS OF PREVIOUSLY COMPLETED FINAL COVER, THE EXISTING FINAL COVER WILL BE STRIPPED (I.E., REMOVED) IN ORDER TO FACILITATE THE DOWNWARD PERCOLATION OF GENERATED LEACHATE INTO THE UNDERLYING EXISTING LEACHATE COLLECTION SYSTEM. THIS REQUIREMENT DOES NOT APPLY TO THE "OVERLAY AREA" BECAUSE IT WILL BE EQUIPPED WITH ITS OWN NEW SUBTITLE D-COMPLIANT LINER AND LEACHATE COLLECTION SYSTEM ON EXISTING WASTE.



FOR PERMIT PURPOSES ONLY

REV	DATE	DESCRIPTION	DRN	APP
2	JUN. 2023	SUBMITTAL OF SUPPLEMENTAL REVISIONS	JJV	SMG
1	APR. 2023	RESPONSE TO TECHNICAL NOD 1	JJV	SMG
	AUG. 2022	INITIAL SUBMITTAL TO TCEQ	JJV	SMG

CITY OF LACY LAKEVIEW AND WASTE MANAGEMENT OF TEXAS INC.

LANDFILL SITE ADDRESS:
677 SELBY LANE
WACO, TEXAS 76705
PHONE: 254.799.9353

Geosyntec
consultants
GEOSYNTEC CONSULTANTS, INC.
TEXAS ENG. FIRM REGISTRATION NUMBER 1182
8217 SHOAL CREEK BLVD, SUITE 200
AUSTIN, TEXAS 78757
PHONE: 512.451.4003

TITLE: **INTERIM FILLING SEQUENCE AT DEVELOPMENT STAGE 2**

PROJECT: **LACY LAKEVIEW RECYCLING AND DISPOSAL FACILITY PERMIT AMENDMENT APPLICATION - MSW PERMIT NO. 1646B**

PROJECT NO.: GW8041	DESIGN BY: SMG	REVIEWED BY: YB	PART NO.:	DRAWING:
FILE: GW8041PI-IIA-26	DRAWN BY: JJV / KH	APPROVED BY: SMG	I/II	I/IIA-25

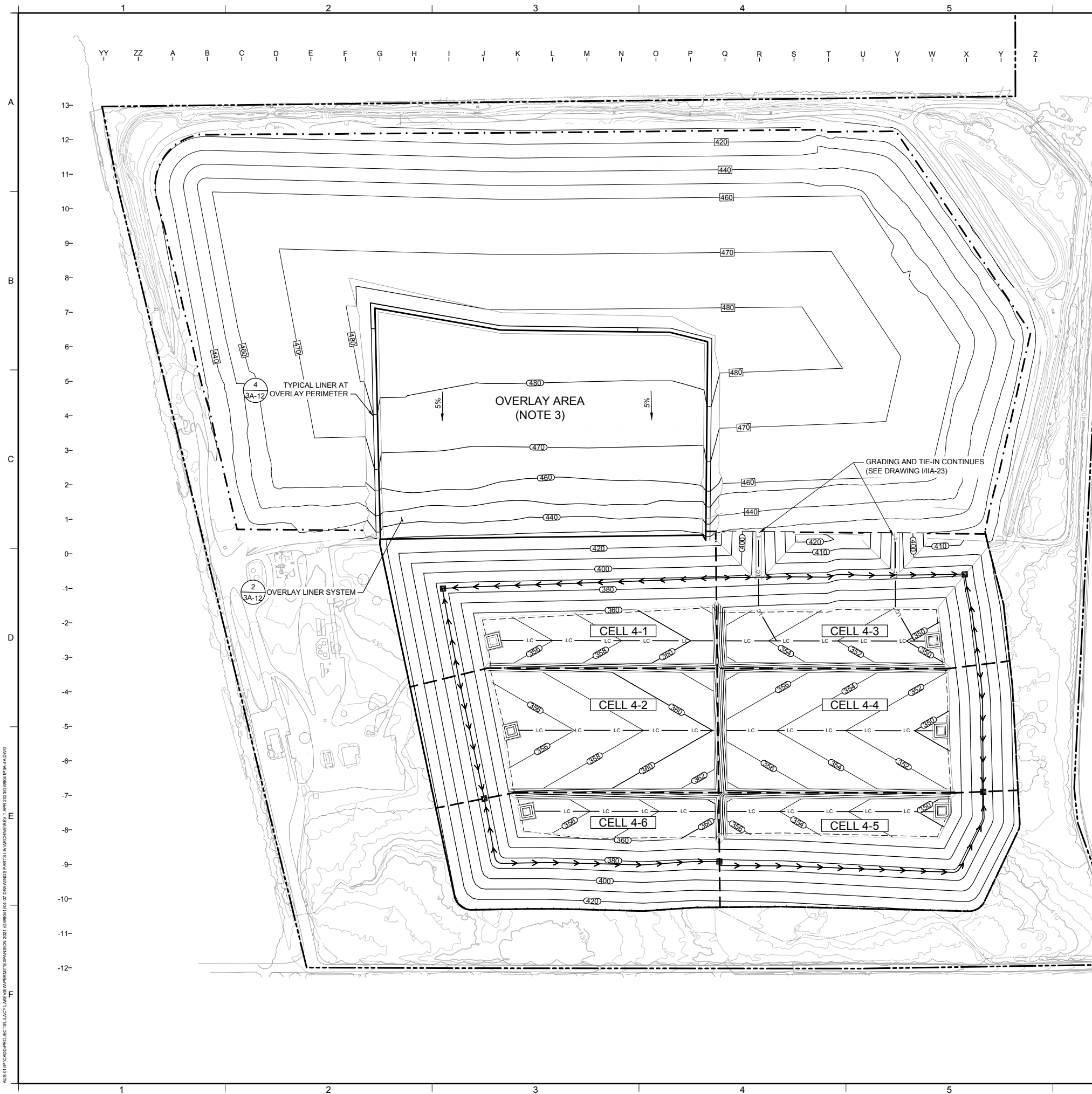
PERMIT DRAWING

AUSTIN PROJECT: LACY LAKEVIEW WASTE MANAGEMENT EXPANSION 2021 (10/04/2021) DRAWINGS PARTS I/IIA-25 TO I/IIA-28

ATTACHMENT 3A

LANDFILL DESIGN DRAWINGS

LIST OF DRAWINGS		
Drawing No.	Title	Drawing Date (latest revision)
3A-1A	Proposed Facility Expansion Plan	April 2023
3A-1	Facility Layout Plan	October 2022
3A-2	Existing Landfill Entrance Area Plan	October 2022
3A-3	Overall Base Grading Plan	April 2023
3A-4	Overlay Area Grading Plan	June April 2023
3A-5	Overall Final Cover Grading Plan	April 2023
3A-6	Landfill Cross-Section Location Map	April 2022
3A-7	Landfill Cross-Section A-A'	October 2022
3A-8	Landfill Cross-Section B-B'	October 2022
3A-9	Landfill Cross-Section C-C'	April 2022
3A-10	Landfill Cross-Section D-D'	April 2022
3A-11	Landfill Cross-Section E-E'	April 2022
3A-12	Liner System Details I	April 2022
3A-13	Liner System Details II	April 2022
3A-14	Final Cover System Details	April 2022
3A-15	Landfill Perimeter Details I	April 2022
3A-16	Landfill Perimeter Details II	October 2022
3A-17	Underdrain Dewatering System Design	April 2022



LEGEND

- 580 ——— EXISTING GROUND ELEVATION CONTOUR (FT, MSL) (NOTES 1, 2)
- EXISTING ROAD
- EXISTING VEGETATION / TREE
- x — x — EXISTING FENCE
- ——— EXISTING BUILDING
- EXISTING WATER LINE
- 13-1 ——— SITE GRID
- PERMIT BOUNDARY
- - - - - LIMIT OF WASTE
- CELL BOUNDARY
- 400 ——— CURRENT LANDFILL COVER GRADES
- 390 ——— PROPOSED BASE AND OVERLAY LINER GRADES
- → → → → SIDESLOPE UNDERDRAIN DEWATERING PIPE (NOTE 6)
- ▲ ——— LOW POINT

SCALE IN FEET
0 150' 300'

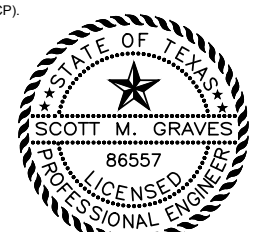
NOTES:

- TOPOGRAPHIC BASE MAP OF EXISTING SITE CONDITIONS WAS GENERATED BY PHOTOGRAMMETRIC METHODS BASED ON AN AERIAL SURVEY FLOWN ON 01 FEBRUARY 2022 BY HYDREX ENVIRONMENTAL. EXISTING TOPOGRAPHY IN OBSCURED AREAS AND / OR OUTSIDE OF PROPERTY WHERE SHOWN SUPPLEMENTED WITH THE UNITED STATES GEOLOGIC SURVEY (USGS) 3DEP PROGRAM, 3 METER RESOLUTION LIDAR FLOWN IN 2011.
- ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (FT, MSL), AS DEFINED BY THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988. COORDINATE GRID OF NORTHINGS AND EASTINGS IS A LOCAL COORDINATE GRID BASED ON A TRANSLATION FROM STATE PLANE COORDINATES, THAT HAS BEEN USED FOR HISTORICAL SURVEY ACTIVITIES AT THE SITE.
- LINER OVERLAY AREA IS A PROPOSED SUBTITLE D LINER AREA ONTO WHICH NEW (FUTURE) TYPE I MSW WILL BE PLACED AND DISPOSED. LINER OVERLAY IS APPROXIMATELY 13.3 ACRES, WITH MAXIMUM DIMENSIONS OF 960 FT BY 650 FT.
- THE OVERALL STAGES OF LANDFILL EXPANSION DEVELOPMENT AND DESCRIPTION OF OTHER PLANNED ACTIVITIES AT EACH STAGE ARE TABULATED BELOW.

