March 12, 2025
SCS Project No. 16224067.00

Mr. Arten Avakian
MSW Permits Section – MC 124
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711

Subject: City of Uvalde MSW Landfill - Uvalde County
Municipal Solid Waste - Permit No. 1725
Permit Modification Application – Landfill Gas Management Plan
RN102803921 / CN600648455

Dear Mr. Avakian:

On behalf of City of Uvalde (City), SCS Engineers (SCS) has prepared the attached permit modification application of Attachment 14 - Landfill Gas Management Plan (LGMP), as requested by Texas Commission on Environmental Quality (TCEQ) in letters dated August 23, 2024 (Tracking Nos. 29886183 and 30043922) and December 6, 2024 (Tracking No. 30360699). This permit modification has been prepared to address specific questions and/or comments provided by you in an email dated June 30, 2024 and addressed to Mr. Brett DeVries, P.E., Ph.D, as described below. Specifically, the purpose of this permit modification is to update the LGMP to reflect current site conditions and incorporate complete documentation on the landfill gas (LFG) monitoring system, including temporary probes, vents, and the gas extraction system (descriptive text, tables, drawings, and appendices containing logs and construction details), specifically related to the LFG remediation efforts for GMP-4. As such, this permit modification is being submitted consistent with the 30 TAC §305.70(k)(3), related to installation of a landfill gas management system for a landfill gas remediation plan, which requires public notice.

In response to your June 30, 2024 email, the following summarizes the revisions made to the LGMP, as described below in response to your questions/comments:

- Section 1.1, Site Description – Reference to prior Figure 1.3 (dated 10/21/2016) was **removed** since it is now combined with **new** Figure 1.2 (replaced prior Figure 1.2, dated 10/21/2016). Reference to prior Figure 1.4 has been corrected to the **new** Figure 3.1 (replaced prior Figure 3.1, dated 10/21/2016).
- Section 2.5, Facility Boundaries (Permitted Area) – Added the definition for the acronym, EAP – Exceedance Action Plan.
- Section 3.1, Landfill Gas Monitoring System – Removed an unnecessary reference to a previous superseded LGMP (replaced due to permit modification dated 10/21/2016) and added a reference to the added Table 2.0, Gas Monitoring Probe/Vent Completion Details; clarified what changes would be made to the LGMP should an EAP be required.
- Section 3.2.1 Gas Probe Monitoring Procedures – Identified which buildings would be monitored and referenced the monitoring form added as Appendix C.
- Section 3.2.4 Backup Monitoring Plan – Added text regarding the timeframe in which damaged/failed gas monitoring features would be repaired/replaced and what documentation would be provided and kept in the Site Operating Record, as well as when a permit modification would be necessary for such changes.

Received Waste Permits Division: 03/14/2025
Tracking No.: 31432047

Texas Commission on Environmental Quality

Waste Permits Division Correspondence Cover Sheet

Date: March 12, 2025
Facility Name: City of Uvalde Landfill
Permit or Registration No.: 1725

Nature of Correspondence:
☒ Initial/New
☐ Response/Revision to TCEQ Tracking No.: _____ (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
☐ New Notice of Intent	☐ Alternative Daily Cover Report
☐ Notice of Intent Revision	☐ Closure Report
☐ New Permit (including Subchapter T)	☐ Compost Report
☐ New Registration (including Subchapter T)	☐ Groundwater Alternate Source Demonstration
☐ Major Amendment	☐ Groundwater Corrective Action
☐ Minor Amendment	☐ Groundwater Monitoring Report
☐ Limited Scope Major Amendment	☐ Groundwater Background Evaluation
☒ Notice Modification	☐ Landfill Gas Corrective Action
☐ Non-Notice Modification	☐ Landfill Gas Monitoring
☐ Transfer/Name Change Modification	☐ Liner Evaluation Report
☐ Temporary Authorization	☐ Soil Boring Plan
☐ Voluntary Revocation	☐ Special Waste Request
☐ Subchapter T Disturbance Non-Enclosed Structure	☐ Other:
☐ Other:	

Table 2 - Industrial & Hazardous Waste Correspondence

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

- Section 4.1.1 Passive Vents – Added section with information of passive gas vent remediation efforts implemented-to-date.
- Section 4.1.2 Backup/Temporary Monitoring Probes – Added section with information pertaining to backup and temporary monitoring probes installed for remediation efforts-to-date.
- Section 4.1.3 Initial Gas Collection System – Added section with information pertaining to the initial gas collection system installed for continued remediation efforts.
- Figure 1.1 – USGS Site Location Map: Map was **replaced** to show the City of Uvalde as a reference point.
- Figure 1.2 – Potential Offsite Residences: Map was **replaced** and renamed "Regulatory Distances" to incorporate the regulatory distances shown in prior Figure 1.3 (dated 10/21/2016, removed from this permit modification, as noted above), as well as the offsite residences shown in prior Figure 1.2 (dated 10/21/2016).
- Figure 1.3 – Regulatory Distances: Map was removed and the information added to **new** Figure 1.2.
- Figure 1.4 – General Landfill Facility Layout: Map was **removed** and the information incorporated into **new** Figure 3.1 – GMP and GV Location Map.
- Figure 3.1 – GMP and GV Location Map: Map has been renamed "Gas Monitoring Features Location Map" and replaced with a new updated map showing the location of all gas monitoring probes, remediation features incorporated into the Landfill Gas Management System, as well as showing information included in prior Figure 1.4 (dated 10/21/2016, removed from this permit modification, as noted above).
- Appendix A – Methane Monitoring Form: Appendix and form have been added to the LGMP
- Appendix B – Landfill Gas Remediation Plans: Appendix has been added to the document for reference of implemented remediation plans.
- Appendix C – Vertical Extraction Vents/Wells: Appendix has been added to reflect all available boring logs and completion records of gas passive/active extraction wells and vents.

In response to your questions/comments provided in your email dated July 30, 2024, we have included your original comment, followed by our response and/or revision in ***bold/italics***.

A1a. [Table of Contents] Add entries in TOC for appendices. Examples:

- Appendix A: Gas Monitoring Probe Boring Logs and Completion Logs
- Appendix B: BGMP and TGMP Boring Logs and Completion Logs
- Appendix C: Temporary gas investigations probes
- Appendix D: UGV and TV Construction Details, Drawings
- Appendix E: Gas extraction system
- Appendix F: Summary of all gas monitoring measurements.

Appendix B: Gas Remediation Plans have been added to the LGMP.

Appendix C: Vertical Extraction Vents/Wells has been added to the LGMP. The appendix includes boring logs and completion details for vertical extraction wells and vents.

The Uvalde Gas Vent/Temporary Vent details as well as the gas extraction system details are included in Appendix B. Gas measurements have not been included in the LGMP since it is not a requirement per the current regulations. The measurements are located in the Site Operating Record as referenced in the LGMP.

A1b. [Table of Contents] Are all remediation features through Phase 4.0 installed/implemented?

Phase 4.0, as referenced in the landfill gas remediation plan dated September 2, 2022, has not been implemented or installed at this time. The City is currently evaluating other remediation options and will provide an updated remediation plan under a separate transmittal cover letter.

A1c. [Table of Contents] Any thoughts on why gas being generated?

The gas is being generated from the decaying waste, but the migration seems to be related to the Pre-Subtitle D, Stage A cell.

A1d. [Table of Contents] Any leachate in the landfill?

Leachate is collected and stored onsite in an above ground storage tank on the south side of the landfill.

A2. [Table of Contents] Add table or tables of completion details, including installation dates:

- Gas monitoring probes
- BGMPs, TGMPs, GMP #.#s, UGVs, TVs, etc.
- Vents in waste
- Gas extraction wells

Two tables have been added to the LGMP with information that is available: Table 2.0, Gas Monitoring Probe Completion Details and Table 3.0, Gas Extraction Well/Vent Completion Details.

A3. [Section 1.1 Site Description] One structure looks like it may be within 1,000 ft.

The closest structure is just outside the 1,000-foot distance from the waste placement boundary, as shown on the <u>new</u> Figure 1.2.

A4. [Section 2.5 Facility Boundaries] What is EAP?

The definition for EAP, Exceedance Action Plan, has been added to Section 2.5 Facility Boundaries (Permitted Area).

A5. [Section 3.1 Landfill Gas Monitoring System] Reference table listing probes and details.

A reference to Table 2.0, Gas Monitoring Probe Completion Details, has been added to the text Section 3.1 Landfill Gas Monitoring System.

A6. [Section 3.1 Landfill Gas Monitoring System] Is this text necessary?

The text in question has been removed as it is not necessary since it references a previous superseded LGMP (replaced due to permit modification dated 10/21/2016) and added a reference to the added Table 2.0, Gas Monitoring Probe/Vent Completion Details.

A7. [Section 3.1 Landfill Gas Monitoring System] Modify to add something to the effect of: If additional monitoring points or gas management features are needed, this LGMP will be modified to document and incorporate those details in the permit.

A clarification of what would be included in the modified LGMP should an EAP be necessary has been added to the text.

A8a. [Section 3.2.1 Gas Probe Monitoring Procedures] Which building?

Clarifying text has been added to specifically identify any building(s) being monitored.

A8b. [Section 3.2.1 Gas Probe Monitoring Procedures] Do the buildings have automatic, continuous methane sensors that will sound an audible alarm if methane is detected?

The buildings do not have automatic, continuous methane sensors with alarms, but are sampled during the quarterly monitoring periods using a portable methane gas detector as described in Section 3.2.1 Gas Probe Monitoring Procedures.

A9. [Section 3.2.4 Backup Monitoring Plan] Clarify what the mod would be for . . . install replacement and plug old probe if it cannot be repaired?

The statement has been clarified to address what measures would be taken in the event of a gas monitoring system feature damage or failure.

A10. [Section 4.0 Exceedance Action Plan] Do we have a map of current landowners within 1,000 ft?

A current landowners map and list have been included for the permit modification submittal as required for public notice modifications.

A11. [Figure 1.1] Is this City of Uvalde? Label to provide a point of reference on the map.

Figure 1.1, USGS Site Location Map, has been <u>replaced</u> to include identification of the City of Uvalde for a point of reference.

A12. [Figure 1.2] The location of these structures does not quite seem to match current, as seen in aerial photo, and one may be within 1,000 ft of waste unit boundary.

Figure 1.2 has been <u>replaced</u> with an aerial version to depict any habitable structures within 1,000 feet and 3,000 feet of the waste placement boundary. The closest structure is just outside the 1,000-foot boundary.

A13. [Figure 1.3] Same comment re structures.

Figure 1.3 has been <u>removed</u> from the LGMP and combined with the <u>new</u> Figure 1.2 referenced in the previous comment.

A14a. [Figure 1.4] Just FYI right now:
MW-11, Jan 2023 cis-1,2-dichloroethene detected; not yet resampled.

It is acknowledged that in January 2023, cis- 1,2-dichloroethene was detected in MW-11 and has not been resampled.

A14b. [Figure 1.4] Just FYI right now:
MW-12, Initial detections of benzene and cis-1,2-dichloroethene in July 2022; not detected in verification resamples.

It is acknowledged that initial detections of benzene and cis- 1,2-dichloroethene in July 2022 were not detected in verification resamples.

A15. [Figure 1.4] Would be good to have gas probe here, between waste unit boundary and facility structures outside permit boundary.

Given no historical methane exceedance readings in GMP-2 or the structures, and no further exceedance readings in GMP-3 since 2004, as well as the spacing of GMP-2 and GMP-3 following the current LGMP, an additional probe is not proposed between the waste unit boundary and the structures at this time.

A16. [Figure 1.4] Is MW-7 checked for methane? May not be useful as it is likely completed at depths below zones of potential gas migration.

MW-7 is not checked for methane. The necessity for methane testing in MW-7 is not suggested based on the same reasoning stated above.

A17. [Figure 1.4] Do structures have continuous gas monitors?

The structures do not have continuous gas monitors. Please refer to the response to comment A8b.

A18. [Figure 1.4] Modify monitoring point labels to be consistent with current terminology.

Figure 1.4, General Landfill Facility Layout, has been removed and the information is incorporated into the updated and replaced Figure 3.1, Gas Monitoring Features Location Map. The monitoring point labels have been updated for consistency in the replaced Figure 3.1.

A19. [Figure 3.1] Replace with drawing showing all of the gas monitoring and management features. Label monitoring point consistent with current terminology.

Figure 3.1, GMP & GV Location Map, has been renamed Gas Monitoring Features Location Map and replaced with an updated map of the current gas monitoring system and features, including the general facility layout information previously shown in Figure 1.4, General Landfill Facility Layout, as well as updated terminology.

A20. [Figure 3.2] Confirm:
Is this how probes were constructed (flush completion, no casing "stickup")?

The detail shown on Figure 3.2 is applicable to the installation of the GMPs and BGMPs.

A21. [Appendix 1997 Landfill Gas Management Plan] A lot of good information here that should be brought forward and merged into current LGMP (figures, tables, forms, etc.).

The figures and tables in the 1997 LGMP can either be found in the Geology Report (Attachment 4 of the Site Development Plan) or have been updated and included in this modification. Appendix A, Methane Monitoring and Recording Form has been added to include a current Methane Monitoring Form. All other information has been superseded by the current LGMP and the modifications herein, and therefore not necessary for inclusion in the LGMP as an Appendix.

Consistent with TCEQ regulations we have included Form TCEQ-2065, related to Application Form for MSW Permit or Registration Modification or Temporary Authorization, in Attachment A. Additionally, in accordance with 30 TAC §305.70(k)(9), this permit modification will require public notice consistent with §39.106 and §39.413. As such, we have included a landowner's map and list for properties within ¼-mile of the landfill property boundary (see Attachment B). Consistent with 30 TAC §305.70(d), this submittal addresses minor changes to the landfill that do not substantially alter the permit conditions and do not reduce the capability of the facility to protect human health and the environment. Furthermore, consistent with §330.59(f), we have submitted one original and two copies of the permit modification, with one of the copies marked to clearly show the above-described revisions (see Attachment C for marked version and Attachment D for unmarked version for replacement pages within the approved landfill permit application).

Lastly, in accordance with 30 TAC §330.59(h)(1), SCS has also remitted payment of the $150.00 application fee through e-Pay (see attached receipt in Attachment A).

We appreciate your review of this permit application. If you or your staff have any questions, please do not hesitate to call Jennifer Brown at 817-358-6130.

Sincerely,

Jennifer Brown P.E.
Project Manager
SCS ENGINEERS
TBPE Registration No. F-3407

Ryan Kuntz, P.E.
Vice President/Satellite Office Manager
SCS ENGINEERS

Attachments: Attachment A – Permit Modification Application Form and e-Pay receipt
Attachment B – Landowner's Map and List
Attachment C – Permit Revisions (Marked)
Attachment D – Permit Revisions (Unmarked)

cc: Mr. Juan Zamora, City of Uvalde
TCEQ Region Office 13

ATTACHMENT A

PERMIT MODIFICATION APPLICATION FORM

Texas Commission on Environmental Quality

Application Form for Municipal Solid Waste Permit or Registration Modification or Temporary Authorization

Application Tracking Information

Facility Name: City of Uvalde Landfill

Permittee or Registrant Name: City of Uvalde

MSW Authorization Number: 1725

Initial Submission Date: 03/12/2025

Revision Date: _____

Instructions for completing this form are provided in form TCEQ-20650-instr[1]. 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

☒ Modification with Public Notice ☐ Modification without Public Notice

☐ Temporary Authorization (TA) ☐ Modification for Name Change or Transfer

4. Application Fee

Amount

The application fee for a modification or temporary authorization is $150.

Payment Method

☐ Check

☒ Online through ePay portal www3.tceq.texas.gov/epay/

If paid online, enter ePay Trace Number: 582EA000658903

[1] www.tceq.texas.gov/downloads/permitting/waste-permits/msw/forms/20650-instr.pdf

5. Electronic Versions of Application

For modifications that require notice, TCEQ will publish electronic versions of the application online. Applicants must provide a clean copy of the administratively complete application and technically complete application. TCEQ will also publish electronic versions of NOD responses online.

6. Party Responsible for Mailing Notice

For modifications that require notice, indicate who will be responsible for mailing notice:

☐ Applicant ☐ Agent in Service ☒ Consultant

Contact Name: Jennifer Brown

Title: Project Manager

Email Address: [redacted]

7. Confidential Documents

Does the application contain confidential documents?

☐ Yes ☒ No

If "Yes", reference the confidential documents in the application, but submit the confidential documents as an attachment in a separate binder marked "CONFIDENTIAL."

8. Facility General Information

Facility Name: City of Uvalde Landfill

Contact Name: Juan Zamora Title: Director of Public Works

MSW Authorization Number (if existing): 1725

Regulated Entity Reference Number: **RN** 102803921

Physical or Street Address: 3774 FM 481

City: Uvalde County: Uvalde State: TX Zip Code: 78801

Phone Number: (830) 278-3315

Latitude (Degrees, Minutes, Seconds): 29° 10' 19.92"

Longitude (Degrees, Minutes, Seconds): 99° 51' 35.28"

9. Facility Types

☒ Type I ☐ Type IV ☐ Type V

☐ Type IAE ☐ Type IVAE ☐ Type VI

10. Description of the Revisions to the Facility

Provide a brief description of revisions to permit or registration conditions and supporting documents referred to by the permit or registration, and a reference to the specific provisions under which the modification or temporary authorization application is being made. Also, provide an explanation of why the modification or temporary authorization is needed:

The purpose of this permit modification is to update the LGMP to reflect current site conditions and incorporate complete documentation on the landfill gas (LFG) monitoring system, including temporary probes, vents, and the gas extraction system (descriptive text, tables, drawings, and appendices containing logs and construction details), specifically related to the LFG remediation efforts for GMP-4, consistent with the 30 TAC §305.70(k)(3), related to installation of a landfill gas management system for a landfill gas remediation plan.

11. Facility Contact Information

Site Operator (Permittee or Registrant)

Name: City of Uvalde

Customer Reference Number: **CN** 600648455

Contact Name: Juan Zamora Title: Director of Public Works

Mailing Address: P.O. Box 799

City: Uvalde County: Uvalde State: TX Zip Code: 78802

Phone Number: (830) 278-3315

Email Address: zamora@uvaldetx.gov

Texas Secretary of State (SOS) Filing Number: _____

Operator (if different from *Site Operator*)

Name: _____

Customer Reference Number: **CN**_____

Contact Name: _____ Title: _____

Mailing Address: _____

City: _____ County: _____ State: _____ Zip Code: _____

Phone Number: _____

Email Address: _____

Texas Secretary of State (SOS) Filing Number: _____

Consultant (if applicable)

Firm Name: SCS Engineers

Consultant Name: Jennifer Brown

Texas Board of Professional Engineers Firm Registration Number: F-3407

Contact Name: Jennifer Brown Title: Project Manager

Mailing Address: 1901 Central Drive, Suite 550

City: Bedford County: Tarrant State: TX Zip Code: 76021

Phone Number: (817) 358-6130

Email Address: [redacted]

Agent in Service (required for out-of-state applicants)

Name: _____

Mailing Address: _____

City: _____ County: _____ State: TX Zip Code: _____

Phone Number: _____

Email Address: _____

12. Ownership Status of the Facility

Is this a modification that changes the legal description, the property owner, or the Site Operator (Permittee or Registrant)?

☐ Yes ☒ No

If the answer is "No", skip this section.

Does the Site Operator (Permittee or Registrant) own all the facility units and all the facility property?

☐ Yes ☐ No

If "No", provide the following information for other owners.

Owner Name: _____

Mailing Address: _____

City: _____ County: _____ State: TX Zip Code: _____

Phone Number: _____

Email Address: _____

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: Juan Zamora Title: Director of Public Works

Email Address: zamora@uvaldetx.gov

Signature: _____ Date: 3-12-25

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 Juan Zamora

On this 12th day of March, 2025

My commission expires on the 30th day of June, 2027

LeeAnn M. Ortiz,

Notary Public in and for

Uvalde County, Texas

LEEANN M ORTIZ
Notary ID #11100355
My Commission Expires
June 30, 2027

Note: Application Must Bear Signature and Seal of Notary Public

Attachments for Permit or Registration Modification with Public Notice

Refer to instruction document **200650-instr** for professional engineer seal requirements.

Attachments Table 1. Required attachments.

Required Attachments	Attachment Number
Land Ownership Map	B
Landowners List	B
Marked (Redline/Strikeout) Pages	C
Unmarked Revised Pages	D

Attachments Table 2. Additional attachments as applicable.

Additional Attachments as Applicable (select all that apply and add others as needed)	Attachment Number
☐ TCEQ Core Data Form(s)	N/A
■ Signatory Authority Delegation	A
■ Fee Payment Receipt	A
☐ Confidential Documents	N/A

Attachments for Permit or Registration Modification without Public Notice, or Temporary Authorization

Refer to instruction document **200650-instr** for professional engineer seal requirements.

Attachments Table 3. Required attachments for modifications.

Required Attachments for Modification	Attachment Number
Marked (Redline/Strikeout) Pages	N/A
Unmarked Revised Pages	N/A

Attachments Table 4. Additional attachments for modifications and temporary authorizations, as applicable.

Additional Attachments as Applicable (select all that apply and add others as needed)	Attachment Number
☐ TCEQ Core Data Form(s)	N/A
☐ Signatory Authority Delegation	N/A
☐ Fee Payment Receipt	N/A
☐ Confidential Documents	N/A

Attachments for Permit or Registration Name Change or Transfer Modification

Refer to instruction document **200650-instr** for professional engineer seal requirements.

Attachments Table 5. Required attachments.

Required Attachments	Attachment Number
TCEQ Core Data Form(s)	N/A
Property Legal Description	N/A
Property Metes and Bounds Description	N/A
Metes and Bounds Drawings	N/A
On-Site Easements Drawing	N/A
Land Ownership Map	N/A
Land Ownership List	N/A
Property Owner Affidavit	N/A
Verification of Legal Status	N/A
Evidence of Competency	N/A

Attachments Table 6. Additional attachments as applicable.

Additional Attachments as Applicable (select all that apply and add others as needed)	Attachment Number
☐ Signatory Authority Delegation	N/A
☐ Fee Payment Receipt	N/A
☐ Confidential Documents	N/A
☐ Final Plat Record of Property	N/A
☐ Assumed Name Certificate	N/A

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
EPAY • ONLINE PAYMENT APPLICATION

Your transaction is complete. Thank you for using TCEQ ePay.

Note: It may take up to 3 working days for this electronic payment to be processed and be reflected in the TCEQ ePay system. Print this receipt and the vouchers for your records. An email receipt has also been sent.

Transaction Information

Trace Number:	582EA000658903
Date:	03/11/2025 03:26 PM
Payment Method:	CC - Authorization 0000053200
ePay Actor:	KRYSTAL L KUNTZ
Actor Email:	[redacted]
IP:	99.48.161.145
TCEQ Amount:	$150.00
Texas.gov Price:	$153.63*

* This service is provided by Texas.gov, the official website of Texas. The price of this service includes funds that support the ongoing operations and enhancements of Texas.gov, which is provided by a third party in partnership with the State.

Payment Contact Information

Name:	JENNIFER BROWN
Company:	SCS ENGINEERS
Address:	1901 CENTRAL DRIVE SUITE 550, BEDFORD, TX 76021
Phone:	817-798-0733

Cart Items

Click on the voucher number to see the voucher details.

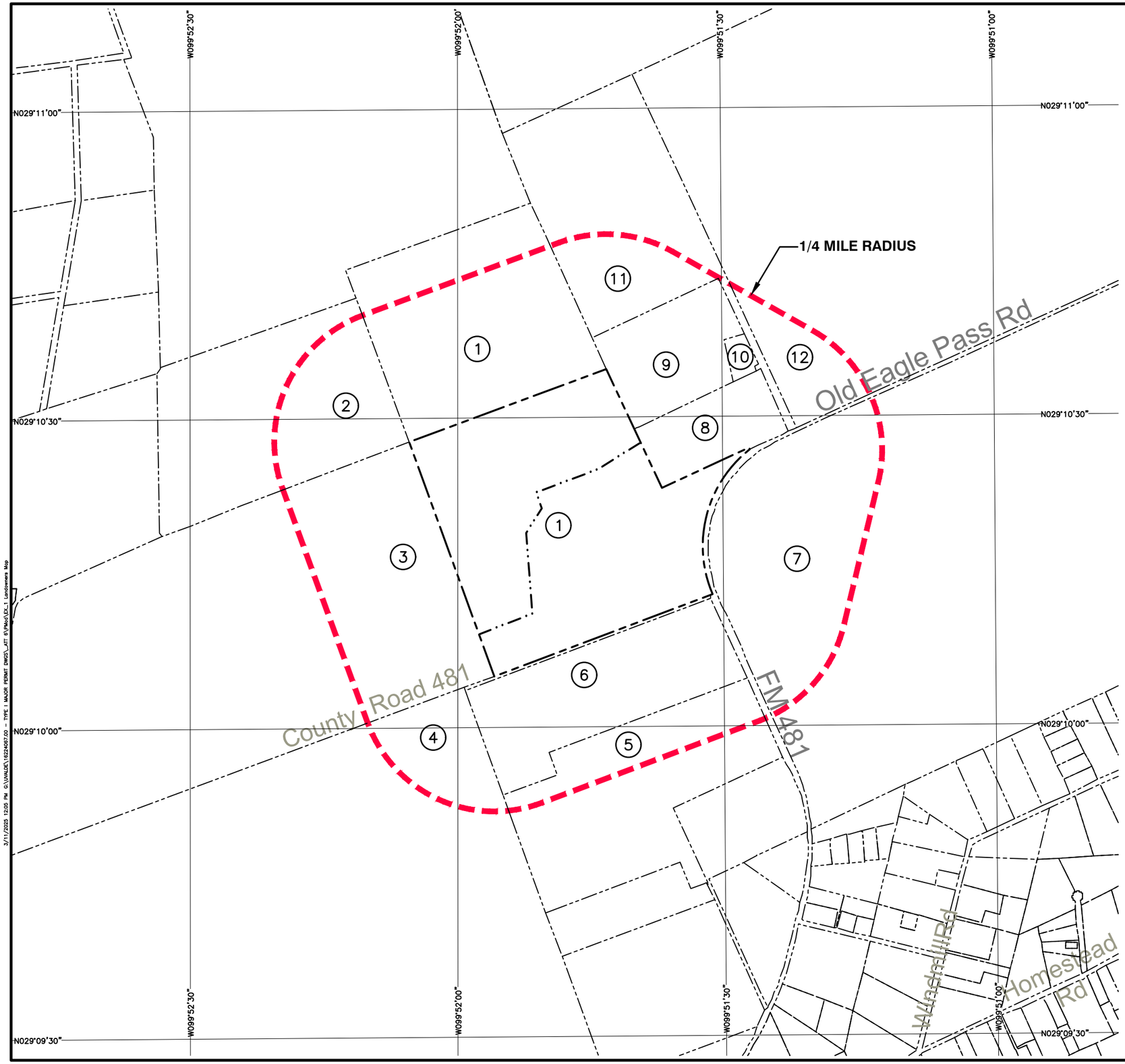
Voucher	Fee Description	AR Number	Amount
757051	NONHAZARDOUS WASTE PERMIT - MODIFICATIONS		$100.00
757052	30 TAC 305.53B HWP NOTIFICATION FEE		$50.00
		TCEQ Amount:	$150.00

ePay Again | Exit ePay

Note: It may take up to 3 working days for this electronic payment to be processed and be reflected in the TCEQ ePay system. Print this receipt for your records.

ATTACHMENT B

LANDOWNER'S MAP AND LIST



0 500 1000
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- ADJACENT PROPERTY BOUNDARY
- 1/4 MILE RADIUS
- 96°55'30" LATITUDE/LONGITUDE LINES

NOTES:

1. (X) CORRESPONDS TO LANDOWNERS LISTED ON LANDOWNERS LIST.
2. PROPERTY OWNERS WITHIN 1/4 MILE OF THE PERMIT BOUNDARY ARE SHOWN.
3. LANDOWNER PROPERTY BOUNDARIES INDICATED ARE APPROXIMATE.

LANDOWNER'S LIST

1. CITY OF UVALDE
P.O. BOX 799
UVALDE, TEXAS 78802–0799
PROPERTY ID: 125012

2. KESSLER HWY 90 RANCH LTD.
200 EAST NOPAL ST., SUITE 200
UVALDE, TEXAS 78801–5332
PROPERTY ID: 18069

3. EGBERT JIM GUY ET UX. HEATHER
430 S. SANTA ROSA
SAN ANTONIO, TEXAS 78207
PROPERTY ID: 18071

4. MIRASOL RANCH FAMILY LTD. PARTNERSHIP
C/O DULLNIG ROBERT AND JEAN
315 BURR ROAD
SAN ANTONIO, TEXAS 78209
PROPERTY ID: 20422

5. JUAN MARTINEZ, JR. AND MARIA DAVILA
1698 WINDMILL ROAD
UVALDE, TEXAS 78801
PROPERTY ID: 123452

6. ROBERT M. DULLNIG
315 BURR ROAD
SAN ANTONIO, TEXAS 78209
PROPERTY ID: 122946

7. FLYING W PROPERTIES LTD.
P.O. BOX 2109
SAN MARCOS, TEXAS 78667
PROPERTY ID: 18233

8. MINYARD INVESTMENTS LP
1004 CEDAR PARK DRIVE
CEDAR PARK, TEXAS 78613
PROPERTY ID: 18294

9. SORRELLS KENNETH D. JR.
ET UX. LISA W
102 OLD SAN ANTONIO ROAD
BOERNE, TEXAS 78006
PROPERTY ID: 117039

10. SORRELLS KENNETH D. JR.
102 OLD SAN ANTONIO ROAD
BOERNE, TEXAS 78006
PROPERTY ID: 18295

11. FLYING W PROPERTIES LTD.
P.O. BOX 2109
SAN MARCOS, TEXAS 78667–2109
PROPERTY ID: 18293

12. FLYING W PROPERTIES LTD.
P.O. BOX 2109
SAN MARCOS, TEXAS 78667–2109
PROPERTY ID: 18292

SOURCE: UVALDE COUNTY APPRAISAL DISTRICT–UVALDE CAD PROPERTY SEARCH LAST ACCESSED ON 01/10/2025. NO MINERAL INTEREST OWNERSHIP WAS IDENTIFIED ON THE UVALDE COUNTY APPRAISAL DISTRICT FOR THE LAND WHERE THE LANDFILL IS LOCATED.

STATE OF TEXAS
JENNIFER R. BROWN
94685
LICENSED PROFESSIONAL ENGINEER
03/12/25

REV | DATE | DESCRIPTION | BY
TEXAS BOARD OF PROFESSIONAL ENGINEERS REG. NO. F-3407

DRAWING TITLE: LANDOWNER'S MAP

PROJECT TITLE: CITY OF UVALDE LANDFILL PERMIT MODIFICATION

CLIENT: CITY OF UVALDE
3774 FM 481
UVALDE, TEXAS 78801

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
1901 CENTRAL DRIVE, SUITE 550, BEDFORD, TX 76021
PH (817) 571-2288 FAX NO. (817) 571-2186

PROD. NO.
DWN. BY: JLJ
CHK. BY: JRB
D/A RVW BY: RRK
APP. BY: RRK
DSN. BY: JRB

CADD FILE: EX_1 LANDOWNERS MAP

DATE: 02/2025

SCALE: AS SHOWN

EXHIBIT: 1

ATTACHMENT C

MARKED VERSION

ATTACHMENT 14

LANDFILL GAS MANAGEMENT PLAN

CITY OF UVALDE
MUNICIPAL SOLID WASTE LANDFILL
TCEQ PERMIT NO. 1725
UVALDE, TEXAS

Prepared by
~~Forbes Environmental Engineering~~SCS Engineers
Texas Board of Professional Engineers, Reg. No. F-3407
Dallas/Fort Worth Office
1901 Central Drive, Suite 550
~~San Antonio~~Bedford, Texas
~~78216~~76021
817/571-2288

[Note: This Plan (LGMP #~~3~~4) relies on information presented in previous LGMP completed and sealed by other engineers and approved by Texas Natural Resource Conservation Commission/Texas Commission on Environmental Quality and is accepted as presented, but ~~Forbes Environmental Engineering~~SCS Engineers cannot attest to its accuracy.]

Version #~~3~~ 4
(~~10/21/16~~03/12/25)
~~Forbes Environmental Engrg~~SCS Engineers

TABLE OF CONTENTS

FIGURES ~~AND TABLES~~

STATE OF TEXAS
JENNIFER R. BROWN
94685
LICENSED PROFESSIONAL ENGINEER
03/12/25

SCS Engineers
TBPE Reg. # F-3407

TABLES

SCS Engineers
TBPE Reg. # F-3407

APPENDICES

Appendix A – Methane Monitoring and Recording Form

Appendix B – Landfill Gas Remediation Plans

Appendix C – Vertical Extraction Vents/Wells

SCS Engineers
TBPE Reg. # F-3407

LANDFILL GAS MANAGEMENT PLAN

City of Uvalde Municipal Solid Waste Landfill

TCEQ Permit No.1725

Uvalde, Texas

1.0 INTRODUCTION

The purpose of this Landfill Gas Monitoring Plan (LGMP) Version #3 is to provide guidelines for the management of the landfill gas at the City of Uvalde Municipal Solid Waste Landfill (MSWLF) in accordance with Subchapter I (Landfill Gas Management) 30 TAC §330.371 and to update LGMP Version #2 requirements per §330.37l(g). Specific relevant TAC chapters and sections are cited in brackets, subchapters and paragraphs are not included, except when specific reference may help confirm or clarify change. All figures are included at the end of text.

1.1 Site Description

The Uvalde MSWLF is located in Uvalde County approximately 3.8 miles southwest of the City Uvalde and 3.3 miles of the intersection of U.S. Highway 90 and Texas F.M. 481. Figure 1.1 shows general location of the Site. The predominant land use in the vicinity of and adjacent to the Site is undeveloped rangeland used for grazing cattle. There reportedly 6 habitable building located within 3,000 feet of the facility waste placement boundary, but they are not located within a 1,000 feet radius of the waste boundary.~~.~~ s~~S~~ee Figure 1.2~~ and 1.3~~. Figure ~~1.4~~3.1 shows the Site Layout.

The landfill development plan calls for three Stages (A, B, C) of development. Stage A was completed before Subtitle D design regulations came into effect and was completed to a greater depth than Stages B or C (i.e. nominally 917msl to 935msl respectively with respect to bottom of buried waste). This LGMP applies for all landfill Stages during final phase of landfill operation.

For purposes of clarity, this LGMP specifically addresses regulated activities within the facility boundary (permitted area). The MSWLF *facility boundary* is defined *"by the legal description in the permit"* per §330.37l(b)(2), that is considered to herein analogous *"permitted area"*. This

includes regulated activity and facilities (landfill, ground water monitor wells and gas probes, leachate tank etc.) located within the 57.50 acre permitted area defined by the permit facility boundary. The legal description of the permitted area is found in the original approved permit and shown in Figure ~~1.4~~3.1.

2.0 LANDFILL GAS MONITORING PROGRAM {§330.371(b)}

The method and frequency of landfill gas monitoring is based on site-specific physical conditions in accordance with reference regulations. These conditions are discussed at length in the Permit *Geology Report* located in Section 4.0 of the Permit Site Development Plan, and summarized below as relates to the LGMP, which provides the basis for determining the monitoring program criteria {§330.37l(b)(l)}.

2.1 Soil

The soils identified at the Site are shown in Figure 2.1. The predominant soils are HYD and KnA, which make-up the upper stratum overlaying geologic Quaternary Alluvium formation discussed below. The soil characteristics are summarized in Table 1.0. The general depth of the soils ranges from 0-60" based on drilling log.

2.2 Site Geology

The principal formations at the Site from youngest to oldest are:

- Quaternary Alluvium (Qtu) which includes Uvalde Gravel
- Anacacho (Kac)
- Austin Chalk (Kau- which contains the permit designated uppermost aquifer)
- Eagle Ford (Kef).

Stage A portion of the landfill is completed in Anacacho Clay, which would most likely serve as barrier to migration.

Based on these conditions, it was determined that the maximum spacing between permanent gas monitoring probes (GMP) placed around the landfill perimeter should be no greater than 1000 feet apart and completed to depths equivalent to the depth of waste buried in the vicinity of the nearest gas monitoring probes (GMP), with casing screen and sand filter of sufficient height to capture gas from highest level of waste and still allow an adequate annulus seal at surface.

2.5 Facility Boundaries (Permitted Area)

The Site and facility boundaries were discussed earlier in Section 1.1 and shown in Figure 1.4. No building structures are located within the facility boundary. Two buildings are located within the Site boundary outside the permitted area, as shown in figure. One building is the small landfill gate/scale house and the other is the landfill maintenance/operations office building. The buildings are located outside the permitted area and are not considered likely to be exposed to gases released from the landfill. However, they are included in the quarterly monitoring program, and gas monitoring of these structures may be conducted using portable gas monitoring detectors in accordance with the Exceedance Action Plan, EAP (Section 4.0), when and if gas exceedances are reported in GMP within 1,000-ft of buildings.

2.6 Location of Easement and Underground Utilities

There are no easements, buildings, subsurface vaults, utilities, or other areas where methane gas buildup would be a concern within the area bounded by the approved landfill gas monitoring system.

3.0 LANDFILL METHANE GAS MONITORING PROGRAM {§330.37l(b)}

A routine methane gas-monitoring program has been implemented as required to ensure that the following standards are met:

(1) The concentration of methane gas generated by the facility does not exceed 1.25% by volume in the facility structures located within facility boundary, excluding gas control or recovery components (§330.37l(a)(l)); and

(2) The concentration of methane gas does not exceed 5% by volume in monitoring points, probes, subsurface soils, or other matrices at the facility boundary as defined by the legal description in the permit (§330.371 (a)(2)).

The monitoring network design also includes provisions for monitoring facility structures (i.e. buildings, subsurface vaults, utilities) or any other areas within the permitted area that would be of concern per §330.37l(i). *While both ancillary structures are not located within the facility boundary, they are included in the quarterly gas monitoring program with the GMP, and will be measured in accordance with the Exceedance Action Plan (EAP) discussed in Section 4.0.*

3.1 Landfill Gas Monitoring System §330.371(g)(2)

The existing permanent gas monitoring probe system includes GMP-1 though GMP-7, ~~which were installed in accordance with the previous LGMP #2, approved by the TNRCC (currently the TCEQ) and accepted accordingly~~ see Table 2.0, Gas Monitoring Probe Completion Details. These GMP comprise the landfill gas monitoring points to be monitored on a quarterly basis. GMP Design and installation criteria are discussed in Section 3.1.1.

Figure 3.1 shows the location of current Landfill Gas Monitoring facilities within the permitted area. Based on the site-specific physical conditions discussed in Section 2, *gas-monitoring probes will be placed around the landfill perimeters at distances not to exceed l,000-ft.*

While additional GMP or increased monitoring frequency is not anticipated, they could become necessary as part of the EAP, should methane gas exceedances occur in the future. These GMP will be completed in accordance with the Methane Gas Monitoring Probe Design Details as shown in Figure 3.2 and summarized in the following section. If additional permanent GMPs or other gas management features are installed, the LGMP will be modified accordingly to document and incorporate the changes with the TCEQ concurrence per the EAP.

3.2 GMP Design and Installation {16TAC§76}

At a minimum, the GMP will be designed to meet the applicable governing rules for monitoring wells (16TAC§76) as applied to gas monitoring probes. See Figure 2.4. The landfill GMP should be installed to the maximum depth of the buried waste in the vicinity of the probe and screened from the bottom cap to a few feet below the surface to allow sufficient room to construct surface completion. Surface completion should meet no less than the minimum surface completion requirements per 16TAC§76.1 00(f)(4), such as waterproof protective collar or vault extending 2" above the surface with a minimum 12" radius (or 2x2-ft) sloping cement sloping pad. The casing should be capped with locking cap such as expandable compression plug or equivalent to seal casing between monitoring events and allow access for taking measurements. Where GMP are located in areas of heavy traffic or site activity, one to three 4"-bollard posts will be placed around the GMP to protect it from damage.

3.2.1 Gas Probe Monitoring Procedures

Monitoring the GMP system consists of measuring methane gas in each of the probes conducted by or under the supervision of a qualified and trained landfill operator to ensure methane limits and concentrations are not exceeded as follows:

- Monitoring of the GMP system, ~~and~~ the Gate House, and Maintenance building will be conducted on a quarterly basis, unless monitoring landfill gas exceedance has occurred as discussed in the EAP (Section 4.0).
- Methane gas will be measured in each GMP (GMP 1 through 7) and structures *using industry standard portable methane gas detectors, such as or equivalent to ENMET* CGS-*90R or Gas Measurement Instruments, GasSurveyor 6, et.al.:*
    - Monitoring equipment will be calibrated in accordance with manufacturer's instructions, prior to each monitoring event.

- Methane concentrations as % volume will be measured and recorded at each GMP on the Methane Monitoring and Recording Form (Appendix C) or similar form.
- Probe condition will be visually inspected and recorded.

o Gas monitoring recordkeeping will be maintained per Section 3.2.5.

- **Exceedance Action Plan will be initiated when gas-monitoring readings confirm that methane gas concentrations> 5% volume are recorded at facility boundary.** See Section 3.0.

3.2.2 Backup GMP (BGMP)

As discussed in the Exceedance Action Plan (EAP-Section 4.0), probes installed to assess gas migration serve as backup-GMP (BGMP). They are located relative to the location of a reported exceedance and are not monitored unless an exceedance has occurred. Figure 3.1 shows the location of current Landfill Gas Monitoring facilities within (GMP/BGMP). Gas monitoring probe design and installation criteria are discussed in Section 3.2.

3.2.3 Maintenance Procedures

The permanent GMP system will be inspected on a quarterly basis during regularly scheduled monitoring events. Each probe and vent will be inspected for damage to protective barrier, casing, cap, working pad, and covers. The general maintenance conditions will be noted in the field sampling record and all damage will be repaired as soon as practical and duly recorded. Major damage to monitoring system will be reported and appropriate authorities notified in accordance with following section.