OVERALL STAGES OF LANDFILL EXPANSION DEVELOPMENT

LANDFILL EXPANSION DEVELOPMENT STAGE	CELL BEING CONSTRUCTED	OTHER PLANNED CONSTRUCTION ACTIVITIES	GENERAL LOCATION OF WASTE PLACEMENT (UPON COMPLETION, APPROVAL OF CELL)
1	CELL 4-1	NONE	PORTIONS OF EXISTING LANDFILL TOP-DECK AREAS PER PART III, APPENDIX IIIA, DRAWING IIIA-25 BEFORE AND DURING CELL 4-1 CONSTRUCTION, AND CELL 4-1
2	CELL 4-2	- CONSTRUCT DIVERSION CHANNEL - CONSTRUCT STORMWATER POND 1 - CONSTRUCT LEACHATE EVAPORATION POND 2 (NOTE 5).	CELLS 4-1 AND 4-2
3	CELL 4-3	- TIE-IN AND EXTEND CELL 2-1 AND 2-2 SUMPS INTO CELL 4-3; - CONSTRUCT STORMWATER POND 2.	CELLS 4-1 AND 4-3
4	CELL 4-4	NONE	CELLS 4-3 AND 4-4
5	NONE	NONE	CELLS 2-1, 2-2, AND 4-3
6	OVERLAY AREA	NONE	OVERLAY (LINER) AREA, CELLS 3-1 TO 3-4, CELL 4-1; RAISE OVERALL LANDFILL GRADES
7	CELL 4-5	NONE	CELLS 4-4 AND 4-5; RAISE OVERALL LANDFILL GRADES
8	CELL 4-6	NONE	CELLS 4-3, 4-5, AND 4-6; FILL OVERALL LANDFILL TO FINAL WASTE GRADES

- CONSTRUCTION OF LEACHATE EVAPORATION POND 2 MAY BE DEFERRED TO A LATER STAGE, OR IT MAY NOT NEED TO BE CONSTRUCTED, DEPENDING ON ACTUAL LEACHATE GENERATION QUANTITIES AND THE ABILITY TO PROPERLY MANAGE LEACHATE VIA THE EXISTING STORAGE AREAS.
- REFER TO PART III, ATTACHMENT 3A, DRAWING 3A-17 FOR UNDERDRAIN SYSTEM DESIGN DETAILS. UNDERDRAIN PIPE LOCATION IS APPROXIMATE AND IS ESTIMATED BASED ON THE EXPECTED LOCATION OF THE POTENTIAL WATER-BEARING ZONE ON THE SIDESLOPES. ACTUAL PIPE LOCATION AND CORRESPONDING LOW POINTS (UNDERDRAIN SUMPS) TO BE ESTABLISHED IN THE FIELD DURING CONSTRUCTION BASED ON OBSERVED WATER-BEARING ZONE ELEVATIONS. UNDERDRAIN GEOCOMPOSITE DRAINAGE LAYER IS TO BE PLACED ON SIDESLOPES TO INTERCEPT POTENTIAL GROUNDWATER FLOW IN THE WATER-BEARING ZONE AT ELEVATIONS ABOVE THE UNDERDRAIN PIPE, AS ILLUSTRATED ON DRAWING 3A-17. THE DEWATERING SYSTEM WILL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE PROCEDURES GIVEN IN SECTION 10.4 OF THE LINER QUALITY CONTROL PLAN (LQCP).



FOR PERMIT PURPOSES ONLY

REV	DATE	DESCRIPTION	DRN	APP
2	JUN. 2023	SUBMITTAL OF SUPPLEMENTAL REVISIONS	JJV	SMG
1	APR. 2023	RESPONSE TO TECHNICAL NOD 1	JJV	SMG
-	OCT. 2022	INITIAL SUBMITTAL TO CEC	JJV	SMG

CITY OF LACY LAKEVIEW AND WASTE MANAGEMENT OF TEXAS INC.

Geosyntec consultants
GEOSYNTEC CONSULTANTS, INC.
TEXAS ENG. FIRM REGISTRATION NUMBER 1182
8217 SHOAL CREEK BLVD, SUITE 200
AUSTIN, TEXAS 78757
PHONE: 512.451.4003

TITLE: OVERLAY AREA GRADING PLAN

PROJECT: LACY LAKEVIEW RECYCLING AND DISPOSAL FACILITY PERMIT AMENDMENT APPLICATION - MSW PERMIT NO. 1646B

PROJECT NO.: GW8041	DESIGN BY: SMG	REVIEWED BY: YB	PART NO.: III	DRAWING: 3A-4
FILE: GW8041P3A-4A	DRAWN BY: JJV / KH	APPROVED BY: SMG		

PERMIT DRAWING

AUS:DWG\CADD\PROJECTS\LACY LAKEVIEW\WASTE MANAGEMENT\EXPANSION 2021\DWG\104-47 DRAWINGS PARTS\IV\ARCHIVE\REV 1.dwg 2023/06/04 10:34:41.DWG

Written by:	<u>Livingstone Dumenu</u>	Date:	<u>07/22/22</u>	Reviewed & Revised by:	<u>Scott Graves</u>	Date:	<u>7/26/2022;</u> <u>64/24/2023</u>
Client:	<u>WMTX</u>	Project:	<u>Lacy Lakeview</u>	Project No.:	<u>GW8041</u>	Task No.:	<u>05</u>

ATTACHMENT 3E.1
LEACHATE GENERATION RATES AND HEAD ON LINER
(HELP MODEL CALCULATIONS)

FOR PERMIT PURPOSES ONLY;
CALCULATION PAGES 3E.1-1
THROUGH 3E.1-129

GEOSYNTec CONSULTANTS, INC.
TX ENG FIRM REGISTRATION NO. F-1182

INTRODUCTION

The purposes of this analysis are to:

- estimate the design leachate collection rates in the leachate collection system for various operation conditions;
- calculate the design hydraulic conductivity and transmissivity of the leachate drainage layer in the leachate collection system;
- evaluate the maximum leachate head on the liner system for compliance with the Texas Commission on Environmental Quality (TCEQ) regulations, which require the maximum head of leachate to be less than 30 cm (12 in.) [30 TAC §330.331(a)(2)]; and
- evaluate the implementation of leachate recirculation.

METHOD OF ANALYSIS

The leachate collection rates and maximum leachate head on the liner system were estimated using the Hydrologic Evaluation of Landfill Performance (*HELP*) computer model, Version 3.95 D, developed by Dr. Klaus Berger of the University of Hamburg, Institute of Soil Science. *HELP* simulates hydrologic processes for a landfill by performing daily, sequential water balance analyses using a quasi-two-dimensional, deterministic approach (Berger and Schroeder, 2013; Schroeder et al., 1994a, 1994b).

The hydrologic processes considered in the *HELP* model include precipitation, surface-water evaporation, runoff, infiltration, plant transpiration, soil water evaporation, soil water storage,

Written by: Livingstone Dumenu Date: 07/22/22 Reviewed & Revised by: Scott Graves Date: 7/26/2022; 6/2/2023
 Client: WMTX Project: Lacy Lakeview Project No.: GW8041 Task No.: 05

TABLE 3E.1-3. LEACHATE GENERATION RATES FOR CASES WITHOUT LEACHATE RECIRCULATION

(A) ANNUAL AVERAGE

Area	Case ID		Total Leachate Collected	
			(in./ac./yr)	(gpad)
New Fill (NF)	1	Floor	6.0E+00	448
	2	Floor	3.6E+00	271
	3	Floor	3.6E+00	271
	4	Floor	4.0E-05	1
	5	Sideslope	3.7E+00	272
Liner Overlay (LO)	1	Floor	1.4E+00	102
	2	Floor	3.7E+00	272
	3	Floor	1.1E-04	1
Existing Fill (EF)	1	Floor	3.7E+00	272
	2	Floor	3.7E+00	272
	3	Floor	1.0E-05	1

(B) PEAK DAILY

Area	Case ID		Total Leachate Collected	
			(in./ac./day)	(gpad)
New Fill (NF)	1	Floor	1.6E-01	4,356
	2	Floor	1.4E-01	3,706
	3	Floor	1.4E-01	3,673
	4	Floor	0.0E+00	0
	5	Sideslope	1.3E-01	3,623 8
Liner Overlay (LO)	1	Floor	1.3E-01	3,465
	2	Floor	1.4E-01	3,708
	3	Floor	1.0E-05	1
Existing Fill (EF)	1	Floor	1.6E-01	4,403
	2	Floor	1.6E-01	4,439
	3	Floor	0.0E+00	0

Note: gpad = gallons per acre per day

CLEAN REPLACEMENT PAGES

A completed Page 1 and 11 of the Part I Form is attached, reflecting this revision and including the applicant's signed and notarized certification statement.