3.2.4 Backup Monitoring Plan

The purpose of this Backup Plan is to provide a plan of action in the event that the main monitoring system breaks down or it becomes ineffective in accordance to §330.371(g)(3).

In the event a gas monitoring probe/vent failure has been damaged and is inoperative, they will be repaired or replaced within 60 days of discovery. Upon completion of a replacement GMP/vent, an installation report including boring logs and/or construction details will be maintained in the landfill Site Operating Record. A~~a~~ permit modification will be submitted to the TCEQ within 60 days of ~~noticing the failure~~ GMP/vent replacement if located more than 100 feet from initial location, in accordance with applicable regulations.

landfill gas migration. Copies of the action plan will be placed in the operating record and sent to the TCEQ. The following subsections summarize the remediation efforts at the landfill, including installation of passive vents, backup/temporary monitoring probes and gas collection and control systems.

4.1.1 Passive Vents

[2004 LFG Vents in waste] To control LFG migration at GMP-1 and GMP-3 four passive gas monitoring vents (GMV-1 through GMV-4 as shown on Figure 2.0 of Appendix B, Remediation Plan (05/08/18)) were installed in Stage A to release pressure in the storage cells, see Table 3.0 for gas extraction well/vent completion information.

[2010 LFG Vents in waste] Two additional vents (one in Stage A and one in Stage B) were installed to control LFG migration at GMP-4. GMV-5 and GMV-6 are shown on Figure 2.0 of Appendix B, Remediation Plan (05/08/18).

[2018 Temporary LFG Vents outside waste] To continue with remediation efforts, three additional vents were installed as part of Phase 1.0 of the Remediation Plan submitted to TCEQ dated May 5, 2018, included in Appendix B. Temporary vents TV-1, TV-2 and TV-3 are shown on Figure 3.0 of the 2018 Remediation Plan.

[2018 LFG vents in waste] To continue with remediation efforts, five additional vents were installed as part of Phase 2.0 of the Remediation Plan dated May 5, 2018. The gas vents are shown as GV-7, GV-7a, GV-8, GV-9 and GV-10 on Figure 1.0 in Appendix B, Remediation Plan Update (01/17/22).

4.1.2 Backup/Temporary Monitoring Probes

[2010 Backup Monitoring Probes] Four backup gas monitoring probes were installed in the vicinity of GMP-4, designated as BGMP-4.1, 4.2, 4.3 & 4.4, as shown in Figure 2.0 of Appendix B, Remediation Plan (05/08/18), to identify the gas migration path.

[2018 Temporary Gas Monitoring Probes] To continue the identification of the landfill gas migration path, five temporary gas monitoring probes were installed at various depths along the north property line outside the Stage B limits of waste. Figure 3.0 of

Appendix B, Remediation Plan (05/08/18) depicts the locations of TGMP-1, TGMP-2 and TGMP-3.1, 3.2, 3.3.

4.1.3 Gas Collection and Control System

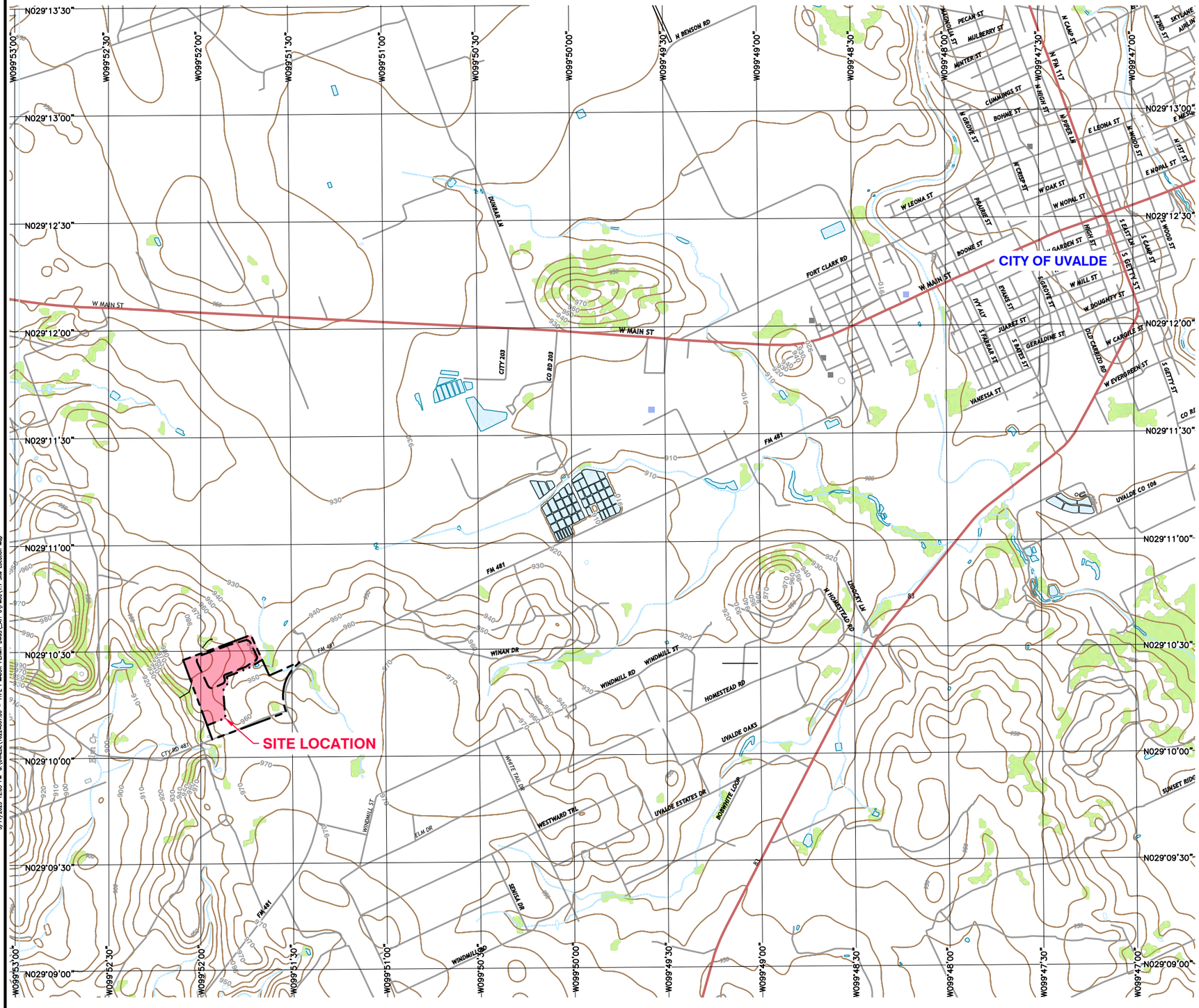
[2023 Vertical LFG Extraction Wells] In order to reduce gas emissions and further minimize the potential for offsite migration, an initial landfill gas collection system (GCS) was installed as shown on Drawing 1 of Appendix B, Remediation plan (09/02/22). The initial GCS included installing four vertical LFG extraction wells connected by lateral piping and routed to localized blowers and solar vent flares.

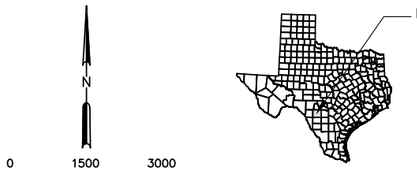
5.0 POST CLOSURE REQUIREMENTS {§330.371(e)&(f)}

This LGMP or its future approved renditions will be in place for a period of 30 years after certification of final closure of the facility. A reduction in the monitoring and control period may be approved by the TCEQ or its predecessors upon demonstration that there is no potential for gas migration beyond the property boundary or on-site structures.

Post-closure land use at the Site should not interfere with the gas monitoring and control systems and underground utilities trenches crossing the landfill boundary should be vented and monitored regularly.

FIGURES





0 1500 3000
SCALE IN FEET

COUNTY LOCATION

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- PERMITTED AREA
- LIMITS OF WASTE
- RIVERS/CREEKS
- 560 EXISTING CONTOURS (SEE NOTE 1)
- W099°51'30" LATITUDE/LONGITUDE LINES

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD

Interstate Route US Route State Route

NOTE:

1. CONTOURS SHOWN ARE FROM THE 24K QUAD MAP FOR AXTELL, TEXAS (2016) PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY

STATE OF TEXAS
JENNIFER R. BROWN
94685
LICENSED PROFESSIONAL ENGINEER
3/12/25

REV	DATE	DESCRIPTION	BY

TEXAS BOARD OF PROFESSIONAL ENGINEERS REG. NO. F-3407

DRAWING TITLE: SITE LOCATION MAP

PROJECT TITLE: CITY OF UVALDE LANDFILL PERMIT MODIFICATION

CLIENT: CITY OF UVALDE
3774 FM 481
UVALDE, TEXAS 78801

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
1901 CENTRAL DRIVE, SUITE 550, BEDFORD, TX 76021
PH (817) 571-2288 FAX NO. (817) 571-2188

PROJ. NO.
DWN. BY: JLJ
O/A RVW BY: RRK
CHK. BY: JRB
APP. BY: RRK
DSN. BY: JRB

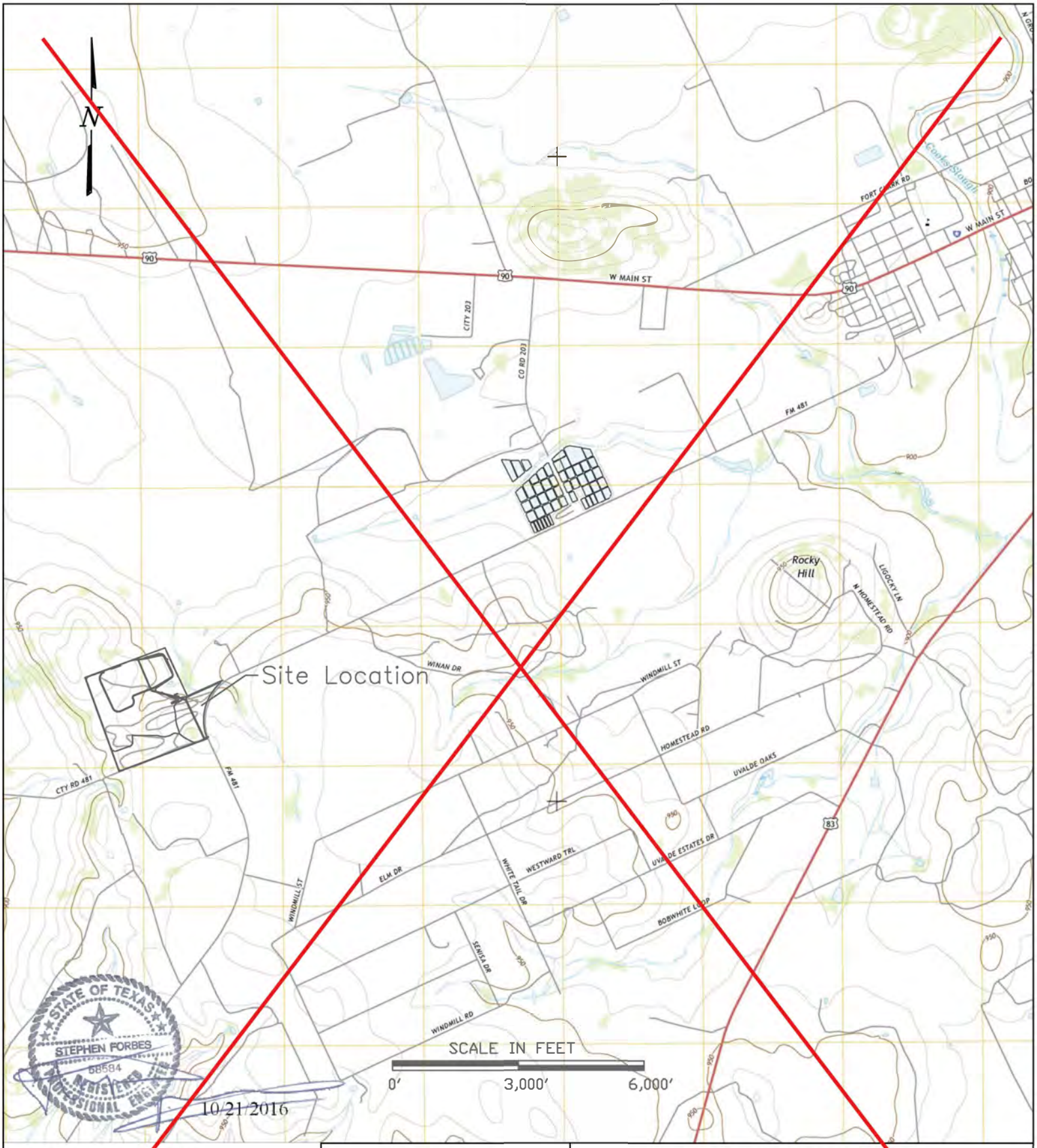
CADD FILE: 1.1 SITE LOCATION MAP

DATE: 02/2025

SCALE: AS SHOWN

FIGURE: 1.1

3/11/2025 12:05 PM G:\UVALDE\162240\97.00 - TYPE I MAJOR PERMIT DWGS_ATT 6\Plots\1.1 Site Location Map

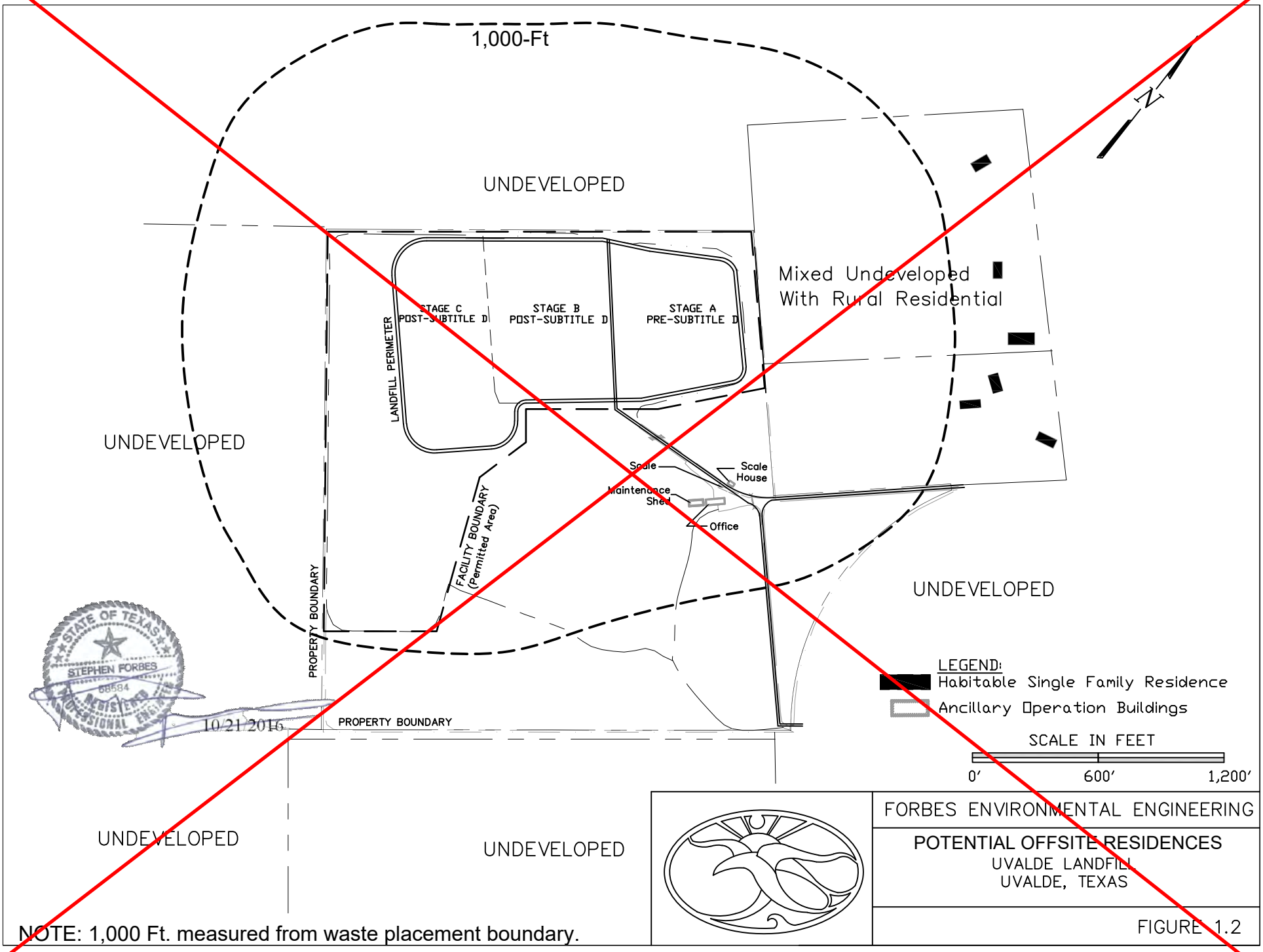


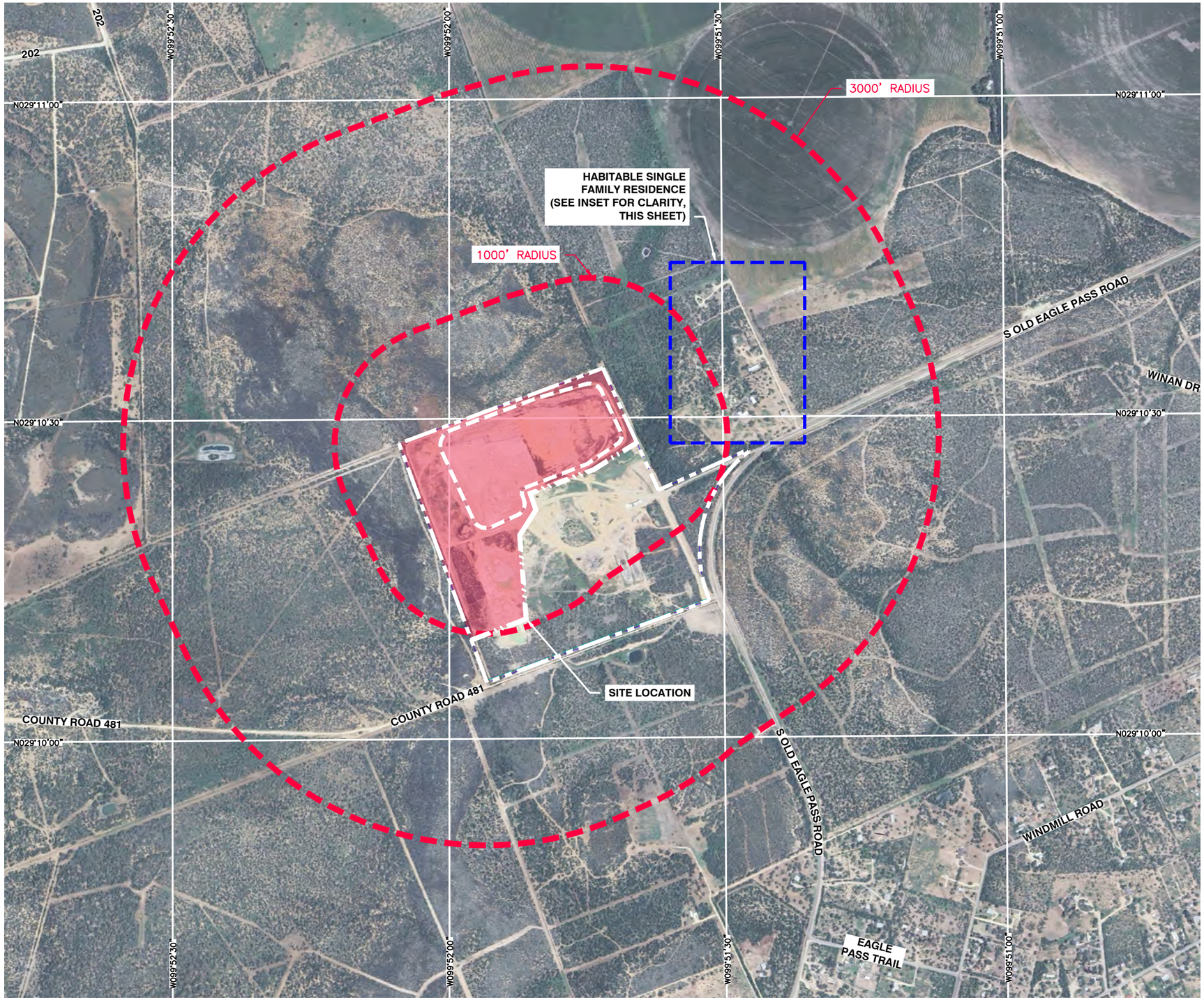
Source: USGS Uvalde Quadrangle
7.5 Minute Series

FORBES ENVIRONMENTAL ENGINEERING

USGS SITE LOCATION MAP
CITY OF UVALDE LANDFILL
UVALDE, TEXAS

FIGURE 1.1


1,000-Ft
UNDEVELOPED
Mixed Undeveloped
With Rural Residential
STAGE C
POST-SUBTITLE D
STAGE B
POST-SUBTITLE D
STAGE A
PRE-SUBTITLE D
LANDFILL PERIMETER
UNDEVELOPED
Scale
Scale House
Maintenance Shed
Office
FACILITY BOUNDARY
(Permitted Area)
PROPERTY BOUNDARY
UNDEVELOPED
STATE OF TEXAS
STEPHEN FORBES
68584
REGISTERED
PROFESSIONAL ENGINEER
10/21/2016
PROPERTY BOUNDARY
LEGEND:
Habitable Single Family Residence
Ancillary Operation Buildings
SCALE IN FEET
0'
600'
1,200'
UNDEVELOPED
UNDEVELOPED
FORBES ENVIRONMENTAL ENGINEERING
POTENTIAL OFFSITE RESIDENCES
UVALDE LANDFILL
UVALDE, TEXAS
FIGURE 1.2
NOTE: 1,000 Ft. measured from waste placement boundary.



N

0 500 1000

SCALE IN FEET

LEGEND

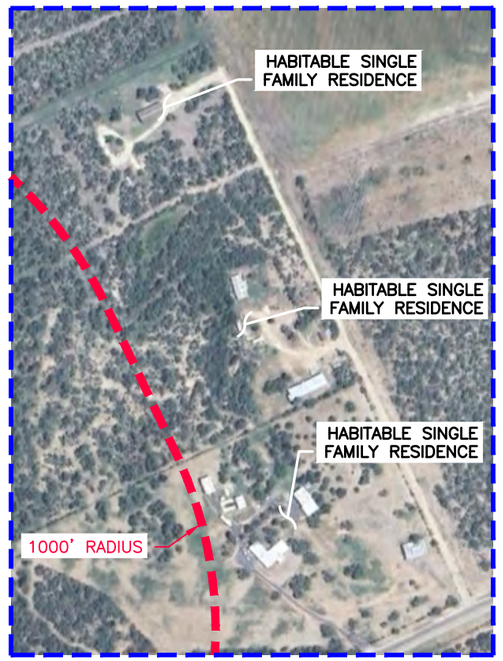
- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- PERMITTED AREA
- LIMITS OF WASTE
- LIMITS OF WASTE RADIAL MARKER
- LATITUDE/LONGITUDE LINES

W099°51'30"

NOTE:

1. AERIAL SHOWN WAS SOURCED FROM THE GOOGLE EARTH DATED JUNE 21, 2023.

STATE OF TEXAS
JENNIFER R. BROWN
94685
LICENSED PROFESSIONAL ENGINEER
5/12/25



INSET
1" = 200'

REV	DATE	DESCRIPTION	BY

TEXAS BOARD OF PROFESSIONAL ENGINEERS REG. NO. F-3407

DRAWING TITLE: REGULATORY DISTANCES

PROJECT TITLE: CITY OF UVALDE LANDFILL PERMIT MODIFICATION

CLIENT: CITY OF UVALDE
3774 FM 481
UVALDE, TEXAS 78801

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
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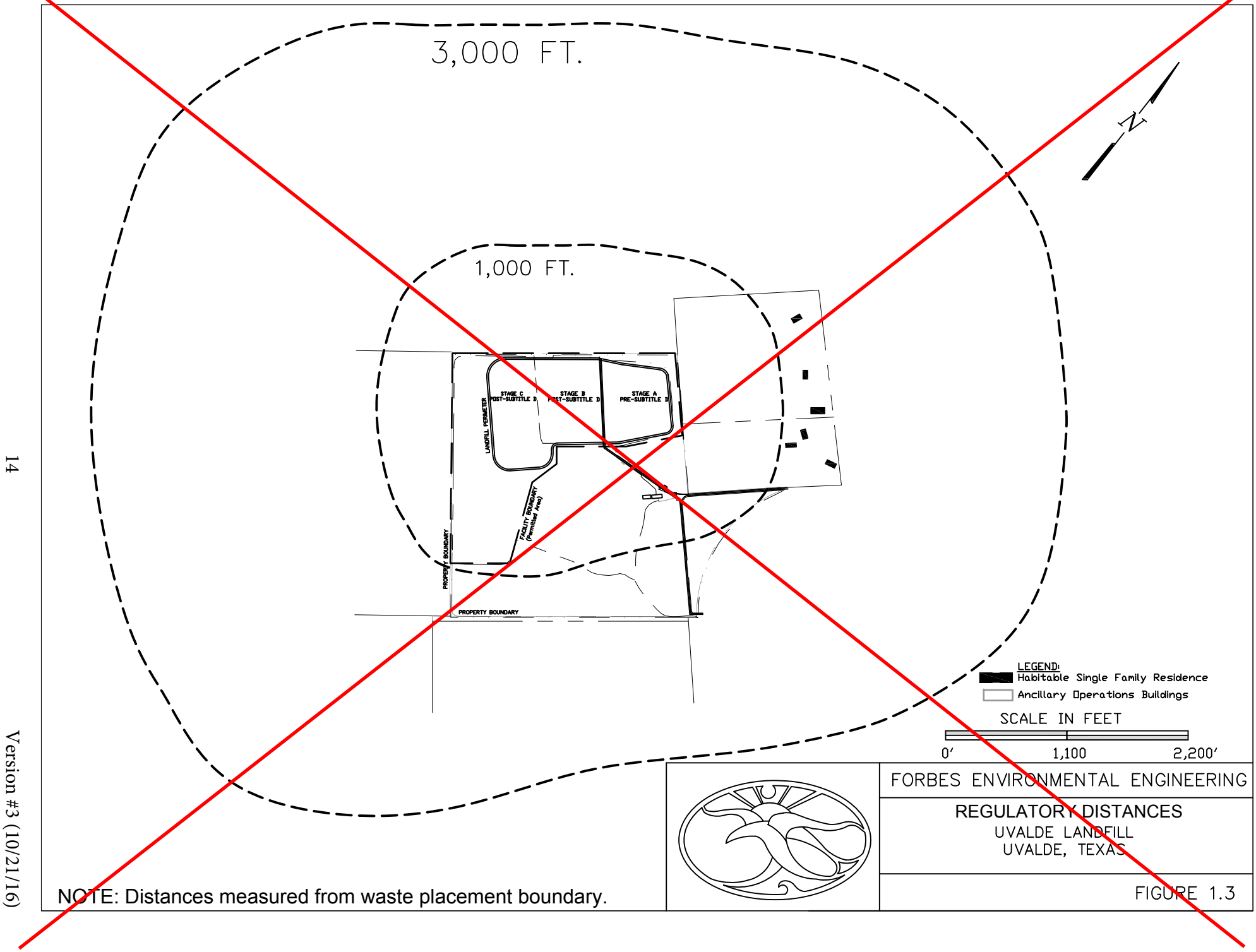
PROJ. NO.	DSN. BY:	DWN. BY:	CHK. BY:	QA/QC BY:	APP. BY:
	JRB	JLJ	JRB	RRK	RRK

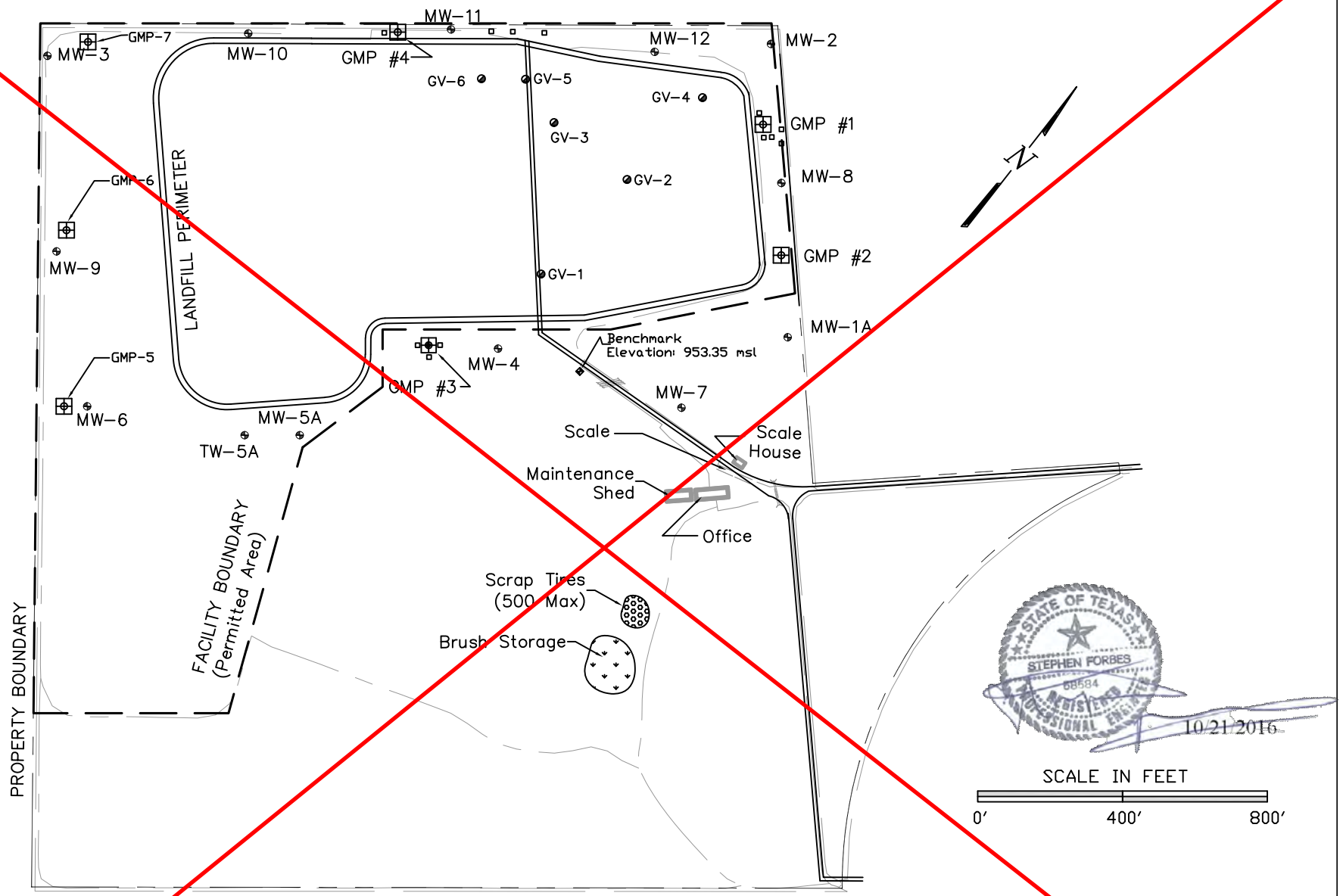
CADD FILE: 1.2 REGULATORY DISTANCES MAP

DATE: 02/2025

SCALE: AS SHOWN

FIGURE: **1.2**

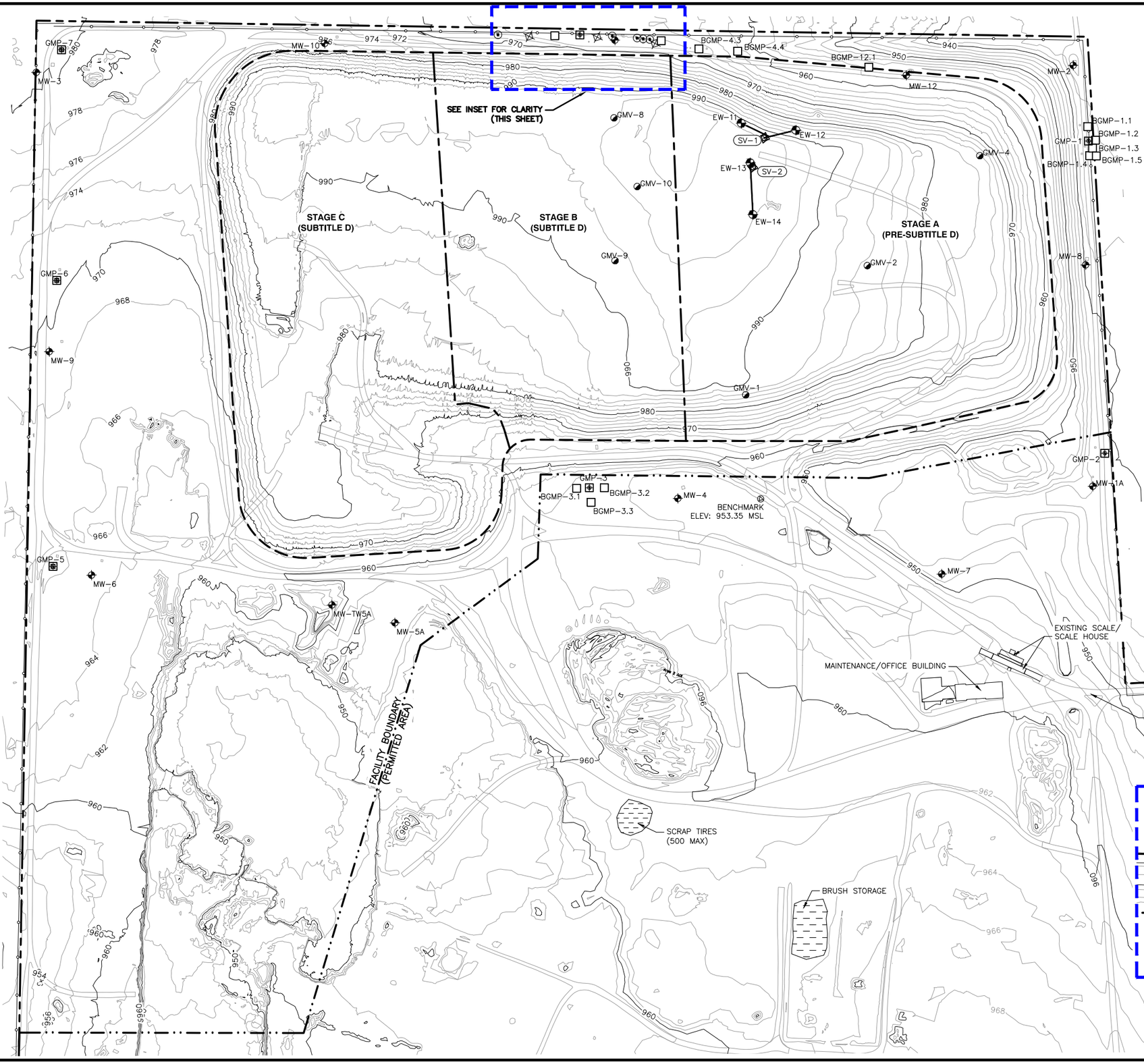

3,000 FT.
1,000 FT.
N
STAGE C
PRE-SUBTITLE D
STAGE B
PRE-SUBTITLE D
STAGE A
PRE-SUBTITLE D
LANDFILL PERIMETER
FACILITY BOUNDARY
(Permitted Area)
PROPERTY BOUNDARY
PROPERTY BOUNDARY
LEGEND:
Habitable Single Family Residence
Ancillary Operations Buildings
SCALE IN FEET
0'
1,100
2,200'
FORBES ENVIRONMENTAL ENGINEERING
REGULATORY DISTANCES
UVALDE LANDFILL
UVALDE, TEXAS
FIGURE 1.3
NOTE: Distances measured from waste placement boundary.

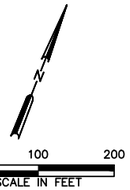


FORBES ENVIRONMENTAL ENGINEERING

GENERAL LANDFILL FACILITY LAYOUT
UVALDE LANDFILL
UVALDE, TEXAS

FIGURE 1.4





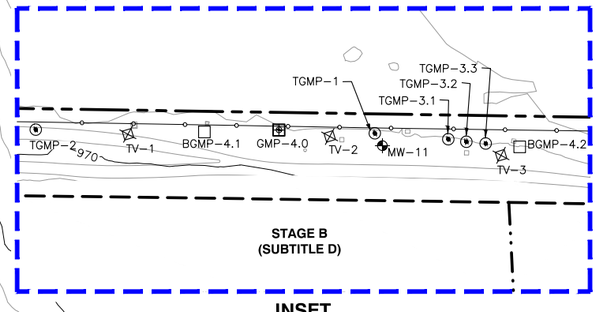
LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LIMITS OF WASTE (SEE NOTE 2)
- CELL BOUNDARY
- 960 — EXISTING CONTOURS (SEE NOTE 1)
- EXISTING FENCE
- MW-2 — EXISTING GROUNDWATER MONITORING WELL
- GMV-4 — EXISTING GAS MONITORING VENT
- GMP-1 — EXISTING GAS MONITORING PROBE
- BGMP-1.2 — EXISTING BACKUP GAS MONITORING PROBE
- TGMP-1.2 — EXISTING TEMPORARY GAS MONITORING PROBE
- TV-3 — EXISTING LFG TEMPORARY VENT
- EW-11 — EXISTING LFG EXTRACTION WELL
- EXISTING 6" LATERAL
- SV-1 — EXISTING PUSH PIN SOLAR VENT FLARE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS ARE FROM A SURVEY CONDUCTED ON SEPTEMBER 26,2024 BY DIRKSEN ENGINEERING.
2. LIMIT OF WASTE OBTAINED FROM SECTION F: DRAWING SET, SITE LAYOUT PLAN BY W.H. MULLINS, INCORPORATED.

STATE OF TEXAS
JENNIFER R. BROWN
94685
LICENSED PROFESSIONAL ENGINEER
03/12/25



INSET
1" = 50'

REV	DATE	DESCRIPTION	BY

TEXAS BOARD OF PROFESSIONAL ENGINEERS REG. NO. F-3407

DRAWING TITLE: GAS MONITORING FEATURES LOCATION MAP

PROJECT TITLE: CITY OF UVALDE LANDFILL PERMIT MODIFICATION

CLIENT: CITY OF UVALDE
3774 FM 481
UVALDE, TEXAS 78801

SCS ENGINEERS
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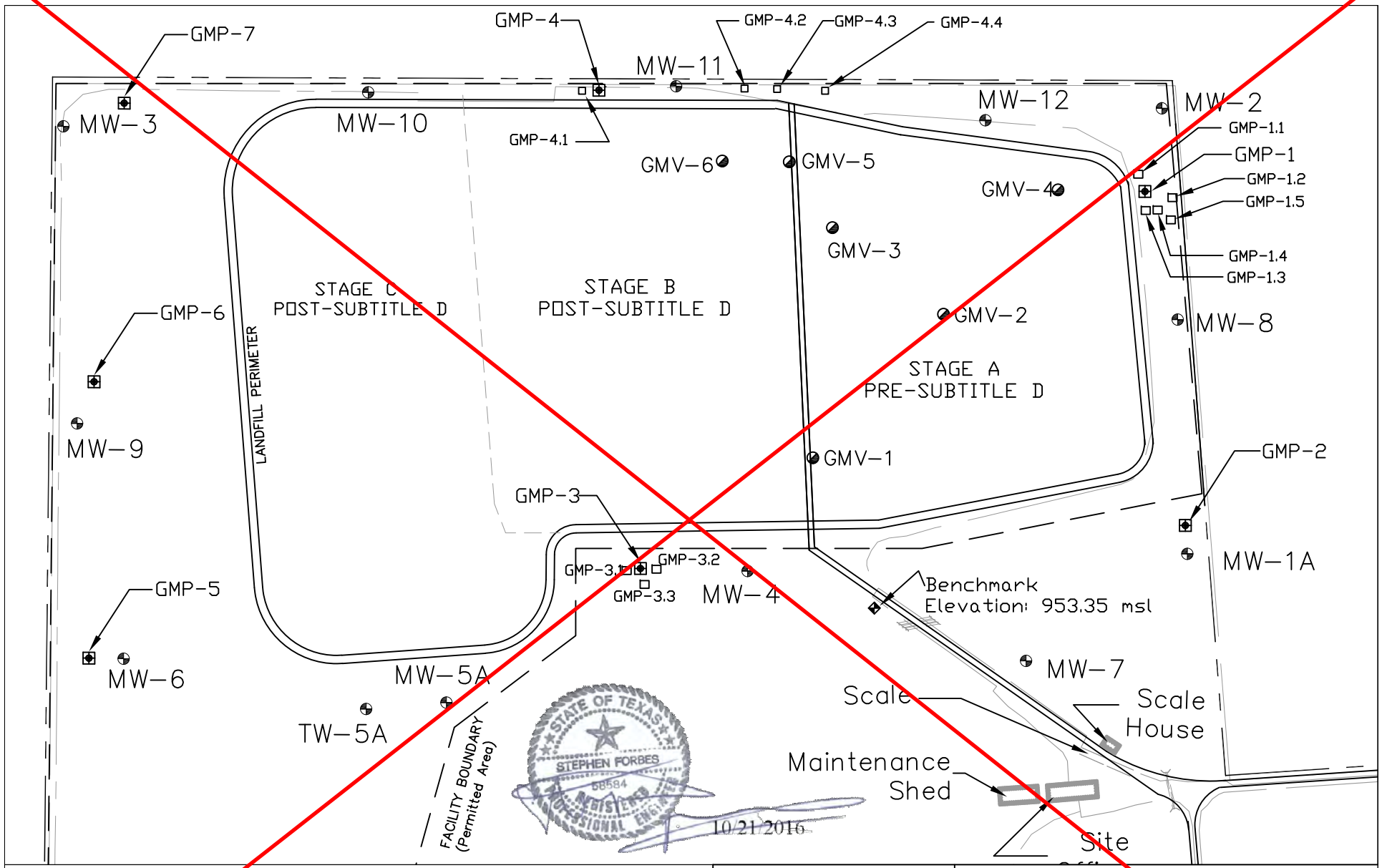
PROJ. NO.	DSN. BY:	DWN. BY:	CHK. BY:	QA/QC BY:	APP. BY:
	JRR	JLJ	JRR	RRK	RRK

CADD FILE: 3.1 GAS MONITORING FEATURES

DATE: 02/2025

SCALE: AS SHOWN

FIGURE: 3.1


GMP-7
GMP-4
GMP-4.2
GMP-4.3
GMP-4.4
MW-11
MW-3
MW-10
MW-12
MW-2
GMP-4.1
GMP-1.1
GMP-1
GMP-1.2
GMP-1.5
GMV-6
GMV-5
GMV-4
GMV-3
GMP-1.4
GMP-1.3
STAGE C
POST-SUBTITLE D
STAGE B
POST-SUBTITLE D
GMV-2
MW-8
GMP-6
LANDFILL PERIMETER
STAGE A
PRE-SUBTITLE D
MW-9
GMV-1
GMP-2
GMP-3
GMP-3.2
GMP-3.1
GMP-3.3
MW-4
MW-1A
Benchmark
Elevation: 953.35 msl
GMP-5
MW-6
MW-5A
MW-7
Scale
Scale
House
TW-5A
FACILITY BOUNDARY
(Permitted Area)
Maintenance
Shed
Site
STATE OF TEXAS
STEPHEN FORBES
68584
REGISTERED
PROFESSIONAL ENGINEER
10/21/2016
LEGEND:
Monitor Wells (MW)
Gas Monitoring Probes (GMP)
Gas Vents (GV)
Backup Gas Monitoring Probes (BGMP)
N
SCALE IN FEET
0'
250'
500'
FORBES ENVIRONMENTAL ENGINEERING
GMP & GV LOCATION MAP
UVALDE LANDFILL
UVALDE, TEXAS
FIGURE 3.1

TABLES

	Table 1.0 MSWLF Soils Map Adapted from Uvalde County, Texas (Source: Natural Resource Conservation Service)					
	Hindes&Yolgo soils, undulating (HYB)					
Map Unit Characteristics	Hindes	Yologo	Knippa (KnA)	MoA Montell Clay	OLB Olmos	UvA Uvalde Clay
Acres/% in Area of Interest (AOI)	70.7ac/56.5%		7ac/5.6%	16.1ac/12.9%	26.9ac/21.5%	1.4ac/2.4%
Parent material	Gravelly, loamy alluvium	NR	Calcareous clayey alluvium	Calcareous clayey alluvium	Calcareous loamy alluvium	Calcareous alluvium
Typical profile						
H1 or Ap/A	O-8 inches gravelly sandy clay loam	0- 5" gravely loam	H1 - 0 to 18 inches: clay	Ap - 0 to 8 inches: clay	H1 - 0 to 13 inches: very gravelly loam	A - 0 to 17 inches: clay loam
H2 or Bnss	8-31 very gravely clay	5-12" very gravelly clay loam	H2 - 18 to 35 inches: clay	Bnss - 8 to 32 inches: clay	H2 - 13 to 14 inches: cemented material	Bk1 - 17 to 34 inches: clay loam
H3 or Bknss	21-60 clay loam	12-14" Cemented material	H3 - 35 to 60 inches: clay loam	Bknss - 32 to 58 inches: clay	H3 - 14 to 26 inches: very gravelly loam	Bk2 - 34 to 50 inches: clay loam
H4 or Bkny	Not reported	H4: 14 to 16"	Not reported	Bkny: 58 to 80 inches: clay	H4 - 26 to 60 inches: gravelly loam	Bk3 - 50 to 80 inches: silty clay loam
Properties and qualities						
Slope: 1 to 8 percent	1-8 %	1-8%	0-1%	0-1%	1-8%	0-1%
Depth to restrictive feature	>80 inches	>80"	>80"	>80"	10 to 20" to petrocalcic	>80"
Runoff Class	NR	NR	NR	High		Low
Natural drainage class	Well drained	well drained	well drained	Moderatelly well drained	Well drained	Well Drained
Capacity to transmit water (Ksat)	Moderately high	Mod low to Mod High	Moderately high	Mod low to Mod High	Very low	Mod High to high
Available water storage in profile	Low	very low	High	Moderate		
Interpretive groups						
Hydrologic Soil Group:	C	D	C	D	D	C
Hydric soil	No	No	No	no	No	No

NR= not rated

ATTACHMENT D

UNMARKED VERSION

ATTACHMENT 14
LANDFILL GAS MANAGEMENT PLAN

CITY OF UVALDE
MUNICIPAL SOLID WASTE LANDFILL
TCEQ PERMIT NO. 1725
UVALDE, TEXAS

Prepared by
SCS Engineers
Texas Board of Professional Engineers, Reg. No. F-3407
Dallas/Fort Worth Office
1901 Central Drive, Suite 550
Bedford, Texas 76021
817/571-2288

[Note: This Plan (LGMP #4) relies on information presented in previous LGMP completed and sealed by other engineers and approved by Texas Natural Resource Conservation Commission/Texas Commission on Environmental Quality and is accepted as presented, but SCS Engineers cannot attest to its accuracy.]

Version #4 (03/12/25)
SCS Engineers

TABLE OF CONTENTS

STATE OF TEXAS
JENNIFER R. BROWN
94685
LICENSED PROFESSIONAL ENGINEER
03/12/25

SCS Engineers
TBPE Reg. # F-3407

FIGURES

TABLES

APPENDICES

Appendix A – Methane Monitoring and Recording Form

Appendix B – Landfill Gas Remediation Plans

Appendix C – Vertical Extraction Vents/Wells

LANDFILL GAS MANAGEMENT PLAN

City of Uvalde Municipal Solid Waste Landfill

TCEQ Permit No.1725

Uvalde, Texas

1.0 INTRODUCTION

The purpose of this Landfill Gas Monitoring Plan (LGMP) Version #3 is to provide guidelines for the management of the landfill gas at the City of Uvalde Municipal Solid Waste Landfill (MSWLF) in accordance with Subchapter I (Landfill Gas Management) 30 TAC §330.371 and to update LGMP Version #2 requirements per §330.37l(g). Specific relevant TAC chapters and sections are cited in brackets, subchapters and paragraphs are not included, except when specific reference may help confirm or clarify change. All figures are included at the end of text.

1.1 Site Description

The Uvalde MSWLF is located in Uvalde County approximately 3.8 miles southwest of the City Uvalde and 3.3 miles of the intersection of U.S. Highway 90 and Texas F.M. 481. Figure 1.1 shows general location of the Site. The predominant land use in the vicinity of and adjacent to the Site is undeveloped rangeland used for grazing cattle. There reportedly 6 habitable building located within 3,000 feet of the facility waste placement boundary, but they are not located within a 1,000 feet radius of the waste boundary, see Figure 1.2. Figure 3.1 shows the Site Layout.

The landfill development plan calls for three Stages (A, B, C) of development. Stage A was completed before Subtitle D design regulations came into effect and was completed to a greater depth than Stages B or C (i.e. nominally 917msl to 935msl respectively with respect to bottom of buried waste). This LGMP applies for all landfill Stages during final phase of landfill operation.

For purposes of clarity, this LGMP specifically addresses regulated activities within the facility boundary (permitted area). The MSWLF *facility boundary* is defined *"by the legal description in the permit"* per §330.37l(b)(2), that is considered to herein analogous *"permitted area"*. This

includes regulated activity and facilities (landfill, ground water monitor wells and gas probes, leachate tank etc.) located within the 57.50 acre permitted area defined by the permit facility boundary. The legal description of the permitted area is found in the original approved permit and shown in Figure 3.1.

2.0 LANDFILL GAS MONITORING PROGRAM {§330.371(b)}

The method and frequency of landfill gas monitoring is based on site-specific physical conditions in accordance with reference regulations. These conditions are discussed at length in the Permit *Geology Report* located in Section 4.0 of the Permit Site Development Plan, and summarized below as relates to the LGMP, which provides the basis for determining the monitoring program criteria {§330.37l(b)(l)}.

2.1 Soil

The soils identified at the Site are shown in Figure 2.1. The predominant soils are HYD and KnA, which make-up the upper stratum overlaying geologic Quaternary Alluvium formation discussed below. The soil characteristics are summarized in Table 1.0. The general depth of the soils ranges from 0-60" based on drilling log.

2.2 Site Geology

The principal formations at the Site from youngest to oldest are:

- Quaternary Alluvium (Qtu) which includes Uvalde Gravel
- Anacacho (Kac)
- Austin Chalk (Kau- which contains the permit designated uppermost aquifer)
- Eagle Ford (Kef).

Stage A portion of the landfill is completed in Anacacho Clay, which would most likely serve as barrier to migration.

Based on these conditions, it was determined that the maximum spacing between permanent gas monitoring probes (GMP) placed around the landfill perimeter should be no greater than 1000 feet apart and completed to depths equivalent to the depth of waste buried in the vicinity of the nearest gas monitoring probes (GMP), with casing screen and sand filter of sufficient height to capture gas from highest level of waste and still allow an adequate annulus seal at surface.

2.5 Facility Boundaries (Permitted Area)

The Site and facility boundaries were discussed earlier in Section 1.1 and shown in Figure 1.4. No building structures are located within the facility boundary. Two buildings are located within the Site boundary outside the permitted area, as shown in figure. One building is the small landfill gate/scale house and the other is the landfill maintenance/operations office building. The buildings are located outside the permitted area and are not considered likely to be exposed to gases released from the landfill. However, they are included in the quarterly monitoring program, and gas monitoring of these structures may be conducted using portable gas monitoring detectors in accordance with the Exceedance Action Plan, EAP (Section 4.0), when and if gas exceedances are reported in GMP within 1,000-ft of buildings.

2.6 Location of Easement and Underground Utilities

There are no easements, buildings, subsurface vaults, utilities, or other areas where methane gas buildup would be a concern within the area bounded by the approved landfill gas monitoring system.

3.0 LANDFILL METHANE GAS MONITORING PROGRAM {§330.37l(b)}

A routine methane gas-monitoring program has been implemented as required to ensure that the following standards are met:

(1) The concentration of methane gas generated by the facility does not exceed 1.25% by volume in the facility structures located within facility boundary, excluding gas control or recovery components (§330.37l(a)(l)); and

(2) The concentration of methane gas does not exceed 5% by volume in monitoring points, probes, subsurface soils, or other matrices at the facility boundary as defined by the legal description in the permit (§330.371 (a)(2)).

The monitoring network design also includes provisions for monitoring facility structures (i.e. buildings, subsurface vaults, utilities) or any other areas within the permitted area that would be of concern per §330.37l(i). *While both ancillary structures are not located within the facility boundary, they are included in the quarterly gas monitoring program with the GMP, and will be measured in accordance with the Exceedance Action Plan (EAP) discussed in Section 4.0.*

3.1 Landfill Gas Monitoring System §330.371(g)(2)

The existing permanent gas monitoring probe system includes GMP-1 though GMP-7, see Table 2.0, Gas Monitoring Probe Completion Details. These GMP comprise the landfill gas monitoring points to be monitored on a quarterly basis. GMP Design and installation criteria are discussed in Section 3.1.1.

Figure 3.1 shows the location of current Landfill Gas Monitoring facilities within the permitted area. Based on the site-specific physical conditions discussed in Section 2, *gas-monitoring probes will be placed around the landfill perimeters at distances not to exceed l,000-ft.*

While additional GMP or increased monitoring frequency is not anticipated, they could become necessary as part of the EAP, should methane gas exceedances occur in the future. These GMP will be completed in accordance with the Methane Gas Monitoring Probe Design Details as shown in Figure 3.2 and summarized in the following section. If additional permanent GMPs or other gas management features are installed, the LGMP will be modified accordingly to document and incorporate the changes with the TCEQ concurrence per the EAP.

3.2 GMP Design and Installation {16TAC§76}

At a minimum, the GMP will be designed to meet the applicable governing rules for monitoring wells (16TAC§76) as applied to gas monitoring probes. See Figure 2.4. The landfill GMP should be installed to the maximum depth of the buried waste in the vicinity of the probe and screened from the bottom cap to a few feet below the surface to allow sufficient room to construct surface completion. Surface completion should meet no less than the minimum surface completion requirements per 16TAC§76.1 00(f)(4), such as waterproof protective collar or vault extending 2" above the surface with a minimum 12" radius (or 2x2-ft) sloping cement sloping pad. The casing should be capped with locking cap such as expandable compression plug or equivalent to seal casing between monitoring events and allow access for taking measurements. Where GMP are located in areas of heavy traffic or site activity, one to three 4"-bollard posts will be placed around the GMP to protect it from damage.

3.2.1 Gas Probe Monitoring Procedures

Monitoring the GMP system consists of measuring methane gas in each of the probes conducted by or under the supervision of a qualified and trained landfill operator to ensure methane limits and concentrations are not exceeded as follows:

- Monitoring of the GMP system, the Gate House, and Maintenance building will be conducted on a quarterly basis, unless monitoring landfill gas exceedance has occurred as discussed in the EAP (Section 4.0).
- Methane gas will be measured in each GMP (GMP 1 through 7) and structures *using industry standard portable methane gas detectors, such as or equivalent to ENMET* CGS-*90R or Gas Measurement Instruments, GasSurveyor 6, et.al.:*
    - o Monitoring equipment will be calibrated in accordance with manufacturer's instructions, prior to each monitoring event.

- Methane concentrations as % volume will be measured and recorded at each GMP on the Methane Monitoring and Recording Form (Appendix C) or similar form.
- Probe condition will be visually inspected and recorded.

o Gas monitoring recordkeeping will be maintained per Section 3.2.5.

- **Exceedance Action Plan will be initiated when gas-monitoring readings confirm that methane gas concentrations> 5% volume are recorded at facility boundary.** See Section 3.0.

3.2.2 Backup GMP (BGMP)

As discussed in the Exceedance Action Plan (EAP-Section 4.0), probes installed to assess gas migration serve as backup-GMP (BGMP). They are located relative to the location of a reported exceedance and are not monitored unless an exceedance has occurred. Figure 3.1 shows the location of current Landfill Gas Monitoring facilities within (GMP/BGMP). Gas monitoring probe design and installation criteria are discussed in Section 3.2.

3.2.3 Maintenance Procedures

The permanent GMP system will be inspected on a quarterly basis during regularly scheduled monitoring events. Each probe and vent will be inspected for damage to protective barrier, casing, cap, working pad, and covers. The general maintenance conditions will be noted in the field sampling record and all damage will be repaired as soon as practical and duly recorded. Major damage to monitoring system will be reported and appropriate authorities notified in accordance with following section.

3.2.4 Backup Monitoring Plan

The purpose of this Backup Plan is to provide a plan of action in the event that the main monitoring system breaks down or it becomes ineffective in accordance to §330.371(g)(3).

In the event a gas monitoring probe/vent failure has been damaged and is inoperative, they will be repaired or replaced within 60 days of discovery. Upon completion of a replacement GMP/vent, an installation report including boring logs and/or construction details will be maintained in the landfill Site Operating Record. A permit modification will be submitted to the TCEQ within 60 days of GMP/vent replacement if located more than 100 feet from initial location, in accordance with applicable regulations.

landfill gas migration. Copies of the action plan will be placed in the operating record and sent to the TCEQ. The following subsections summarize the remediation efforts at the landfill, including installation of passive vents, backup/temporary monitoring probes and gas collection and control systems.

4.1.1 Passive Vents

[2004 LFG Vents in waste] To control LFG migration at GMP-1 and GMP-3 four passive gas monitoring vents (GMV-1 through GMV-4 as shown on Figure 2.0 of Appendix B, Remediation Plan (05/08/18)) were installed in Stage A to release pressure in the storage cells, see Table 3.0 for gas extraction well/vent completion information.

[2010 LFG Vents in waste] Two additional vents (one in Stage A and one in Stage B) were installed to control LFG migration at GMP-4. GMV-5 and GMV-6 are shown on Figure 2.0 of Appendix B, Remediation Plan (05/08/18).

[2018 Temporary LFG Vents outside waste] To continue with remediation efforts, three additional vents were installed as part of Phase 1.0 of the Remediation Plan submitted to TCEQ dated May 5, 2018, included in Appendix B. Temporary vents TV-1, TV-2 and TV-3 are shown on Figure 3.0 of the 2018 Remediation Plan.

[2018 LFG vents in waste] To continue with remediation efforts, five additional vents were installed as part of Phase 2.0 of the Remediation Plan dated May 5, 2018. The gas vents are shown as GV-7, GV-7a, GV-8, GV-9 and GV-10 on Figure 1.0 in Appendix B, Remediation Plan Update (01/17/22).

4.1.2 Backup/Temporary Monitoring Probes

[2010 Backup Monitoring Probes] Four backup gas monitoring probes were installed in the vicinity of GMP-4, designated as BGMP-4.1, 4.2, 4.3 & 4.4, as shown in Figure 2.0 of Appendix B, Remediation Plan (05/08/18), to identify the gas migration path.

[2018 Temporary Gas Monitoring Probes] To continue the identification of the landfill gas migration path, five temporary gas monitoring probes were installed at various depths along the north property line outside the Stage B limits of waste. Figure 3.0 of

Appendix B, Remediation Plan (05/08/18) depicts the locations of TGMP-1, TGMP-2 and TGMP-3.1, 3.2, 3.3.

4.1.3 Gas Collection and Control System

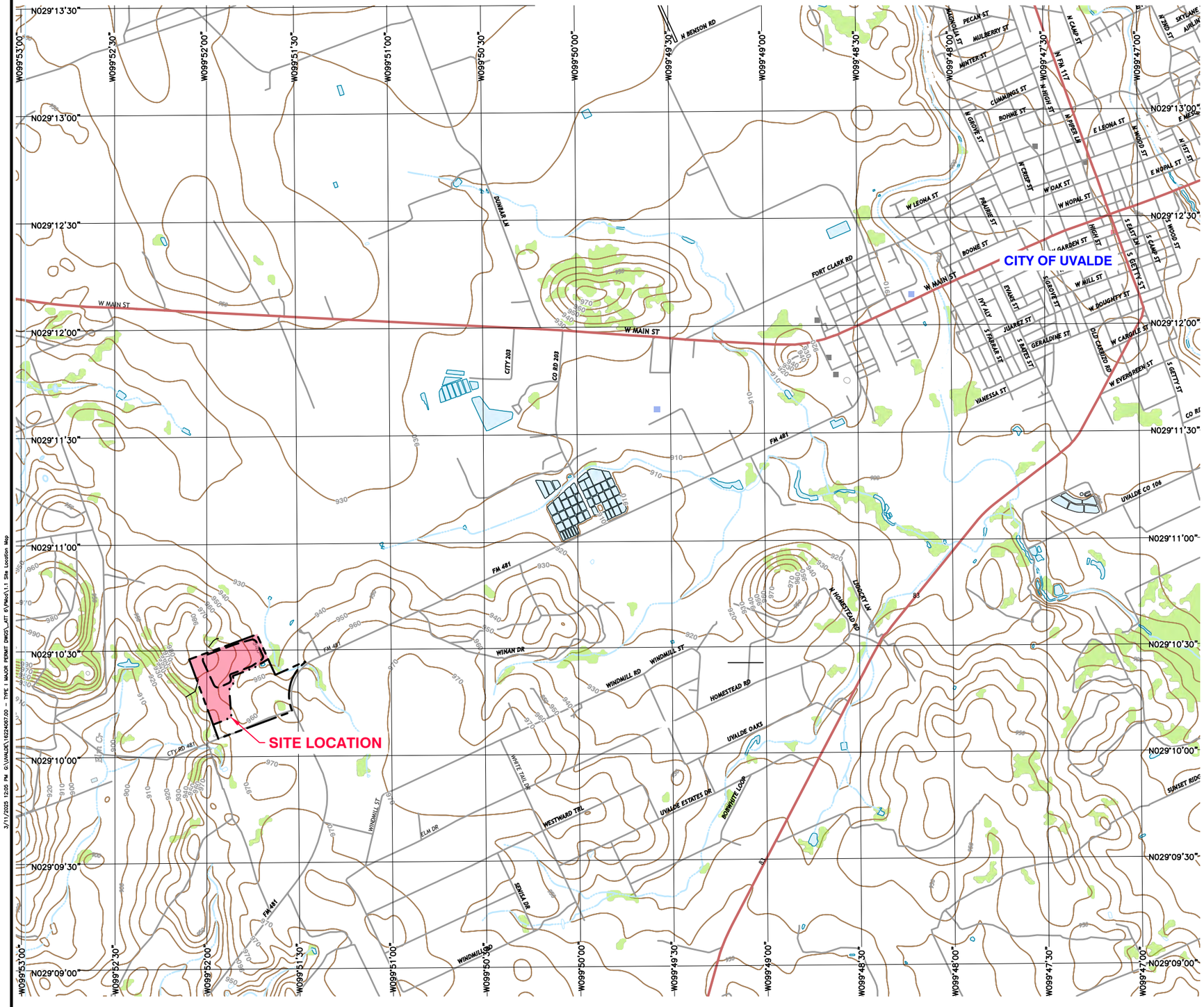
[2023 Vertical LFG Extraction Wells] In order to reduce gas emissions and further minimize the potential for offsite migration, an initial landfill gas collection system (GCS) was installed as shown on Drawing 1 of Appendix B, Remediation plan (09/02/22). The initial GCS included installing four vertical LFG extraction wells connected by lateral piping and routed to localized blowers and solar vent flares.

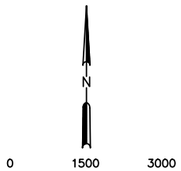
5.0 POST CLOSURE REQUIREMENTS {§330.371(e)&(f)}

This LGMP or its future approved renditions will be in place for a period of 30 years after certification of final closure of the facility. A reduction in the monitoring and control period may be approved by the TCEQ or its predecessors upon demonstration that there is no potential for gas migration beyond the property boundary or on-site structures.

Post-closure land use at the Site should not interfere with the gas monitoring and control systems and underground utilities trenches crossing the landfill boundary should be vented and monitored regularly.

FIGURES





COUNTY LOCATION

0 1500 3000
SCALE IN FEET

LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- PERMITTED AREA
- LIMITS OF WASTE
- RIVERS/CREEKS
- 560 EXISTING CONTOURS (SEE NOTE 1)
- W099°51'30" LATITUDE/LONGITUDE LINES

ROAD CLASSIFICATION

Expressway	Local Connector
Secondary Hwy	Local Road
Ramp	4WD

Interstate Route · US Route · State Route

NOTE:

1. CONTOURS SHOWN ARE FROM THE 24K QUAD MAP FOR AXTELL, TEXAS (2016) PRODUCED BY THE UNITED STATES GEOLOGICAL SURVEY

STATE OF TEXAS
JENNIFER R. BROWN
94685
LICENSED PROFESSIONAL ENGINEER
3/12/25

REV	DATE	DESCRIPTION	BY

TEXAS BOARD OF PROFESSIONAL ENGINEERS REG. NO. F-3407

DRAWING TITLE: SITE LOCATION MAP

PROJECT TITLE: CITY OF UVALDE LANDFILL PERMIT MODIFICATION

CLIENT: CITY OF UVALDE
3774 FM 481
UVALDE, TEXAS 78801

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
1901 CENTRAL DRIVE, SUITE 550, BEDFORD, TX 76021
PH (817) 571-2288 FAX NO. (817) 571-2188

PROJ. NO.	DWN. BY: JLJ	O/A RVW BY: RRK
DSN. BY: JRB	CHK. BY: JRB	APP. BY: RRK

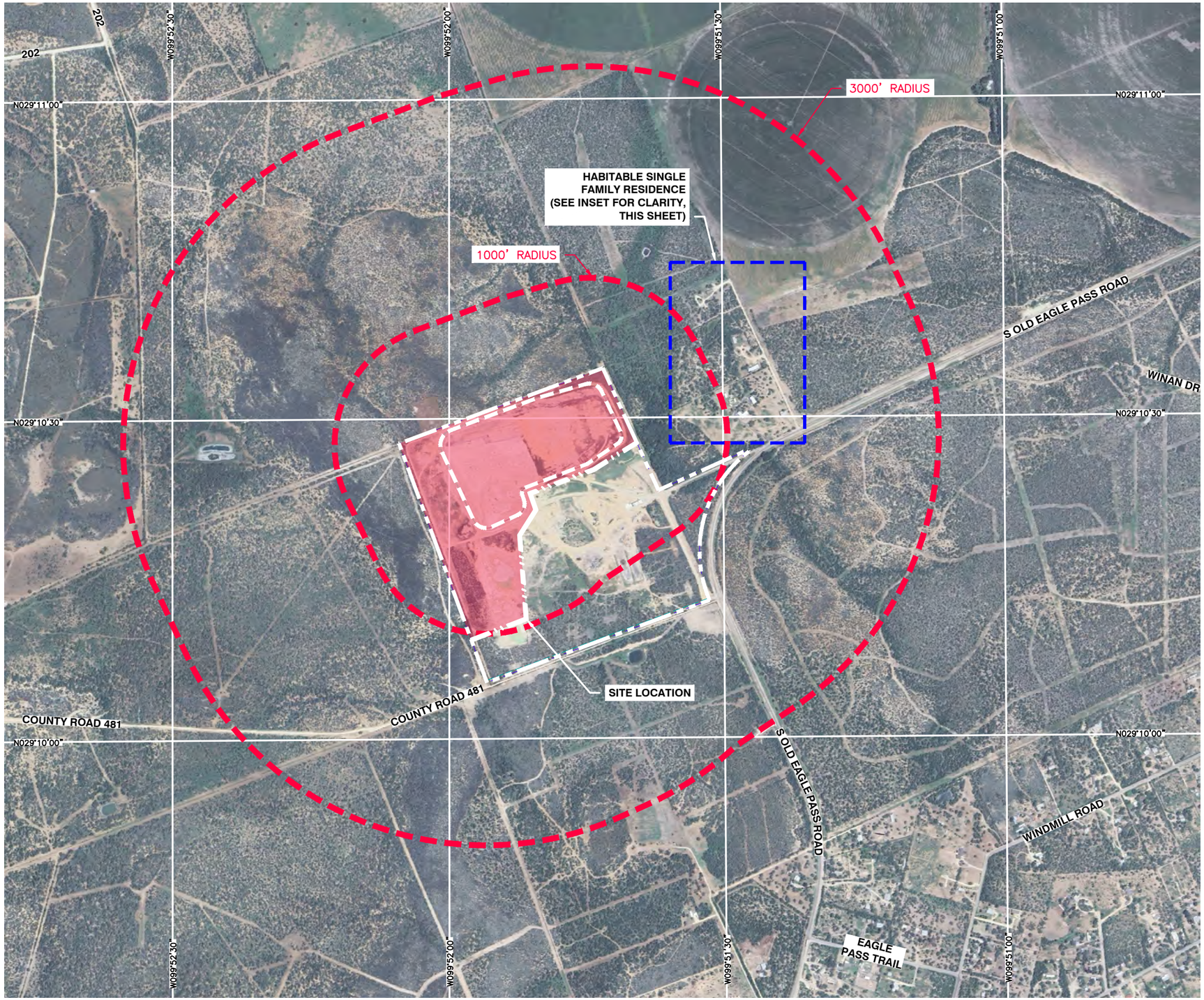
CADD FILE: 1.1 SITE LOCATION MAP

DATE: 02/2025

SCALE: AS SHOWN

FIGURE: 1.1

3/11/2025 12:05 PM G:\UVALDE\1622409700 - TYPE I MAJOR PERMIT DWGS_ATT 6\Plots\1.1 Site Location Map



N

0 500 1000

SCALE IN FEET

LEGEND

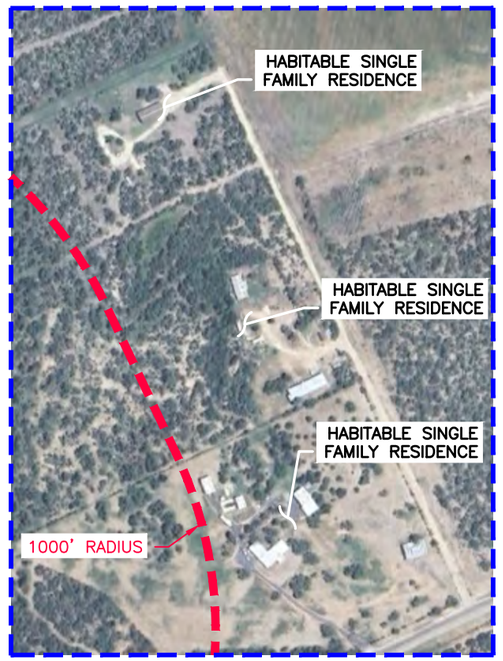
- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- PERMITTED AREA
- LIMITS OF WASTE
- LIMITS OF WASTE RADIAL MARKER
- LATITUDE/LONGITUDE LINES

W099°51'30"

NOTE:

1. AERIAL SHOWN WAS SOURCED FROM THE GOOGLE EARTH DATED JUNE 21, 2023.

STATE OF TEXAS
JENNIFER R. BROWN
94685
LICENSED PROFESSIONAL ENGINEER
5/12/25



INSET
1" = 200'

REV	DATE	DESCRIPTION	BY

TEXAS BOARD OF PROFESSIONAL ENGINEERS REG. NO. F-3407

DRAWING TITLE: REGULATORY DISTANCES

PROJECT TITLE: CITY OF UVALDE LANDFILL PERMIT MODIFICATION

CLIENT: CITY OF UVALDE
3774 FM 481
UVALDE, TEXAS 78801

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
1901 CENTRAL DRIVE, SUITE 550, BEDFORD, TX 76021
PH (817) 571-2288 FAX NO. (817) 571-2188

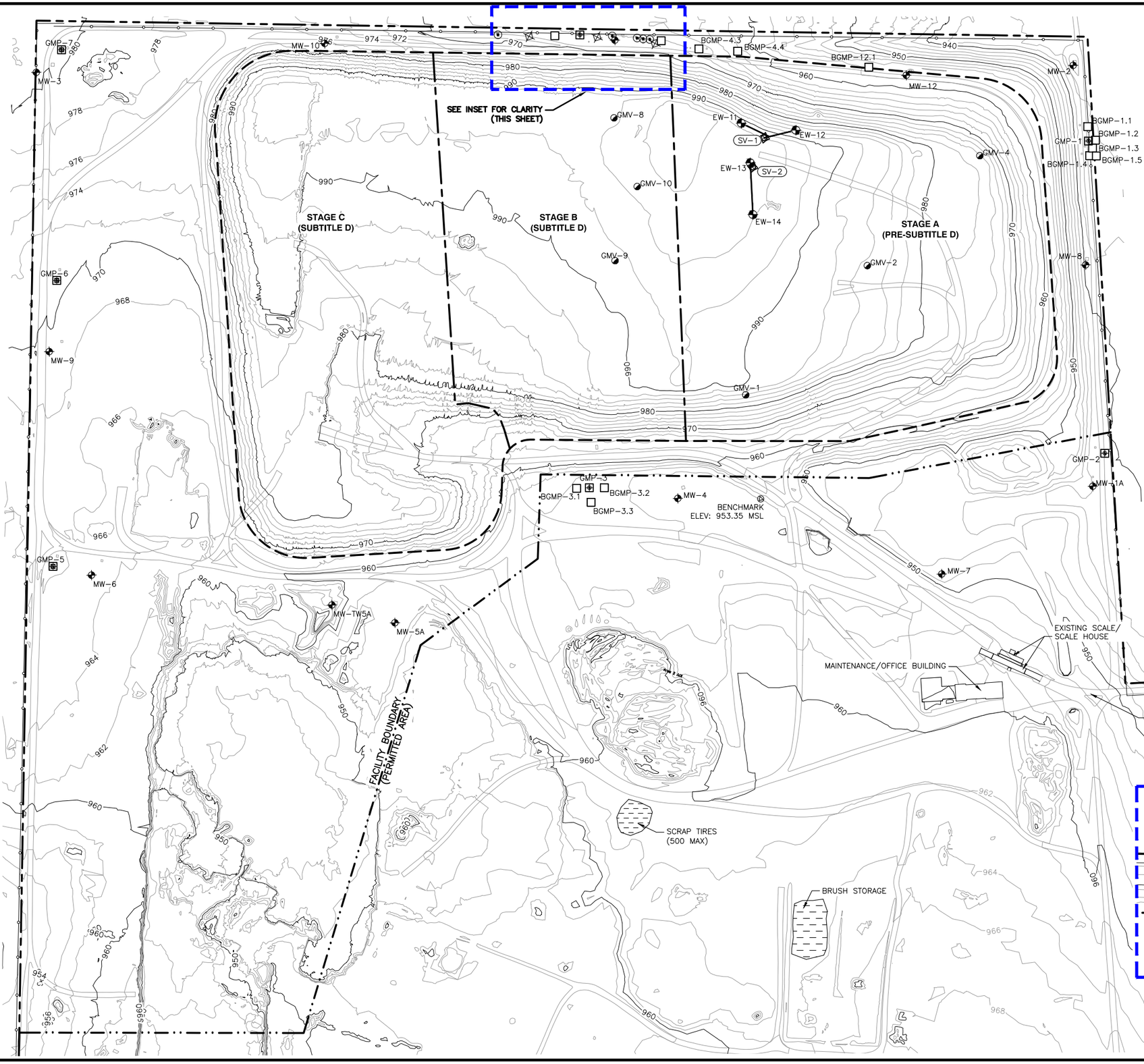
PROJ. NO.	DSN. BY:	DWN. BY:	CHK. BY:	QA/A RVW BY:	APP. BY:
	JRB	JLJ	JRB	RRK	RRK

CADD FILE: 1.2 REGULATORY DISTANCES MAP

DATE: 02/2025

SCALE: AS SHOWN

FIGURE: 1.2



0 100 200
SCALE IN FEET

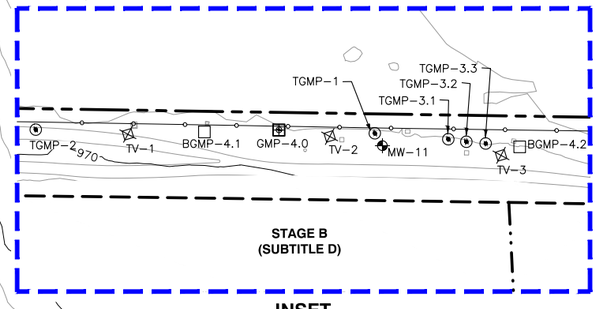
LEGEND

- PROPERTY BOUNDARY
- PERMIT BOUNDARY
- LIMITS OF WASTE (SEE NOTE 2)
- CELL BOUNDARY
- 960 EXISTING CONTOURS (SEE NOTE 1)
- EXISTING FENCE
- MW-2 EXISTING GROUNDWATER MONITORING WELL
- GMV-4 EXISTING GAS MONITORING VENT
- GMP-1 EXISTING GAS MONITORING PROBE
- BGMP-1.2 EXISTING BACKUP GAS MONITORING PROBE
- TGMP-1.2 EXISTING TEMPORARY GAS MONITORING PROBE
- TV-3 EXISTING LFG TEMPORARY VENT
- EW-11 EXISTING LFG EXTRACTION WELL
- EXISTING 6" LATERAL
- SV-1 EXISTING PUSH PIN SOLAR VENT FLARE

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS ARE FROM A SURVEY CONDUCTED ON SEPTEMBER 26,2024 BY DIRKSEN ENGINEERING.
2. LIMIT OF WASTE OBTAINED FROM SECTION F: DRAWING SET, SITE LAYOUT PLAN BY W.H. MULLINS, INCORPORATED.

STATE OF TEXAS
JENNIFER R. BROWN
94685
LICENSED PROFESSIONAL ENGINEER
03/12/25



INSET
1" = 50'

REV	DATE	DESCRIPTION	BY

TEXAS BOARD OF PROFESSIONAL ENGINEERS REG. NO. F-3407

DRAWING TITLE: GAS MONITORING FEATURES LOCATION MAP

PROJECT TITLE: CITY OF UVALDE LANDFILL PERMIT MODIFICATION

CLIENT: CITY OF UVALDE
3774 FM 481
UVALDE, TEXAS 78801

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
1901 CENTRAL DRIVE, SUITE 550, BEDFORD, TX 76021
PH (817) 571-2288 FAX NO. (817) 571-2188

PROJ. NO.	DWN: BY: JLJ	C/A REVIEW BY: RRK
DSN: BY: JRR	CHK: BY: JRR	APP: BY: RRK

CADD FILE: 3.1 GAS MONITORING FEATURES

DATE: 02/2025

SCALE: AS SHOWN

FIGURE: **3.1**

3/11/2025 12:05 PM G:\UVALDE\162240670.00 - TYPE I MAJOR PERMIT DWGS_ART 6\Phase\3.1 Gas Monitoring Features

TABLES

	Table 1.0 MSWLF Soils Map Adapted from Uvalde County, Texas (Source: Natural Resource Conservation Service)					
	Hindes&Yolgo soils, undulating (HYB)					
Map Unit Characteristics	Hindes	Yologo	Knippa (KnA)	MoA Montell Clay	OLB Olmos	UvA Uvalde Clay
Acres/% in Area of Interest (AOI)	70.7ac/56.5%		7ac/5.6%	16.1ac/12.9%	26.9ac/21.5%	1.4ac/2.4%
Parent material	Gravelly, loamy alluvium	NR	Calcareous clayey alluvium	Calcareous clayey alluvium	Calcareous loamy alluvium	Calcareous alluvium
Typical profile						
H1 or Ap/A	O-8 inches gravelly sandy clay loam	0- 5" gravely loam	H1 - 0 to 18 inches: clay	Ap - 0 to 8 inches: clay	H1 - 0 to 13 inches: very gravelly loam	A - 0 to 17 inches: clay loam
H2 or Bnss	8-31 very gravely clay	5-12" very gravelly clay loam	H2 - 18 to 35 inches: clay	Bnss - 8 to 32 inches: clay	H2 - 13 to 14 inches: cemented material	Bk1 - 17 to 34 inches: clay loam
H3 or Bknss	21-60 clay loam	12-14" Cemented material	H3 - 35 to 60 inches: clay loam	Bknss - 32 to 58 inches: clay	H3 - 14 to 26 inches: very gravelly loam	Bk2 - 34 to 50 inches: clay loam
H4 or Bkny	Not reported	H4: 14 to 16"	Not reported	Bkny: 58 to 80 inches: clay	H4 - 26 to 60 inches: gravelly loam	Bk3 - 50 to 80 inches: silty clay loam
Properties and qualities						
Slope: 1 to 8 percent	1-8 %	1-8%	0-1%	0-1%	1-8%	0-1%
Depth to restrictive feature	>80 inches	>80"	>80"	>80"	10 to 20" to petrocalcic	>80"
Runoff Class	NR	NR	NR	High		Low
Natural drainage class	Well drained	well drained	well drained	Moderatelly well drained	Well drained	Well Drained
Capacity to transmit water (Ksat)	Moderately high	Mod low to Mod High	Moderately high	Mod low to Mod High	Very low	Mod High to high
Available water storage in profile	Low	very low	High	Moderate		
Interpretive groups						
Hydrologic Soil Group:	C	D	C	D	D	C
Hydric soil	No	No	No	no	No	No

NR= not rated

TABLE 2 .0

GAS MONITORING PROBE COMPLETION DETAILS

LANDFILL GAS MANAGEMENT PLAN

Probe No.	Installation Date**	TOC (msl)	BOC (msl)	Probe Depth (fbgs)	Screen Interval (ft)	Notes
GMP-1*	1986	N/A	N/A	19.9	N/A	
GMP-2*	1986	N/A	N/A	19.3	N/A	
GMP-3*	2002	N/A	N/A	39.8	N/A	
GMP-4*	2002	N/A	N/A	50	N/A	Converted to a vent on 06/08/18
GMP-5*	2011	N/A	N/A	36.7	N/A	
GMP-6*	2011	N/A	N/A	39.8	N/A	
GMP-7*	2011	N/A	N/A	40	N/A	
BGMP-1.1*	2004	N/A	N/A	39.3	N/A	
BGMP-1.2*	2004	N/A	N/A	37.9	N/A	
BGMP-1.3*	2004	N/A	N/A	39.7	N/A	
BGMP-1.4*	2004	N/A	N/A	40	N/A	
BGMP-1.5*	2004	N/A	N/A	38.8	N/A	
BGMP-3.1*	2004	N/A	N/A	39.9	N/A	
BGMP-3.2*	2004	N/A	N/A	34.5	N/A	
BGMP-3.3*	2004	N/A	N/A	38.9	N/A	
BGMP-4.1*	2009	N/A	N/A	26	N/A	
BGMP-4.2*	2009	N/A	N/A	20	N/A	Converted to a vent on 06/08/18
BGMP-4.3*	2009	N/A	N/A	38	N/A	Converted to a vent on 06/08/18
BGMP-4.4*	2009	N/A	N/A	62	N/A	
BGMP-12.1*	2009	N/A	N/A	47.4	N/A	
TGMP-1	5/2/18	967.00	947.00	20	10 - 20	Refusal hit at 20' (conglomerate)
TGMP-2	5/2/18	966.00	946.00	20	10 - 20	Refusal hit at 20' (conglomerate)
TGMP-3.1	5/3/18	966.00	926.00	40	20 - 40	Drilled with air rotary. Completed in Anacacho
TGMP-3.2	5/3/18	966.00	936.00	30	25 - 30	Drilled using air rotary. Completed in Uvalde Gravel
TGMP-3.3	5/3/18	966.00	958.00	8	0 - 5	Completed in Uvalde Gravel

*Probe/vent depth was field measured due to limited available information

**When exact dates are unavailable, approximate year is provided

GMP= Gas Monitoring Probe

BGMP= Backup Gas Monitoring Probe

TGMP= Temporary Gas Monitoring Probe

N/A= Not Available

TABLE 3 .0

GAS EXTRACTION WELL/VENT COMPLETION DETAILS

LANDFILL GAS MANAGEMENT PLAN

Well No.	Installation Date	TOC (msl)	BOC (msl)	Probe Depth (fbgs)	Screen Interval (ft)	Notes
GMV-1*	2004	N/A	N/A	45	N/A	
GMV-2*	2004	N/A	N/A	33	N/A	
GMV-3*	2004	N/A	N/A	23	N/A	Abandoned on 08/01/23
GMV-4*	2004	N/A	N/A	50	N/A	
GMV-5*	2009	N/A	N/A	24	N/A	Abandoned on 07/31/23
GMV-6*	2009	N/A	N/A	57	N/A	Abandoned on 08/05/23
GV-7*	7/29/18	N/A	N/A	50	N/A	Abandoned on 08/04/23
GV-7a*	7/29/18	N/A	N/A	57	N/A	Abandoned on 08/04/23
GV-8*	7/29/18	N/A	N/A	50	N/A	
GV-9*	7/29/18	N/A	N/A	60	N/A	
GV-10*	7/29/18	N/A	N/A	59	N/A	
TV-1*	5/16/18	N/A	N/A	15	N/A	
TV-2*	5/16/18	N/A	N/A	13	N/A	
TV-3*	5/16/18	N/A	N/A	26	N/A	
EW-11	45139	992	952	40	20 - 40	
EW-12	45139	986.4	947.4	39	20 - 39	
EW-13	45139	994.7	947.7	47	20 - 47	
EW-14	45140	994	947	47	20 - 47	

*Probe/vent depth was field measured due to limited available information

GMV= Gas Monitoring Vent

GV= Gas Vent

TV= Temporary Vent

EW= Extraction Well

Appendix A

Methane Monitoring and Recording Form

Methane Monitoring and Recording Form

S11100

Quarter / Year: _____ Weather: _____

Instrument/Make: Model:

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4				
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance Building				
North Wall				
East Wall				
South Wall				
West Wall				
BGMP				
TGMP				
TV				

Reading recorded by: Date:

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

Appendix B

Landfill Gas Remediation Plans

Landfill Gas Remediation Plan

Dated May 8, 2018

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 5, 2018

Mr. Vince DiPiazza
Uvalde City Manager
City of Uvalde
P.O. Box 799
Uvalde, Texas 78802

Re: City of Uvalde Landfill – Uvalde County
Municipal Solid Waste (MSW) – Permit No. 1725
Landfill Gas Remediation Plan (LGRP)
Tracking No. 22850073; RN102803921/CN600648455

Dear Mr. DiPiazza:

The MSW Permits Section has received a Landfill Gas Remediation Plan (LGRP). The LGRP is dated May 8, 2018 and was prepared by Steve Forbes, PhD, P.E., P.G., with Forbes Environmental Engineering & Associates on your behalf. Thank you for your submittal. The LGRP documents gas levels in GMP-4 that were above the action level and indicates that notification was performed to Texas Commission of Environmental Quality (TCEQ) central and regional offices, city and county officials, emergency response, and landowners within 1,000 feet of GMP-4. Daily monitoring was being conducted at GMP-4 and three other probes in its vicinity. Temporary gas investigation probes were installed to identify the breadth of the perimeter where gas action levels were being exceeded.