Also, the attached pages are replacements to the previous version of the following pages:

- Revised Part I/II, Appendix I/IIA – Cover Page, and Drawings I/IIA-24 and 25;
- Revised Part III, Attachment 3A – Cover Page, and Drawing 3A-4; and
- Revised Part III, Attachment 3E.1 – Pages 3E.1-1, 3E.1-14, and 3E.1-65 through 73.



Texas Commission on Environmental Quality

Part I Application Form for New Permit, Permit Amendment, or Registration for a Municipal Solid Waste Facility

Application Tracking Information

Facility Name: Lacy Lakeview Recycling and Disposal Facility

Permittee or Registrant Name: City of Lacy Lakeview

MSW Authorization Number: 1646B

Initial Submission Date: 10/28/2022

Revision Date: 6/2/2023

Instructions for completing this Part I Application Form are provided in [TCEQ 00650-instr](#)¹. Include a [Core Data Form \(TCEQ 10400\)](#)² with the application for the facility owner, and another Core Data Form for the operator if different from the owner. If you have questions, contact the Municipal Solid Waste Permits Section by email to mswper@tceq.texas.gov, or by phone at 512-239-2335.

Application Data

1. Submission Type

Initial Submission Notice of Deficiency (NOD) Response

2. Authorization Type

Permit Registration

3. Application Type

New Permit
 Permit Major Amendment Permit Limited Scope Major Amendment
 New Registration

¹ www.tceq.texas.gov/downloads/permitting/waste-permits/msw/forms/00650-instr.pdf

² www.tceq.texas.gov/goto/coredata

Signature Page

Site Operator or Authorized Signatory

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Name: Calvin Hodde Title: City Manager

Email Address: Calvin.hodde@lacylakeview.org

Signature: *Calvin Hodde* Date: June 2nd 2023

Operator or Principal Executive Officer Designation of Authorized Signatory

To be completed by the operator if the application is signed by an authorized representative for the operator.

I hereby designate _____ as my representative and hereby authorize said representative to sign any application, submit additional information as may be requested by the Commission; and/or appear for me at any hearing or before the Texas Commission on Environmental Quality in conjunction with this request for a Texas Water Code or Texas Solid Waste Disposal Act permit. I further understand that I am responsible for the contents of this application, for oral statements given by my authorized representative in support of the application, and for compliance with the terms and conditions of any permit which might be issued based upon this application.

Operator or Principal Executive Officer Name: _____

Email Address: _____

Signature: _____ Date: _____

Notary

SUBSCRIBED AND SWORN to before me by the said Christian Ross

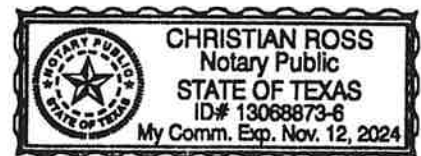
On this 2nd day of June, 2023

My commission expires on the 12th day of November, 2024

Christian Ross

Notary Public in and for

McLennan County, Texas

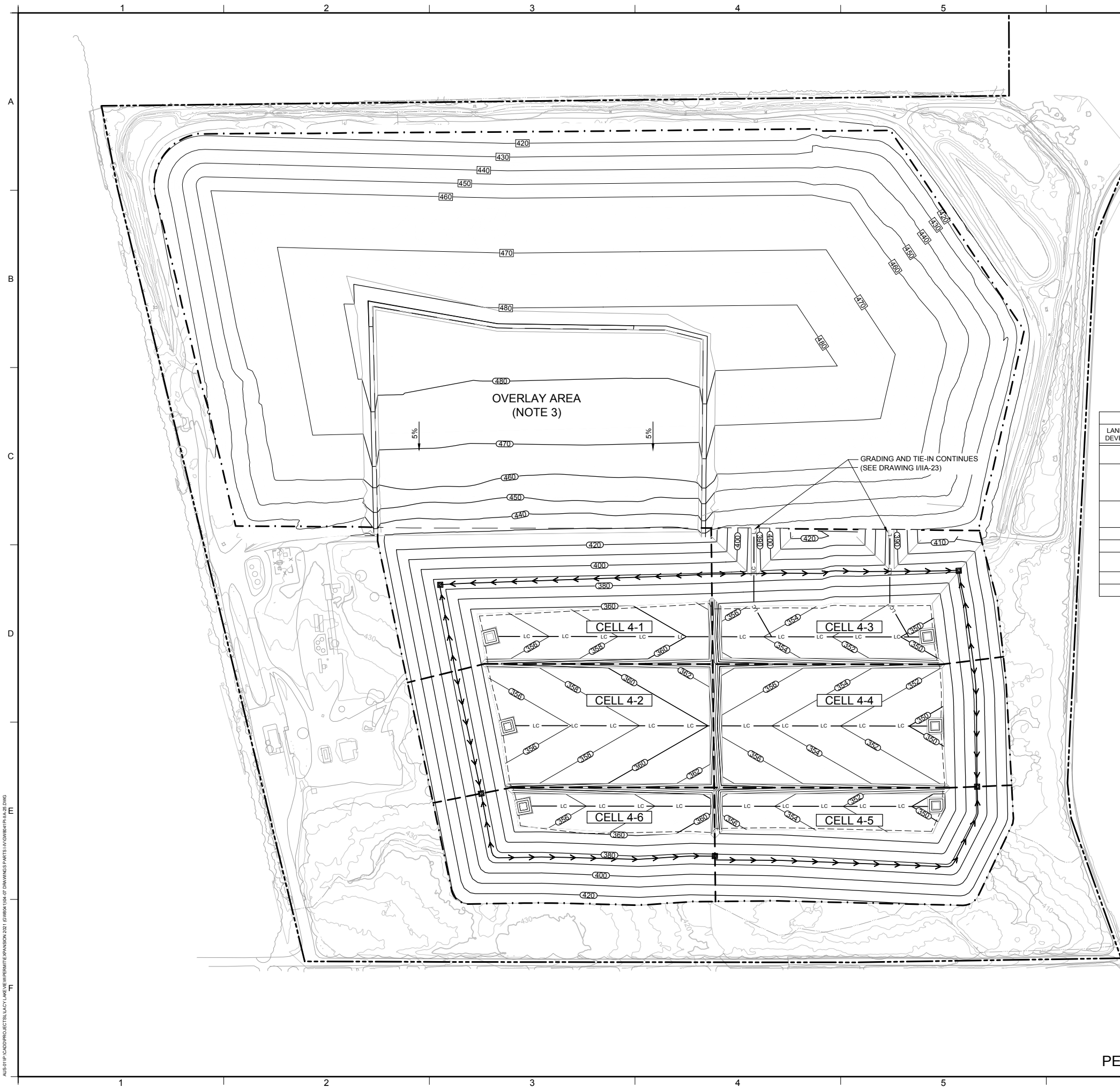


Note: Application Must Bear Signature & Seal of Notary Public

APPENDIX I/IIA

GENERAL LOCATION MAPS

LIST OF DRAWINGS		
Drawing No.	Title	Drawing Date (latest revision)
I/IIA-1	General Location Highway Map	October 2022
I/IIA-2	Detailed Highway Map	October 2022
I/IIA-3	General Topographic Map	April 2023
I/IIA-4	Current Aerial Photograph of Surroundings	October 2022
I/IIA-5	2010 Aerial Photograph of Surroundings	October 2022
I/IIA-6	2003 Aerial Photograph of Surroundings	October 2022
I/IIA-7	1995 Aerial Photograph of Surroundings	October 2022
I/IIA-8	1982 Aerial Photograph of Surroundings	October 2022
I/IIA-9	2022 Site Aerial Photograph	October 2022
I/IIA-10	General Land Use Map	October 2022
I/IIA-11	Detailed Land Use Map	April 2023
I/IIA-12	Zoning Map – City of Waco	October 2022
I/IIA-13	Zoning Map – City of Bellmead	October 2022
I/IIA-14	Population Growth Trends – 5 Miles	October 2022
I/IIA-15	Airport Map	October 2022
I/IIA-16	Structures and Inhabitable Buildings Map	October 2022
I/IIA-17	Map of Area Wells	October 2022
I/IIA-18	FEMA Floodplain Map	October 2022
I/IIA-19	Drainage, Pipeline, and Utility Easement Map	October 2022
I/IIA-20A	Proposed Facility Expansion Plan	April 2023
I/IIA-20	Facility Layout Plan	October 2022
I/IIA-21	Facility Access Control Features Plan	October 2022
I/IIA-22	Groundwater and Landfill Gas Monitoring Plan	April 2023
I/IIA-23	Cell Layout Plan – Base Liner Grades	April 2023
I/IIA-24	Cell Layout Plan – Showing Overlay Area	June 2023
I/IIA-25	Interim Filling Sequence at Development Stage 2	June 2023
I/IIA-26	Interim Filling Sequence at Development Stage 6	April 2023
I/IIA-27	Interim Filling Sequence at Development Stage 7	April 2023
I/IIA-28	Landfill Completion Plan	October 2022