The LGRP includes a three-phased approach. In Phase 1, three two-inch vents were to be installed on a 200-foot spacing, screened in the upper 10 feet of the Uvalde Gravel. Phase 2, to be implemented if Phase 1 is ineffective, includes installation of two six-inch vents in the Stage B waste, screened to one foot above the bottom liner. Phase 3, to be implemented if Phases 1 and 2 are ineffective, includes installation of a passive diversion trench between the landfill and remediation probes installed in Phase 1. Once landfill gas exceedances have been addressed, a notice modification will be submitted in accordance with 30 TAC §305.70(k)(3).

I received an email from Stephen Forbes on August 2, 2018. This email notes that all daily readings in all remediation area probes and vents are decreasing, but concentrations in the temporary probes are decreasing at a much slower rate and the area affected by landfill gas has diminished by approximately 50%. The email indicates that one or two four-inch vents will be installed in the center of the area affected by landfill gas and two vents of four to six inches will be installed in both Stage A and B to further reduce landfill gas concentrations at the perimeter of the facility.

If you have any questions concerning this letter, please contact me at (512) 239-4568, or at the address on our letterhead, please include mail code MC 124.

Sincerely,

Steve Odil

Steve Odil, P.E.
Municipal Solid Waste Permits Section
Waste Permits Division

SPO/arm

cc: Mr. Stephen Forbes, Ph.D., P.E., P.G., Forbes Environmental Engineering, San Antonio

FORBES
ENVIRONMENTAL
ENGINEERING & ASSOCIATES

11839 Parliament St., #813
San Antonio, Texas 78216
Phone (210)323-7313

TO: Mr. Steve Odil, P.E.
Waste Permit Division, MSW Permits Section
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

DATE: May 8, 2018

CC: Mr. Juan Zamora – City of Uvalde, Director of Public Works
Mr. Cameron Diaz – TCEQ Region 13

SUBJECT: Uvalde Landfill Gas Remediation Plan (LGRP)

The attached LGRP provides a remediation plan to address the recent methane gas exceedance (i.e. above 5% methane gas) reported by City landfill staff. The exceedance was reported in GMP-4 during the quarterly gas monitoring event conducted on March 8, 2018 at the City of Uvalde Municipal Solid Waste Landfill facility.

The attached provides the initial actions taken (EAP) and includes the landfill gas remediation plan (LGRP) to address the landfill gas exceedance in accordance with the facilities approved Permit 1725 Landfill Gas Management Plan (LGMP). The LGRP will be submitted to the TCEQ on May 8, 2018 in accordance 30 TAC §330.371 (c)(3). (Landfill Gas Management).

The following is a summary of the actions conducted after the date of the initial reading in GMP-4 that exceeded the maximum allowable methane gas limit:

- Initiated steps to ensure protection of human health by restricting landfill operations in the vicinity of GMP-4, and staff was informed of potential risks of and warned against smoking in area. Public access to the landfill is restricted to disposal area.

- Notified the TCEQ central and regional offices as well as city and county officials, emergency response, and adjacent landowners within 1000 feet of GMP-4.

- Conducted daily gas monitoring in GMP-4, BGMP-4.1 through BGMP-4.4 and MW-11, and reported weekly findings to TCEQ central and regional offices.

- Installed temporary gas investigations probes to identify the potential migration pathway and strata. The initial findings identified the apparent breath of gas concentrations ranging from west of TGMP-2 to east of BGMP-4.4 approximately 600 feet, contained within the upper permeable gravel bed approximately 3-8 feet below surface within the Uvalde Gravel formation. Based on these findings prepared landfill gas remediation plan, as outlined below; figures are included with report.

Landfill Gas Remediation Plan Summary

The LGRP strategy is a three-phased approach building upon the results obtained during the previous phases to progressively and effectively, control and mitigate offsite migration in a practical and expedient

time frame. Because of the proximity of GMP-4 to the property line, Phase 1.0 focus on controlling gas migration before it reaches the probes as soon as practical. It is anticipated that Phase 1.0 will be sufficient, but if not the adjustments will be made to increase efficiency (e.g. turbine ventilators) and/or initiate subsequent Phases 2 and/or 3 to achieve objectives. If all three phases are not adequate, more aggressive alternatives will be addressed and discussed with TCEQ.

- Phase 1.0: Install 3 2-inch vents on 200 foot spacing, screened within the upper 10 ft of the Uvalde Gravel in the relatively uniform gravel in which the current gas exceedances appear to occur. The screen zone with a 10' riser above the surface will divert and dissipate the gas before reaches primary remediation monitoring probes (GMP-4, BGMP-4.1through BGMP-4.4, and TGMP-1, TGMP-2 and TGMP-3.1 through TGMP-3.3).
  - Monitor remediation monitoring probes on a weekly basis for a period of one (1) month to determine response and trend of gas concentrations with respect to the 5% CH_4 limit.
    - If CH_4 concentration exhibits a decreasing trend, continue monitoring on a monthly basis until concentrations are less than the CH_4 limit for at least 3 consecutive months, and then return to normal gas monitoring quarterly monitoring and reporting schedule. Monthly reports to TCEQ will be submitted until return to quarterly monitoring period.
    - If gas readings in monitoring probes do not exhibit a decreasing trend within a month after installing vents or a stabilized trend does not reach sustained CH_4 concentration limits within a 3-month period, Phase 2.0 will be initiated.
- Phase 2.0: Install 2 6-inch PVC vents in Stage B waste screened to one foot above bottom liner. This has been the practice at the Site in the past, including previous exceedance in GMP-4 in 2009. Gas always decreased, but over an extended period until the current exceedance.
  - Monitor remediation monitoring probes on same schedule as Phase 1.0.
- Phase 3: Install a passive diversion trench between the landfill and remediation monitoring probes connected to Phase 1.0 vents. The length and depth of the trench will be determined based on findings of Phase 1 and 2 and bar-hole test boring. The trench design will be filled with gravel inset with 2-inch screened probe connected to the existing vents. The gravel will be capped with bentonite barrier above gravel, with upgradient side lined with geosynthetic liner. Details and schedule will be discussed with TCEQ at the time.
- A permit Modification will be submitted with public notice in accordance with 30 TAC §330.371 (k)(3) upon completion of implementation LGRP.

Please contact me at (210) 323-7313, if you have any questions or need additional information. Thank you for your assistance and consideration.

Stephen Forbes, PhD, P.E. P.G.

LANDFILL GAS REMEDIATION PLAN
FOR GMP-4

CITY OF UVALDE
MUNICIPAL SOLID WASTE LANDFILL
PERMIT NO. 1725

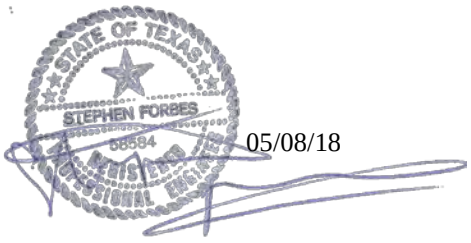
Prepared for:

City of Uvalde
Uvalde, Texas

Prepared by:

Forbes Environmental Engineering
San Antonio, Texas 78216

May 2018



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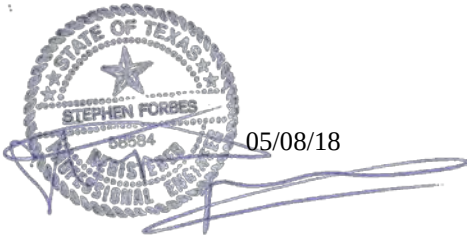


LANDFILL GAS REMEDIATION PLAN FOR GMP-4

1.0 Gas Release Description

A landfill gas exceedance (i.e. methane gas concentration greater than 5% by volume) was reported in gas monitoring probe GMP-4 during the quarterly gas monitoring event conducted on March 8, 2018. The Site is located in a sparely populated area with no residents or habitable buildings within 1000 feet of the property boundaries. See Figure 1.0. GMP-4 is located on the north side of the currently permitted landfill, within a few feet of the northern property line and permit boundary (Refer to Figure 2.0 which shows the Existing Site Gas Monitoring System). No other exceedances were reported in any of the gas monitoring probes along the south, east and west property lines during this quarterly gas monitoring event, nor in the Site Operations building and Scale house.

1.1 History

Two gas exceedance events have occurred at the landfill since placed in operations. The first occurred in 2004 and was reported in GMP-1 and GMP-3. Investigative probes indicated the releases were local to the respective probes and as suggested by the TCEQ, four vents were installed in Stage A to release pressure in the storage cells. Once stabilized below LEL, no further gas exceedance occurred until 2009 reported in GMP-4. Once again vents were installed, one in Stage A and the other in Stage B. While the Stage B vent was not very productive, the exceedances receded to compliance levels and methane has not been reported above 5% by volume since, until the recent occurrence.

2.0 Exceedance Action Plan (EAP)

Due to the recent methane gas exceedance reported in GMP-4, an exceedance action plan (EAP) was implemented in accordance with the current permit's recently revised Landfill Gas Management Plan (LGMP) approved in February of 2017. The EAP response actions to date include:

- Taking all the necessary steps to ensure protection of human health, such as:
    - Post warning signs at GMP-4
    - Ensure GMP-4 secure

- Prevent public access to GMP-4 vicinity
- Restrict landfill equipment traffic within GMP-4 vicinity
- Implement standard health and safety precautions within close proximity of GMP-4

— Immediately notifying the TCEQ central and regional offices, local and county officials, emergency response officials and adjacent landowners within 1000 feet of GMP-4. There are no residences within 1000 feet of the Site. See Appendix A.1.

— Within seven days of detection (3/15/18), all the information regarding the initial reading (concentration of methane gas, date, location) along with a description of the response actions to protect human health was placed in the SOR, as well as all subsequent information generated to date.

— In order to determine the nature and extent of the methane gas migration and to ensure protection of human health, GMP-4 and existing BGMP (GMP-4.1 through GMP-4.4) and MW-11 (over a distance of approximately 380 feet) were monitored on a weekly basis and monitoring results were provided to the TCEQ.

— Three temporary gas monitoring probes, including one cluster of probes were completed at three different depths from the nominal bottom of the landfill to the surface. See below.

— Within 60 days of detection, a remediation plan to address the methane gas exceedances should be implemented, and a copy of the plan should be placed in the SOR. In addition, by submittal of this LGRP, notify the TCEQ that the remediation plan is being implemented and provide a copy of the plan.

Table 1.0 summarizes the gas monitoring results collected during the initial exceedance action plan (EAP) and LGRP. Landfill gas was monitored in GMP-4 and corresponding BGMP (BGMP-4.1-4.4), installed in 2010 to depths equivalent to bottom of the Stage B landfill liner (935 feet msl or 42 fbgs) and screened from TD to 10’ bentonite seal below the surface. Table 2.0 is compilation of the EAP assessment probes completion details.

Since the initial reported exceedance, landfill gas readings in GMP-4 have not been consistent, ranging from 0 to 47%. No methane gas has been detected in BGMP-4.1, which is approximately 15 feet to the west of GMP-4, nor was gas initially reported in BGMP-4.2, 4.3, and 4.4. However, subsequent readings during installation of EAP probe did report gas exceedances in

BGMP-4.2, and BGMP-4.4. This may have been due to disturbances caused by drilling, which could be indicative to the potential migration paths and rates. Gas readings were taken in monitoring wells MW-10, MW-11, and MW-12. Exceedances were only reported in MW-11, and therefore MW-10 and MW-12 were dropped from monitoring schedule, although BPMP-12.1 was maintained as furthest study area data point to the east, since it is consistently reporting CH_4 concentrations below the 5% CH_4 limit.

Due to lack of availability of drilling rigs, initial site field gas evaluation survey was conducted on May 2, 2018, using Direct Push Technology (DPT) to determine the extent of a potential gas release as well as to mitigate the potential for gas migration in the vicinity of gas monitoring probe GMP-4.

The intent of installation of temporary gas monitoring probes was to set the probes at 40± feet depth equivalent to waste depth in Stage B, and a three-GMP cluster with each probe completed at different depths to identify depth of measured gas. However, the DPT rig reached point of refusal (POF) at 17.5 feet (TGMP-1) and 23 feet (TGMP-2). These boring were converted to temporary gas monitoring probes. Fortunately, the drilling company was able to make a rotary rig available to install the cluster probes to 40, 30, and 8 feet (TGMP-3.1, TGMP-3.2, and TGMP-3.3, respectively). Five foot PVC screens were placed at the different elevations. These temporary probes in conjunction with the existing GMP and BGMP provided sufficient data points to identify the general delineation of the gas migration in the vicinity of the property line from TGMP-1 to BGMP-4.4. Gas was reported at the upper elevation (3-8 fbgs), but was not reported at the lower depths. Figure 2.0 shows the Existing Site Gas Monitoring System and indicates the general ongoing EAP/LGRP study area, while Figure 3.0 focuses on the assessment area. Figure 4.0 shows the typical gas monitoring probe design details. Table 3.0 tabulates the TGPM completion details.

The gas readings in these primary monitoring probes were measured over two days during temporary installation as tabulated in Table 1.0. While these readings are sufficient to provide relative concentrations for qualitative comparison, continued monitoring over time is necessary to establish a gas migration trend and additional temporary GMP might be necessary depending

on results and final remediation efforts as summarized in the Landfill Gas Remediation Plan (LGRP) outlined below.

2.1 Initial EAP Evaluation Findings

Based on the EAP gas readings shown in Table 1.0, it appears that the gas migration above 5% CH_4 is not constant nor migrates in a predictable linear direction, but is characteristic of gas flow as it meanders about following the paths of least resistance subject to the permeability of medium.

Based on the landfill permit and confirmed by recent ongoing geologic studies, the Uvalde Gravel is the upper most formation overlying the Site. For the most part it does not retain water, although there are isolated perched zones and the shallow depths are generally silty gravel to depths of 15 to 20 feet, which provide paths for migration. In general, the Uvalde Gravel lithology is comprised of an irregular matrix of sedimentary crossbedding ranging from pebble to boulder size, well to poorly sorted gravels, which in many places are cemented and difficult to drill (See Figure 4.0 and 5.0). The field boring cuttings logged during field survey are typical of the Uvalde Gravel. Due to the hardness of the formation, the boring had to be drilled with air to reach target depth at the bottom of Stage B landfill.

Figure 5.0 is a draft cross-section of the geology prepared for an ongoing major permit amendment application showing general lithology and projected landfill bottom from MW-3 in the northwest corner to MW-2 in the northeast corner along the north property line. Stage A was permitted prior to Subtitle D liner requirements, while Stages B and C were permitted in accordance with Subtitle D liner requirements. Stages A and B are separated by a berm with a geosynthetic clay liner (GCL) on the Stage B side, but it is not known if GCL was used on the Stage A side. For the most part all the Stages are completed in the Uvalde Gravel, underlain by the Anacacho, which is nearly 70 feet of essentially impermeable clay. Stage B provides an unlikely pathway for gas migration because of the geosynthetic liner. On the other hand, Stage A, completed without an HDPE liner is a possible source, especially at the upper elevations of the Uvalde Gravel exposed to narrow lens of poorly sorted pebble gravel, such as that encountered in the temporary gas monitoring borings.

3.0 Landfill Gas Remediation Plan

Consistent with 30 TAC §330.371(c)(3), a remediation plan (LGRP) to address the methane gas release should be implemented within 60 days of detection and the TCEQ duly notified and a copy placed in the SOR. Initially, the EAP was implemented as a precursor to the LGRP and is essentially the preliminary assessment phase of the LGRP. Using the findings determined by the EAP, a remediation strategy was identified.

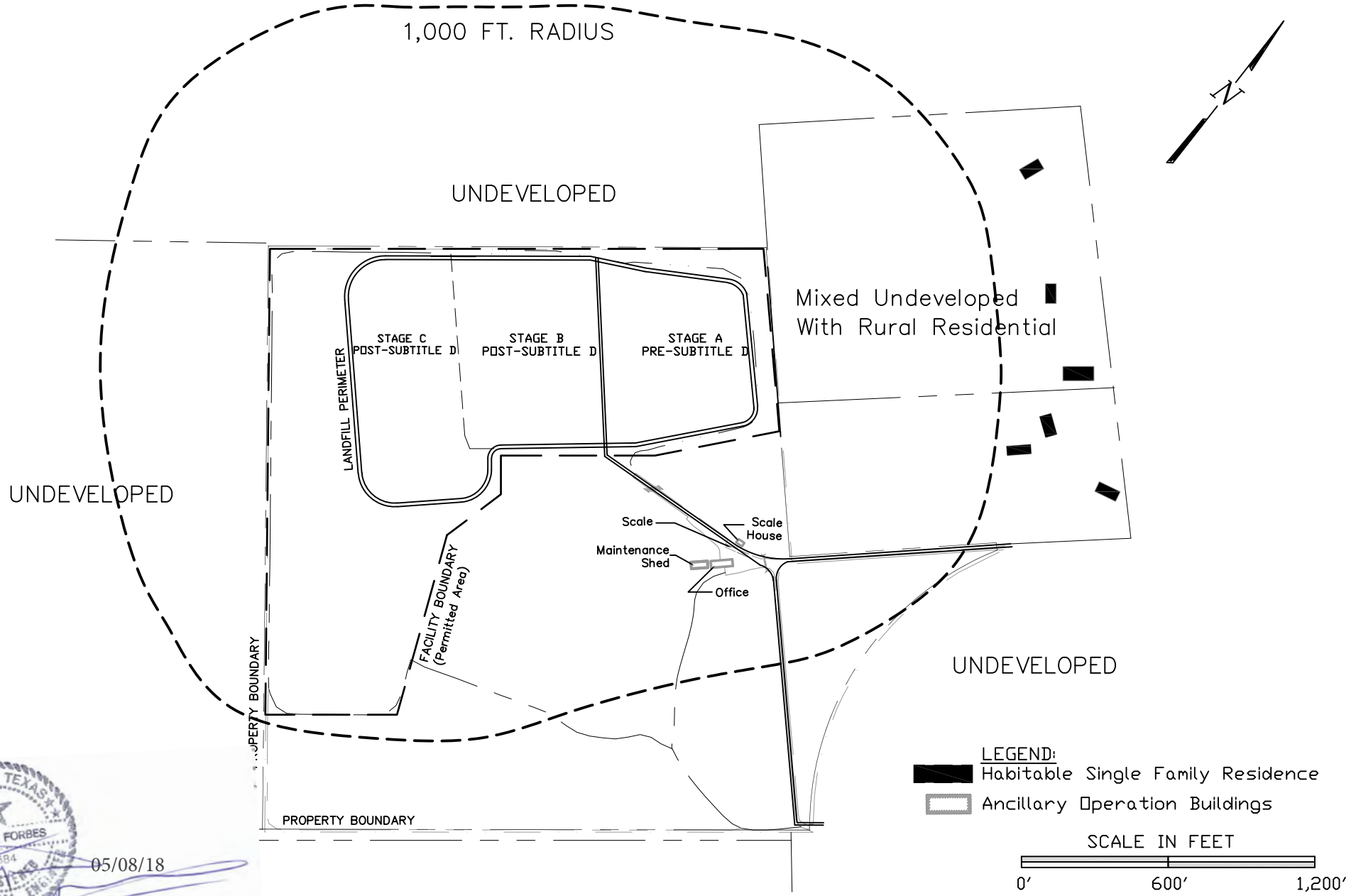
The LGRP is a three-phased approach building upon the results obtained during the previous phase to progressively and effectively, control and prevent offsite migration in a practical and expedient time frame. Because of the proximity of GMP-4 to the property line, Phase 1.0 focus on controlling gas migration before it reaches the probes as soon as practical.

It is anticipated that Phase 1.0 will be sufficient, due to the relatively loosely packed gravel strata from approximately 3-8 feet below the surface. However, if this not the case, the subsequent Phases 2 and/or 3 will be implemented to achieve objectives. Otherwise, more aggressive alternatives will be addressed and discussed with the TCEQ.

- Phase 1.0: Install 3 2-inch vents on approximate 200 foot spacing screened in the upper Uvalde Gravel with a 10-ft riser to intercept and divert the gas before it reaches primary remediation monitoring probes (GMP-4, BGMP-4.1 through BGMP-4.4, and TGMP-1 through TBMP-3.3). Figure 6.0 shows the general passive Uvalde Gravel vent completion and Figure 3.0 shows the locations. (Spacing may be adjusted in the field depending on drilling and gas concentrations.)
  - Monitor remediation monitoring probes on a weekly basis for a period of 1 month to determine response and trend of gas concentrations with respect to the 5% CH_4 limit.
    - If concentration exhibits a decreasing trend, continue monitoring monthly until concentrations are less than the CH_4 limit for at least 3 consecutive months, and then return to normal gas quarterly monitoring and reporting schedule. Monthly reports to the TCEQ will be submitted until return to quarterly monitoring period.
    - If initial readings in GMP do not exhibit a decreasing trend within a month after installing vents or stabilized trend does not reach sustained CH_4 concentration

limits within a 3-month period, additional vents may be installed and/or Phase 2.0 will be initiated.

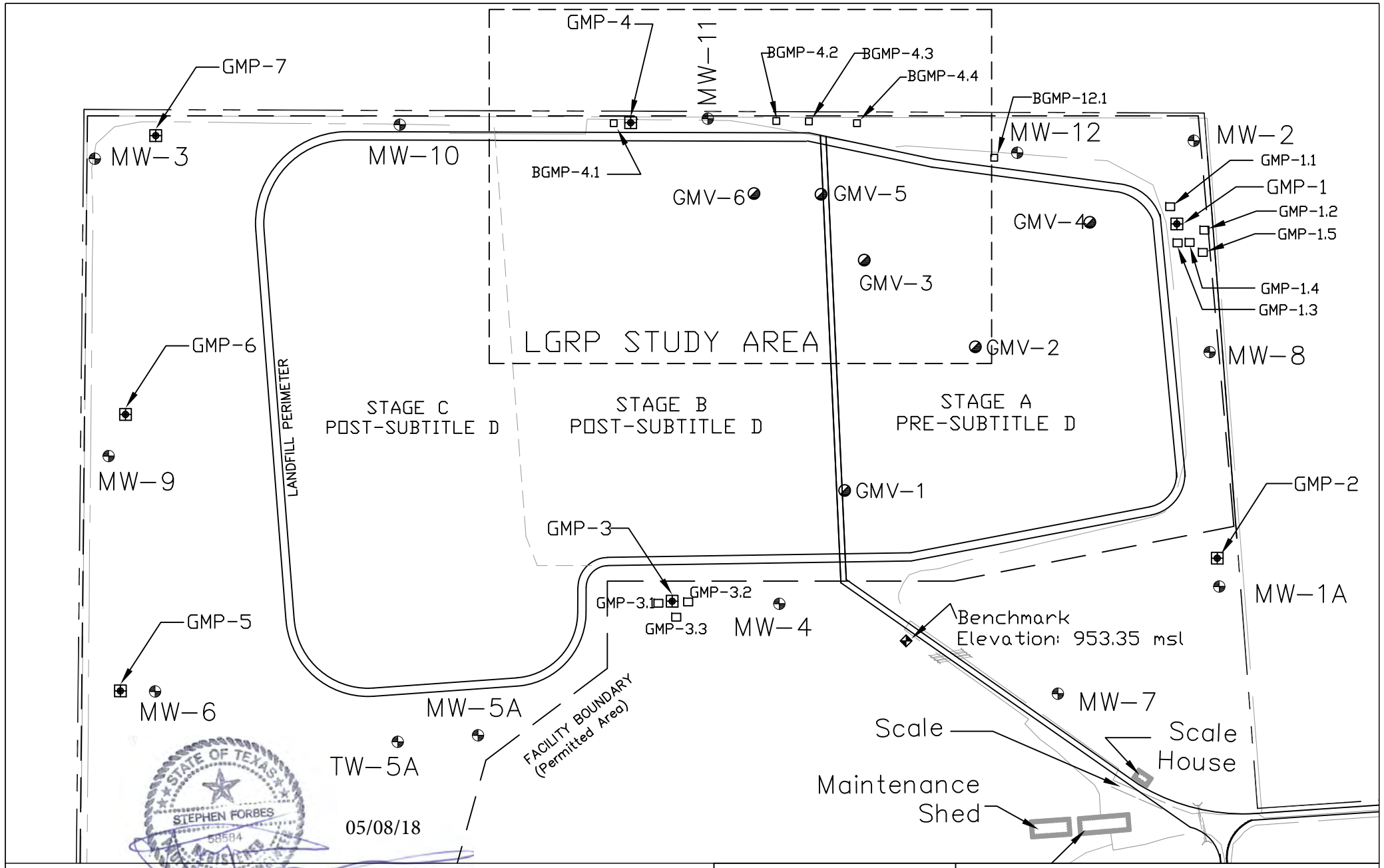
- Phase 2.0: Install 2 6-inch PVC vents in Stage B waste screened to one foot above bottom liner. This has been the practice at the Site in the past, including previous exceedance in GMP-4 back in 2009. Gas concentration always decreased, but over an extended period. The vents will be placed in the northwest corner and center of Stage B. Figure 7.0 shows the typical landfill gas vent completion. The locations are shown Figure 3.0—if necessary.
    - Monitor remediation monitoring probes on same schedule as Phase 1.0.
- Phase 3.0: Install a passive diversion trench upgradient of remediation monitoring probes tied into Phase 1.0 vents. If needed, the trench design will be typical of passive diversion trenches filled with gravel capped with bentonite barrier above gravel, with north side lined with geosynthetic barrier line. The location, length and depth of the trench will be determined based on findings of Phase 1 and 2 and bar-hole test boring. Details and schedule will be discussed with the TCEQ at the time.
- A Permit Modification will be submitted with public notice in accordance with 30 TAC §330.371 (k)(3) upon completion of implementation LGRP.



FORBES ENVIRONMENTAL ENGINEERING

LANDFILL 1,000 FT RADIUS
UVALDE LANDFILL
UVALDE, TEXAS

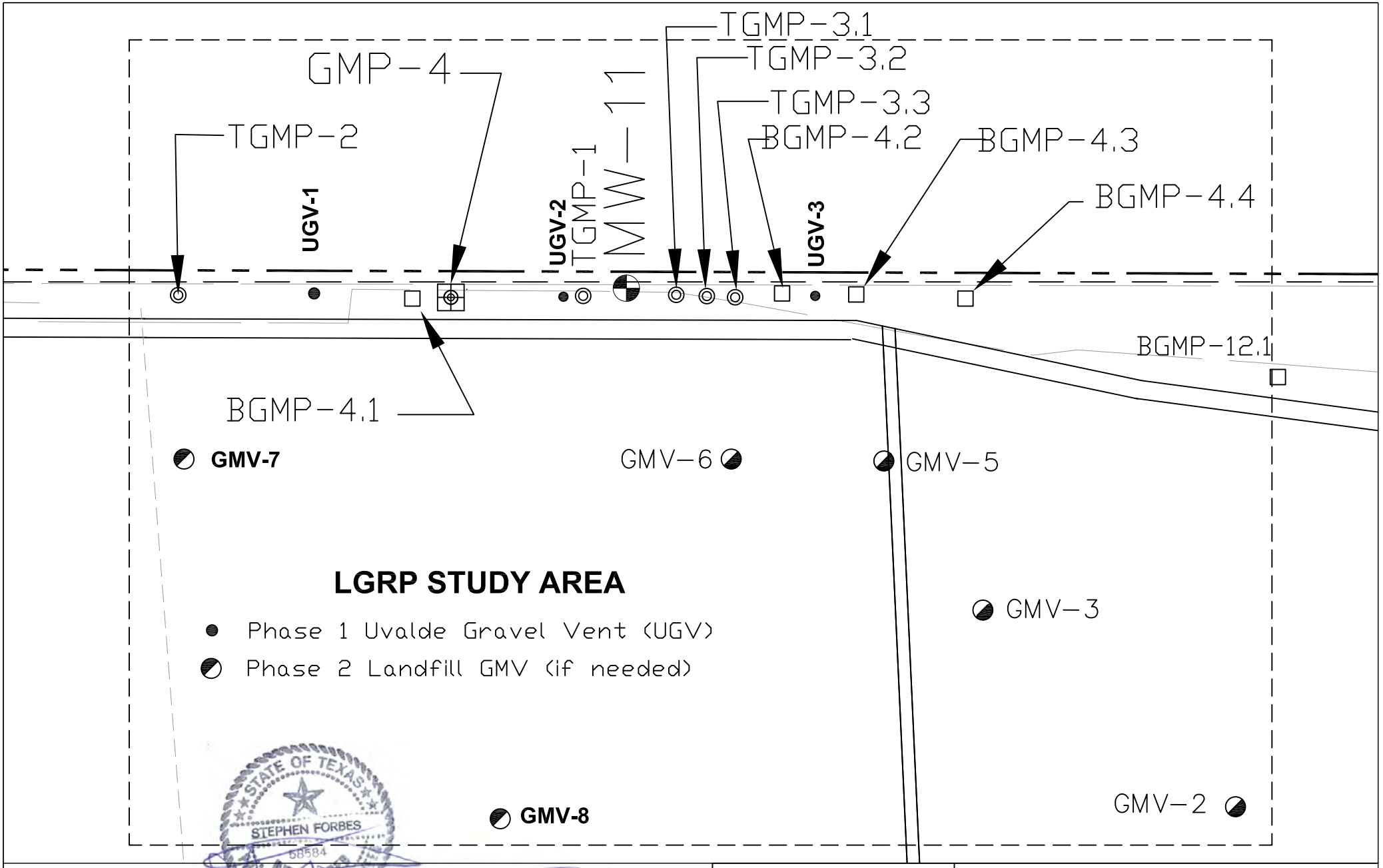
FIGURE 1.0



FORBES ENVIRONMENTAL ENGINEERING

EXISTING SITE GAS MONITORING SYSTEM
UVALDE LANDFILL
UVALDE, TEXAS

FIGURE 2.0



STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED
PROFESSIONAL ENGINEER
05/08/18

LEGEND:

- Monitor Wells (MW)
- Gas Monitoring Probes (GMP)
- Existing Gas Monitoring Vents (GMV)
- Backup Gas Monitoring Probes (BGMP)
- Temporary Gas Monitoring Probes (TGMP) (Installed May 2 & 3, 2018)

TGMP Locations approximate

N

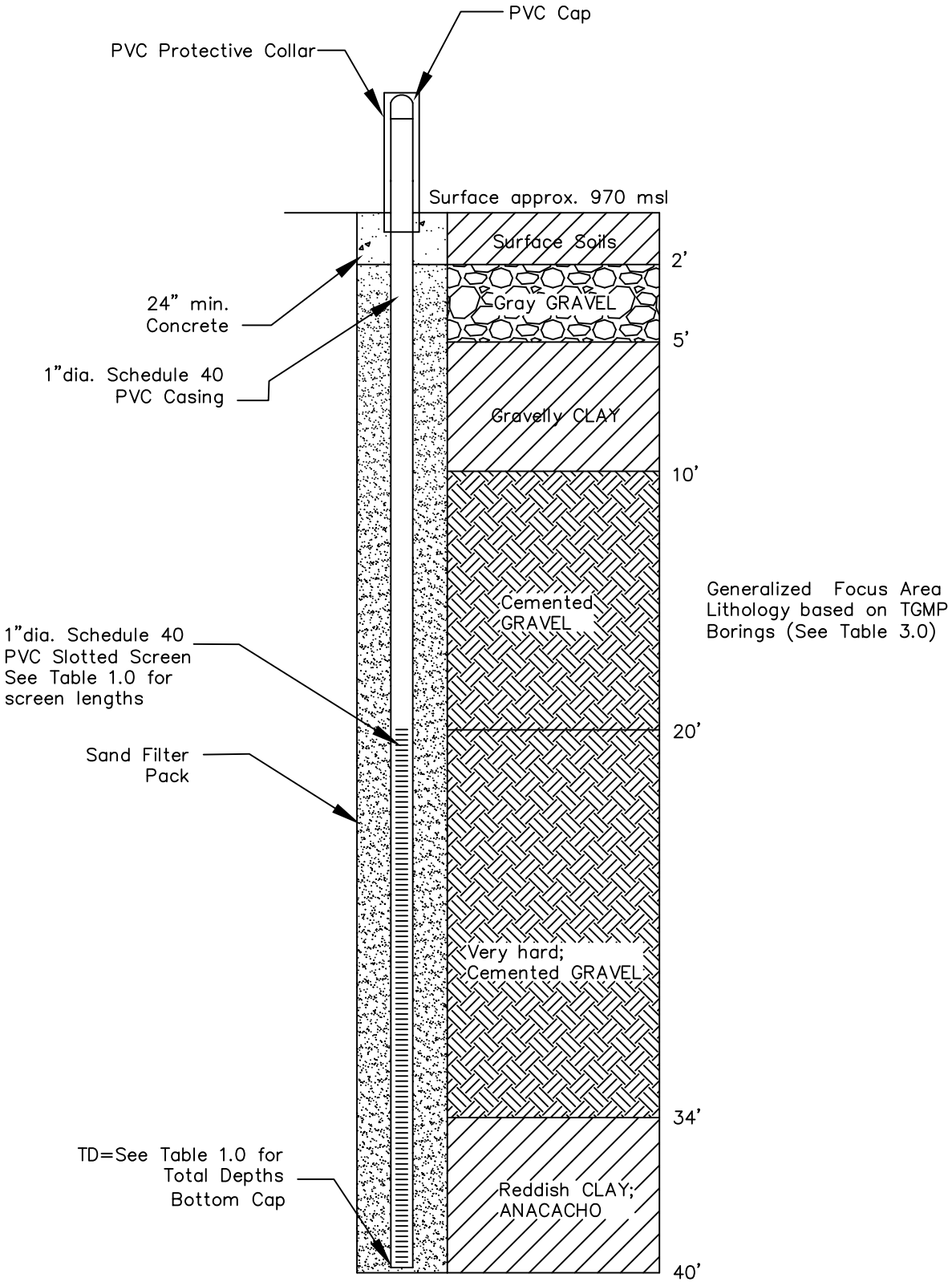
SCALE IN FEET

0′ 120′ 240′

FORBES ENVIRONMENTAL ENGINEERING

EAP/LGMP STUDY AREA
UVALDE LANDFILL
UVALDE, TEXAS

FIGURE 3.0



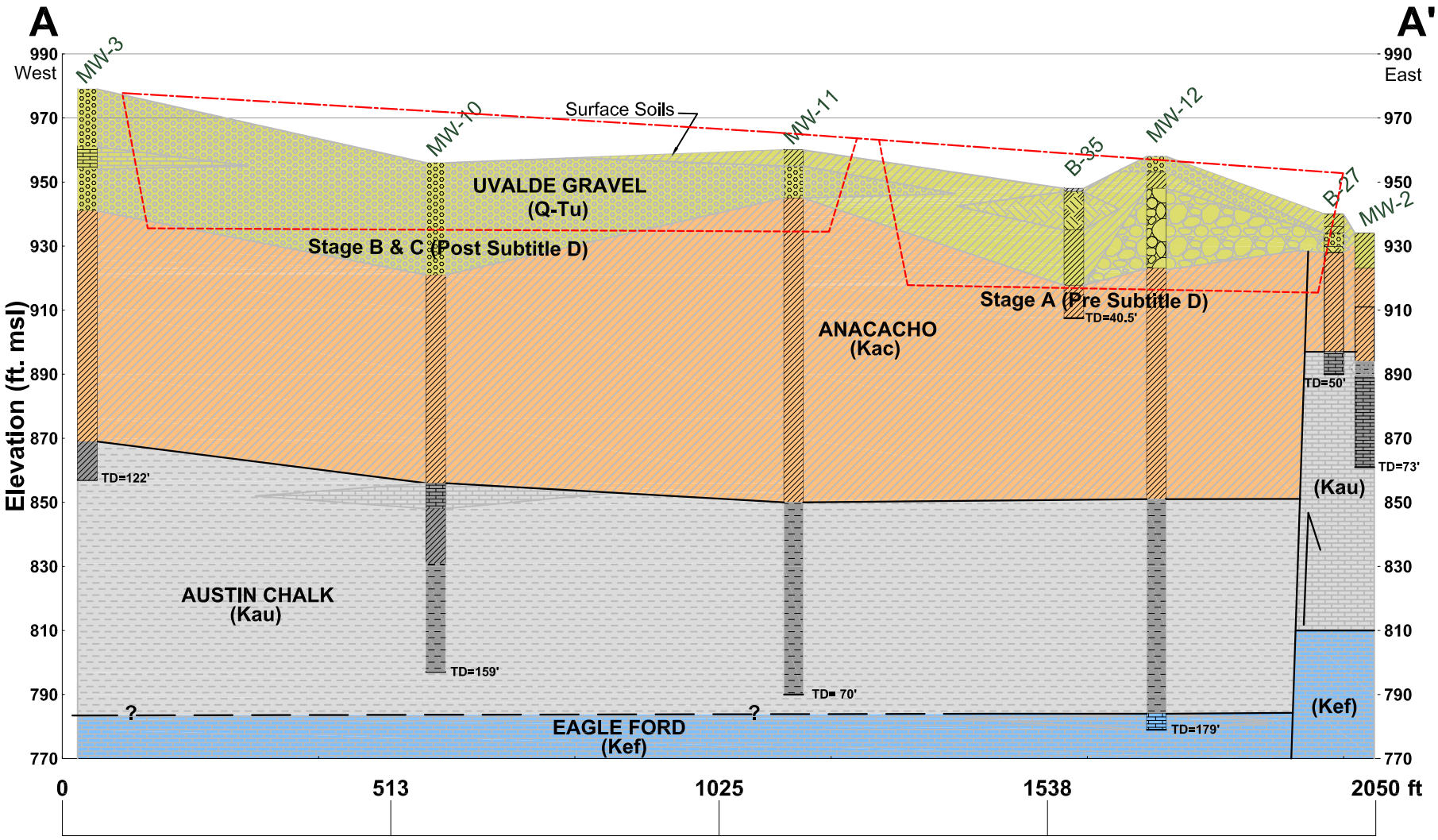
STATE OF TEXAS
STEPHEN FORBES
58594
REGISTERED
PROFESSIONAL ENGINEER

05/08/18

FORBES ENVIRONMENTAL ENGINEERING

TYPICAL EAP TGMP DESIGN
CITY OF UVALDE LANDFILL
UVALDE, TEXAS

FIGURE 4.0



LITHOLOGY

Caliche	Gravel	Shale
Clay	Marl	
Limestone	Conglomerate	

SCALE

0 200 400

Vertical Exaggeration = 5x

Perimeter Berm

Projected Landfill Bottom
(from construction drawings)

STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED
PROFESSIONAL ENGINEER

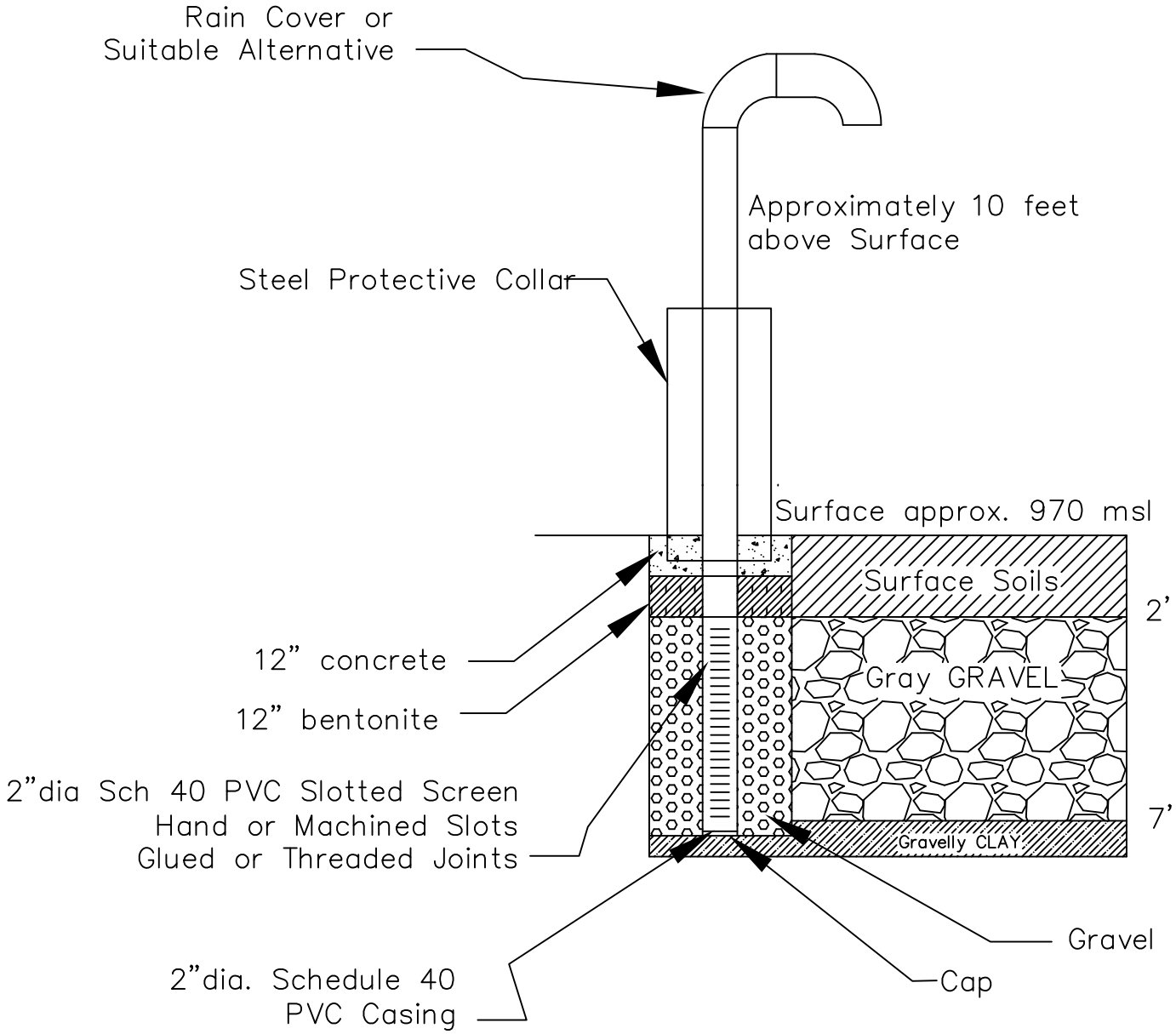
05/08/18

DRAFT

FORBES ENVIRONMENTAL ENGINEERING

GEOLOGIC CROSS SECTION A–A'
UVALDE LANDFILL
UVALDE, TEXAS

FIGURE 5.0

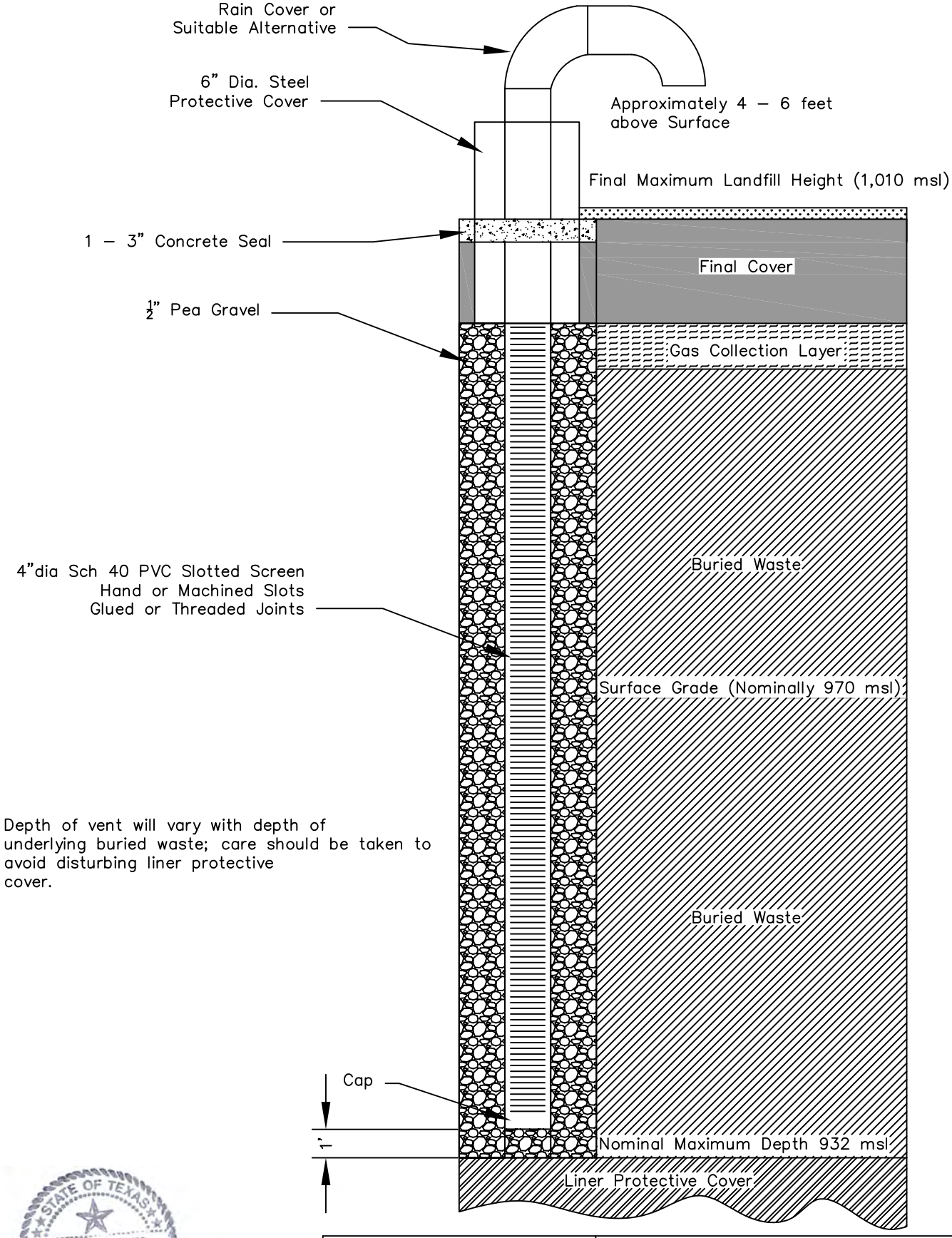


STATE OF TEXAS
STEPHEN FORBES
58584
REGISTERED
PROFESSIONAL ENGINEER
05/08/18

FORBES ENVIRONMENTAL ENGINEERING

TYPICAL UVALDE GRAVEL VENT
CITY OF UVALDE LANDFILL
UVALDE, TEXAS

FIGURE 6.0



STATE OF TEXAS
STEPHEN FORBES
88584
REGISTERED
PROFESSIONAL ENGINEER

05/08/18

FORBES ENVIRONMENTAL ENGINEERING

TYPICAL LANDFILL VENT
CITY OF UVALDE LANDFILL
UVALDE, TEXAS

FIGURE 7.0

TABLE 1 .0
EAP Gas Readings, in % volume CH4
LANDFILL GAS REMEDIATION PLAN

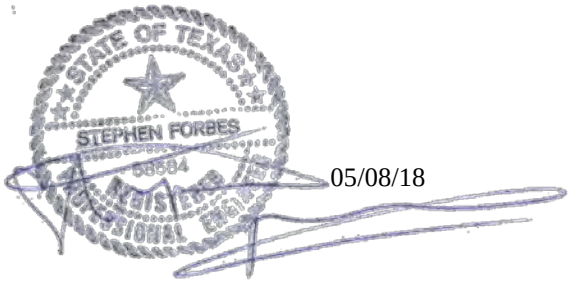
Probe No.	5/2/18 am, pm	5/3/18 am, pm
TGMP-1	6,40	45, 39
GMP 4.0	0,28	0,19
BGMP 4.1	0, 0	0,0
MW-11	14, 11	14, 12
BGMP 4.2	0,0	18, 12
BGMP 4.3	0,12	0,0
BGMP 4.4	0,6	29, 22
BGMP 12.1	0,10	0, 0
MW-12	--, 0	0,0
TGMP-2	9,0	18,10
TGMP 3.1	NA	0,0
TGMP 3.2	NA	0,0
TGMP 3.3	NA	0, 21

NA=probes not installed

TABLE 2 .0
EAP ASSESSMENT GAS MONITORING PROBE COMPLETION DETAILS
LANDFILL GAS REMEDIATION PLAN

Probe No.	Installation Date	TOC (msl)	BOC (msl)	Probe Depth (fbgs)	Screen Interval (ft)	Notes
TGMP-1	5/2/18	967.00	947.00	20	10 - 20	Refusal hit at 20' (conglomerate)
TGMP-2	5/2/18	966.00	946.00	20	10 - 20	Refusal hit at 20' (conglomerate)
TGMP-3.1	5/3/18	966.00	926.00	40	20 - 40	Drilled with air rotary. Completed in Anacacho
TGMP-3.2	5/3/18	966.00	936.00	30	25 - 30	Drilled using air rotary. Completed in Uvalde Gravel
TGMP-3.3	5/3/18	966.00	958.00	8	0 - 5	Completed in Uvalde Gravel

See Figure 4.0 for Typical Probe Design and general geology.
TGMP= Temporary Gas Monitoring Probe



APPENDIX A.1

CITY OF UVALDE GAS EXCEEDANCE NOTICE

CITY OF UVALDE
Uvalde, Texas

P.O. BOX 799, 78802-0799
(830) 278-3315
FAX: (830) 591-2685

City of Uvalde
Uvalde County
Uvalde Emergency Response Department

Date: March 13, 2018

To whom it may concern:

In accordance with Texas Commission on Environmental Quality (TCEQ) regulation 30 TAC §330.371 Subchapter I regarding Landfill Gas Management, this letter is to notify you that a reading of 8% methane gas was measured in gas monitoring probe (GMP-4) at the City of Uvalde's Municipal Solid Waste Landfill (MSWLF) on March 8, 2018. This is above the landfill's permitted limit of 5% by volume.

As outlined in the cited regulations, the MSWLF must take appropriate action to ensure protection of public health. The last such exceedance occurred 2010, which was satisfactorily resolved. The facility is in the process of implementing a similar plan of action in accordance with its permit, all of which will be coordinated with the TCEQ.

Please to not hesitate to call Juan Zamora at (830)-275-1785 if you have any questions.

Sincerely Yours,

Juan Zamora
Director of Public Works

APPENDIX A.2

LANDFILL GAS READING LOGS

CITY OF UVALDE MSWLF
PERMIT NO. 1725
UVALDE COUNTY, TEXAS

SUMMARY OF QUARTERLY GAS MONITORING DATA
FOR 2017 CALENDAR QUARTER OF 1st

GMP ID NUMBER	DATE	TIME	PRESSURE (In. WC)	GAS TEMP (C/F)	%CH4	%LEL
[redacted]	2-8-17	~~9:00AM~~	29.99			0%
[redacted]	2-8-17	10:00AM	29.99			0%
GMP-3	2-8-17	10:15AM	29.99			0%
GMP-4	2-8-17	10:23AM	29.99			0%
GMP-5	2-8-17	10:38AM	29.99			0%
GMP-6	2-8-17	10:47AM	29.99			0%
GMP-7	2-8-17	10:56AM	29.99			0%

Notes:
Form to be submitted with each quarterly gas monitoring event.
If methane is detected, also include field sampling form and graph.
GMP Forms to file in Site Operating Records, and not submitted to TCEQ unless an exceedance occurs.

CITY OF UVALDE MSWLF
PERMIT NO. 1725
UVALDE COUNTY, TEXAS

SUMMARY OF QUARTERLY GAS MONITORING DATA
FOR 2017 CALENDAR QUARTER OF 2nd

GMP ID NUMBER	DATE	TIME	PRESSURE (In. WC)	GAS TEMP (C/F)	%CH4	%LEL
[redacted]	6-15-17	1055Am	29.98			0%
[redacted]	6-15-17	1110Am	29.98			0%
GMP-3	6-15-17	1177Am	29.98			0%
GMP-4	6-15-17	1124Am	29.98			0%
GMP-5	6-15-17	1137Am	29.98			0%
GMP-6	6-15-17	1146Am	29.98			0%
GMP-7	6-15-17	1155Am	29.98			0%

Notes:
Form to be submitted with each quarterly gas monitoring event.
If methane is detected, also include field sampling form and graph.
GMP Forms to file in Site Operating Records, and not submitted to TCEQ unless an exceedance occurs.

CITY OF UVALDE MSWLF
PERMIT NO. 1725
UVALDE COUNTY, TEXAS

SUMMARY OF QUARTERLY GAS MONITORING DATA
FOR 2017 CALENDAR QUARTER OF 3rd

GMP ID NUMBER	DATE	TIME	PRESSURE (In. WC)	GAS TEMP (C/F)	%CH4	%LEL
[redacted]	8-18-17	9:15Am	29.96			0%
[redacted]	8-18-17	9:30Am	29.96			0%
GMP-3	8-18-17	9:35Am	29.96			0%
GMP-4	8-18-17	9:40Am	29.96			0%
GMP-5	8-18-17	9:50Am	29.96			0%
GMP-6	8-18-17	9:59Am	29.96			0%
GMP-7	8-18-17	10:05Am	29.96			0%

Notes:
Form to be submitted with each quarterly gas monitoring event.
If methane is detected, also include field sampling form and graph.
GMP Forms to file in Site Operating Records, and not submitted to TCEQ unless an exceedance occurs.

CITY OF UVALDE MSWLF
PERMIT NO. 1725
UVALDE COUNTY, TEXAS

SUMMARY OF QUARTERLY GAS MONITORING DATA
FOR 4th 2017 CALENDAR QUARTER OF 4th

GMP ID NUMBER	DATE	TIME	PRESSURE (In. WC)	GAS TEMP (C/F)	%CH4	%LEL
[redacted]	12-13-17	944	29.92			0 %
[redacted]	12-13-17	910AM	29.92			0 %
GMP-3	12-13-17	920AM	29.92			0 %
GMP-4	12-13-17	935AM	29.92			0 %
GMP-5	12-13-17	940AM	29.92			0 %
GMP-6	12-13-17	944AM	29.92			0 %
GMP-7	12-13-17	950AM	29.92			0 %

Notes:
Form to be submitted with each quarterly gas monitoring event.
If methane is detected, also include field sampling form and graph.
GMP Forms to file in Site Operating Records, and not submitted to TCEQ unless an exceedance occurs.

CITY OF UVALDE MSWLF
PERMIT NO. 1725
UVALDE COUNTY TEXAS

SUMMARY OF WEEKLEY GAS MONITORING DATA
FOR 2018 CALENDAR QUARTER OF 1ST

FACILITY STRUCTURES BUILDING ID:	DATE	TIME	TEMP(C/F)	%CH4	%LEL
GATE HOUSE	3				
NORTH WALL	3-8-18				0 %
EAST WALL	3-08-18				0 %
SOUTH WALL	3-08-18				0 %
WEST WALL	3-08-18				0 %
MAINTENANCE BUILDING					
NORTH WALL	3-08-18	9:AM			0%
EAST WALL	3-08-18	9:AM			0 %
SOUTH WALL	3-08-18	9:AM			0 %
WEST WALL	3-08-18	9:AM			0 %

Notes:

Form to be submitted with each weekly gas monitoring event.

If methane is dected, also include field sampling form and graph.

GMP Forms to file in Site Operating Records, and not submitted to TCEQ unless an exceedance occurs

Summary of Quarterly Gas Monitoring Data

Quarter 1st Year 2018 Weather: Fair, Sunny, Partly cloudy

Instrument: Make: _____; Model: _____

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4				
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall	3-15-18	930AM	0%	
East Wall	3-15-18	930AM	0%	
South Wall	3-15-18	930AM	0%	
West Wall	3-15-18	931AM	0%	
Maintenance Building				
North Wall	3-15-18	944AM	0%	
East Wall	3-15-18	944AM	0%	
South Wall	3-15-18	944AM	0%	
West Wall	3-15-18	944AM	0%	
BGMP				

Reading recorded by: _____ Date 3-15-18

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

LFOTM Form 8 & 9 Revised 3/10/18

Summary of Quarterly Gas Monitoring Data

Quarter / Year: 1st- 2018 Weather:

Instrument/Make: GMI Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment 29.90 pressure
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4	3/15/2018	11:20a	21 gas	
GMP-4.1				
MW #11				
BGMP 12.1				
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance				
Building				
North Wall				
East Wall				
South Wall				
West Wall				
TGMP				
#2				
#1				
3.1				
3.2				
3.3				

Reading recorded by: Carl Mis Date: 3/15/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

Summary of Quarterly Gas Monitoring Data

Quarter 1st Year 2018 Weather: Mostly Cloudy

Instrument: Make: GMI ; Model: Gasurveyor 500 Series

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4	3-15-18	11:20Am	21 gas	
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance Building				
North Wall				
East Wall				
South Wall				
West Wall				
BGMP				

Reading recorded by: _____ Date 3-15-18

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

UVALDE MSW LANDFILL INCIDENT RECORD

Completed by: Carl Mireles Date: 3-15-18

Incident Check One:

- [ ] Prohibited Waste
- [ ] Fire
- [ ] Pond Water
- [ ] Site Security Breach
- [ ] Erosion
- [ ] Groundwater
- [ ] Surface Water Drainage
- [x] Gas Monitoring
- [ ] Other: _____

Date of occurrence: 3-15-18

Location: Landfill

Conditions (e.g. weather, etc.): Cool 58°

Description: Read Methane gas on GMP4 21 gas

Cause:

Action taken: Notified Regional, State and site Manager of Readin

Current Status: Still Monitoring

Notication (check and date):		Date	Contact
	[x] Site Manager	3-15-18	Juan Zan
Agency:	[x] Local agencies	3-15-18	City, Cnty Fire Dep
	[x] TCEQ	3-15-18	Regional + State
Identify:	[ ] Other		

Additional information and comments:

Summary of Quarterly Gas Monitoring Data

Quarter / Year: 1st 2018 weekly | Weather: 76 * cloudy

Instrument/Make: GMI | Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4				
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall	3/23/2018	3:04pm	0%	
East Wall	3/23/2018	3:04pm	0%	
South Wall	3/23/2018	3:04pm	0%	
West Wall	3/23/2018	3:04pm	0%	
Maintenance Building				
North Wall	3/23/2018	3:09pm	0%	
East Wall	3/23/2018	3:09pm	0%	
South Wall	3/23/2018	3:09pm	0%	
West Wall	3/23/2018	3:09pm	0%	
BGMP				
4.1				
4.2				

Reading recorded by: Carl Ming Date: 3/23/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

Summary of Quarterly Gas Monitoring Data

Quarter / Year: 1st 2018 Weather: 56* Foggy

Instrument/Make: GMI Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4	3/29/2018	8:30pm	0 GAS	
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance Building				
North Wall				
East Wall				
South Wall				
West Wall				
BGMP				

Reading recorded by: Carl Mix Date: 3/29/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

LFOTM Form 8 & 9 Revised 3/10/18

Summary of Quarterly Gas Monitoring Data

Quarter / Year: 1st 2018- weekly | Weather: 76*f PARTLY CLOUDY

Instrument/Make: GMI | Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4				
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall	3/29/2018	3:30pm	0 gas	
East Wall	3/29/2018	3:30pm	0 gas	
South Wall	3/29/2018	3:30pm	0 gas	
West Wall	3/29/2018	3:30pm	0 gas	
Maintenance Building				
North Wall	3/29/2018	3:35pm	0 gas	
East Wall	3/29/2018	3:35pm	0 gas	
South Wall	3/29/2018	3:35pm	0 gas	
West Wall	3/29/2018	3:35pm	0 gas	
BGMP				

Reading recorded by: Carl Nix Date: 3/29/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

S11100

Quarter / Year: ~~1st~~ 2nd 2018-WEEKLY | Weather: 61*f PARTLY CLOUDY

Instrument/Make: GMI | Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4				
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall	4/5/2018	9:54AM	0%	
East Wall	4/5/2018	9:54AM	0%	
South Wall	4/5/2018	9:54AM	0%	
West Wall	4/5/2018	9:54AM	0%	
Maintenance Building				
North Wall	4/5/2018	10:00AM	0%	
East Wall	4/5/2018	10:00AM	0%	
South Wall	4/5/2018	10:00AM	0%	
West Wall	4/5/2018	10:00AM	0%	
BGMP				
4.1	4/5/2018	9:10AM	0	
4.2	4/5/2018	9:10AM	0	

Reading recorded by: Carl Ming Date: 4/5/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

LFOTM Form 8 & 9 Revised 3/10/18

S11100

Quarter / Year: ~~1st~~ 2nd 2018 | Weather: 61*f PARTLY CLOUDY

Instrument/Make: GMI | Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4	4/5/2018	9:02AM	16 GAS	
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance Building				
North Wall				
East Wall				
South Wall				
West Wall				
BGMP				
4.1	4/5/2018	9:10AM	0	
4.2	4/5/2018	9:10AM	0	

Reading recorded by: Carl Ming Date: 4/5/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

LFOTM Form 8 & 9 Revised 3/10/18

S11100

Quarter / Year: ~~1st~~ 2nd 2018			Weather:	61*f PARTLY CLOUDY
Instrument/Make:		GMI	Model:	GASSURVEYOR 500 SERIES
READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4	4/12/2018	9:25AM	47 GAS	
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance Building				
North Wall				
East Wall				
South Wall				
West Wall				
BGMP				

Reading recorded by: Carl Nix Date: 4/12/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

LFOTM Form 8 & 9 Revised 3/10/18

S11100

Quarter / Year: ~~1st~~ 2nd 2018-WEEKLY | Weather: 61*f CLOUDY

Instrument/Make: GMI | Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4				
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall	4/12/2018	10:27AM	0 GAS	
East Wall	4/12/2018	10:27AM	0 GAS	
South Wall	4/12/2018	10:27AM	0 GAS	
West Wall	4/12/2018	10:27AM	0 GAS	
Maintenance Building				
North Wall	4/12/2018	10:35AM	0 GAS	
East Wall	4/12/2018	10:35AM	0 GAS	
South Wall	4/12/2018	10:35AM	0 GAS	
West Wall	4/12/2018	10:35AM	0 GAS	
BGMP				

Reading recorded by: Carl Ming Date: 4/12/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

LFOTM Form 8 & 9 Revised 3/10/18

Summary of Quarterly Gas Monitoring Data

Quarter / Year: 2nd- 2018 Weather:

Instrument/Make: GMI Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment 29.90 pressure
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4	4/19/2018	8:40a	0 Gas	
GMP-4.1				
MW #11				
BGMP 12.1				
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance				
Building				
North Wall				
East Wall				
South Wall				
West Wall				
BGMP				
4.1	4/19/2018	8:42a	0 Gas	
MW #11	4/19/2018	8:45a	16 Gas	
MW #12	4/19/2018	8:48a	0 Gas	

Reading recorded by: Carl Mix Date: 4/19/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

S11100

Quarter / Year: ~~1st~~ 2nd 2018-WEEKLY | Weather: 63* MOSTLY CLOUDY

Instrument/Make: GMI | Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4				
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall	4/19/2008	9:29AM	0 GAS	
East Wall	4/19/2008	9:30AM	0 GAS	
South Wall	4/19/2008	9:33AM	0 GAS	
West Wall	4/19/2008	9:35AM	0 GAS	
Maintenance Building				
North Wall	4/19/2008	9:41AM	0 GAS	
East Wall	4/19/2008	9:43AM	0 GAS	
South Wall	4/19/2008	9:50AM	0 GAS	
West Wall	4/19/2008	9:51AM	0 GAS	
BGMP				

Reading recorded by: Carl Ming Date: 4/19/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

Summary of Quarterly Gas Monitoring Data

Quarter / Year: 2nd- 2018 Weather:

Instrument/Make: GMI Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment 29.90 pressure
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4	4/26/2018	8:24a	12 Gas	
GMP-4.1				
MW #11				
BGMP 12.1				
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance				
Building				
North Wall				
East Wall				
South Wall				
West Wall				
BGMP				
4.1	4/26/2018	8:26a	0	
MW #11	4/26/2018	8:29a	29 Gas	
MW #12	4/26/2018	8:31a	0 Gas	

Reading recorded by: Carl Mix Date: 4/19/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

S11100

Quarter / Year: 2nd 2018- weekly | Weather: 61*f PARTLY CLOUDY

Instrument/Make: GMI | Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4				
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall	4/26/2018	10:19AM	0	
East Wall	4/26/2018	10:19AM	0	
South Wall	4/26/2018	10:21AM	0	
West Wall	4/26/2018	10:22AM	0	
Maintenance Building				
North Wall	4/26/2018	10/25AM	0	
East Wall	4/26/2018	10:27AM	0	
South Wall	4/26/2018	10:28AM	0	
West Wall	4/26/2018	10:29AM	0	
BGMP				

Reading recorded by: Carl Nix Date: 4/26/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

LFOTM Form 8 & 9 Revised 3/10/18

S11100

Quarter / Year: 2ND 2018-WEEKLY | Weather: 90* SUNNY

Instrument/Make: GMI | Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4				
GMP-5				
GMP-6				
GMP-7				
Gate House				
North Wall	5/3/2018	4:00PM	0	
East Wall	5/3/2018	4:02PM	0	
South Wall	5/3/2018	4:05PM	0	
West Wall	5/3/2018	4:06PM	0	
Maintenance Building				
North Wall	5/3/2018	4:08PM	0	
East Wall	5/3/2018	4:10PM	0	
South Wall	5/3/2018	4:11PM	0	
West Wall	5/3/2018	4:12PM	0	
BGMP				

Reading recorded by: Carl Nix Date: 5/3/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

LFOTM Form 8 & 9 Revised 3/10/18

Summary of Quarterly Gas Monitoring Data

Quarter / Year: 2nd 2018 Weather: 90* Sunny

Instrument/Make: GMI Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment 29.90 pressure
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4	5/3/2018	4:24PM	37 GAS	
GMP-4.1	5/3/2018	4:20PM	15 GAS	
MW #11	5/3/2018	4:28PM	31 GAS	
BGMP 12.1	5/3/2018	4:40PM	10 GAS	
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance Building				
North Wall				
East Wall				
South Wall				
West Wall				
TGMP				
#2	5/3/2018	4:19PM	12 GAS	
#1	5/3/2018	4:26PM	47 GAS	
3.1	5/3/2018	4:30PM	0	
3.2	5/3/2018	4:32PM	0	
3.3	5/3/2018	4:34PM	32 GAS	

Reading recorded by: Carl Nix Date: 5/3/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

Summary of Quarterly Gas Monitoring Data

Quarter / Year: 2nd 2018 Weather: 63* partly cloudy

Instrument/Make: GMI Model: GASSURVEYOR 500 SERIES

READING LOCATION	Date	Time	Reading in % CH4	Comment 29.90 pressure
GMP				
GMP-1				
GMP-2				
GMP-3				
GMP-4	5/7/2018	8:20AM	0	
GMP-4.1	5/7/2018	8:17AM	31 GAS	
MW #11	5/7/2018	8:26AM	27	
BGMP 12.1	5/7/2018	8:40AM	0	
Gate House				
North Wall				
East Wall				
South Wall				
West Wall				
Maintenance Building				
North Wall				
East Wall				
South Wall				
West Wall				
TGMP				
#2	5/7/2018	8:15AM	0	
#1	5/7/2018	8:24AM	0	
3.1	5/7/2018	8:36AM	0	
3.2	5/7/2018	8:35AM	0	
3.3	5/7/2018	8:37AM	0	

Reading recorded by: Carl Nix Date: 5/7/2018

Notes:

— This form is to be completed for each quarterly monitorting event and for additional monitoring per LGMP.

— Completed forms are to be filed with Site Opertating Records; not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings.

— All readings should be recorded as for CH4 by volume, not % LEL .

— BGMP if exceedances reported.

Landfill Gas Remediation Plan Update

Dated January 17, 2022

FORBES
ENVIRONMENTAL
ENGINEERING & ASSOCIATES

11839 Parliament St., #813
San Antonio, Texas 78216
Phone (210)323-7313
[redacted]

TO: Mr. Robert C. Pedersen, P.E.,
Project Manager
Municipal Solid Waste Permits Section – MC 124
Texas Commission on Environmental Quality
P.O. Box 13087
Austin, Texas 78711-3087

DATE: January 17, 2022

CC: Mr. Juan Zamora – Director of Public Works, City of Uvalde

FROM: Stephen Forbes, P.E.

SUBJECT: City of Uvalde Landfill MWS Permit No. 2019–2021 Gas Monitoring Quarterly Reports (TCEQ Tracking No. 26649876, RN102803921/CN60064855)

Dear Mr. Pedersen:

As authorized by the City of Uvalde (City), this Landfill Gas Remediation Plan (LGRP) Update is submitted by Forbes Environmental Engineering on behalf of the City in response to TCEQ's letter dated October 28, 2021, Tracking No. 26649876. Relevant tables and figures are included at the end of text.

Gas monitoring reports were submitted by the City of Uvalde on May 3, 2021 for 2019, 2020, and first quarter of 2021. The TCEQ requested additional information in letter dated May 10, 2021 (Tracking No. 2609384), to which the City's responded with letter report dated May 17, 2021 ("5/17/21 Report").

The quarterly monitoring reports for 2021 were submitted to the TCEQ by the City of Uvalde including quarterly methane gas readings from GMP-1 through GMP-7, facility Gate House and Maintenance Building. The TCEQ responded by its letter dated October 28, 2021, requesting the following information. The City's response is provided in italics, with the 5/17/21 Report incorporated by reference.

1. Provide landfill gas monitoring readings for Backup Gas Monitoring Probes BGMP-4.1, 4.2, 4.3, and 4.4 since an exceedance was reported in GMP-4 [on 5/2/18], per approved Landfill Gas Monitoring Plan.

   GMP-4 was converted to open vent on 6/8/18 to alleviate offsite migration at the property line. Landfill gas monitoring readings were initially provided in the May 5/17/21 Report. See attached Tables 1.0 and 2.0, which have been updated to include landfill gas monitoring data to date.

2. Provide available data for monthly gas probe monitoring performed per your Landfill Gas Remediation Plan dated May 18, 2018.

See Attached Tables 1.0 and 2.0 as well as Charts 1.1 through 1.15.

3. Provide the locations, location numbers, and observed methane values for temporary probes and vents installed during Phases 1 and 2 of the Landfill Gas Remediation Pan

   See attached location map (Figure 1.0) showing location of investigation probes and remediation vents. Five additional vents were installed in Stage B of inactive landfill in August 2018 in an attempt to increase ventilation and retain lateral gas migration (Refer to 5/17/21 Report) within landfill perimeter. Methane values to date for temporary probes and vents are provided in Table 2.0.

4. Provide your schedule to implement the passive landfill gas diversion trench a defined as Phase 3 of your Landfill Gas Remediation Plan Dated May 18, 2018 as a way to lower methane levels below 5% by volume at the perimeter gas monitoring probes.

   The excavation of a passive diversion ditch was delayed to monitor the effectiveness of additional vents, and determine trench location. Depth of a diversion is limited by a hard substrata preventing reaching uniform depths. Figure 2.0 shows the projected gas plume.

   In addition to the actions addressed above, the City is in process of purchasing the property adjacent to the north Landfill property. This will expand the investigation limits and provide the space needed to install an effective passive collection system. The purchase transaction is in the appraisal process. In the event that the transaction does not close, a landfill passive gas diversion trench will be installed, subject to independent engineer review and feedback as well as TCEQ notification.

   In the meantime, the facility is seeking professional and contractor support services to evaluate conditions and propose efficient and effective mitigation controls and construction. Once retained the LGMR plan will be revised for review by TCEQ.

5. Provide your response in one original and two copies for distribution.

   One original and two copies of response have been provided.

In addition, the TCEQ advised to be aware that changes to the existing LFG collection system pertaining to the remediation plan require a permit modification with notice in

accordance with 30 TAC §305.70(k)(3) and must be submitted within 60 days of detection.

> *A permit modification was issued on 2/27/2017 to update the current permit's Landfill Gas Management Plan (LGMP) which includes landfill Gas Management Remediation Plan (LGMRP) which has been followed to date as remediation efforts were evaluated. A permit modification will be submitted with public notice upon completion of current remediation action, unless the TCEQ requires sooner.*

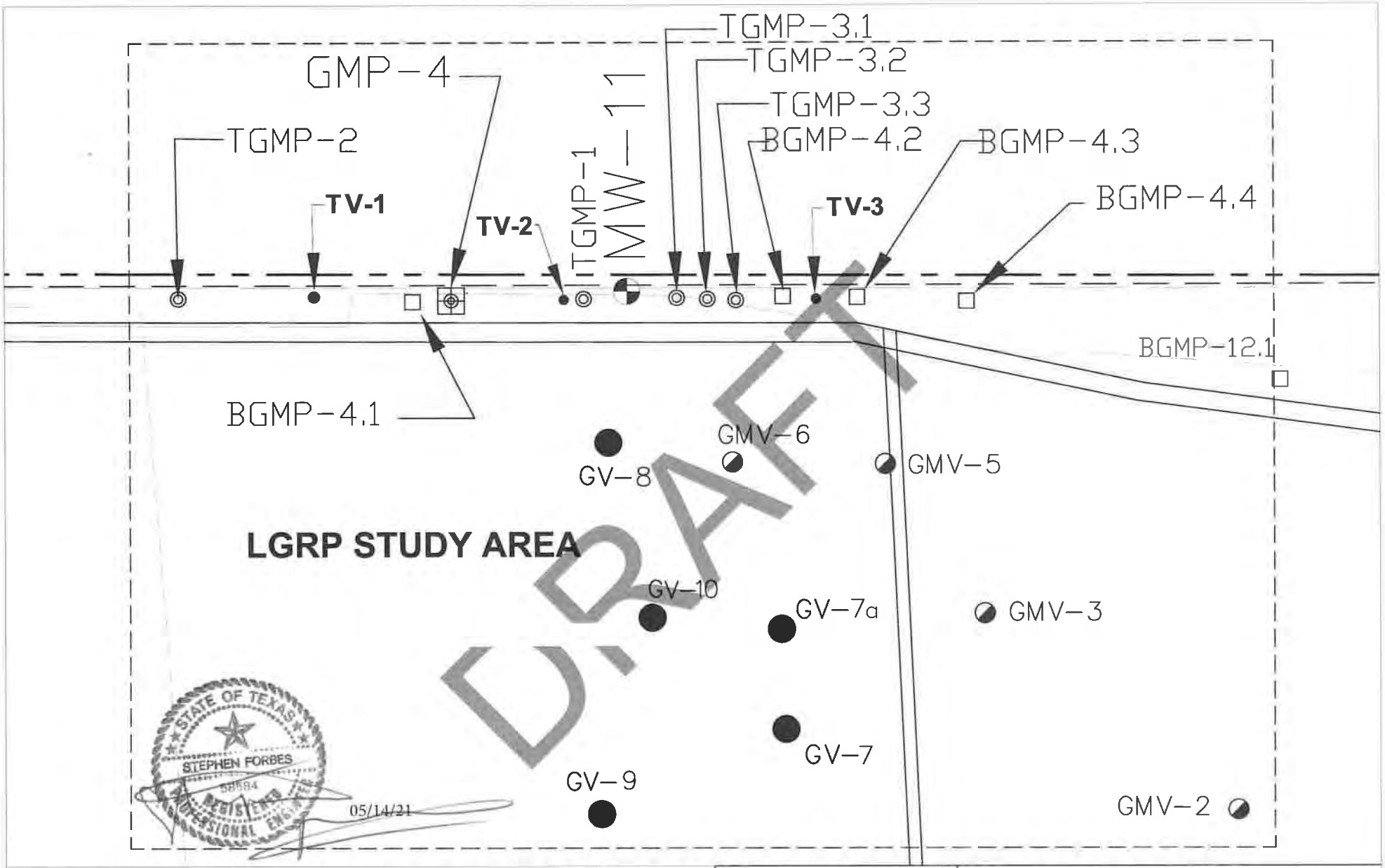
It is hoped this response adequately satisfies TCEQ request to address items 1 through 5 of the above referenced TCEQ notice (dated October 28, 2021). If you have any questions, need additional information, or require further clarification and/or action, please contact me at (210) 323-7313 or Mr. Juan Zamora, City of Uvalde Director of Public works at (830) 278-8883. In the meantime, the City will continue monthly LGRP monitoring, and to take additional action to mitigate LGMP conditions subject to independent review and guidance.

Thank you for your assistance.

Sincerely yours,

Stephen Forbes, PE

Attachments
- Figures
- Tables
- Charts



LEGEND
- Monitor Well (MW)
- Gas Monitoring Probes (GMP)
- Existing Gas Vents (GMV)
- Backup Gas Monitoring Probes (BGMP)
- Temporary Gas Monitoring Probes (TGMP) installed on May 2 & 3, 2018.
- Temporary Gas Vents (TV) installed on May 16, 2018 (LGRP Phase 1).
- Additional Gas Vents (GV) installed on July 29, 2018 (LGRP Phase 2).

N

SCALE IN FEET

0' 120' 240'

NOTES:
EAP: Exceedance Action Plan
LGRP: Landfill Gas Remediation Plan

FORBES ENVIRONMENTAL ENGINEERING

EAP/LGRP GAS MONITORING PROBES
& GAS VENTS LOCATION
UVALDE LANDFILL
UVALDE, TEXAS

FIGURE 1.0

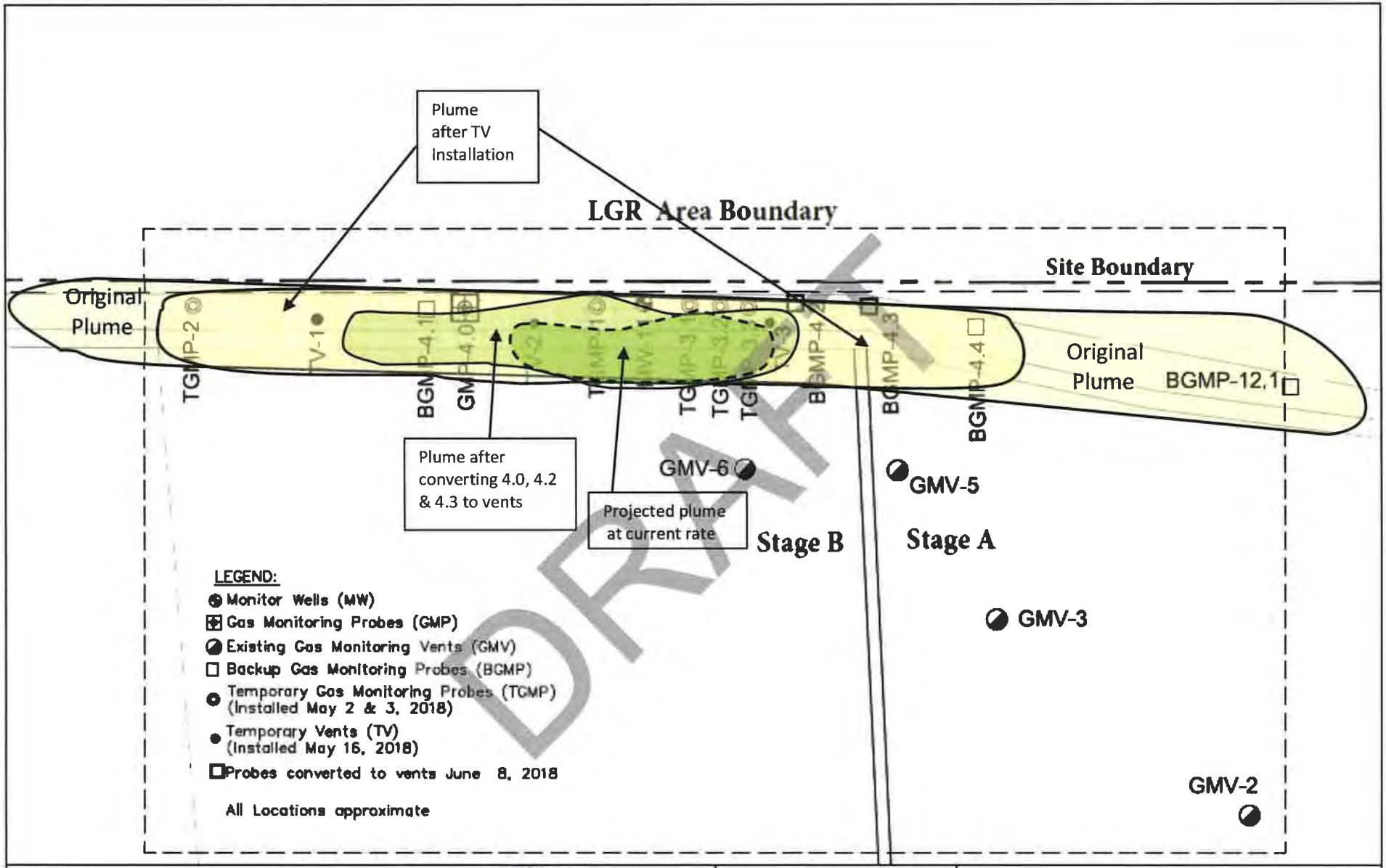

Plume after TV Installation
LGR Area Boundary
Site Boundary
Original Plume
Original Plume
BGMP-12.1
Plume after converting 4.0, 4.2 & 4.3 to vents
Projected plume at current rate
GMV-6
GMV-5
GMV-3
GMV-2
Stage B
Stage A
LEGEND:
Monitor Wells (MW)
Gas Monitoring Probes (GMP)
Existing Gas Monitoring Vents (GMV)
Backup Gas Monitoring Probes (BGMP)
Temporary Gas Monitoring Probes (TGMP) (Installed May 2 & 3, 2018)
Temporary Vents (TV) (Installed May 16, 2018)
Probes converted to vents June 8, 2018
All Locations approximate
DRAFT
N
SCALE IN FEET
0'
120'
240'
STATE OF TEXAS
STEPHEN FORBES
7/21/2018
FORBES ENVIRONMENTAL ENGINEERING
LGRP PROJECTED GAS PLUME
UVALDE LANDFILL
UVALDE, TEXAS
FIGURE 2.0

TABLE 1.0 - LANDFILL GAS MONITORING RESULTS

(Reported as % methane gas by volume)

Exceedance Action Plan - TGMP-1, TGMP2, and TGMP 3.1 - 3.3 Installed on May 2 and 3, 2018.

Date	GMP-4*	BGMP-4.1	BGMP-4.2*	BGMP-4.3*	BGMP-4.4	MW-11	BGMP-12.1	TGMP #2	TGMP #1	TGMP-3.1	TGMP-3.2	TGMP-3.3
5/2/18	38	26				28						
5/3/18	37	15				31	10	12	47			
5/4/18	34	27				29	0	0	0			
5/7/18	0	31				27	0	0	0			
5/8/18	48	47				35	0	38	48	41	41	46
5/9/18	49	50				27	0	15	38	42	45	47
5/10/18	31	45				26	0	19	26	49	48	46
5/11/18	48	46				22	11	44	48	53	52	48
5/14/18	47	43				22	19	46	47	55	51	48
5/15/18						23	14					
5/16/18								43	49			

Landfill Gas Remedation Plan Phase 1 - TV-1, TV-2 and TV-3 Installed on May 16, 2018.

Date	GMP-4*	BGMP-4.1	BGMP-4.2*	BGMP-4.3*	BGMP-4.4	MW-11	BGMP-12.1	TGMP #2	TGMP #1	TGMP-3.1	TGMP-3.2	TGMP-3.3	TV-1	TV-2	TV-3
5/17/18	48	48				35	23	44	50	47	52	49	0	29	12
5/18/18	49	45				33	25	41	50	52	53	49	0	33	8
5/22/18	47	47				31	0	40	49	56	52	47	8	28	6
5/23/18	42	37				30	0	31	49	55	50	47	9	20	0
5/24/18	41	34				28	0	33	50	54	50	47	6	24	7
5/25/18	49	49				33	0	43	50	55	52	48	9	42	18
5/29/18	48	45	50	47	51	38	0	42	50	56	52	49	5	25	12
5/30/18	47	42	43	41	36	23	46	27	50	54	52	49	0	29	13
5/31/18	37	27	32	26	32	29	0	30	50	55	52	48	5	33	11
6/1/18	6	16	10	0	28	29	0	13	48	52	45	46	0	5	0
6/4/18	47	38	48	36	19	25	6	35	50	57	52	49	8	38	42
6/5/18	49	49	52	48	46	25	29	37	50	57	52	56	10	30	30
6/6/18	48	48	51	47	22	23	33	35	49	51	48	47	8	35	41
6/7/18	30	25	8	21	8	28	21	28	49	57	52	47	0	19	0
6/8/18	32	14	15	28	0	19	0	29	50	52	43	43	0	17	5
6/11/18	48	46	57	20	46	4.6	11	44	31	51	53	48	31	48	10
6/12/18	43	28	17	36	36	4	12	13	50	38	45	47	24	42	36
6/13/18	38	32	17	23	16	4	0.03	37	48	38	48	47	22	43	28
6/14/18	47	12	41	43	24	3.4	9	36	50	58	51	48	28	47	9
6/15/18	48	25	49	47	33	2	13	29	49	53	25	41	30	47	44
6/18/18	48	26	45	45	27	5	7	37	47	54	52	47	32	47	43
6/19/18	48	34	46	48	26	5	10	32	48	55	52	47	30	42	27
6/20/18	48	33	15	34	9	5	0	28	48	56	53	47	28	46	44
6/21/18	42	0	0	29	9	5	0	22	48	55	51	47	26	46	32
6/22/18	46	48	23	42	46	0.08	1.3	26	47	55	51	46	27	41	40
6/25/18	36	1.5	6	19	1	1.2	0	9	45	43	51	47	22	43	26
6/26/18	33	0.05	9	28	0.7	0.25	0	10	48	55	51	47	23	44	32
6/27/18	45	0.15	21	42	13	1.25	0	17	46	53	52	46	24	45	32
6/28/18	43	1.4	18	45	14	0.75	1.65	28	47	54	53	46	24	44	37
6/29/18	44	1.5	21	45	10	0.5	2.35	27	47	50	53	45	22	45	41
7/2/18	38	0.15	34	34	19	8	1.3	17	48	48	52	46	21	44	37
7/3/18	43	0.6	36	43	26	0.6	0.15	30	48	54	52	46	21	30	37
7/5/18	15	0	0	12	8	1.35	0.01	0.13	20	41	46	44	19	30	14
7/6/18	34	0	23	28	0.75	0.2	0	21	45	52	49	43	30	42	30
7/9/18	31	2.35	44	25	9	1.05	0	10	44	52	48	41	28	41	11
7/10/18	41	1.2	24	39	6	0.95	1.1	24	45	54	51	42	29	43	36
7/11/18	45	3.05	22	46	32	1.25	11	19	46	53	51	43	30	45	29
7/12/18	43	4	25	35	14	0.3	0.6	15	45	54	50	43	30	44	30
7/13/18	39	1.5	18	30	9	1.1	0.35	15	42	54	49	43	30	43	33
7/16/18	40	2	24	30	16	0.45	0.5	14	45	55	50	44	27	44	31

Notes

* Originally monitoring probes converted to vents

*Some readings taken on 7/25/19 were unusually low, so resampled was conducted on 7/29/19

TABLE 1.0 - LANDFILL GAS MONITORING RESULTS (CONT.)

(Reported as % methane gas by volume)

Date	GMP-4*	BGMP-4.1	BGMP-4.2*	BGMP-4.3*	BGMP-4.4	MW-11	BGMP-12.1	TGMP #2	TGMP #1	TGMP-3.1	TGMP-3.2	TGMP-3,3	TV-1	TV-2	TV-3
7/17/18	32	8	17	0	38	1.2	5	6	17	48	50	43	12	15	1.75
7/18/18	44	2.3	26	29	34	0.95	0.7	17	46	56	48	44	29	47	32
7/19/18	44	21	23	47	29	0.6	2.75	24	43	53	53	45	24	45	33
7/20/18	44	43	18	35	5	0.8	1	28	46	57	52	45	31	45	30
7/23/18	46	6	20	48	16	0.6	2	15	45	55	53	46	33	46	20
7/24/18	41	3.1	29	32	30	1.15	2	22	45	54	45	44	16	29	25
7/25/18	40	0.45	20	29	3	0.35	0.1	23	46	56	48	44	32	44	26
7/26/18	43	2.4	22	35	4	2.1	0.15	9	45	54	49	44	27	37	31
7/27/18	41	1	13	27	5	0.65	0.45	11	45	54	51	44	28	45	30
7/30/18	45	17	31	42	37	4.7	8	14	46	55	50	44	17	36	27
7/31/18	29	0.15	6	23	6	0.2	0.02	9	24	46	49	43	19	31	12
8/1/18	44	11	38	40	20	0.1	11	19	30	56	54	45	17	36	20
8/2/18	41	12	27	38	35	0.3	10	20	45	57	52	43	33	45	30
8/8/18	36	0	7	28	12	0.25	1.2	2.95	40	50	47	42	29	43	27
8/15/18	31	17	6	27	11	1.25	8	7	40	53	46	43	20	30	13
8/22/18	36	0.15	21	28	2.75	0.2	0.4	18	45	55	49	45	30	43	25
8/29/18	36	0.6	19	27	5	1.25	0.8	48	51	46	9	46	19	40	26
9/6/18	44	17	15	29	8	0.5	1.05	8	40	47	50	43	21	30	24
9/13/18	49	25	20	40	18	0.4	0.9	30	48	51	48	50	29	48	26
9/20/18	39	16	16	35	11	0.85	1.5	23	46	46	40	42	24	42	23
9/27/18	49	6	28	37	5	0.25	1	38	51	56	52	51	46	50	35
10/3/18	49	6	18	46	15	0.6	0.05	34	49	47	12	50	41	48	40
10/11/18	45	4.7	10	25	1.45	0.25	1.15	21	50	40	50	50	31	48	24
10/17/18	51	5	15	22	2.85	1.6	0	45	52	55	52	51	49	49	22
10/30/18	50	19	20	50	15	0.4	0.7	35	50	55	52	51	24	50	38
11/7/18	50	7	19	40	3.25	0.05	0	23	50	53	51	51	39	50	27
11/15/18	51	15	23	36	10	1.15	0.15	37	52	57	52	49	45	51	37
11/27/18	41	7	18	28	10	2.75	0.05	41	53	55	50	50	48	48	35
12/6/18	49	10	20	15	5	1.75	0.5	19	48	48	52	49	38	50	37
12/13/18	0	0	0	0	0	1.8	0	0	0	0	0	0.05	38	0	0
12/14/18	15	0	0.05	4.15	0	0.9	0	17	25	0.05	0.15	54	40	39	18
12/21/18	47	12	28	32	19	1.5	15	53	25	48	51	51	48	49	41
12/26/18	51	14	23	50	16	6	0	45	51	56	52	51	50	50	36
1/4/19	52	6	28	31	10	2.4	0	27	52	53	53	52	40	50	27
1/11/19	53	14	21	47	10	11	0	52	52	57	54	52	52	52	48
1/16/19	52	15	19	44	13	9	7	39	52	57	53	52	45	51	41
1/23/19	13	0	12	40	10	3	0.65	38	38	57	47	46	43	35	46
1/30/19	40	6	20	41	11	7	0	28	51	56	47	49	42	47	38
2/6/19	50	35	45	49	37	12	23	41	50	54	51	50	30	49	37
2/15/19	50	13	20	48	12	5	0	35	50	55	50	55	48	49	36
2/20/19	42	16	36	30	17	30	15	37	51	55	51	50	35	46	30
2/28/19	47	4	13	27	1	7	2.15	17	47	29	33	50	39	48	23
3/7/19	49	15	22	31	1.4	6	1.4	32	50	52	51	49	44	49	46
3/15/19	1.75	0	0	1.7	0	4.45	0	14	51	0	45	38	36	24	6
3/22/19	46	5	26	42	11	9	8	15	45	18	49	48	44	48	45
3/29/19	49	12	26	48	12	9	6	20	49	41	50	48	44	48	44
4/5/19	48	32	48	45	23	20	18	46	44	48	50	47	32	48	40
4/12/19	40	5	11	30	9	3.5	0.6	45	49	54	49	47	48	45	34
4/17/19	47	20	24	45	15	18	8	45	49	54	49	47	49	47	43
4/25/19	47	17	21	34	0.95	7	0	38	48	54	49	49	46	46	44
5/1/19	47	7	14	40	0.85	11	0	38	49	52	49	48	40	47	27
5/13/19	46	11	12	23	35	6	0	44	49	54	49	49	49	48	33
5/22/19	44	6	15	29	32	11	0	35	49	48	48	48	48	45	29
5/29/19	48	16	21	50	13	7	1.5	37	48	52	49	48	39	48	43

Notes

* Originally monitoring probes converted to vents

*Some readings taken on 7/25/19 were unusually low, so resampled was conducted on 7/29/19

TABLE 1.0 - LANDFILL GAS MONITORING RESULTS (CONT.)

(Reported as % methane gas by volume)

Date	GMP-4*	BGMP-4.1	BGMP-4.2*	BGMP-4.3*	BGMP-4.4	MW-11	BGMP-12.1	TGMP #2	TGMP #1	TGMP-3.1	TGMP-3.2	TGMP-3.3	TV-1	TV-2	TV-3
6/5/19	48	23	10	40	20	13	0	43	48	53	47	47	47	47	35
6/12/19	48	3.25	1.7	39	13	7	0	43	48	52	47	47	49	45	38
6/19/19	48	18	21	40	24	8	0.45	45	48	53	48	48	44	48	39
6/26/19	23	8	7	31	19	6	0	44	46	52	48	46	43	45	29
7/3/19	47	18	16	49	16	7	1.65	47	48	53	49	48	47	47	41
7/10/19	48	12	24	42	3.2	7	1	46	48	52	49	47	44	47	32
7/18/19	48	27	32	47	27	31	8	43	48	54	49	47	40	49	37
7/25/2019*	14	0.85	0	0	0	6	0.2	12	19	31	29	39	31	25	0
7/29/2019*	12	0.45	4.5	0.05	0.1	10	0.15	8	0.9	3	0	0	23	9	0.05
8/7/19	48	8	17	36	19	4.2	1.25	33	48	53	48	44	40	45	29
8/14/19	44	1.9	0.25	29	4	4.85	0.75	31	45	53	49	43	38	38	24
8/21/19	45	1	1.4	29	5	1.5	0.2	24	36	45	48	38	30	38	24
8/28/19	32	0.15	0.05	21	1.6	0.55	0.9	38	37	48	44	35	29	38	19
9/6/19	44	3.85	6	36	7	4.7	0.4	43	38	47	45	34	35	35	27
9/11/19	36	0.2	0.7	23	5	2.2	0.1	17	25	39	43	33	31	24	17
9/27/19	44	6	4.25	43	17	3.4	4	35	36	44	47	34	16	42	32
10/3/19	35	0.15	1.45	27	4.1	5	0.95	29	34	46	41	32	31	25	20
10/10/19	44	4	16	40	19	6	4.4	28	37	44	49	34	39	42	36
10/16/19	25	4	0	4.25	0.1	2.75	1.5	29	33	46	43	29	49	44	33
10/23/19	40	11	7	28	8	0.95	0.05	45	38	44	43	34	44	38	24
11/1/19	35	8	10	22	12	0.8	0	31	39	40	41	33	37	34	26
11/8/19	32	0.1	0	11	0.2	3.95	0.2	30	39	30	41	36	50	36	10
11/15/19	30	1.55	1.6	14	1.45	0.95	0.2	45	41	46	41	36	43	37	12
11/20/19	48	13	16	26	10	1	0.8	39	43	33	23	38	43	43	12
11/27/19	47	2.35	0	2.65	0	2.5	0	39	46	39	34	43	40	25	18
12/4/19	44	5	7	22	4	2.1	0.45	32	45	43	45	41	34	30	11
12/14/19	49	5	18	34	7	1.05	2	27	40	46	49	43	39	44	54
12/18/19	19	0	5	11	0.45	0.85	0	33	41	43	38	37	39	33	11
1/2/20	49	7	12	14	7	6	3.75	24	47	38	49	43	28	41	17
1/8/20	43	6	15	23	5	1.6	0.6	47	47	47	46	37	41	43	25
1/15/20	46	41	8	24	4	0.6	0.5	17	43	45	45	37	42	29	12
1/23/20	49	10	16	23	3.45	2	1.85	40	45	44	48	43	37	36	17
1/31/20	37	4	0.7	7	0.7	2.7	0	31	27	39	48	33	39	22	5
2/6/20	47	6	9	23	5	1.7	1.3	48	49	50	51	46	47	44	19
2/12/20	49	11	12	28	8	3.4	0.6	36	39	43	51	45	40	44	17
2/19/20	31	0	1.9	14	0	4.4	0	46	49	51	47	42	40	37	16
2/27/20	35	0.2	12	17	33	1.25	0	40	48	52	43	40	42	38	17
3/5/20	10	0	0	4	0.15	0.4	0	24	31	45	45	41	30	28	3
3/11/20	49	14	23	33	20	2	1.2	50	48	52	50	42	44	46	28
3/19/20	49	10	19	33	13	4.4	0.9	49	48	49	49	43	38	44	32
3/26/20	50	11	21	38	7	2.5	0	41	48	52	50	45	46	47	39
4/16/20	44	10	14	30	23	8	0.45	50	48	43	49	45	44	48	30
4/29/20	34	0	0	0	0	1.8	0	39	39	33	37	41	23	14	0
5/23/20	10	0	0.7	0.1	0.05	4.3	0	6	3	10	0	0	32	0	0
6/10/20	12	0	0	12	0.15	4.45	0.3	37	49	42	47	43	42	31	10
6/25/20	15	0.15	0.05	0	1.6	4.2	0.25	12	10	11	18	15	23	25	0
7/15/20	44	2.1	40	30	5	1.2	0.3	26	43	36	45	32	47	37	23
8/7/20	46	2.3	3.5	39	4.3	0.15	0.2	33	41	43	44	38	38	42	24
8/24/20	43	1.1	1.25	29	4	0.1	4	36	40	42	44	35	46	40	24
9/18/20	40	2.75	3	27	2.65	9	0.2	47	35	39	38	28	41	37	24
9/30/20	33	9	1.2	22	1.8	1.05	0.05	46	35	43	40	28	37	36	21
10/23/20	31	0	1.25	7	3.2	0.5	0.15	26	23	23	37	25	30	28	8
11/19/20	36	1.5	2.35	22	2.4	0.65	0	33	21	32	30	21	31	24	17
12/17/20	25	0.9	0	14	0.75	1.4	0.05	44	36	36	37	33	44	32	11
1/15/21	21	0.06	0	13	0.21	2.1	0	47	45	21	43	45	44	36	7
2/10/21	52	9	2.9	31	10.00	3.75	0.35	53	51	50	50	44	49	48	34
3/26/21	39														

Notes:

* Originally monitoring probes converted to vents

*Some readings taken on 7/25/19 were unusually low, so resampled was conducted on 7/29/19

TABLE 2.0 - QUARTERLY LANDFILL GAS MONITORING RESULTS
(2019 - 2020 & 1st Quarter 2021)

	1st Quarter 2019 (Date taken: 3/22/2019)		2nd Quarter 2019 (Date taken: 6/19/2019)		3rd Quarter 2019 (Date taken: 9/20/2019)		4th Quarter 2019 (Date taken: 12/19/2019)		1st Quarter 2020 (Date taken: 3/26/2020)		2nd Quarter 2020 (Date taken: 6/25/2020)		3rd Quarter 2020 (Date taken: 9/30/2020)		4th Quarter 2020 (Date taken: 12/17/2020)		1st Quarter 2021 (Date taken: 3/26/2021)	
READING LOCATION	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume
GMP*																		
GMP-1	10:27AM	0	1:00PM	0	1:08PM	0	10:37AM	0	1:05PM	0	10:27AM	0	1:02PM	0	3:54PM	0	3:45PM	0
GMP-2	11:09AM	0	1:09PM	0	1:12PM	0	10:41AM	0	1:10PM	0	10:31AM	0	1:08PM	0	4:00PM	0	3:49PM	0
GMP-3	11:06AM	0	1:25PM	2	1:20PM	4.3	10:48AM	2	1:16PM	0.11	10:33AM	0	1:44PM	0.1	4:37PM	1.4	3:54PM	0
GMP-4*	11:20AM	46	1:56PM	48	1:43PM	36	10:53AM	48	1:40PM	50	10:58AM	15	1:44PM	33	4:29PM	36	4:19PM	30
GMP-5	11:13AM	0	1:30PM	0	1:25PM	0	11:00AM	0	1:21PM	0	10:38AM	0	1:20PM	0	4:09PM	0	3:58PM	0
GMP-6	11:17AM	0	1:34PM	0	1:29PM	0	11:05AM	0	1:25PM	0	10:45AM	0	1:28PM	0	4:12PM	0	4:03PM	0
GMP-7	11:21AM	0	1:37PM	0	1:32PM	0	11:10AM	0	1:30PM	0	10:49AM	0	1:30PM	0	4:16PM	0	4:08PM	0
Gate House																		
North Wall	2:00PM	0	3:16PM	0	2:30PM	0	11:17AM	0	3:16PM	0	11:40AM	0	2:30PM	0	3:30PM	0	3:25PM	0
East Wall	2:02PM	0	3:18PM	0	2:32PM	0	11:19AM	0	3:18PM	0	11:42AM	0	2:32PM	0	3:32PM	0	3:27PM	0
South Wall	2:04PM	0	3:20PM	0	2:36PM	0	11:21AM	0	3:20PM	0	11:44AM	0	2:36PM	0	3:34PM	0	3:29PM	0
West Wall	2:06PM	0	3:22PM	0	2:38PM	0	11:23AM	0	3:22PM	0	11:46AM	0	2:38PM	0	3:36PM	0	3:31PM	0
Maintenance Building																		
North Wall	2:13PM	0	3:25PM	0	2:43PM	0	11:28AM	0	3:25PM	0	11:48AM	0	2:43PM	0	3:38PM	0	3:33PM	0
East Wall	2:15PM	0	3:27PM	0	2:45PM	0	11:30AM	0	3:27PM	0	11:50AM	0	2:45PM	0	3:40PM	0	3:35PM	0
South Wall	2:17PM	0	3:29PM	0	2:47PM	0	11:32AM	0	3:29PM	0	11:52AM	0	2:47PM	0	3:42PM	0	3:37PM	0
West Wall	2:19PM	0	3:31PM	0	2:49PM	0	11:34AM	0	3:31PM	0	11:54AM	0	2:49PM	0	3:44PM	0	3:39PM	0
Comments:	Weather: 76°F Cloudy Pressure: 29.13		Weather: 100°F Sunny Pressure: 29.869		Weather: 93°F Cloudy Pressure: 28.07		Weather: 52°F Sunny Pressure: 29.33		Weather: 84°F Sunny Pressure: 28.76		Weather: 86°F Sunny Pressure: 29.04		Weather: 86°F Sunny Pressure: 29.03		Weather: 62°F Sunny Pressure: 29.14		Weather: 87°F Sunny Pressure: 28.77	

* Converted to Vent as part of LGRP

Notes:

— Instrument/Make: GMI; Model: Gassurveyor 500 Series

— This form is to be completed for each quarterly monitoring event and for additional monitoring per LGMP

— Completed forms are to be filed with Site Operating Records; not to be submitted to TCEQ unless an exceedance reported

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1 25% in Buildings.

— All readings should be recorded as % CH4 by volume, not % LEL

— Adapted from LPOTM Form 8 & 9 Revised 3/10/18

TABLE 1.0 - QUARTERLY LANDFILL GAS MONITORING RESULTS

(2019 - 2020 & 1st Quarter 2021)

	1st Quarter 2019 (Date taken: 3/22/2019)		2nd Quarter 2019 (Date taken: 6/19/2019)		3rd Quarter 2019 (Date taken: 9/20/2019)		4th Quarter 2019 (Date taken: 12/19/2019)		1st Quarter 2020 (Date taken 3/26/2020)		2nd Quarter 2020 (Date taken: 6/25/2020)		3rd Quarter 2020 (Date taken: 9/30/2020)		4th Quarter 2020 (Date taken: 12/17/2020)		1st Quarter 2021 (Date taken: 3/26/2021)	
READING LOCATION	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume	Time	% CH_4 by volume
GMP																		
GMP-1	10:27AM	0	1:00PM	0	1:08PM	0	10:37AM	0	1:05PM	0	10:27AM	0	1:02PM	0	3:54PM	0	3:45PM	0
GMP-2	11:03AM	0	1:09PM	0	1:12PM	0	10:43AM	0	1:10PM	0	10:31AM	0	1:08PM	0	4:00PM	0	3:49PM	0
GMP-3	11:08AM	0	1:25PM	2	1:21PM	4.3	10:48AM	2	1:16PM	0.11	10:33AM	0	1:44PM	0.1	4:37PM	1.4	3:54PM	0
GMP-4*	11:26AM	46	1:56PM	48	1:43PM	36	10:53AM	48	1:44PM	50	10:58AM	15	1:44PM	33	4:29PM	36	4:19PM	39
GMP-5	11:13AM	0	1:30PM	0	1:25PM	0	11:00AM	0	1:21PM	0	10:38AM	0	1:20PM	0	4:09PM	0	3:58PM	0
GMP-6	11:17AM	0	1:34PM	0	1:29PM	0	11:05AM	0	1:25PM	0	10:42AM	0	1:25PM	0	4:12PM	0	4:03PM	0
GMP-7	11:21AM	0	1:37PM	0	1:32PM	0	11:10AM	0	1:30PM	0	10:45AM	0	1:30PM	0	4:16PM	0	4:05PM	0
Gate House																		
North Wall	2:00PM	0	3:16PM	0	2:30PM	0	11:17AM	0	3:16PM	0	11:40AM	0	2:30PM	0	3:30PM	0	3:25PM	0
East Wall	2:02PM	0	3:18PM	0	2:32PM	0	11:19AM	0	3:18PM	0	11:42AM	0	2:32PM	0	3:32PM	0	3:27PM	0
South Wall	2:04PM	0	3:20PM	0	2:36PM	0	11:21AM	0	3:20PM	0	11:44AM	0	2:36PM	0	3:34PM	0	3:29PM	0
West Wall	2:06PM	0	3:22PM	0	2:38PM	0	11:23AM	0	3:22PM	0	11:46AM	0	2:38PM	0	3:36PM	0	3:31PM	0
Maintenance Building																		
North Wall	2:13PM	0	3:25PM	0	2:43PM	0	11:28AM	0	3:25PM	0	11:48AM	0	2:43PM	0	3:38PM	0	3:33PM	0
East Wall	2:15PM	0	3:27PM	0	2:45PM	0	11:30AM	0	3:27PM	0	11:50AM	0	2:45PM	0	3:40PM	0	3:35PM	0
South Wall	2:17PM	0	3:29PM	0	2:47PM	0	11:32AM	0	3:29PM	0	11:52AM	0	2:47PM	0	3:42PM	0	3:37PM	0
West Wall	2:19PM	0	3:31PM	0	2:49PM	0	11:34AM	0	3:31PM	0	11:54AM	0	2:49PM	0	3:44PM	0	3:39PM	0
Comments:	Weather 76°F Cloudy Pressure 29.11		Weather 100°F Sunny Pressure 29.80		Weather 93°F Cloudy Pressure 28.07		Weather 52°F Sunny Pressure 29.33		Weather 84°F Sunny Pressure 28.76		Weather 88°F Sunny Pressure 29.04		Weather 86°F Sunny Pressure 29.05		Weather 62°F Sunny Pressure 29.14		Weather 87°F Sunny Pressure 28.77	

Notes:

* Converted to vent as part of LGRP

— Instrument/Make: GMI; Model Gassurveyor 500 Series

— This form is to be completed for each quarterly monitoring event and for additional monitoring per LGMP

— Completed forms are to be filed with Site Operating Records, not to be submitted to TCEQ unless an exceedance reported.

— Exceedance: greater than 5% methane (CH4) by volume in GMP, or 1.25% in Buildings

— All readings should be recorded as % CH4 by volume, not % LEL

— Adapted from LFOTM Form 8 & 9 Revised 3/10/18

TABLE 2.0 - LANDFILL GAS MONITORING RESULTS

(Reported as % methane gas by volume)

Exceedance Action Plan - TGMP-1, TGMP2, and TGMP 3.1 - 3.3 Installed on May 2 and 3, 2018.

Date	GMP-4*	BGMP-4.1	BGMP-4.2*	BGMP-4.3*	BGMP-4.4	MW-11	BGMP-12.1	TGMP #2	TGMP #1	TGMP-3.1	TGMP-3.2	TGMP-3.3
5/2/18	38	26				28						
5/3/18	37	15				31	10	12	47			
5/4/18	34	27				29	0	0	0			
5/7/18	0	31				27	0	0	0			
5/8/18	48	47				35	0	38	48	41	41	46
5/9/18	49	50				27	0	15	38	42	45	47
5/10/18	31	45				26	0	19	26	49	48	46
5/11/18	48	46				22	11	44	48	53	52	48
5/14/18	47	43				22	19	46	47	55	51	48
5/15/18						23	14					
5/16/18								43	49			

Landfill Gas Remedation Plan Phase 1 - TV-1, TV-2 and TV-3 Installed on May 16, 2018.

Date	GMP-4*	BGMP-4.1	BGMP-4.2*	BGMP-4.3*	BGMP-4.4	MW-11	BGMP-12.1	TGMP #2	TGMP #1	TGMP-3.1	TGMP-3.2	TGMP-3.3	TV-1	TV-2	TV-3
5/17/18	48	48				35	23	44	50	47	52	49	0	29	12
5/18/18	49	45				33	25	41	50	52	53	49	0	33	8
5/22/18	47	47				31	0	40	49	56	52	47	8	28	6
5/23/18	42	37				30	0	31	49	55	50	47	9	20	0
5/24/18	41	34				28	0	33	50	54	50	47	6	24	7
5/25/18	49	49				33	0	43	50	55	52	48	9	42	18
5/29/18	48	45	50	47	51	38	0	42	50	56	52	49	5	25	12
5/30/18	47	42	43	41	36	23	46	27	50	54	52	49	0	29	13
5/31/18	37	27	32	26	32	29	0	30	50	55	52	48	5	33	11
6/1/18	6	16	10	0	28	29	0	13	48	52	45	46	0	5	0
6/4/18	47	38	48	36	19	25	6	35	50	57	52	49	8	38	42
6/5/18	49	49	52	48	46	25	29	37	50	57	52	56	10	30	30
6/6/18	48	48	51	47	22	23	33	35	49	51	48	47	8	35	41
6/7/18	30	25	8	21	8	28	21	28	49	57	52	47	0	19	0
6/8/18	32	14	15	28	0	19	0	29	50	52	43	43	0	17	5
6/11/18	48	46	57	20	46	4.6	11	44	31	51	53	48	31	48	10
6/12/18	43	28	17	36	36	4	12	13	50	38	45	47	24	42	36
6/13/18	38	32	17	23	16	4	0.03	37	48	38	48	47	22	43	28
6/14/18	47	12	41	43	24	3.4	9	36	50	58	51	48	28	47	9
6/15/18	48	25	49	47	33	2	13	29	49	53	25	41	30	47	44
6/18/18	48	26	45	45	27	5	7	37	47	54	52	47	32	47	43
6/19/18	48	34	46	48	26	5	10	32	48	55	52	47	30	42	27
6/20/18	48	33	15	34	9	5	0	28	48	56	53	47	28	46	44
6/21/18	42	0	0	29	9	5	0	22	48	55	51	47	26	46	32
6/22/18	46	48	23	42	46	0.08	1.3	26	47	55	51	46	27	41	40
6/25/18	36	1.5	6	19	1	1.2	0	9	45	43	51	47	22	43	26
6/26/18	33	0.05	9	28	0.7	0.25	0	10	48	55	51	47	23	44	32
6/27/18	45	0.15	21	42	13	1.25	0	17	46	53	52	46	24	45	32
6/28/18	43	1.4	18	45	14	0.75	1.65	28	47	54	53	46	24	44	37
6/29/18	44	1.5	21	45	10	0.5	2.35	27	47	50	53	45	22	45	41
7/2/18	38	0.15	34	34	19	8	1.3	17	48	48	52	46	21	44	37
7/3/18	43	0.6	36	43	26	0.6	0.15	30	48	54	52	46	21	30	37
7/5/18	15	0	0	12	8	1.35	0.01	0.13	20	41	46	44	19	30	14
7/6/18	34	0	23	28	0.75	0.2	0	21	45	52	49	43	30	42	30
7/9/18	31	2.35	44	25	9	1.05	0	10	44	52	48	41	28	41	11
7/10/18	41	1.2	24	39	6	0.95	1.1	24	45	54	51	42	29	43	36
7/11/18	45	3.05	22	46	32	1.25	11	19	46	53	51	43	30	45	29
7/12/18	43	4	25	35	14	0.3	0.6	15	45	54	50	43	30	44	30
7/13/18	39	1.5	18	30	9	1.1	0.35	15	42	54	49	43	30	43	33
7/16/18	40	2	24	30	16	0.45	0.5	14	45	55	50	44	27	44	31

Notes:

* Originally monitoring probes converted to vents

TABLE 2.0 - LANDFILL GAS MONITORING RESULTS (CONT.)

(Reported as % methane gas by volume)

Date	GMP-4*	BGMP-4.1	BGMP-4.2*	BGMP-4.3*	BGMP-4.4	MW-11	BGMP-12.1	TGMP #2	TGMP #1	TGMP-3.1	TGMP-3.2	TGMP-3.3	TV-1	TV-2	TV-3	
7/17/18	32	8	17	0	38	1.2	5	6	17	48	50	43	12	15	1.75	
7/18/18	44	2.3	26	29	34	0.95	0.7	17	46	56	48	44	29	47	32	
7/19/18	44	21	23	47	29	0.6	2.75	24	43	53	53	45	24	45	33	
7/20/18	44	43	18	35	5	0.8	1	28	46	57	52	45	31	45	30	
7/23/18	46	6	20	48	16	0.6	2	15	45	55	53	46	33	46	20	
7/24/18	41	3.1	29	32	30	1.15	2	22	45	54	45	44	16	29	25	
7/25/18	40	0.45	20	29	3	0.35	0.1	23	46	56	48	44	32	44	26	
7/26/18	43	2.4	22	35	4	2.1	0.15	9	45	54	49	44	27	37	31	
7/27/18	41	1	13	27	5	0.65	0.45	11	45	54	51	44	28	45	30	
7/30/18	45	17	31	42	37	4.7	8	14	46	55	50	44	17	36	27	
7/31/18	29	0.15	6	23	6	0.2	0.02	9	24	46	49	43	19	31	12	
8/1/18	44	11	38	40	20	0.1	11	19	30	56	54	45	17	36	20	
8/2/18	41	12	27	38	35	0.3	10	20	45	57	52	43	33	45	30	
8/8/18	36	0	7	28	12	0.25	1.2	2.95	40	50	47	42	29	43	27	
8/15/18	31	17	6	27	11	1.25	8	7	40	53	46	43	20	30	13	
8/22/18	36	0.15	21	28	2.75	0.2	0.4	18	45	55	49	45	30	43	25	
8/29/18	36	0.6	19	27	5	1.25	0.8	48	51	46	9	46	19	40	26	
9/6/18	44	17	15	29	8	0.5	1.05	8	40	47	50	43	21	30	24	
9/13/18	49	25	20	40	18	0.4	0.9	30	48	51	48	50	29	48	26	
9/20/18	39	16	16	35	11	0.85	1.5	23	46	46	40	42	24	42	23	
9/27/18	49	6	28	37	5	0.25	1	38	51	56	52	51	46	50	35	
10/3/18	49	6	18	46	15	0.6	0.05	34	49	47	12	50	41	48	40	
10/11/18	45	4.7	10	25	1.45	0.25	1.15	21	50	40	50	50	31	48	24	
10/17/18	51	5	15	22	2.85	1.6	0	45	52	55	52	51	49	49	22	
10/30/18	50	19	20	50	15	0.4	0.7	35	50	55	52	51	24	50	38	
11/7/18	50	7	19	40	3.25	0.05	0	23	50	53	51	51	39	50	27	
11/15/18	51	15	23	36	10	1.15	0.15	37	52	57	52	49	45	51	37	
11/27/18	41	7	18	28	10	2.75	0.05	41	53	55	50	50	48	48	35	
12/6/18	49	10	20	15	5	1.75	0.5	19	48	48	52	49	38	50	37	
12/13/18	0	0	0	0	0	1.8	0	0	0	0	0	0.05	38	0	0	
12/14/18	15	0	0.05	4.15	0	0.9	0	17	25	0.05	0.15	54	40	39	18	
12/21/18	47	12	28	32	19	1.5	15	53	25	48	51	51	48	49	41	
12/26/18	51	14	23	50	16	6	0	45	51	56	52	51	50	50	36	
1/4/19	52	6	28	31	10	2.4	0	27	52	53	53	52	40	50	27	
1/11/19	53	14	21	47	10	11	0	52	52	57	54	52	52	52	48	
1/16/19	52	15	19	44	13	9	7	39	52	57	53	52	45	51	41	
1/23/19	13	0	12	40	10	3	0.65	38	38	57	47	46	43	35	46	
1/30/19	40	6	20	41	11	7	0	28	51	56	47	49	42	47	38	
2/6/19	50	35	45	49	37	12	23	41	50	54	51	50	30	49	37	
2/15/19	50	13	20	48	12	5	0	35	50	55	50	55	48	49	36	
2/20/19	42	16	36	30	17	30	15	37	51	55	51	50	35	46	30	
2/28/19	47	4	13	27	1	7	2.15	17	47	29	33	50	39	48	23	
3/7/19	49	15	22	31	1.4	6	1.4	32	50	52	51	49	44	49	46	
3/15/19	1.75	0	0	1.7	0	4.45	0	14	51	0	45	38	36	24	6	
3/22/19	46	5	26	42	11	9	8	15	45	18	49	48	44	48	45	
3/29/19	49	12	26	48	12	9	6	20	49	41	50	48	44	48	44	
4/5/19	48	32	48	45	23	20	18	46	44	48	50	47	32	48	40	
4/12/19	40	5	11	30	9	3.5	0.6	45	49	54	49	47	48	45	34	
4/17/19	47	20	24	45	15	18	8	45	49	54	49	47	49	47	43	
4/25/19	47	17	21	34	0.95	7	0	38	48	54	49	49	46	46	44	
5/1/19	47	7	14	40	0.85	11	0	38	49	52	49	48	40	47	27	
5/13/19	46	11	1.2	23	35	6	0	44	49	54	49	49	49	48	33	
5/22/19	44	6	15	29	32	11	0	35	49	48	48	48	48	45	29	
5/29/19	48	16	21	50	13	7	1.5	37	48	52	49	48	39	48	43	

Notes:

* Originally monitoring probes converted to vents

TABLE 2.0 - LANDFILL GAS MONITORING RESULTS (CONT.)