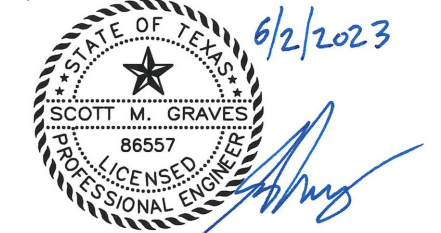
LEGEND	
	EXISTING GROUND ELEVATION CONTOUR (FT, MSL) (NOTES 1, 2)
	EXISTING ROAD
	EXISTING VEGETATION / TREE
	EXISTING FENCE
	EXISTING BUILDING
	EXISTING WATER LINE
	SITE GRID
	PERMIT BOUNDARY
	LIMIT OF WASTE
	CELL BOUNDARY
	CURRENT LANDFILL COVER GRADES
	PROPOSED BASE AND OVERLAY LINER GRADES
	SIDESLOPE UNDERDRAIN DEWATERING PIPE (NOTE 6)
	LOW POINT

NOTES:

- TOPOGRAPHIC BASE MAP OF EXISTING SITE CONDITIONS WAS GENERATED BY PHOTOGRAMMETRIC METHODS BASED ON AN AERIAL SURVEY FLOWN ON 01 FEBRUARY 2022 BY HYDREX ENVIRONMENTAL. EXISTING TOPOGRAPHY IN OBSCURED AREAS AND / OR OUTSIDE OF PROPERTY WHERE SHOWN SUPPLEMENTED WITH THE UNITED STATES GEOLOGIC SURVEY (USGS) 3DEP PROGRAM, 3 METER RESOLUTION LIDAR FLOWN IN 2011.
- ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (FT, MSL), AS DEFINED BY THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988. COORDINATE GRID OF NORTHINGS AND EASTINGS IS A LOCAL COORDINATE GRID BASED ON A TRANSLATION FROM STATE PLANE COORDINATES, THAT HAS BEEN USED FOR HISTORICAL SURVEY ACTIVITIES AT THE SITE.
- LINER OVERLAY AREA IS A PROPOSED SUBTITLE D LINER AREA ONTO WHICH NEW (FUTURE) TYPE I MSW WILL BE PLACED AND DISPOSED. LINER OVERLAY IS APPROXIMATELY 13.3 ACRES, WITH MAXIMUM DIMENSIONS OF 960 FT BY 650 FT.
- THE OVERALL STAGES OF LANDFILL EXPANSION DEVELOPMENT AND DESCRIPTION OF OTHER PLANNED ACTIVITIES AT EACH STAGE ARE TABULATED BELOW.

OVERALL STAGES OF LANDFILL EXPANSION DEVELOPMENT			
LANDFILL EXPANSION DEVELOPMENT STAGE	CELL BEING CONSTRUCTED	OTHER PLANNED CONSTRUCTION ACTIVITIES	GENERAL LOCATION OF WASTE PLACEMENT (UPON COMPLETION/ APPROVAL OF CELL)
1	CELL 4-1	NONE	PORTIONS OF EXISTING LANDFILL TOP-DECK AREAS PER DRAWING I/IIA-25 BEFORE AND DURING CELL 4-1 CONSTRUCTION; AND CELL 4-1
2	CELL 4-2	- CONSTRUCT DIVERSION CHANNEL; - CONSTRUCT STORMWATER POND 1; - CONSTRUCT LEACHATE EVAPORATION POND 2 (NOTE 5).	CELLS 4-1 AND 4-2
3	CELL 4-3	- TIE-IN AND EXTEND CELL 2-1 AND 2-2 SUMPS INTO CELL 4-3; - CONSTRUCT STORMWATER POND 2.	CELLS 4-1 AND 4-3
4	CELL 4-4	NONE	CELLS 4-3 AND 4-4
5	NONE	NONE	CELLS 2-1, 2-2, AND 4-3
6	OVERLAY AREA	NONE	OVERLAY (LINER) AREA, CELLS 3-1 TO 3-4, CELL 4-1; RAISE OVERALL LANDFILL GRADES
7	CELL 4-5	NONE	CELLS 4-4 AND 4-5; RAISE OVERALL LANDFILL GRADES
8	CELL 4-6	NONE	CELLS 4-3, 4-5, AND 4-6; FILL OVERALL LANDFILL TO FINAL WASTE GRADES

- CONSTRUCTION OF LEACHATE EVAPORATION POND 2 MAY BE DEFERRED TO A LATER STAGE, OR IT MAY NOT NEED TO BE CONSTRUCTED, DEPENDING ON ACTUAL LEACHATE GENERATION QUANTITIES AND THE ABILITY TO PROPERLY MANAGE LEACHATE VIA THE EXISTING STORAGE AREAS.
- REFER TO PART III, ATTACHMENT 3A, DRAWING 3A-17 FOR UNDERDRAIN SYSTEM DESIGN DETAILS. UNDERDRAIN PIPE LOCATION IS APPROXIMATE AND IS ESTIMATED BASED ON THE EXPECTED LOCATION OF THE POTENTIAL WATER-BEARING ZONE ON THE SIDESLOPES. ACTUAL PIPE LOCATION AND CORRESPONDING LOW POINTS (UNDERDRAIN SUMPS) TO BE ESTABLISHED IN THE FIELD DURING CONSTRUCTION BASED ON OBSERVED WATER-BEARING ZONE ELEVATIONS. UNDERDRAIN GEOCOMPOSITE DRAINAGE LAYER IS TO BE PLACED ON SIDESLOPES TO INTERCEPT POTENTIAL GROUNDWATER FLOW IN THE WATER-BEARING ZONE AT ELEVATIONS ABOVE THE UNDERDRAIN PIPE, AS ILLUSTRATED ON DRAWING 3A-17. THE DEWATERING SYSTEM WILL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE PROCEDURES GIVEN IN SECTION 10.4 OF THE LINER QUALITY CONTROL PLAN (LQCP).



FOR PERMIT PURPOSES ONLY

REV	DATE	DESCRIPTION	DRN	APP
2	JUN. 2023	SUBMITTAL OF SUPPLEMENTAL REVISIONS	JJV	SMG
1	APR. 2023	RESPONSE TO TECHNICAL NOD 1	JJV	SMG
-	OCT. 2022	INITIAL SUBMITTAL TO TCEQ	JJV	SMG

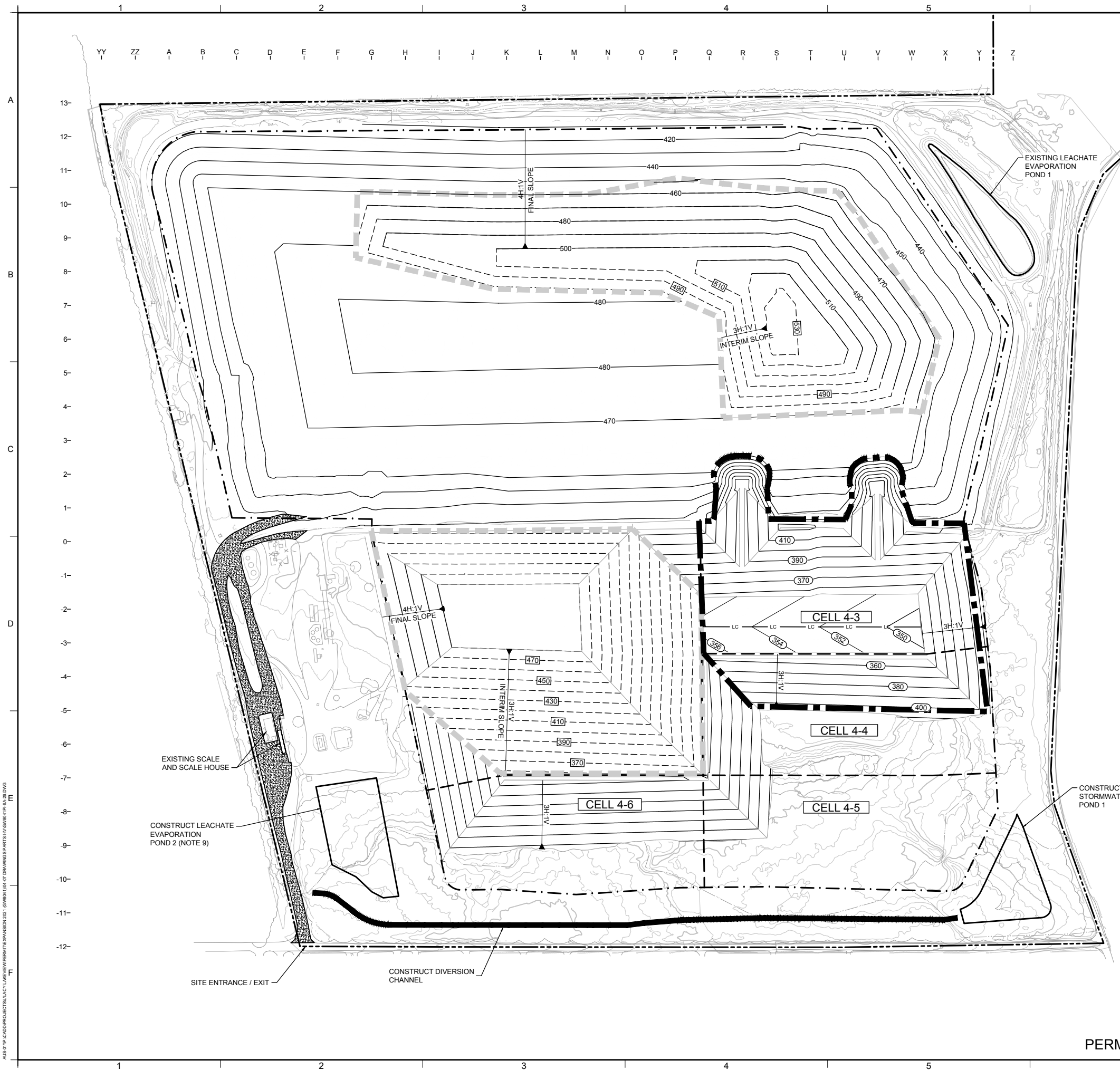
CITY OF LACY LAKEVIEW AND WASTE MANAGEMENT OF TEXAS INC. LANDFILL SITE ADDRESS: 677 SELBY LANE WACO, TEXAS 76705 PHONE: 254.799.9353	Geosyntec consultants GEOSYNTEC CONSULTANTS, INC. TEXAS ENG. FIRM REGISTRATION NUMBER 1182 8217 SHOAL CREEK BLVD, SUITE 200 AUSTIN, TEXAS 78757 PHONE: 512.451.4003

PROJECT: LACY LAKEVIEW RECYCLING AND DISPOSAL FACILITY
PERMIT AMENDMENT APPLICATION - MSW PERMIT NO. 1646B

PROJECT NO.: GW8041	DESIGN BY: SMG	REVIEWED BY: YB	PART NO.: I/II	DRAWING: I/IIA-24
FILE: GW8041PI-IIA-25	DRAWN BY: JJV / KH	APPROVED BY: SMG		

PERMIT DRAWING

AUSTIN PROJECT: LACY LAKEVIEW WASTE MANAGEMENT FACILITY EXPANSION 2021 (DRAWING 104-07 DRAWINGS PARTS I/IIA-25 TO I/IIA-29)

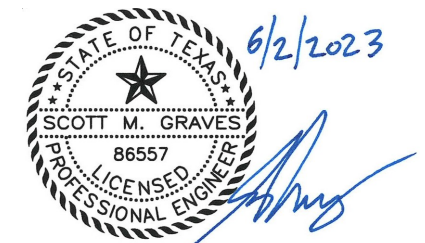


LEGEND	
	EXISTING GROUND ELEVATION CONTOUR (FT, MSL)
	EXISTING ROAD
	EXISTING VEGETATION / TREE
	EXISTING FENCE
	EXISTING BUILDING
	EXISTING WATER LINE
	PERMIT BOUNDARY
	LIMIT OF WASTE
	CELL BOUNDARY
	CELL DESIGNATION
	SITE GRID
	PROPOSED FINAL GROUND ELEVATION (FT, MSL)
	INTERIM WASTE SLOPE
	PROPOSED TOP OF LINER BASE GRADES (FT, MSL)
	CELL EXCAVATION/CONSTRUCTION AREA
	MAIN LANDFILL ACCESS ROAD
	PRIMARY AREA OF POTENTIAL LANDFILL FILLING



NOTES:

- OVERALL THE LANDFILL WILL BE DEVELOPED IN THE SEQUENCE INDICATED ON DRAWING I/II-24.
- ON-SITE ACCESS ROADS AND INTERIOR HAUL ROADS TO THE WORKING FACE SHALL BE CONSTRUCTED WITH AN ALL-WEATHER SURFACE. INTERIOR HAUL ROADS LOCATIONS WILL VARY AND WILL BE DETERMINED DURING SITE OPERATIONS.
- UNCONTAMINATED STORM WATER COLLECTING IN EXCAVATION AREAS WILL BE PERIODICALLY REMOVED AND PUMPED INTO THE PERIMETER STORM WATER MANAGEMENT SYSTEM AND ALSO USED FOR SITE ACTIVITIES (E.G., DUST CONTROL, LINER CONSTRUCTION) AS NEEDED.
- REFER TO PART III, ATTACHMENT 2 FOR THE DRAINAGE REPORT, WHICH PRESENTS THE DESIGN OF THE PERMANENT LANDFILL DRAINAGE FEATURES (STORM WATER PONDS, CULVERTS, DITCHES, DOWNCHUTES, AND DRAINAGE TERRACES).
- REFER TO PART III, ATTACHMENT 3E FOR THE CONTAMINATED WATER MANAGEMENT PLAN AND ASSOCIATED DESIGN OF ACTIVE-FACE STORM-WATER CONTROLS IS PRESENTED IN PART III, ATTACHMENT 2F.
- REFER TO PART III, ATTACHMENT 2G FOR THE INTERIM COVER EROSION AND SEDIMENT CONTROL PLAN (ICESCP).
- LOCATIONS OF GROUNDWATER MONITORING WELLS AND LANDFILL GAS MONITORING PROBES ARE SHOWN ON DRAWING I/IIA-22. THE TIMING OF INSTALLATION AND/OR DECOMMISSIONING OF GROUNDWATER MONITORING WELLS AND LANDFILL GAS MONITORING PROBES ARE DESCRIBED IN PART III, ATTACHMENTS 5 AND 6, RESPECTIVELY.
- THE PURPOSE OF THIS DRAWING IS TO PORTRAY FUTURE SITE CONDITIONS OF THE LANDFILL CONFIGURATION (WASTE FILLING AND CELL EXCAVATION/CONSTRUCTION) DURING ONGOING SEQUENTIAL PHASED-DEVELOPMENT. WHILE THIS DRAWING IS REPRESENTATIVE OF THE DEVELOPMENT SEQUENCE, THE CONFIGURATION SHOWN HERE IS APPROXIMATE AND CONCEPTUAL AND MAY NOT REFLECT THE EXACT CONFIGURATION AT ANY GIVEN POINT IN TIME, SINCE IT COULD VARY DUE TO SITE OPERATIONS. DECISIONS ON SPECIFIC AREAS TO BE FILLED AT A GIVEN POINT IN TIME WITHIN THIS GENERAL STAGE.
- CONSTRUCTION OF LEACHATE EVAPORATION POND 2 MAY BE DEFERRED TO A LATER STAGE, OR IT MAY NOT NEED TO BE CONSTRUCTED, DEPENDING ON ACTUAL LEACHATE GENERATION QUANTITIES AND THE ABILITY TO PROPERLY MANAGE LEACHATE VIA THE EXISTING STORAGE AREAS.
- WITHIN VERTICAL EXPANSION AREAS OTHER THAN THE "OVERLAY AREA", PRIOR TO PLACING NEW WASTE OVER AREAS OF PREVIOUSLY COMPLETED FINAL COVER, THE EXISTING FINAL COVER WILL BE STRIPPED (I.E., REMOVED) IN ORDER TO FACILITATE THE DOWNWARD PERCOLATION OF GENERATED LEACHATE INTO THE UNDERLYING EXISTING LEACHATE COLLECTION SYSTEM. THIS REQUIREMENT DOES NOT APPLY TO THE "OVERLAY AREA" BECAUSE IT WILL BE EQUIPPED WITH ITS OWN NEW SUBTITLE D-COMPLIANT LINER AND LEACHATE COLLECTION SYSTEM ON EXISTING WASTE.



FOR PERMIT PURPOSES ONLY

REV	DATE	DESCRIPTION	DRN	APP
2	JUN. 2023	SUBMITTAL OF SUPPLEMENTAL REVISIONS	JJV	SMG
1	APR. 2023	RESPONSE TO TECHNICAL NOD 1	JJV	SMG
-	OCT. 2022	INITIAL SUBMITTAL TO TCEQ	JJV	SMG

CITY OF LACY LAKEVIEW AND WASTE MANAGEMENT OF TEXAS INC.