(Reported as % methane gas by volume)

Date	GMP-4*	BGMP-4.1	BGMP-4.2*	BGMP-4.3*	BGMP-4.4	MW-11	BGMP-12.1	TGMP #2	TGMP #1	TGMP-3.1	TGMP-3.2	TGMP-3.3	TV-1	TV-2	TV-3	
6/5/19	48	23	10	40	20	13	0	43	48	53	47	47	47	47	35	
6/12/19	48	3.25	1.7	39	13	7	0	43	48	52	47	47	49	45	38	
6/19/19	48	18	21	40	24	8	0.45	45	48	53	48	48	44	48	39	
6/26/19	23	8	7	31	19	6	0	44	46	52	48	46	43	45	29	
7/3/19	47	18	16	49	16	7	1.65	47	48	53	49	48	47	47	41	
7/10/19	48	12	24	42	3.2	7	1	46	48	52	49	47	44	47	32	
7/18/19	48	27	32	47	27	31	8	43	48	54	49	47	40	49	37	
7/25/2019**	14	0.85	0	0	0	6	0.2	12	19	31	29	39	31	25	0	
7/29/2019**	12	0.45	4.5	0.05	0.1	10	0.15	8	0.9	3	0	0	23	9	0.05	
8/7/19	48	8	17	36	19	4.2	1.25	33	48	53	48	44	40	45	29	
8/14/19	44	1.9	0.25	29	4	4.85	0.75	31	45	53	49	43	38	38	24	
8/21/19	45	1	1.4	29	5	1.5	0.2	24	36	45	48	38	30	38	24	
8/28/19	32	0.15	0.05	21	1.6	0.55	0.9	38	37	48	44	35	29	38	19	
9/6/19	44	3.85	6	36	7	4.7	0.4	43	38	47	45	34	35	35	27	
9/11/19	36	0.2	0.7	23	5	2.2	0.1	17	25	39	43	33	31	24	17	
9/27/19	44	6	4.25	43	17	3.4	4	35	36	44	47	34	16	42	32	
10/3/19	35	0.15	1.45	27	4.1	5	0.95	29	34	46	41	32	31	25	20	
10/10/19	44	4	16	40	19	6	4.4	28	37	44	49	34	39	42	36	
10/16/19	25	4	0	4.25	0.1	2.75	1.5	29	33	46	43	29	49	44	33	
10/23/19	40	11	7	28	8	0.95	0.05	45	38	44	43	34	44	38	24	
11/1/19	35	8	10	22	12	0.8	0	31	39	40	41	33	37	34	26	
11/8/19	32	0.1	0	11	0.2	3.95	0.2	30	39	30	41	36	50	36	10	
11/15/19	30	1.55	1.6	14	1.45	0.95	0.2	45	41	46	41	36	43	37	12	
11/20/19	48	13	16	26	10	1	0.8	39	43	33	23	38	43	43	12	
11/27/19	47	2.35	0	2.65	0	2.5	0	39	46	39	34	43	40	25	18	
12/4/19	44	5	7	22	4	2.1	0.45	32	45	43	45	41	34	30	11	
12/14/19	49	5	18	34	7	1.05	2	27	40	46	49	43	39	44	54	
12/18/19	19	0	5	11	0.45	0.85	0	33	41	43	38	37	39	33	11	
1/2/20	49	7	12	14	7	6	3.75	24	47	38	49	43	28	41	17	
1/8/20	43	6	15	23	5	1.6	0.6	47	47	47	46	37	41	43	25	
1/15/20	46	41	8	24	4	0.6	0.5	17	43	45	45	37	42	29	12	
1/23/20	49	10	16	23	3.45	2	1.85	40	45	44	48	43	37	36	17	
1/31/20	37	4	0.7	7	0.7	2.7	0	31	27	39	48	33	39	22	5	
2/6/20	47	6	9	23	5	1.7	1.3	48	49	50	51	46	47	44	19	
2/12/20	49	11	12	28	8	3.4	0.6	36	39	43	51	45	40	44	17	
2/19/20	31	0	1.9	14	0	4.4	0	46	49	51	47	42	40	37	16	
2/27/20	35	0.2	12	17	33	1.25	0	40	48	52	43	40	42	38	17	
3/5/20	10	0	0	4	0.15	0.4	0	24	31	45	45	41	30	28	3	
3/11/20	49	14	23	33	20	2	1.2	50	48	52	50	42	44	46	28	
3/19/20	49	10	19	33	13	4.4	0.9	49	48	49	49	43	38	44	32	
3/26/20	50	11	21	38	7	2.5	0	41	48	52	50	45	46	47	39	
4/16/20	44	10	14	30	23	8	0.45	50	48	43	49	45	44	48	30	
4/29/20	34	0	0	0	0	1.8	0	39	39	33	37	41	23	14	0	
5/23/20	10	0	0.7	0.1	0.05	4.3	0	6	3	10	0	0	32	0	0	
6/10/20	12	0	0	12	0.15	4.45	0.3	37	49	42	47	43	42	31	10	
6/25/20	15	0.15	0.05	0	1.6	4.2	0.25	12	10	11	18	15	23	25	0	
7/15/20	44	2.1	40	30	5	1.2	0.3	26	43	36	45	32	47	37	23	
8/7/20	46	2.3	3.5	39	4.3	0.15	0.2	33	41	43	44	38	38	42	24	
8/24/20	43	1.1	1.25	29	4	0.1	4	36	40	42	44	35	46	40	24	
9/18/20	40	2.75	3	27	2.65	9	0.2	47	35	39	38	28	41	37	24	
9/30/20	33	9	1.2	22	1.8	1.05	0.05	46	35	43	40	28	37	36	21	
10/23/20	31	0	1.25	7	3.2	0.5	0.15	26	23	23	37	25	30	28	8	
11/19/20	36	1.5	2.35	22	2.4	0.65	0	33	21	32	30	21	31	24	17	
12/17/20	25	0.9	0	14	0.75	1.4	0.05	44	36	36	37	33	44	32	11	
1/15/21	21	0.06	0	13	0.21	2.1	0	47	45	21	43	45	44	36	7	
2/10/21	52	9	2.9	31	10.00	3.75	0.35	53	51	50	50	44	49	48	34	
3/26/21	39															

Notes:

* Originally monitoring probes converted to vents

**Some readings taken on 7/25/19 were unusually low, so resampled was conducted on 7/29/19

CHART 1.1 - GMP-4.0 Monitoring Results (Current Status: Temporary Vent)

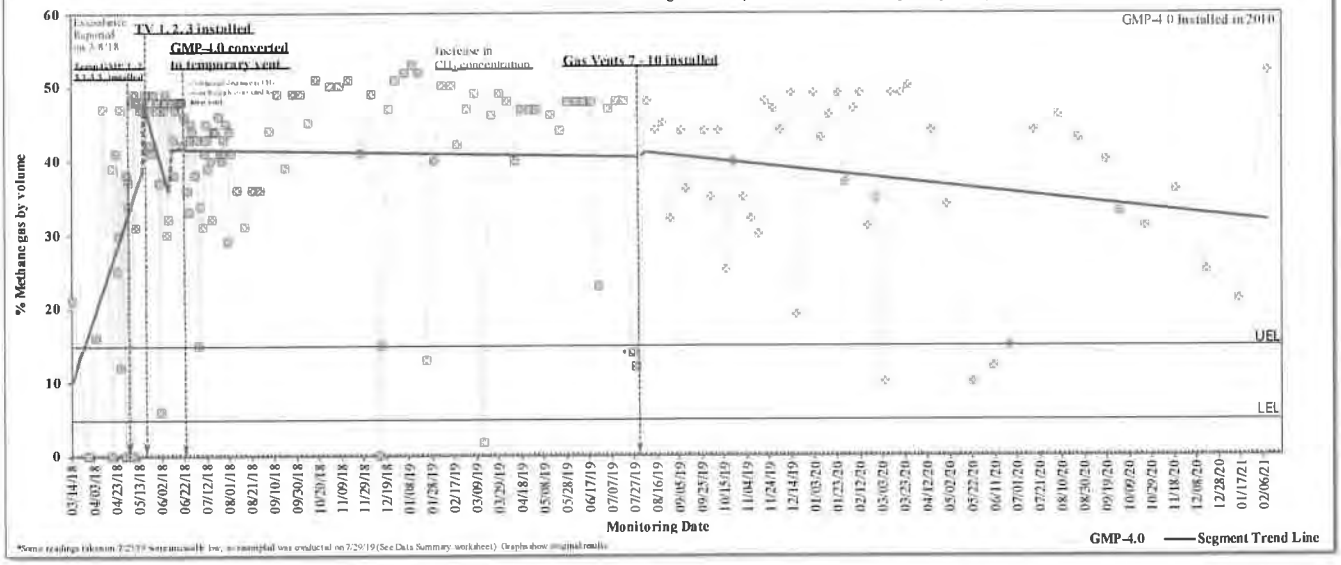


CHART 1.2 - BGMP-4.1 Monitoring Results

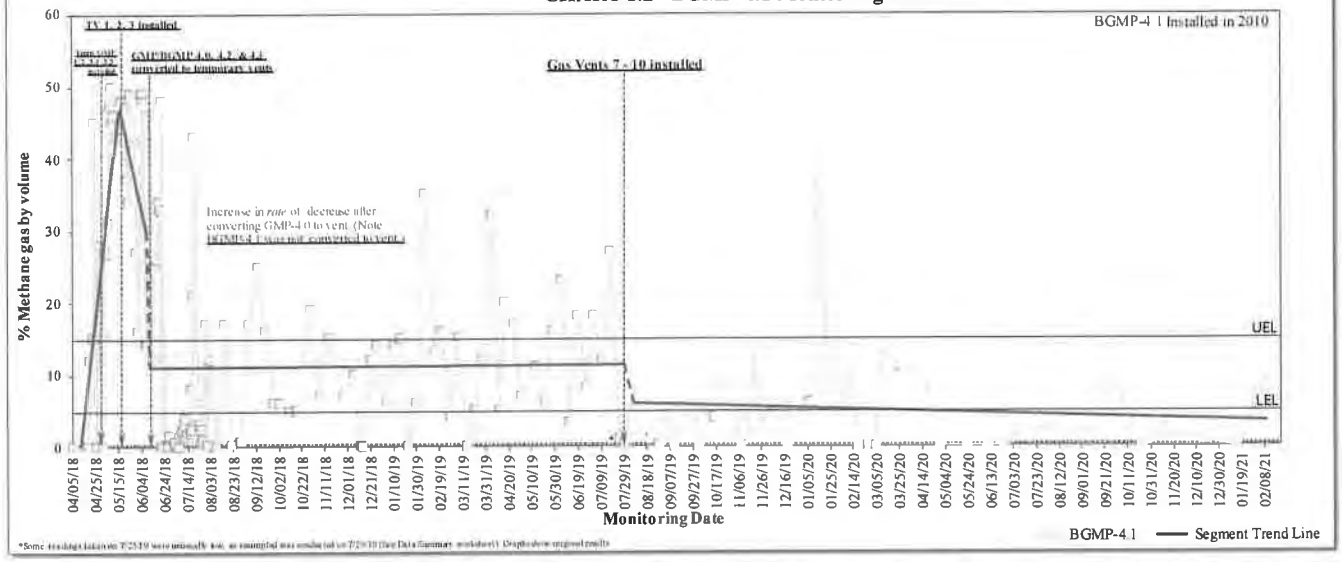


CHART 1.3 - BGMP-4.2 Monitoring Results (Current Status: Temporary Vent)

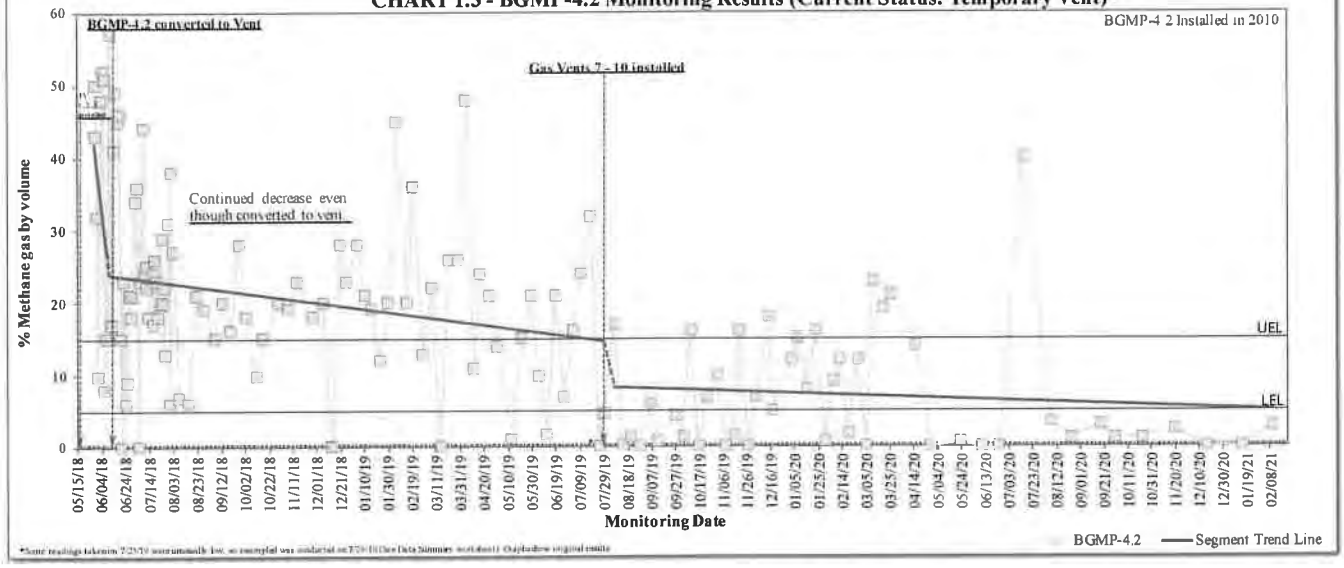
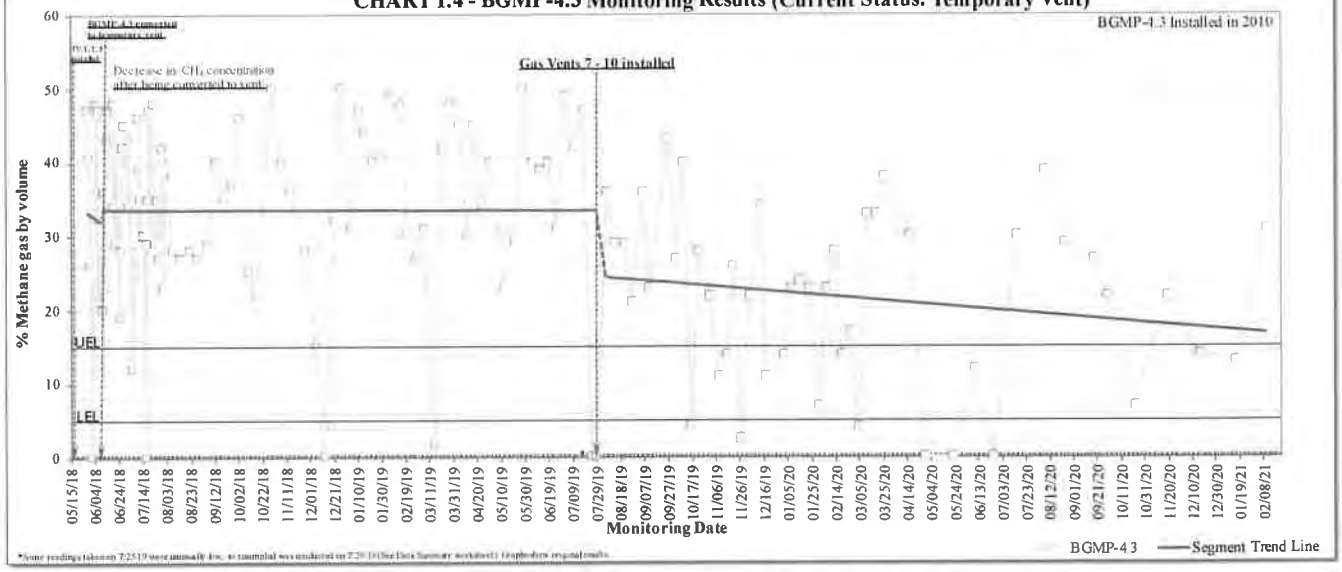
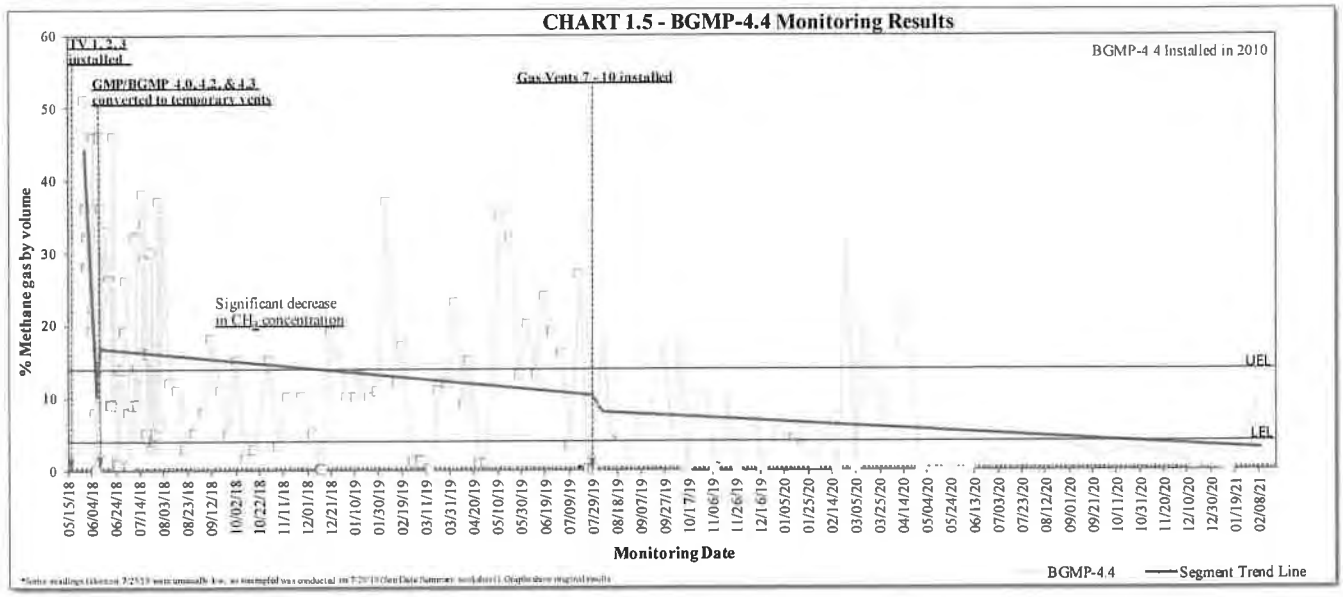


CHART 1.4 - BGMP-4.3 Monitoring Results (Current Status: Temporary Vent)



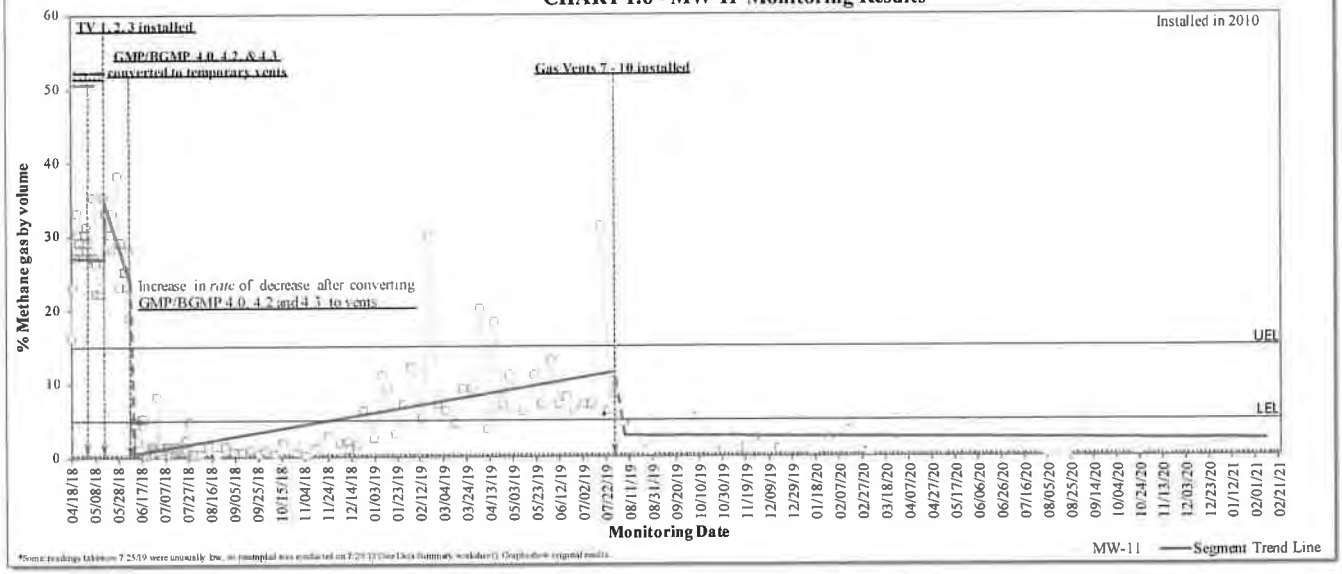
*Some readings taken on 7/25/19 were unusually low, so resampling was conducted on 7/29/19 (See Data Summary worksheet). Graph shows original results.

CHART 1.5 - BGMP-4.4 Monitoring Results



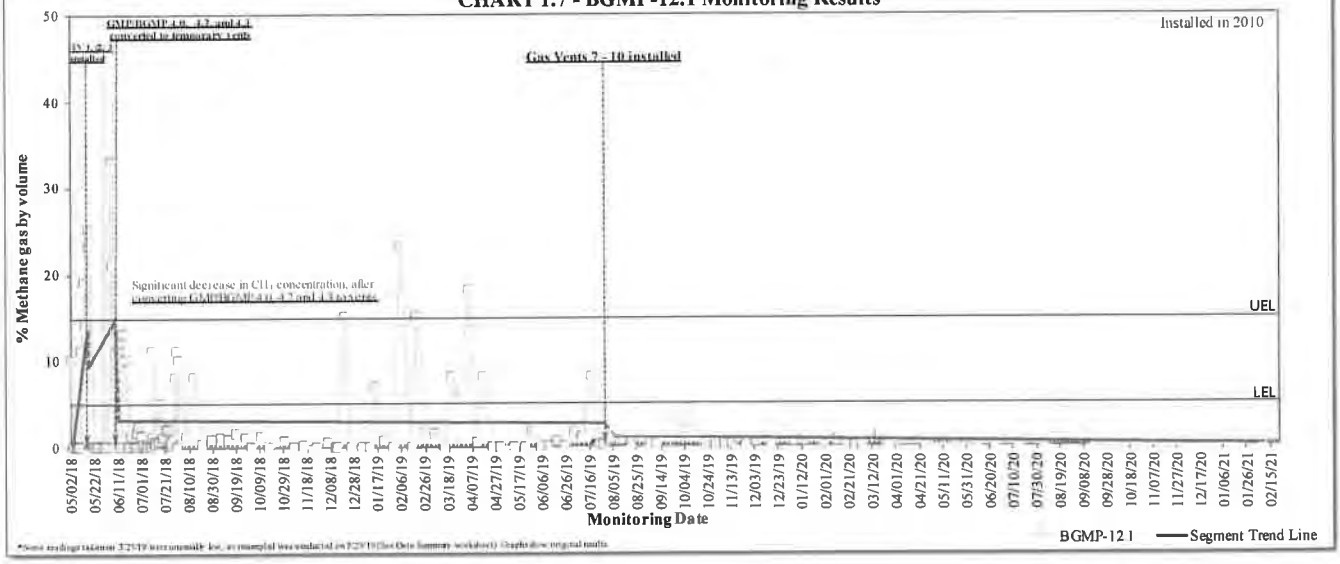
*Some readings taken on 7/25/19 were unusually low, so resampling was conducted on 7/29/19 (See Data Summary worksheet). Graph shows original results.

CHART 1.6 - MW-11 Monitoring Results



*Some readings taken on 7/25/19 were unusually low, so resampling was conducted on 7/29/19 (See Data Summary worksheet). Graph shows original results.

CHART 1.7 - BGMP-12.1 Monitoring Results



*Some readings taken on 7/25/19 were unusually low, so resampling was conducted on 7/29/19 (See Data Summary worksheet). Graph shows original results.

CHART 1.8 - TGMP #2 Monitoring Results

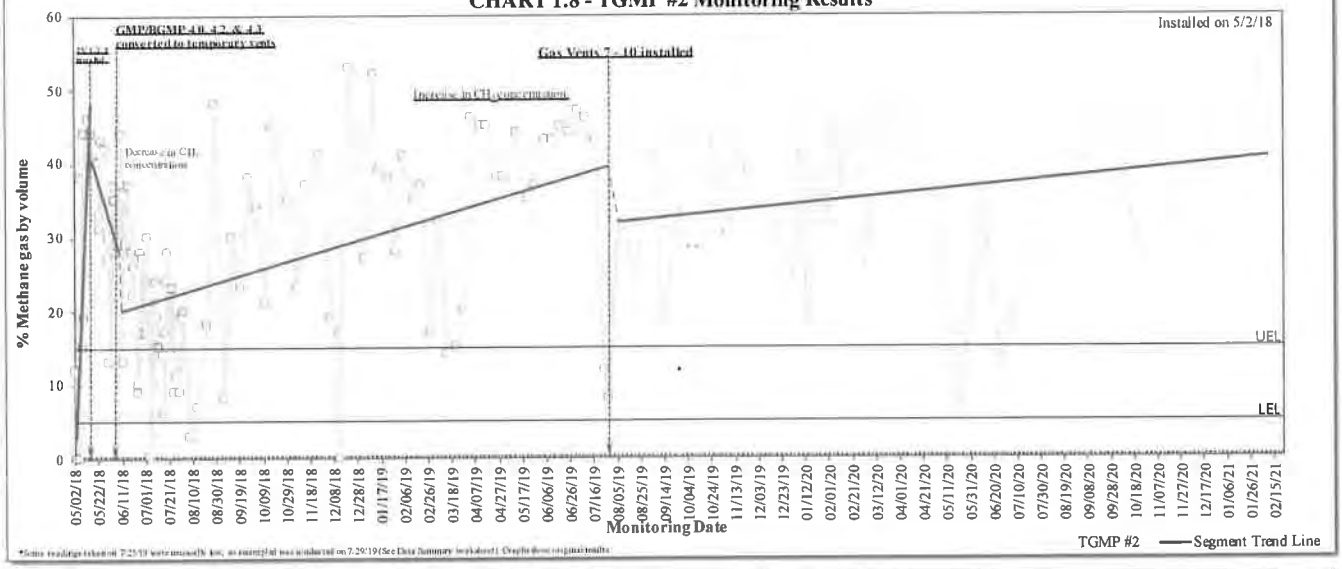


CHART 1.9 - TGMP #1 Monitoring Results

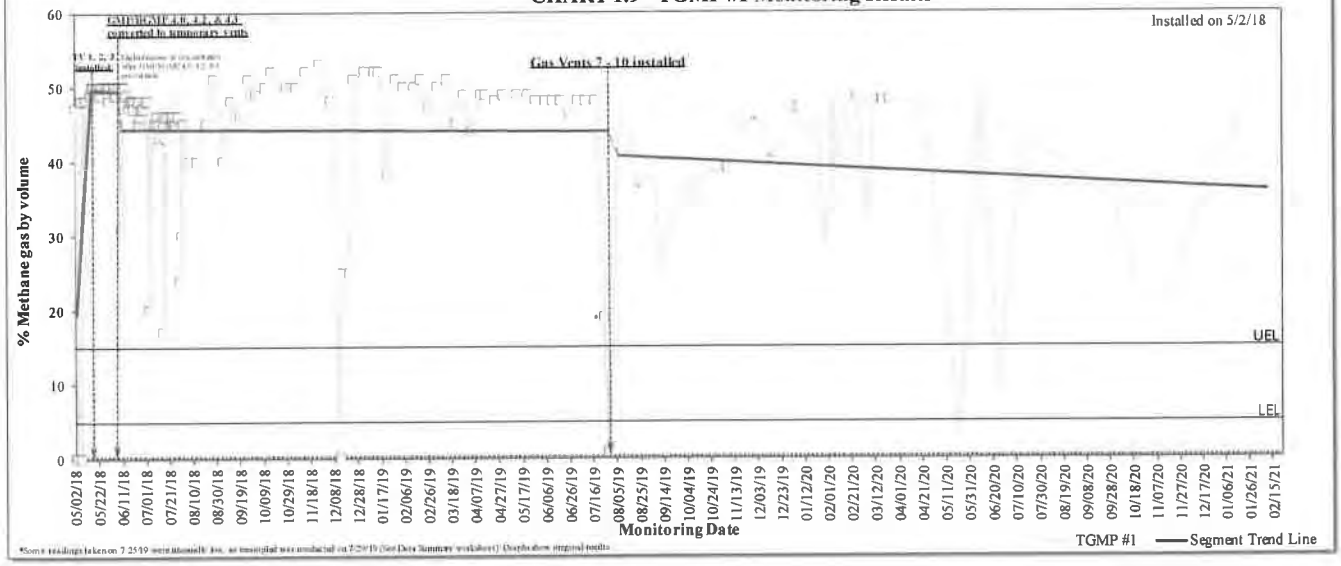


CHART 1.10 - TGMP-3.1 Monitoring Results

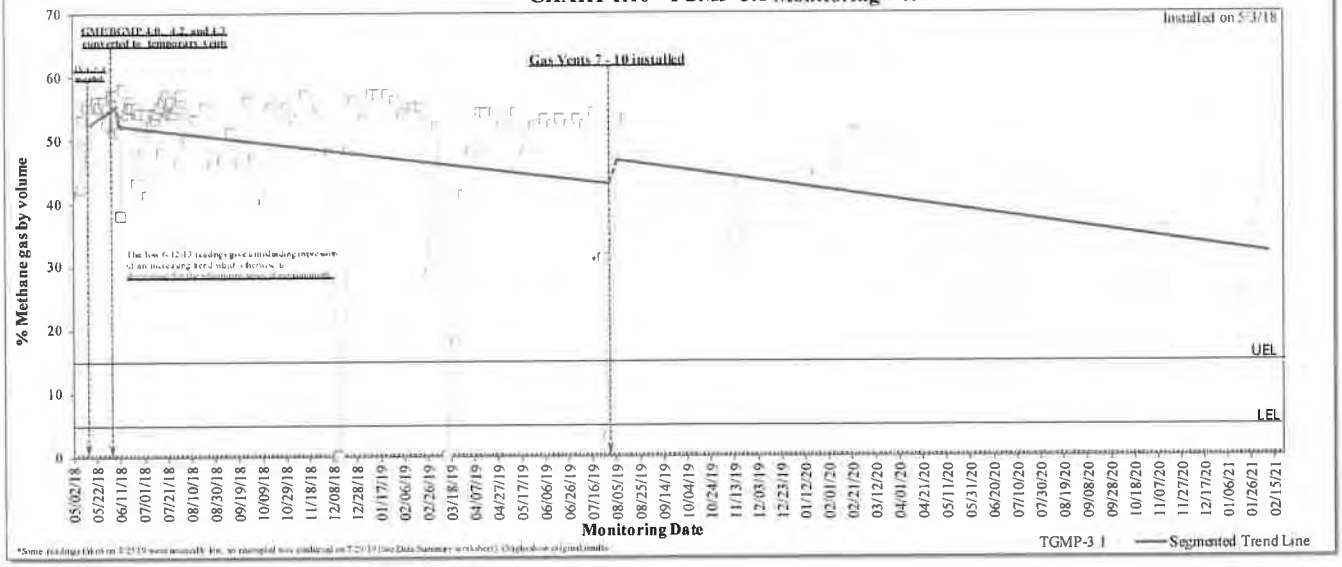


CHART 1.11 - TGMP-3.2 Monitoring Results

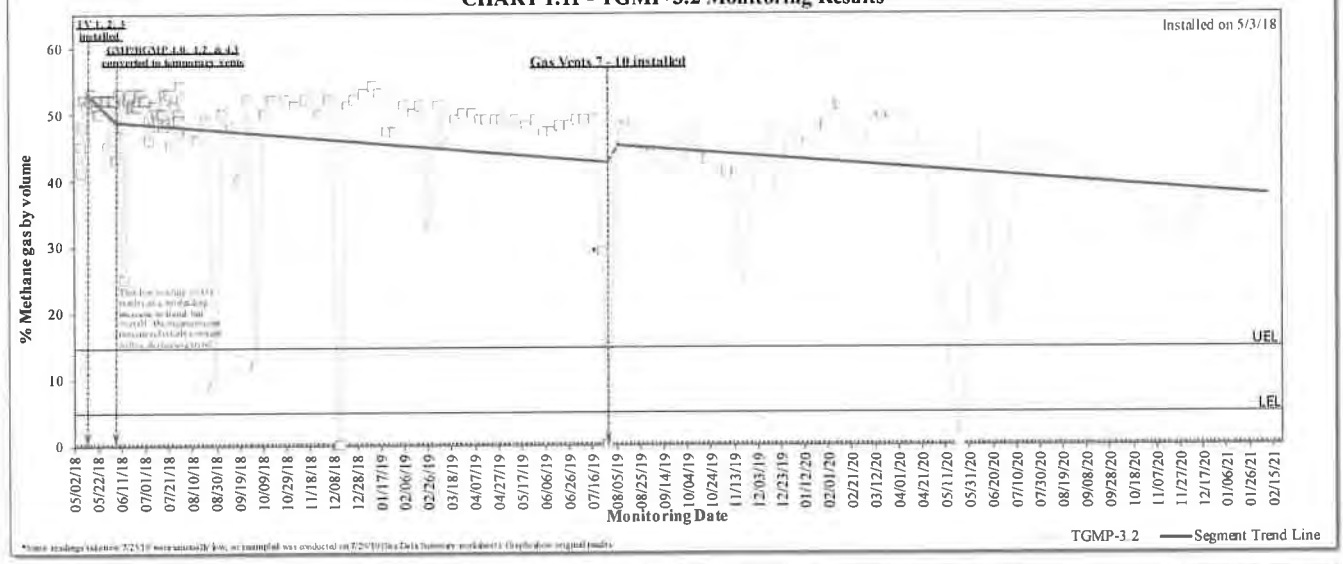


CHART 1.12 - TGMP-3.3 Monitoring Results

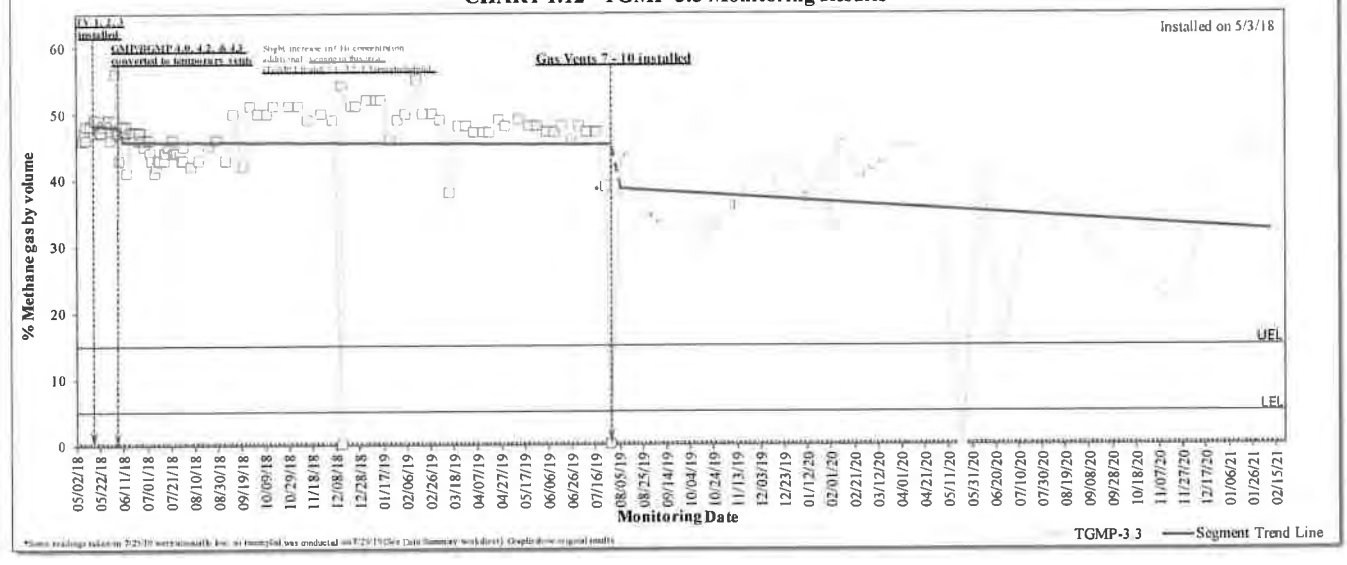


CHART 1.13 - TV-1 Monitoring Results

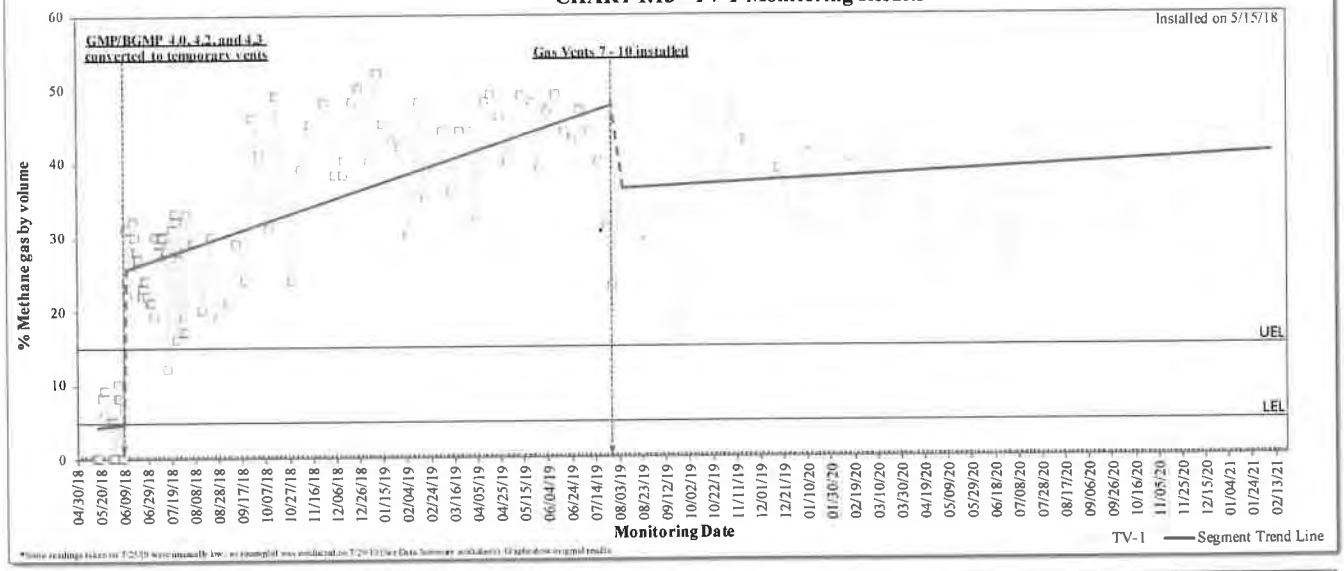


CHART 1.14 - TV-2 Monitoring Results

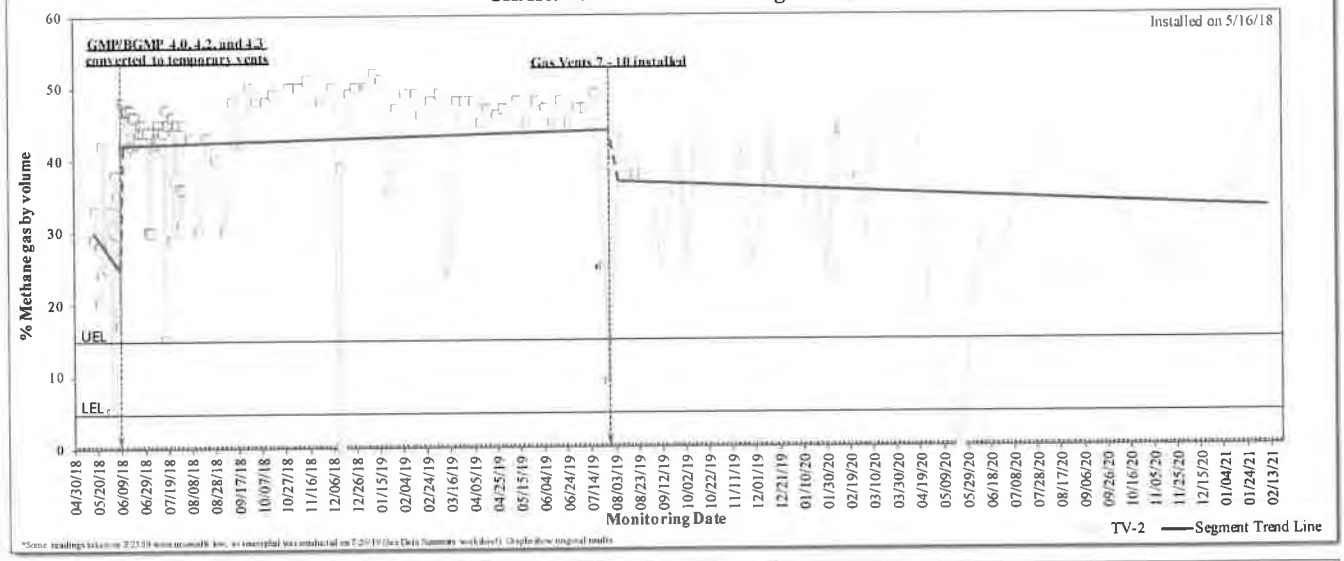
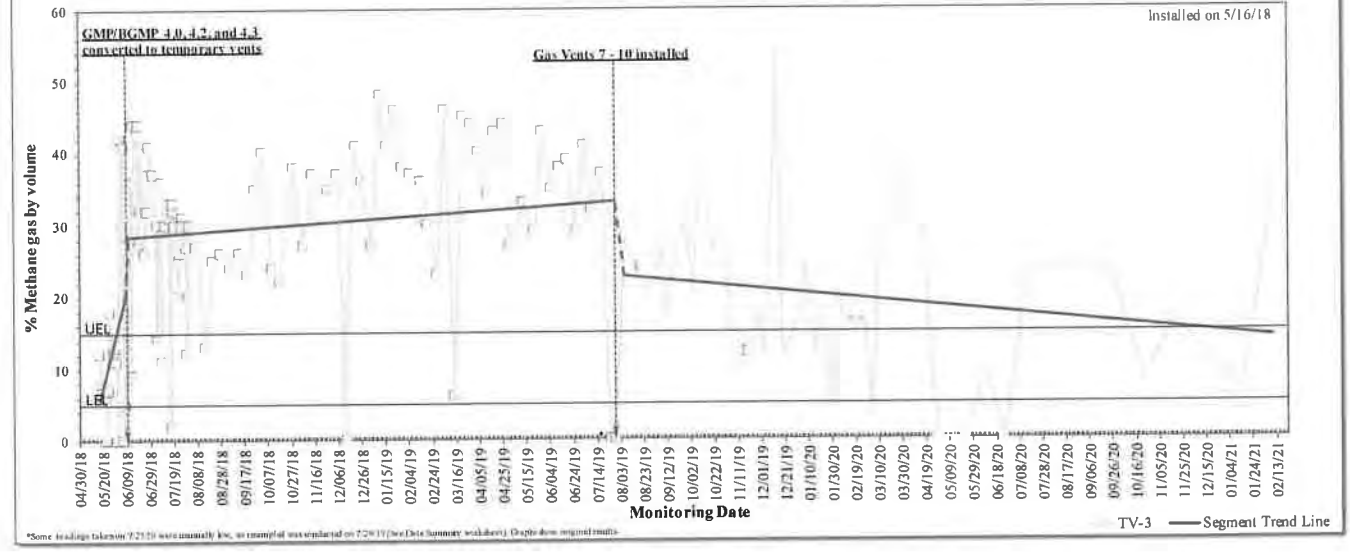


CHART 1.15 - TV-3 Monitoring Results



Landfill Gas Remediation Plan

Dated September 2, 2022

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

September 22, 2022

Mr. Juan Zamora
Public Works Director
City of Uvalde
P.O. Box 799
Uvalde, Texas 78802-0799

Via Email

Re: City of Uvalde Landfill – Uvalde County
Municipal Solid Waste (MSW) – Permit No. 1725
Landfill Gas Remediation Plan for GMP-4 – September 2, 2022
Tracking No. 27810539; RN102803921/CN600648455

Dear Mr. Zamora:

We received your Landfill Gas Remediation Plan for GMP-4 for the above-referenced facility on September 12, 2022. The plan was dated September 2, 2022 and prepared on your behalf by Dr. Brett DeVries, Ph.D., P.E. of SCS Engineers, Bedford. The update responds to our letter dated October 28, 2021 on your methane monitoring results for the 3rd quarter of 2021.