LANDFILL SITE ADDRESS:
677 SELBY LANE
WACO, TEXAS 76705
PHONE: 254.799.9353

Geosyntec consultants
GEOSYNTEC CONSULTANTS, INC.
TEXAS ENG. FIRM REGISTRATION NUMBER 1182
8217 SHOAL CREEK BLVD, SUITE 200
AUSTIN, TEXAS 78757
PHONE: 512.451.4003

TITLE: **INTERIM FILLING SEQUENCE AT DEVELOPMENT STAGE 2**

PROJECT: **LACY LAKEVIEW RECYCLING AND DISPOSAL FACILITY PERMIT AMENDMENT APPLICATION - MSW PERMIT NO. 1646B**

PROJECT NO.: GW8041	DESIGN BY: SMG	REVIEWED BY: YB	PART NO.: I/II	DRAWING: I/IIA-25
FILE: GW8041PI-IIA-26	DRAWN BY: JJV / KH	APPROVED BY: SMG		

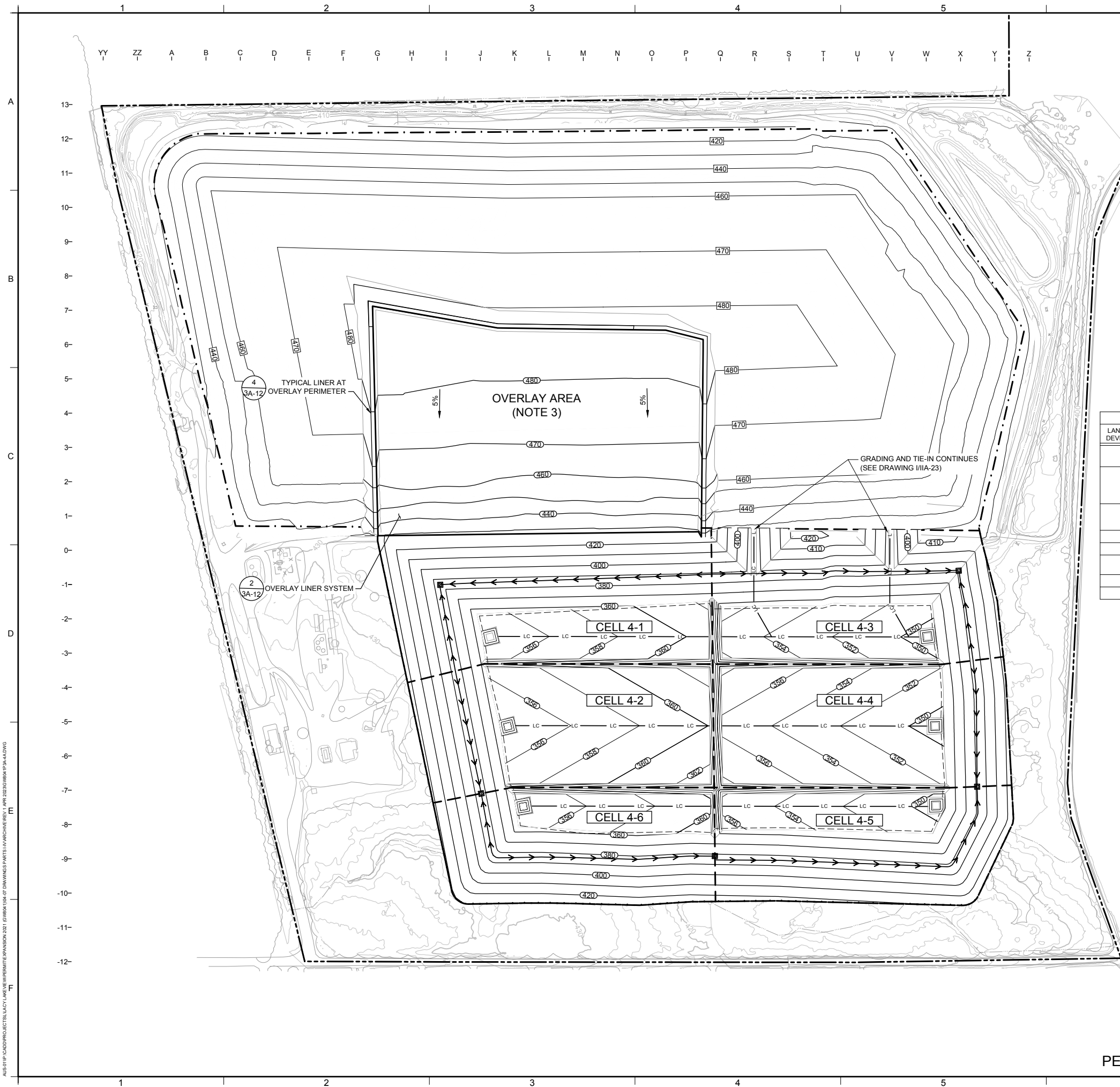
PERMIT DRAWING

AUSTIN PROJECT: LACY LAKEVIEW WASTE MANAGEMENT EXPANSION 2021 (DRAWING I/IIA-25) DRAWINGS PARTS I/IIA-25 TO I/IIA-29

ATTACHMENT 3A

LANDFILL DESIGN DRAWINGS

LIST OF DRAWINGS		
Drawing No.	Title	Drawing Date (latest revision)
3A-1A	Proposed Facility Expansion Plan	April 2023
3A-1	Facility Layout Plan	October 2022
3A-2	Existing Landfill Entrance Area Plan	October 2022
3A-3	Overall Base Grading Plan	April 2023
3A-4	Overlay Area Grading Plan	June 2023
3A-5	Overall Final Cover Grading Plan	April 2023
3A-6	Landfill Cross-Section Location Map	April 2022
3A-7	Landfill Cross-Section A-A'	October 2022
3A-8	Landfill Cross-Section B-B'	October 2022
3A-9	Landfill Cross-Section C-C'	April 2022
3A-10	Landfill Cross-Section D-D'	April 2022
3A-11	Landfill Cross-Section E-E'	April 2022
3A-12	Liner System Details I	April 2022
3A-13	Liner System Details II	April 2022
3A-14	Final Cover System Details	April 2022
3A-15	Landfill Perimeter Details I	April 2022
3A-16	Landfill Perimeter Details II	October 2022
3A-17	Underdrain Dewatering System Design	April 2022

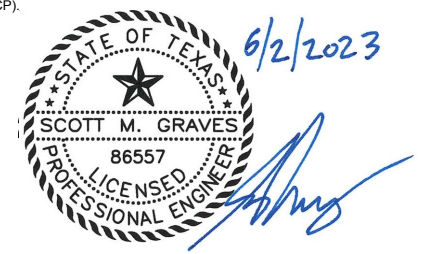


LEGEND	
	EXISTING GROUND ELEVATION CONTOUR (FT, MSL) (NOTES 1, 2)
	EXISTING ROAD
	EXISTING VEGETATION / TREE
	EXISTING FENCE
	EXISTING BUILDING
	EXISTING WATER LINE
	SITE GRID
	PERMIT BOUNDARY
	LIMIT OF WASTE
	CELL BOUNDARY
	CURRENT LANDFILL COVER GRADES
	PROPOSED BASE AND OVERLAY LINER GRADES
	SIDESLOPE UNDERDRAIN DEWATERING PIPE (NOTE 6)
	LOW POINT

- NOTES:
- TOPOGRAPHIC BASE MAP OF EXISTING SITE CONDITIONS WAS GENERATED BY PHOTOGRAMMETRIC METHODS BASED ON AN AERIAL SURVEY FLOWN ON 01 FEBRUARY 2022 BY HYDREX ENVIRONMENTAL. EXISTING TOPOGRAPHY IN OBSCURED AREAS AND / OR OUTSIDE OF PROPERTY WHERE SHOWN SUPPLEMENTED WITH THE UNITED STATES GEOLOGIC SURVEY (USGS) 3DEP PROGRAM, 3 METER RESOLUTION LIDAR FLOWN IN 2011.
 - ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL (FT, MSL), AS DEFINED BY THE NORTH AMERICAN VERTICAL DATUM (NAVD) OF 1988. COORDINATE GRID OF NORTHINGS AND EASTINGS IS A LOCAL COORDINATE GRID BASED ON A TRANSLATION FROM STATE PLANE COORDINATES, THAT HAS BEEN USED FOR HISTORICAL SURVEY ACTIVITIES AT THE SITE.
 - LINER OVERLAY AREA IS A PROPOSED SUBTITLE D LINER AREA ONTO WHICH NEW (FUTURE) TYPE I MSW WILL BE PLACED AND DISPOSED. LINER OVERLAY IS APPROXIMATELY 13.3 ACRES, WITH MAXIMUM DIMENSIONS OF 960 FT BY 650 FT.
 - THE OVERALL STAGES OF LANDFILL EXPANSION DEVELOPMENT AND DESCRIPTION OF OTHER PLANNED ACTIVITIES AT EACH STAGE ARE TABULATED BELOW.

OVERALL STAGES OF LANDFILL EXPANSION DEVELOPMENT			
LANDFILL EXPANSION DEVELOPMENT STAGE	CELL BEING CONSTRUCTED	OTHER PLANNED CONSTRUCTION ACTIVITIES	GENERAL LOCATION OF WASTE PLACEMENT (UPON COMPLETION/ APPROVAL OF CELL)
1	CELL 4-1	NONE	PORTIONS OF EXISTING LANDFILL TOP-DECK AREAS PER PART III, APPENDIX IIIA, DRAWING IIIA-25 BEFORE AND DURING CELL 4-1 CONSTRUCTION, AND CELL 4-1
2	CELL 4-2	- CONSTRUCT DIVERSION CHANNEL; - CONSTRUCT STORMWATER POND 1; - CONSTRUCT LEACHATE EVAPORATION POND 2 (NOTE 5).	CELLS 4-1 AND 4-2
3	CELL 4-3	- TIE-IN AND EXTEND CELL 2-1 AND 2-2 SUMPS INTO CELL 4-3; - CONSTRUCT STORMWATER POND 2.	CELLS 4-1 AND 4-3
4	CELL 4-4	NONE	CELLS 4-3 AND 4-4
5	NONE	NONE	CELLS 2-1, 2-2, AND 4-3
6	OVERLAY AREA	NONE	OVERLAY (LINER) AREA, CELLS 3-1 TO 3-4, CELL 4-1; RAISE OVERALL LANDFILL GRADES
7	CELL 4-5	NONE	CELLS 4-4 AND 4-5; RAISE OVERALL LANDFILL GRADES
8	CELL 4-6	NONE	CELLS 4-3, 4-5, AND 4-6; FILL OVERALL LANDFILL TO FINAL WASTE GRADES

- CONSTRUCTION OF LEACHATE EVAPORATION POND 2 MAY BE DEFERRED TO A LATER STAGE, OR IT MAY NOT NEED TO BE CONSTRUCTED, DEPENDING ON ACTUAL LEACHATE GENERATION QUANTITIES AND THE ABILITY TO PROPERLY MANAGE LEACHATE VIA THE EXISTING STORAGE AREAS.
- REFER TO PART III, ATTACHMENT 3A, DRAWING 3A-17 FOR UNDERDRAIN SYSTEM DESIGN DETAILS. UNDERDRAIN PIPE LOCATION IS APPROXIMATE AND IS ESTIMATED BASED ON THE EXPECTED LOCATION OF THE POTENTIAL WATER-BEARING ZONE ON THE SIDESLOPES. ACTUAL PIPE LOCATION AND CORRESPONDING LOW POINTS (UNDERDRAIN SUMPS) TO BE ESTABLISHED IN THE FIELD DURING CONSTRUCTION BASED ON OBSERVED WATER-BEARING ZONE ELEVATIONS. UNDERDRAIN GEOCOMPOSITE DRAINAGE LAYER IS TO BE PLACED ON SIDESLOPES TO INTERCEPT POTENTIAL GROUNDWATER FLOW IN THE WATER-BEARING ZONE AT ELEVATIONS ABOVE THE UNDERDRAIN PIPE, AS ILLUSTRATED ON DRAWING 3A-17. THE DEWATERING SYSTEM WILL BE INSTALLED AND OPERATED IN ACCORDANCE WITH THE PROCEDURES GIVEN IN SECTION 10.4 OF THE LINER QUALITY CONTROL PLAN (LQCP).



REV	DATE	DESCRIPTION	DRN	APP
2	JUN. 2023	SUBMITTAL OF SUPPLEMENTAL REVISIONS	JJV	SMG
1	APR. 2023	RESPONSE TO TECHNICAL NOD 1	JJV	SMG
-	OCT. 2022	INITIAL SUBMITTAL TO TCEQ	JJV	SMG

FOR PERMIT PURPOSES ONLY

CITY OF LACY LAKEVIEW AND WASTE MANAGEMENT OF TEXAS INC.

Geosyntec consultants
 GEOSYNTEC CONSULTANTS, INC.
 TEXAS ENG. FIRM REGISTRATION NUMBER 1182
 8217 SHOAL CREEK BLVD, SUITE 200
 AUSTIN, TEXAS 78757
 PHONE: 512.451.4003

TITLE: **OVERLAY AREA GRADING PLAN**

PROJECT: **LACY LAKEVIEW RECYCLING AND DISPOSAL FACILITY PERMIT AMENDMENT APPLICATION - MSW PERMIT NO. 1646B**

PROJECT NO.: GW8041	DESIGN BY: SMG	REVIEWED BY: YB	PART NO.: III	DRAWING: 3A-4
FILE: GW8041P3A-4A	DRAWN BY: JJV / KH	APPROVED BY: SMG		

PERMIT DRAWING

AUSTIN PROJECT: LACY LAKEVIEW WASTE MANAGEMENT FACILITY EXPANSION 2021 (DWG) 104-07 DRAWINGS PARTS I-V ARCHIVE REV 1 (R) 20230508M1P3A-4A.DWG

Written by: Livingstone Dumenu Date: 07/22/22 Reviewed & Revised by: Scott Graves Date: 7/26/2022;
6/2/2023

Client: WMTX Project: Lacy Lakeview Project No.: GW8041 Task No.: 05

ATTACHMENT 3E.1
LEACHATE GENERATION RATES AND HEAD ON LINER
(HELP MODEL CALCULATIONS)



FOR PERMIT PURPOSES ONLY;
CALCULATION PAGES 3E.1-1
THROUGH 3E.1-129

GEOSYNTEC CONSULTANTS, INC.
TX ENG FIRM REGISTRATION NO. F-1182

INTRODUCTION

The purposes of this analysis are to:

- estimate the design leachate collection rates in the leachate collection system for various operation conditions;
- calculate the design hydraulic conductivity and transmissivity of the leachate drainage layer in the leachate collection system;
- evaluate the maximum leachate head on the liner system for compliance with the Texas Commission on Environmental Quality (TCEQ) regulations, which require the maximum head of leachate to be less than 30 cm (12 in.) [30 TAC §330.331(a)(2)]; and
- evaluate the implementation of leachate recirculation.

METHOD OF ANALYSIS

The leachate collection rates and maximum leachate head on the liner system were estimated using the Hydrologic Evaluation of Landfill Performance (*HELP*) computer model, Version 3.95 D, developed by Dr. Klaus Berger of the University of Hamburg, Institute of Soil Science. *HELP* simulates hydrologic processes for a landfill by performing daily, sequential water balance analyses using a quasi-two-dimensional, deterministic approach (Berger and Schroeder, 2013; Schroeder et al., 1994a, 1994b).

The hydrologic processes considered in the *HELP* model include precipitation, surface-water evaporation, runoff, infiltration, plant transpiration, soil water evaporation, soil water storage,

Written by: Livingstone Dumenu Date: 07/22/22 Reviewed & Revised by: Scott Graves Date: 7/26/2022;
6/2/2023

Client: WMTX Project: Lacy Lakeview Project No.: GW8041 Task No.: 05

**TABLE 3E.1-3. LEACHATE GENERATION RATES
FOR CASES WITHOUT LEACHATE RECIRCULATION**

(A) ANNUAL AVERAGE

Area	Case ID		Total Leachate Collected	
			(in./ac./yr)	(gpad)
New Fill (NF)	1	Floor	6.0E+00	448
	2	Floor	3.6E+00	271
	3	Floor	3.6E+00	271
	4	Floor	4.0E-05	1
	5	Sideslope	3.7E+00	272
Liner Overlay (LO)	1	Floor	1.4E+00	102
	2	Floor	3.7E+00	272
	3	Floor	1.1E-04	1
Existing Fill (EF)	1	Floor	3.7E+00	272
	2	Floor	3.7E+00	272
	3	Floor	1.0E-05	1

(B) PEAK DAILY

Area	Case ID		Total Leachate Collected	
			(in./ac./day)	(gpad)
New Fill (NF)	1	Floor	1.6E-01	4,356
	2	Floor	1.4E-01	3,706
	3	Floor	1.4E-01	3,673
	4	Floor	0.0E+00	0
	5	Sideslope	1.3E-01	3,662
Liner Overlay (LO)	1	Floor	1.3E-01	3,465
	2	Floor	1.4E-01	3,708
	3	Floor	1.0E-05	1
Existing Fill (EF)	1	Floor	1.6E-01	4,403
	2	Floor	1.6E-01	4,439
	3	Floor	0.0E+00	0

Note: gpad = gallons per acre per day

```

*****
*****
**
**
**          HYDROLOGIC EVALUATION OF LANDFILL PERFORMANCE          **
**
**          HELP Version 3.95 D          (10 August 2012)          **
**          developed at
**          Institute of Soil Science, University of Hamburg, Germany **
**          based on
**          US HELP MODEL VERSION 3.07 (1 NOVEMBER 1997)          **
**          DEVELOPED BY ENVIRONMENTAL LABORATORY                  **
**          USAE WATERWAYS EXPERIMENT STATION                    **
**          FOR USEPA RISK REDUCTION ENGINEERING LABORATORY      **
**
**
*****
*****

```

TIME: 15.04 DATE: 31.05.2023

```

PRECIPITATION DATA FILE:      C:\Users\ybholat\Desktop\lacy\HELP 3.95
D\INPUT\PRECIP-40yr.d4
TEMPERATURE DATA FILE:       C:\Users\ybholat\Desktop\lacy\HELP 3.95
D\INPUT\TEMP-40yr.d7
SOLAR RADIATION DATA FILE:   C:\Users\ybholat\Desktop\lacy\HELP 3.95
D\INPUT\SOLAR-40yr.d13
EVAPOTRANSPIRATION DATA F. 1: C:\Users\ybholat\Desktop\lacy\HELP 3.95
D\INPUT\Evapotranspiration-LAI_1.d11
SOIL AND DESIGN DATA FILE 1: C:\Users\ybholat\Desktop\lacy\HELP 3.95
D\INPUT\SOILS - NF_05.d10
OUTPUT DATA FILE:           C:\Users\ybholat\Desktop\lacy\HELP 3.95 D\OUTPUT\OUT
- NF_05.out

```

```

*****
TITLE:  Lacy_Lakeview_LF - NF_05
*****

```

WEATHER DATA SOURCES

NOTE: PRECIPITATION DATA WAS SYNTHETICALLY GENERATED USING
 COEFFICIENTS FOR WACO TEXAS

NORMAL MEAN MONTHLY PRECIPITATION (INCHES)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
1.69	2.04	1.99	3.79	4.73	2.58
1.78	1.95	3.18	3.06	2.24	1.92

NOTE: TEMPERATURE DATA WAS SYNTHETICALLY GENERATED USING
 COEFFICIENTS FOR WACO TEXAS

NORMAL MEAN MONTHLY TEMPERATURE (DEGREES FAHRENHEIT)

JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
46.20	50.50	58.10	67.10	74.20	81.90
85.90	85.60	79.20	68.80	57.00	49.50

NOTE: SOLAR RADIATION DATA WAS SYNTHETICALLY GENERATED USING
 COEFFICIENTS FOR WACO TEXAS
 AND STATION LATITUDE = 31.37 DEGREES

LAYER DATA 1

VALID FOR 40 YEARS

NOTE: INITIAL MOISTURE CONTENT OF THE LAYERS AND SNOW WATER WERE
 COMPUTED AS NEARLY STEADY-STATE VALUES BY THE PROGRAM.

LAYER 1

TYPE 1 - VERTICAL PERCOLATION LAYER

MATERIAL TEXTURE NUMBER 15

THICKNESS = 12.00 INCHES
 POROSITY = 0.4750 VOL/VOL

FIELD CAPACITY	=	0.3780 VOL/VOL
WILTING POINT	=	0.2650 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3388 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1700E-04 CM/SEC

NOTE: SATURATED HYDRAULIC CONDUCTIVITY IS MULTIPLIED BY 1.80
FOR ROOT CHANNELS IN TOP HALF OF EVAPORATIVE ZONE.

LAYER 2

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 18

THICKNESS	=	1020.00 INCHES
POROSITY	=	0.6710 VOL/VOL
FIELD CAPACITY	=	0.2920 VOL/VOL
WILTING POINT	=	0.0770 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.2928 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1000E-02 CM/SEC

LAYER 3

TYPE 1 - VERTICAL PERCOLATION LAYER
MATERIAL TEXTURE NUMBER 25

THICKNESS	=	24.00 INCHES
POROSITY	=	0.4370 VOL/VOL
FIELD CAPACITY	=	0.3730 VOL/VOL
WILTING POINT	=	0.2660 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.3822 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.3600E-05 CM/SEC

LAYER 4

TYPE 2 - LATERAL DRAINAGE LAYER
MATERIAL TEXTURE NUMBER 20

THICKNESS	=	0.20 INCHES
POROSITY	=	0.8500 VOL/VOL
FIELD CAPACITY	=	0.0100 VOL/VOL
WILTING POINT	=	0.0050 VOL/VOL
INITIAL SOIL WATER CONTENT	=	0.0648 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.	=	0.1100 CM/SEC
SLOPE	=	33.00 PERCENT
DRAINAGE LENGTH	=	250.0 FEET

LAYER 5

TYPE 4 - FLEXIBLE MEMBRANE LINER

MATERIAL TEXTURE NUMBER 35

THICKNESS = 0.06 INCHES
EFFECTIVE SAT. HYD. CONDUCT.= 0.2000E-12 CM/SEC
FML PINHOLE DENSITY = 2.00 HOLES/ACRE
FML INSTALLATION DEFECTS = 2.00 HOLES/ACRE
FML PLACEMENT QUALITY = 3 - GOOD

LAYER 6

TYPE 3 - BARRIER SOIL LINER

MATERIAL TEXTURE NUMBER 16

THICKNESS = 24.00 INCHES
POROSITY = 0.4270 VOL/VOL
FIELD CAPACITY = 0.4180 VOL/VOL
WILTING POINT = 0.3670 VOL/VOL
INITIAL SOIL WATER CONTENT = 0.4270 VOL/VOL
EFFECTIVE SAT. HYD. CONDUCT.= 0.1000E-06 CM/SEC

GENERAL DESIGN AND EVAPORATIVE ZONE DATA 1

VALID FOR 40 YEARS

NOTE: SCS RUNOFF CURVE NUMBER WAS COMPUTED FROM DEFAULT
SOIL DATA BASE USING SOIL TEXTURE #15 WITH A
POOR STAND OF GRASS, A SURFACE SLOPE OF 5.0%
AND A SLOPE LENGTH OF 400. FEET.

SCS RUNOFF CURVE NUMBER = 93.36
FRACTION OF AREA ALLOWING RUNOFF = 50.0 PERCENT
AREA PROJECTED ON HORIZONTAL PLANE = 1.000 ACRES
EVAPORATIVE ZONE DEPTH = 10.0 INCHES
INITIAL WATER IN EVAPORATIVE ZONE = 3.309 INCHES
UPPER LIMIT OF EVAPORATIVE STORAGE = 4.750 INCHES
FIELD CAPACITY OF EVAPORATIVE ZONE = 3.780 INCHES

5	0.0000	0.0000
6	10.2480	0.4270
TOTAL WATER IN LAYERS	321.851	
SNOW WATER	0.000	
INTERCEPTION WATER	0.000	
TOTAL FINAL WATER	321.851	

PEAK DAILY VALUES FOR YEARS 1 THROUGH 40

	(INCHES)	(CU. FT.)
	-----	-----
PRECIPITATION	7.35	26680.500
RUNOFF	4.498	16327.6357
DRAINAGE COLLECTED FROM LAYER 4	0.13482	489.40829
PERCOLATION/LEAKAGE THROUGH LAYER 6	0.000000	0.00152
AVERAGE HEAD ON TOP OF LAYER 5	0.182	
MAXIMUM HEAD ON TOP OF LAYER 5	0.381	
LOCATION OF MAXIMUM HEAD IN LAYER 4 (DISTANCE FROM DRAIN)	0.0 FEET	
SNOW WATER	1.70	6165.7832
MAXIMUM VEG. SOIL WATER (VOL/VOL)		0.4651
MINIMUM VEG. SOIL WATER (VOL/VOL)		0.2650

*** Maximum heads are computed using McEnroe's equations. ***

Reference: Maximum Saturated Depth over Landfill Liner

AVERAGE MONTHLY VALUES IN INCHES FOR YEARS 1 THROUGH 40

	JAN/JUL	FEB/AUG	MAR/SEP	APR/OCT	MAY/NOV	JUN/DEC
	-----	-----	-----	-----	-----	-----
PRECIPITATION						

TOTALS	1.48 1.34	2.04 1.77	1.93 3.13	3.56 2.89	3.98 2.52	2.50 1.50
STD. DEVIATIONS	1.10 1.22	1.09 1.29	1.25 2.03	1.62 2.29	2.80 1.54	1.70 1.05
RUNOFF						

TOTALS	0.089 0.192	0.120 0.200	0.143 0.559	0.610 0.741	0.787 0.314	0.319 0.115
STD. DEVIATIONS	0.188 0.285	0.170 0.290	0.174 0.683	0.626 1.073	0.869 0.392	0.389 0.161
POTENTIAL EVAPOTRANSPIRATION						

TOTALS	2.815 10.170	3.209 9.275	4.949 7.298	6.344 5.078	7.926 3.495	8.879 2.817
STD. DEVIATIONS	0.230 0.269	0.253 0.259	0.346 0.371	0.344 0.256	0.308 0.254	0.333 0.241
ACTUAL EVAPOTRANSPIRATION						

TOTALS	1.191 1.242	1.525 1.444	1.626 2.094	2.546 1.491	2.787 1.563	2.087 1.190
STD. DEVIATIONS	0.621 0.880	0.575 0.866	0.793 1.082	0.865 0.926	1.406 0.615	1.260 0.588

LATERAL DRAINAGE COLLECTED FROM LAYER 4

TOTALS	0.3248	0.2511	0.3056	0.3107	0.5031	0.4499
	0.2444	0.1014	0.0760	0.2104	0.3769	0.4983

STD. DEVIATIONS	0.3045	0.2645	0.3110	0.3110	0.4563	0.4823
	0.3034	0.1362	0.1371	0.2860	0.4050	0.5183

PERCOLATION/LEAKAGE THROUGH LAYER 6

TOTALS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

STD. DEVIATIONS	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

AVERAGES OF MONTHLY AVERAGED DAILY HEADS (INCHES)

DAILY AVERAGE HEAD ON TOP OF LAYER 5

AVERAGES	0.0141	0.0120	0.0133	0.0140	0.0219	0.0202
	0.0106	0.0044	0.0034	0.0091	0.0169	0.0217

STD. DEVIATIONS	0.0132	0.0127	0.0135	0.0140	0.0198	0.0217
	0.0132	0.0059	0.0062	0.0124	0.0182	0.0225

AVERAGE ANNUAL TOTALS & (STD. DEVIATIONS) FOR YEARS 1 THROUGH 40

	INCHES		CU. FEET	PERCENT
	-----	-----	-----	-----
PRECIPITATION	28.62	(5.769)	103894.2	100.00
RUNOFF	4.189	(1.6952)	15207.67	14.638
POTENTIAL EVAPOTRANSPIRATION	72.255	(1.0489)	262284.28	
ACTUAL EVAPOTRANSPIRATION	20.787	(3.2850)	75455.00	72.627
LATERAL DRAINAGE COLLECTED FROM LAYER 4	3.65240	(1.73572)	13258.202	12.76125

PERCOLATION/LEAKAGE THROUGH LAYER 6	0.00001 (0.00001)	0.054	0.00005
AVERAGE HEAD ON TOP OF LAYER 5	0.013 (0.006)		
CHANGE IN WATER STORAGE	-0.007 (0.8108)	-26.68	-0.026