We have the following comments:

1. We have not received quarterly or monthly methane monitoring data for 2022.
2. We have not received monthly methane concentrations newer than February 2021 despite our requests dated May 10, 2021, October 28, 2021, and April 1, 2022 and your references to monthly monitoring in your May 2021 update and January 2022 update.
3. Methane concentrations along the property line north of at least Phase B continue to exceed the regulatory limit of 5% defined in 30 TAC §330.371(a)(2) in spite of the additional gas vents installed in Phases A and B during August 2019.

Please do the following as requested in our letter dated April 1, 2022 on your Landfill Gas Remediation Plan Update dated January 17, 2022:

- Define the extent of methane concentrations above 5% in the ground by monitoring west of TGMP-2 and east of BGMP-4.4 as you proposed in your May 2021 update.
- As noted in your Landfill Gas Management Plan approved February 27, 2017, submit a permit modification under 30 TAC §305.70(k)(3) to update your Landfill Gas Management Plan.
    a. Include the locations and construction details of landfill gas monitoring points and vents added since 2016.
    b. Include your Landfill Gas Remediation Plan dated May 8, 2018.
    c. Include your Landfill Gas Remediation Pan for GMP-4 dated September 2, 2022.

You should continue landfill gas remediation activities under 30 TAC §330.371(c) without waiting to submit or receive approval of your upcoming permit modification.

If you have questions regarding this letter, please contact me at (512) 239-2580 or in writing at either robert.pedersen@tceq.texas.gov or the address on our letterhead (please include mail code MC 124 on the first line).

Sincerely,

Robert C. Pedersen, P.E., Project Manager
Municipal Solid Waste Permits Section
Waste Permits Division
Texas Commission on Environmental Quality

RCP/tw

cc: Dr. Brett DeVries, Ph.D., P.E., SCS Engineers, Bedford
Dr. Stephen Forbes, Ph.D., P.E., P.G., Forbes Environmental Engineering, San Antonio

September 2, 2022
SCS Project No. 16222029.00

Mr. Charlie Fritz
Section Manager
MSW Permits Section (MC-124)
Texas Commission on Environmental Quality
12100 Park 35 Circle, Bldg. F
Austin, Texas 78753

Re: Landfill Gas Remediation Plan for GMP-4
City of Uvalde Landfill – Permit No. MSW-1725
Uvalde County, Texas
RN102803921/CN600648455

Dear Mr. Fritz:

On behalf of the City of Uvalde Landfill, SCS Engineers (SCS) is providing this letter to the Texas Commission on Environmental Quality (TCEQ) as a continuation and update of the landfill gas (LFG) remediation plan (LGRP) for perimeter gas monitoring probe GMP-4 (dated May 8, 2018) and TCEQ letter dated October 28, 2021 (Tracking No. 26649876) for the City of Uvalde Landfill (MSW-1725).

The prior LGRP was dated May 8, 2018 and developed by Forbes Environmental Engineering & Associates. As indicated in the plan, methane concentrations above the regulatory limit (i.e., five (5) percent by volume methane in accordance with 30 Texas Administrative Code (TAC) §330.371(a)(2)) was detected in gas monitoring probe GMP-4 during a quarterly gas probe monitoring event on March 8, 2018.

Following the May 2018 LGRP and generally consistent with the plan, the following remediation efforts were completed:

- Monitoring of methane in the GMPs, gas monitoring vents (GMV), backup gas monitoring probes (BGMP), temporary gas monitoring probes (TGMP), temporary vents (TV), monitoring wells (MW) in proximity to GMP-4 on an at least monthly basis (see Drawing No. 1 for approximate locations). Monitoring results were provided in the response to TCEQ's letter dated October 28, 2021.

- Phase 1.0 of the LGRP: installation of three, 2-inch vents on a general 200 foot spacing, with the vents screened in the upper Uvalde Gravel with a 10-foot riser to intercept and divert the gas before reaching the primary remediation probes.

- Phase 2.0 of the LGRP: five, PVC passive vents in Stage B (Subtitle D area) screened to approximately one foot above bottom liner were installed in August 2019.

As indicated in the response to TCEQ's letter dated October 28, 2021, the size of the LFG plume has decreased following installation of TV-1, 2, and 3, and conversion of BGMP-4.0, 4.2, and 4.3 to vents; however, methane concentrations above the regulatory limit remain in GMP-4; BGMP-4.1, 4.3, and

4.4; TGMP-1, 2, 3.1, 3.2, 3.3; and TV-1, 2, and 3 as of February 2021. As a result of methane concentration readings above the regulatory limit, this plan documents remediation efforts to be implemented in an effort to mitigate methane concentrations above the regulatory limit in GMP-4.

LFG Remediation Plan

As described above, the City has conducted remediation efforts for GMP-4, and vents/probes near GMP-4 have been monitored on at least monthly basis to evaluate the effects of the remediation efforts. Additionally, the City will perform further remediation efforts in 2022/2023 and 2023/2024, as necessary, to mitigate methane levels above the regulatory limit in GMP-4 as discussed in the subsequent sections.

Based on review of historical information and existing site conditions, it is believed that the LFG migration is originating from the Pre-Subtitle D area (Stage A), and potentially migrating along and under the GCL installed in Stage A and Subtitle D liner installed in Stage B where a separation berm between Stage A and B was constructed. As a result, the remediation efforts proposed in the subsequent sections focus on controlling LFG at the edge of the GCL in Stage A. Internal gas pressure is known to be a driving force behind LFG migration. As such, the proposed remediation efforts focuses on extracting LFG from its source (i.e., the landfill), relieving pressure buildup and reducing the potential of LFG migration.

Passive Gas System Installation, Monitoring, and Evaluation

To continue the remediation efforts at the landfill, the City will proceed with a two phase approach (Phase 3.0 and 4.0). Phase 3.0 will be completed in 2022 or beginning of 2023 and Phase 4.0 will be completed following the Phase 3.0 evaluation period (anticipated in forth quarter of 2023 or beginning of 2024, if needed). Details related to Phases 3.0 and 4.0 are described below:

- **Phase 3.0:** installation of four passive LFG extraction wells east of the GCL termination in Stage A on the north side of the landfill (nearest the LFG migration). These four wells will be connected by lateral piping and routed to blowers and solar vent flares. The permit level plan-view and detail drawings are provided in Attachment A. Following completion of construction, methane concentrations will be monitored on a monthly basis in GMP-4, BGMP-4, TGMP-3.1, 3.2, and 3.3, and TGMP-2 for a twelve-month evaluation period. If these probes are not able to demonstrate six consecutive monthly readings below the regulatory limit, then the City will continue with Phase 4.0.

- **Phase 4.0:** installation of three passive LFG extraction wells east of the GCL termination in Stage A, south of the Phase 3.0 extraction wells. These three wells will be connected by lateral piping and routed to a blower and solar vent flare. The permit level plan-view and detail drawings are provided in Attachment A. Following completion of construction, methane concentrations will be monitored on a monthly basis in GMP-4, BGMP-4.4, TGMP-3.1, 3.2, and 3.3, and TGMP-2 for a twelve-month evaluation period. If these probes are not able to demonstrate six consecutive monthly readings below the regulatory limit, then the City will pursue other remediation efforts and an update to this remediation plan will be submitted to TCEQ.

Following completion of Phase 3.0 and/or 4.0, methane concentrations will be monitored on a monthly basis in GMP-4, BGMP-4.4, TGMP-3.1, 3.2, and 3.3, and TGMP-2, and results will be submitted to

TCEQ on a quarterly basis. If GMP-4 is able to demonstrate six consecutive monthly readings below the regulatory limit, then the probe will be considered remediated and will return to quarterly monitoring.

As described in the May 2018 LGRP, a permit modification of the Landfill Gas Management Plan (LGMP) will be submitted to TCEQ in accordance with 30 TAC §305.70(k)(3), to incorporate the remediation efforts into the LGMP once remediation efforts have been completed.

Closing

One original and two copies of this plan are provided for your use and distribution. In addition, a copy has been provided to the TCEQ Region 13 office and placed in the site operations record. If you have any questions or need additional information, please contact Brett DeVries, Ph.D., P.E. at (817) 358-6110.

Sincerely,

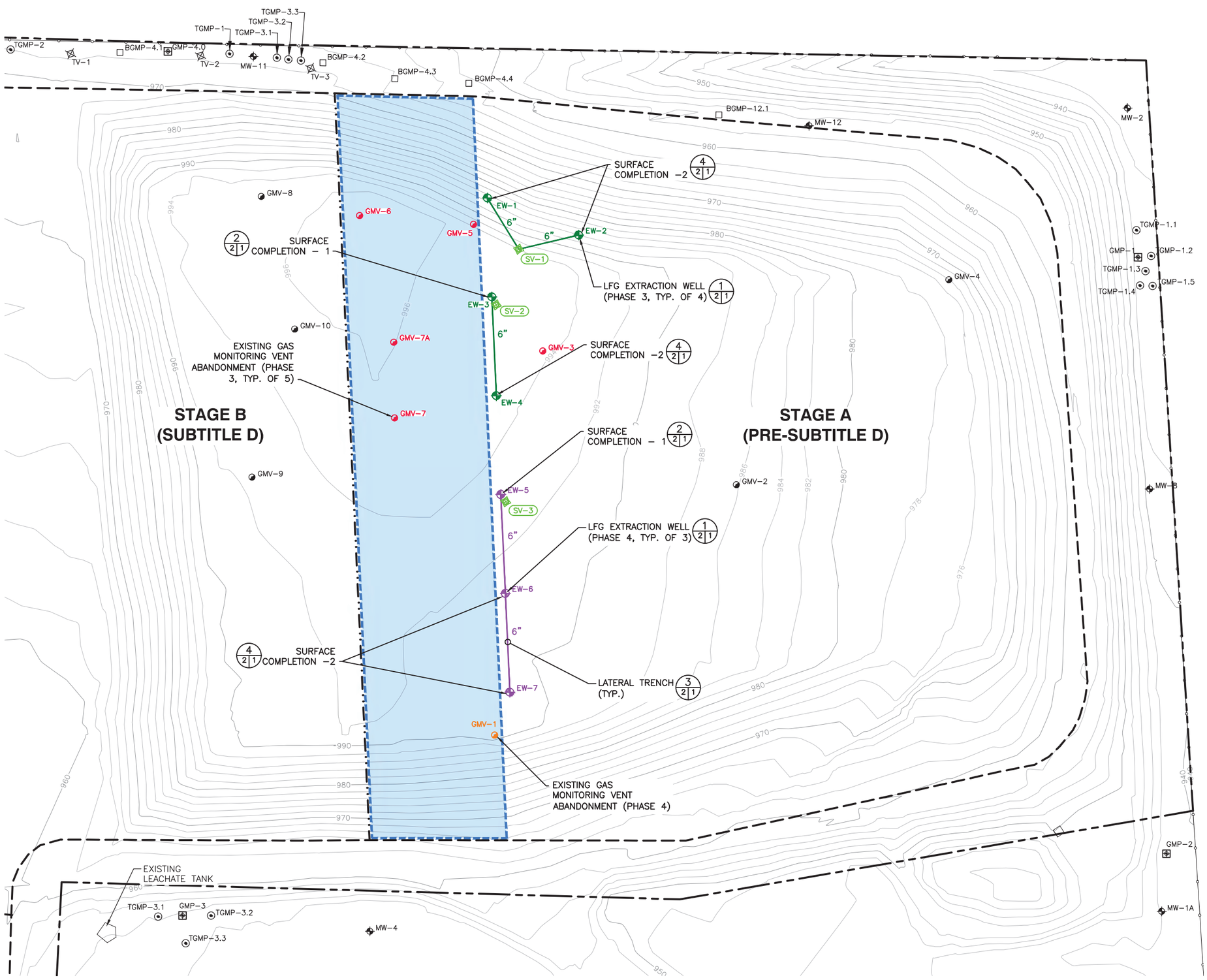
Brett DeVries, Ph.D., P.E.
Project Manager
SCS Engineers
TBPE Registration No. F-3407

Ryan Kuntz, P.E.
Vice President / Satellite Office Manager
SCS Engineers

Attachment

cc: Mr. Juan Zamora – Director of Public Works, City of Uvalde
Mr. Stephen Forbes, Ph.D., P.E., P.G.
TCEQ Region 13

ATTACHMENT A
PASSIVE GAS SYSTEM DRAWINGS



0 50 100
SCALE IN FEET

LEGEND

- APPROX. PERMIT BOUNDARY (SEE NOTE 2)
- APPROX. LIMITS OF WASTE (SEE NOTE 3)
- APPROX. CELL BOUNDARY (SEE NOTE 2)
- 960 EXISTING CONTOURS (SEE NOTE 1)
- EXISTING FENCE
- MW-2 EXISTING GROUNDWATER MONITORING WELL (APPROX.)
- GMV-4 EXISTING GAS MONITORING VENT (APPROX.)
- GMP-1 EXISTING GAS MONITORING PROBE (APPROX.)
- BGMP-12.1 BACKUP GAS MONITORING PROBE (APPROX.)
- TGMP-1.2 TEMPORARY GAS MONITORING PROBE (APPROX.)
- TV-3 EXISTING LFG TEMPORARY VENT (APPROX.)
- APPROX. LOCATION OF INSTALLED GCL (SEE NOTE 3)
- EW-1 PROPOSED VERTICAL LFG WELL (PHASE 3)
- EW-5 PROPOSED VERTICAL LFG WELL (PHASE 4)
- PROPOSED LATERAL (PHASE 3)
- PROPOSED LATERAL (PHASE 4)
- SV-1 PROPOSED PUSH PIN SOLAR VENT FLARE
- GMV-6 PHASE 3 – EXISTING GAS MONITORING VENT ABANDONMENT (APPROX.)
- GMV-1 PHASE 4 – EXISTING GAS MONITORING VENT ABANDONMENT (APPROX.)

NOTES:

1. EXISTING CONTOURS AND ELEVATIONS ARE FROM AERIAL PHOTOGRAPHY FLOWN IN 2010.
2. PERMIT BOUNDARY AND CELL BOUNDARY WERE OBTAINED FROM FIGURE I–1.4, GENERAL SITE LAYOUT MAP BY FORBES ENVIRONMENTAL ENGINEERING.
3. LIMIT OF WASTE AND LOCATION OF INSTALLED GCL WERE OBTAINED FROM SHEET 3, SITE LAYOUT PLAN BY TAYLOR & MULLINS, INCORPORATED.
4. ALL PROPOSED LFG COLLECTION SYSTEM COMPONENTS, INCLUDING WELLS, PIPING, ETC. MAY VARY FROM THE LOCATIONS DEPICTED DEPENDING ON EXISTING TOPOGRAPHY AT THE TIME OF CONSTRUCTION.

STATE OF TEXAS
BRETT J. DeVRIES
128061
LICENSED PROFESSIONAL ENGINEER
Brett DeVries 9/1/22

FOR PERMITING PURPOSES ONLY

REV	DATE	DESCRIPTION	BY

TEXAS BOARD OF PROFESSIONAL ENGINEERS REG. NO. F-3407

DRAWING TITLE: SITE LAYOUT

PROJECT TITLE: CITY OF UVALDE LANDFILL LANDFILL GAS REMEDIATION PLAN FOR GMP-4

CLIENT: CITY OF UVALDE
3774 FM 481
UVALDE, TEXAS 78801

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT
CONSULTING ENGINEERS
19011 CENTRAL DRIVE, SUITE 550, BEDFORD, TX 76021
PH (817) 571-2288 FAX NO. (817) 571-4186

PROJ. NO.	DSN. BY:	DWN. BY:	CHK. BY:	Q/A REVW BY:	APP. BY:
182220029.00	RJD	RGC	RJD	SDS	RRK

CADD FILE: 01 – SITE LAYOUT

DATE: 6/2022

SCALE: AS SHOWN

DRAWING NO. 1

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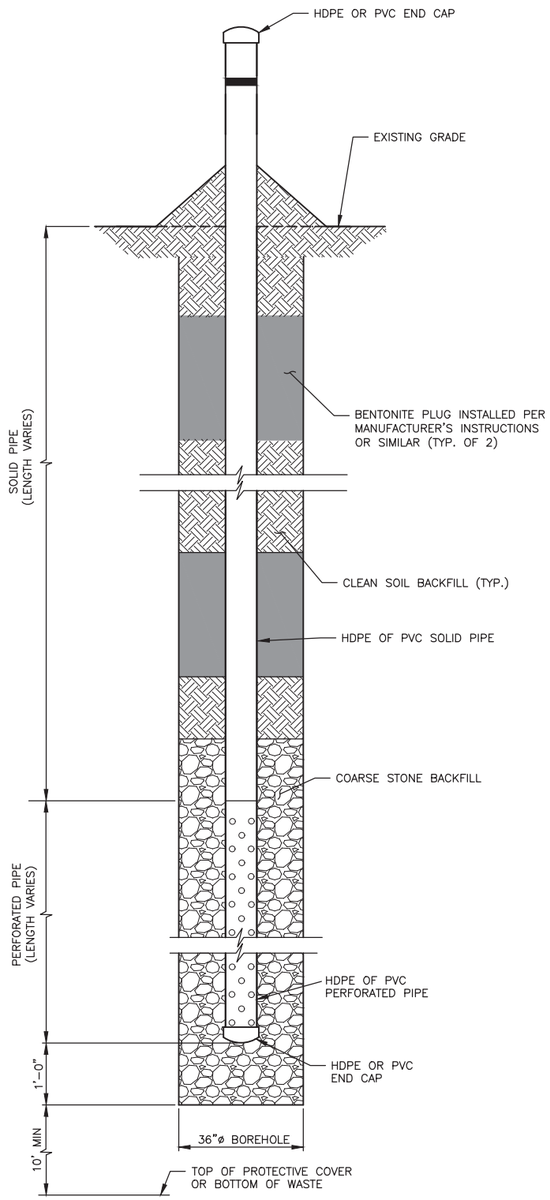
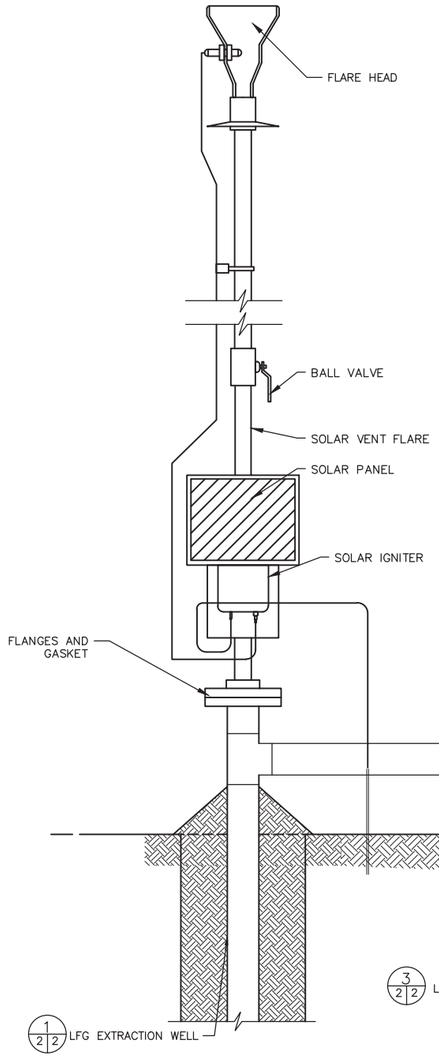


LFG EXTRACTION WELL (1/2/2) — NTS — 1,2

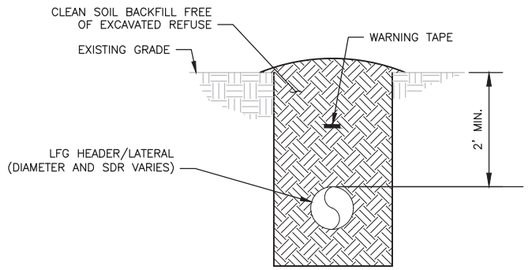


NOTES:

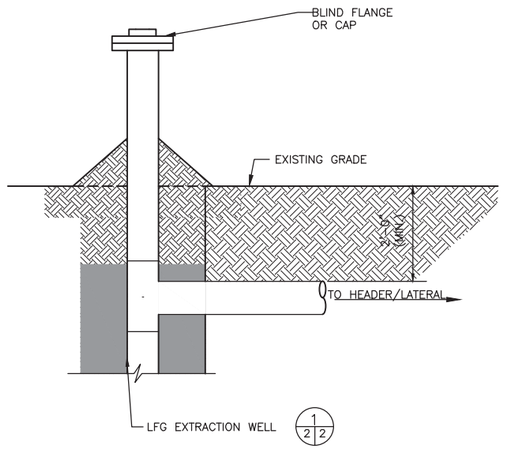
1. VENTS ARE DESIGNED TO BE CONVERTED TO AN ACTIVE LFG COLLECTION SYSTEM, IF NEEDED.
2. BLOWER MAY BE INSTALLED ON THE VENT FLARE.

SURFACE COMPLETION - 1 (2/2/1) — NTS

DETAIL DESIGNATION (X / X X)
DRAWING DETAIL REFERENCES
DRAWING DETAIL SHOWN ON



LATERAL TRENCH (3/2/1,2) — NTS



SURFACE COMPLETION - 2 (4/2/1) — NTS

STATE OF TEXAS
BRETT J. DeVRIES
128061
LICENSED PROFESSIONAL ENGINEER
Brett DeVries 9/1/22

FOR PERMITING PURPOSES ONLY

6/13/2022 3:40 PM G:\UVALDE\162220293.00 - LFG Remediation Services\02 - DETAILS

REV	DATE	DESCRIPTION	BY

TEXAS BOARD OF PROFESSIONAL ENGINEERS REG. NO. F-3407

DRAWING TITLE: **PASSIVE SYSTEM DETAILS**

PROJECT TITLE: **CITY OF UVALDE LANDFILL LANDFILL GAS REMEDIATION PLAN FOR GMP-4**

CLIENT: **CITY OF UVALDE 3774 FM 481 UVALDE, TEXAS 78801**

SCS ENGINEERS
STEARNS, CONRAD AND SCHMIDT CONSULTING ENGINEERS
1901 CENTRAL DRIVE, SUITE 550, BEDFORD, TX 76021
PH (817) 571-2288 FAX NO. (817) 571-2188

PROJ. NO. 162220293.00 | DSN. BY: RJD | DWN. BY: BGC | CHK. BY: RJD | QA/A RVW BY: SDS | APP. BY: JRK

CADD FILE: 02 - DETAILS

DATE: 6/2022

SCALE: AS SHOWN

DRAWING NO. **2**

Appendix C

Vertical Extraction Vents/Wells

SCS ENGINEERS

Boring Logs

Date:	8/1/2023	**Project Name:**	**Uvalde Stage 1 Remediation Effort**
CQA Technician:	J Lewallen	**Boring Diameter:**	**36"**
Well Number	GV-11	**Driller:**	**J Johnson**

Waste Characteristics

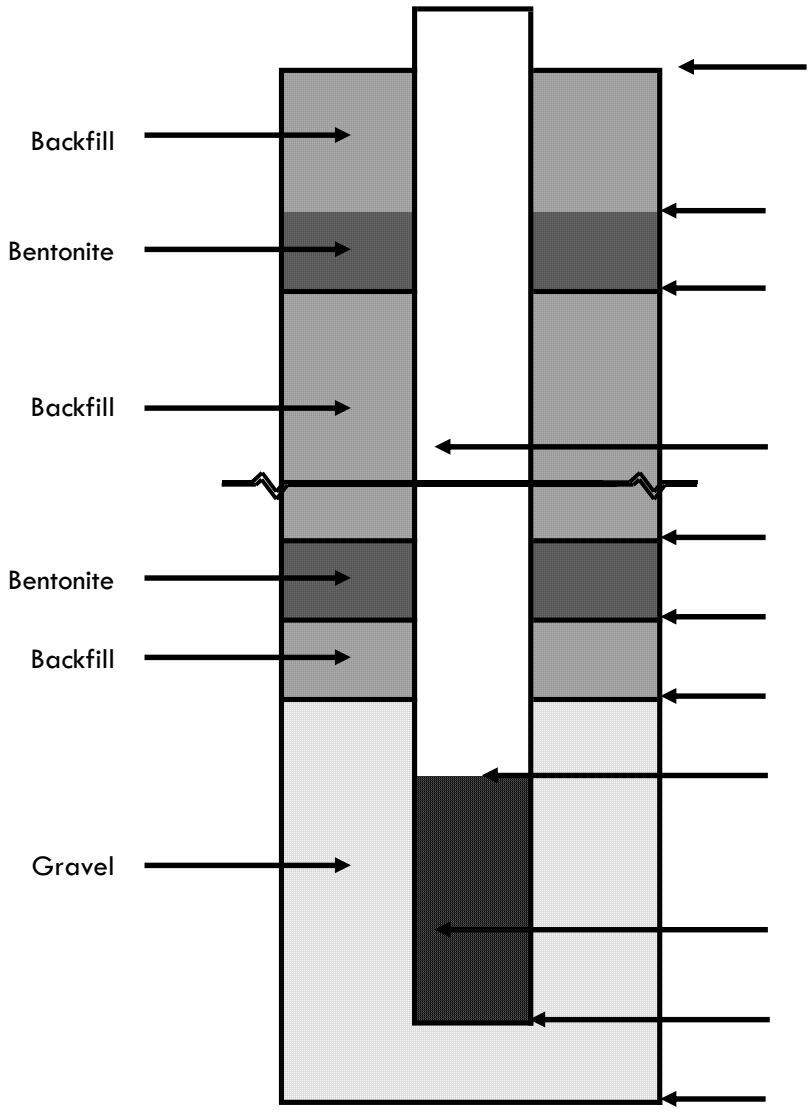
Time	Depth (ft)	Temp (°F)	Waste Profile				Decomp	Moisture
10:48	0.0							
15:02	10.0	100.0	MSW	Soil			Light	Light
11:09	20.0	91.0	MSW	Soil			Moderate	Moderate
11:19	30.0	91.0	Wood	C & D			Light	Light
11:40	40.0	82.0	MSW	C & D			Heavy	Moderate
11:43	41.0	86.0	MSW				Heavy	Moderate

Notes

SCS ENGINEERS

GAS EXTRACTION WELL INSTALLATION RECORD

Project Name	**Uvalde Stage 1 LFG Remediation Effort**		
Project Number:	16222099.00	**Boring Depth**	41
Date	8/1/2023	**Boring Diameter**	36
CQA Technician	J Lewallen	**Pipe Spec.**	SDR 11 HDPE
Well Number ID	GV-11	**Pipe Diameter**	6"



992	Surface Elevation (SE) ft MSL	
990 (ft MSL)	Top of Foam Plug	2 Depth BSE
988 (ft MSL)	Top of Backfill	4 Depth BSE
20	Length of Solid Pipe (ft)	
977 (ft MSL)	Top of Bentonite Plug	15 Depth BSE
975 (ft MSL)	Top of Backfill	17 Depth BSE
974 (ft MSL)	Top of Gravel	18 Depth BSE
972 (ft MSL)	Top of Perforated Pipe	20 Depth BSE
20	Length of Perforated Pipe (ft)	
952 (ft MSL)	Bottom of Perforated Pipe	40 Depth BSE
951 (ft MSL)	Bottom of Well (ft MSL)	41 Depth BSE

NOTES:

SCS ENGINEERS

Boring Logs

Date:	8/1/2023	**Project Name:**	**Uvalde Stage 1 Remediation Effort**
CQA Technician:	J Lewallen	**Boring Diameter:**	**36"**
Well Number	GV-12	**Driller:**	**J Johnson**

Waste Characteristics

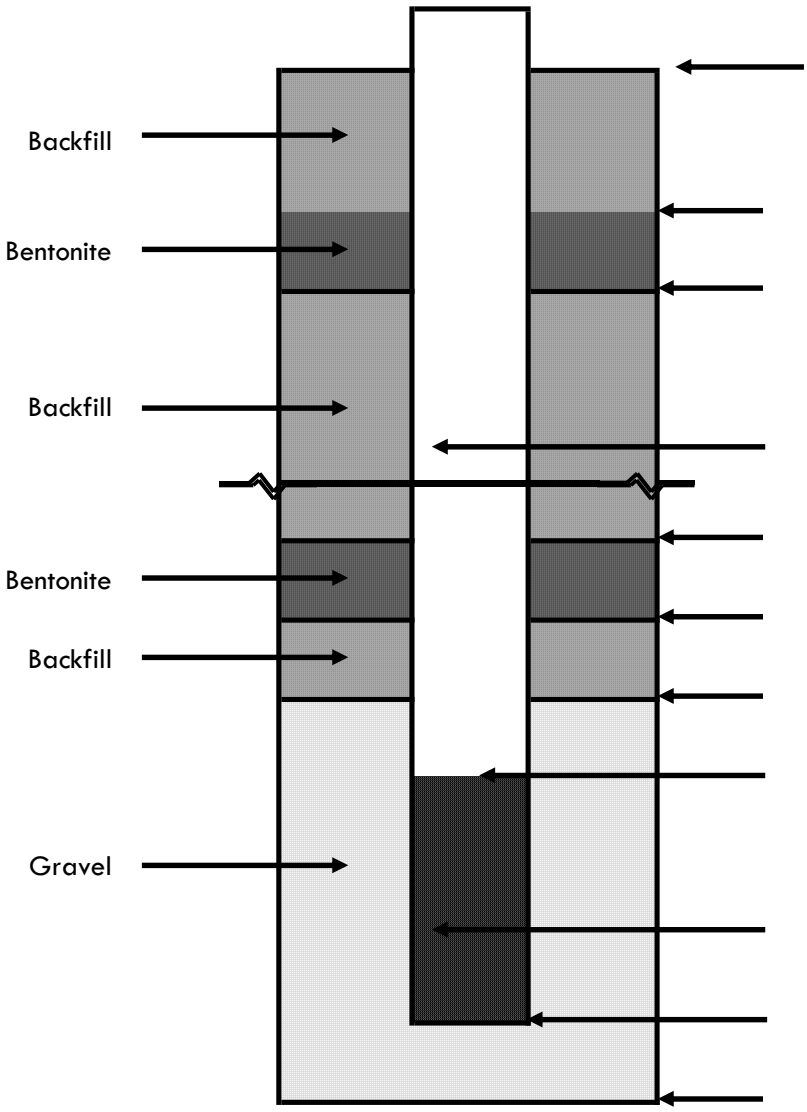
Time	Depth (ft)	Temp (°F)	Waste Profile				Decomp	Moisture
12:50	0.0							
12:57	10.0	88.0	MSW	Soil			Light	Dry
13:05	20.0	98.0	MSW	Soil			Light	Dry
13:19	30.0	101.0	MSW				Light	Dry
13:30	40.0	103.0	C & D	Soil			Moderate	Light

Notes

SCS ENGINEERS

GAS EXTRACTION WELL INSTALLATION RECORD

Project Name	**Uvalde Stage 1 LFG Remediation Effort**		
Project Number:	16222099.00	**Boring Depth**	40
Date	8/1/2023	**Boring Diameter**	36"
CQA Technician	J Lewallen	**Pipe Spec.**	HDPE SDR 11
Well Number ID	GV-12	**Pipe Diameter**	6"



986.4	Surface Elevation (SE) ft MSL	
984.4 (ft MSL)	Top of Foam Plug	2 Depth BSE
982.4 (ft MSL)	Top of Backfill	4 Depth BSE
20	Length of Solid Pipe (ft)	
971.4 (ft MSL)	Top of Bentonite Plug	15 Depth BSE
969.4 (ft MSL)	Top of Backfill	17 Depth BSE
968.4 (ft MSL)	Top of Gravel	18 Depth BSE
966.4 (ft MSL)	Top of Perforated Pipe	20 Depth BSE
19	Length of Perforated Pipe (ft)	
947.4 (ft MSL)	Bottom of Perforated Pipe	39 Depth BSE
946.4 (ft MSL)	Bottom of Well (ft MSL)	40 Depth BSE

NOTES:

SCS ENGINEERS

Boring Logs

Date:	8/1/2023	**Project Name:**	**Uvalde Stage 1 Remediation Effort**
CQA Technician:	J Lewallen	**Boring Diameter:**	**36"**
Well Number	GV-13	**Driller:**	**J Johnson**

Waste Characteristics

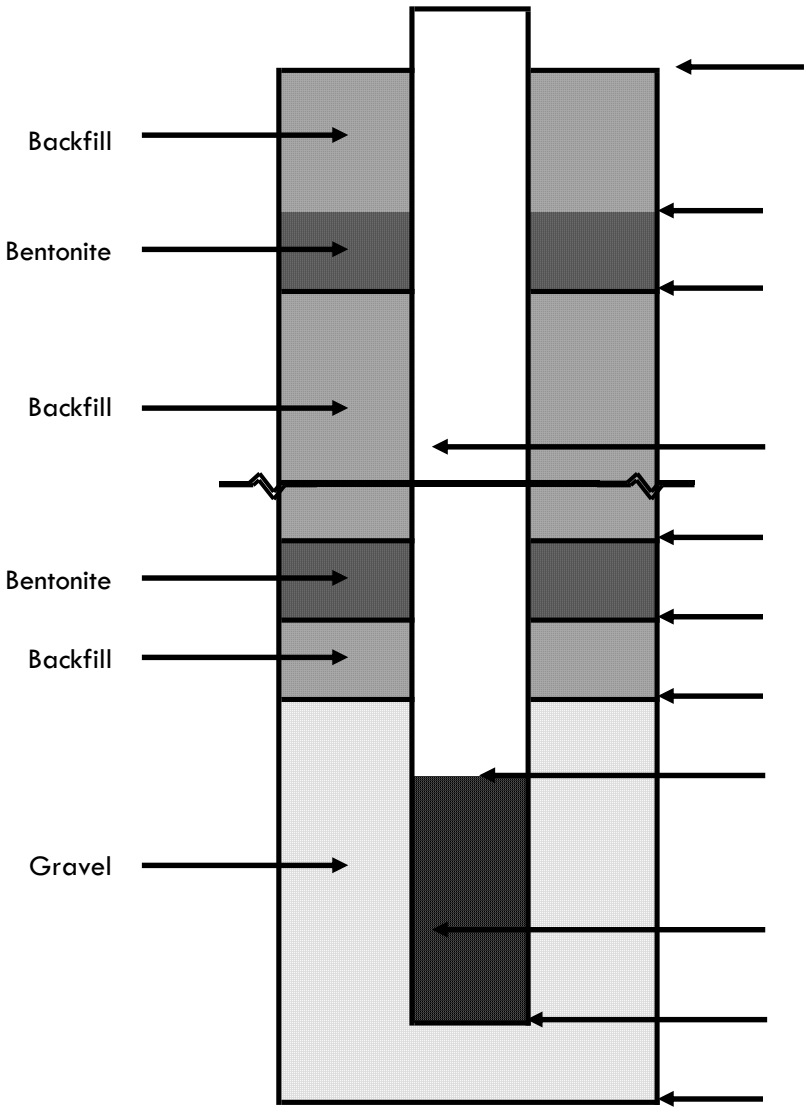
Time	Depth (ft)	Temp (°F)	Waste Profile				Decomp	Moisture
14:29	0.0							
14:36	10.0	98.0	MSW				Light	Dry
14:45	20.0	101.0	C & D	MSW			light	Dry
14:57	30.0	103.0	MSW				Light	Dry
15:12	40.0	101.0	C & D	MSW			Moderate	Dry
15:30	48.0	99.0	MSW				Moderate	Dry

Notes

SCS ENGINEERS

GAS EXTRACTION WELL INSTALLATION RECORD

Project Name	**Uvalde Stage 1 LFG Remediation Effort**		
Project Number:	16222099.00	**Boring Depth**	48
Date	8/1/2023	**Boring Diameter**	36"
CQA Technician	J Lewallen	**Pipe Spec.**	HDPE SDR 11
Well Number ID	GV-13	**Pipe Diameter**	6"



994.7	Surface Elevation (SE) ft MSL	
992.7 (ft MSL)	Top of Foam Plug	2 Depth BSE
990.7 (ft MSL)	Top of Backfill	4 Depth BSE
20	Length of Solid Pipe (ft)	
978.7 (ft MSL)	Top of Bentonite Plug	16 Depth BSE
976.7 (ft MSL)	Top of Backfill	18 Depth BSE
975.7 (ft MSL)	Top of Gravel	19 Depth BSE
974.7 (ft MSL)	Top of Perforated Pipe	20 Depth BSE
27	Length of Perforated Pipe (ft)	
947.7 (ft MSL)	Bottom of Perforated Pipe	47 Depth BSE
946.7 (ft MSL)	Bottom of Well (ft MSL)	48 Depth BSE

NOTES:

SCS ENGINEERS

Boring Logs

Date:	8/2/2023	**Project Name:**	**Uvalde Stage 1 Remediation Effort**
CQA Technician:	J Lewallen	**Boring Diameter:**	**36"**
Well Number	GV-14	**Driller:**	**J Johnson**

Waste Characteristics

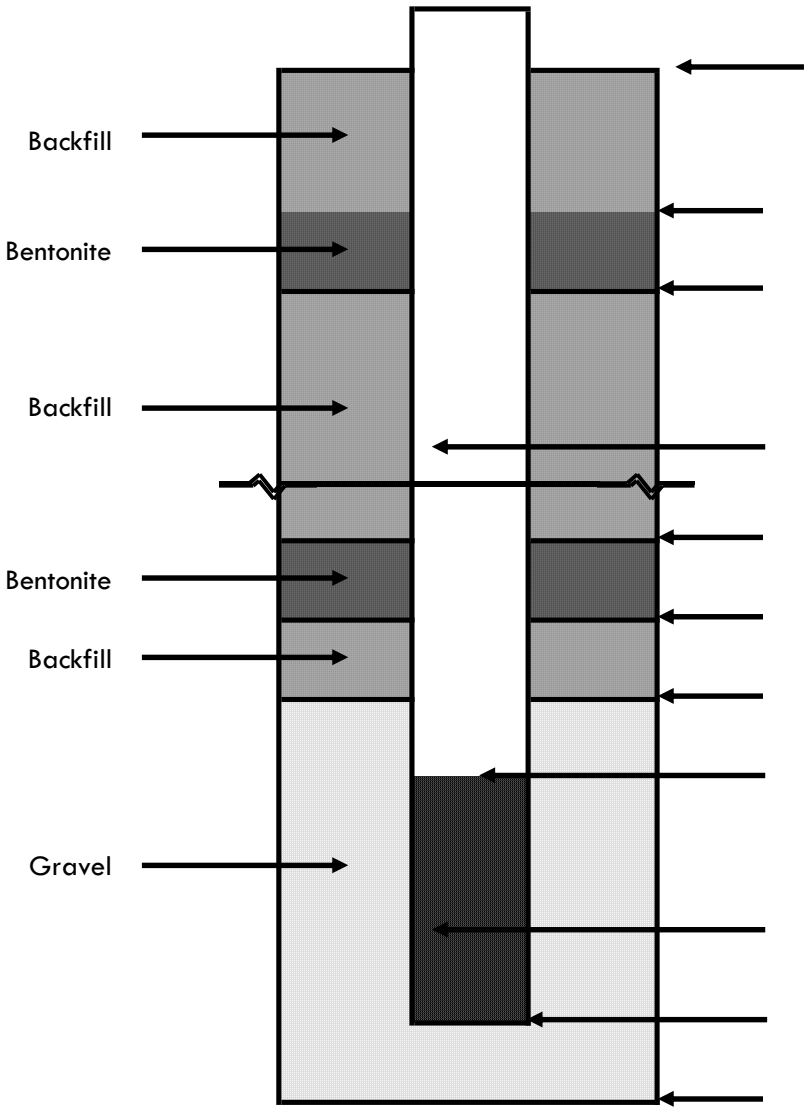
Time	Depth (ft)	Temp (°F)	Waste Profile				Decomp	Moisture
7:30	0.0							
7:39	10.0	86.0	Soil					Dry
7:56	20.0	88.0	Soil	MSW			Light	Dry
8:20	30.0	88.0	Soil	MSW			Moderate	Dry
8:48	40.0	97.0	MSW				Heavy	Light
9:01	48.0	89.0	Soil	MSW			Heavy	Dry

Notes

SCS ENGINEERS

GAS EXTRACTION WELL INSTALLATION RECORD

Project Name	**Uvalde Stage 1 LFG Remediation Effort**		
Project Number:	16222099.00	**Boring Depth**	48
Date	8/2/2023	**Boring Diameter**	36"
CQA Technician	J Lewallen	**Pipe Spec.**	HDPE SDR 11
Well Number ID	GV-14	**Pipe Diameter**	6"



994	Surface Elevation (SE) ft MSL	
992 (ft MSL)	Top of Foam Plug	2 Depth BSE
990 (ft MSL)	Top of Backfill	4 Depth BSE
20	Length of Solid Pipe (ft)	
978 (ft MSL)	Top of Bentonite Plug	16 Depth BSE
976 (ft MSL)	Top of Backfill	18 Depth BSE
975 (ft MSL)	Top of Gravel	19 Depth BSE
974 (ft MSL)	Top of Perforated Pipe	20 Depth BSE
27	Length of Perforated Pipe (ft)	
947 (ft MSL)	Bottom of Perforated Pipe	47 Depth BSE
946 (ft MSL)	Bottom of Well (ft MSL)	48 Depth BSE

NOTES: