CITY OF EDINBURG SOLID WASTE MANAGEMENT

PERMIT AMENDMENT APPLICATION

Part III, Attachment 6

LANDFILL GAS MANAGEMENT PLAN

EDINBURG REGIONAL DISPOSAL FACILITY

Edinburg, Hidalgo County, Texas

TCEQ Permit MSW-956C

Submitted To: City of Edinburg
Department of Solid Waste Management
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Edinburg, Texas 78542 USA

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INTENDED FOR PERMITTING PURPOSES ONLY

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Golder Associates

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EXECUTIVE SUMMARY

30 TAC §§330.63(g), 330.371(a)(1), 330.371(a)(2), 330.371(e) & 330.371(f)

In accordance with 30 TAC §330.63(g) and all of the requirements 30 TAC §330, Subchapter I, a Landfill Gas Management Plan (LFGMP) has been developed for the facility to provide a site-specific approach for implementing landfill gas (LFG) monitoring and control. LFG, containing approximately equal amounts of flammable methane and non-flammable carbon dioxide and various other trace gases, is produced by microorganisms biologically decomposing organic waste. The purpose of LFGMP is to provide the methodology whereby LFG will be managed to ensure the concentration of methane gas generated by the facility does not exceed 1.25 percent by volume (25 percent of the lower explosive limit (LEL)) in facility structures (excluding gas control or recovery system components) and the concentration of methane gas does not exceed 5 percent by volume (100 percent of the LEL) in monitoring points, probes, subsurface soils, or other matrices at the facility boundary.

The City of Edinburg (City) shall continue the gas monitoring and control program for a period of 30 years after certification of final closure of the facility or until the owner or operator receives written authorization to reduce the program. Authorization to reduce gas monitoring and control shall be based on a demonstration by the City that there is no potential for gas migration beyond the property boundary or into on-site structures. Demonstration of a proposal to reduce gas monitoring and control shall be supported by data collected and additional studies as required.

Gas monitoring and control systems shall be revised as needed to maintain current and effective gas monitoring and control systems. Post-closure land use at the site shall not interfere with the function of gas monitoring and control systems. Any underground utility trenches that cross the landfill facility boundary shall be vented and monitored regularly.

In addition to this LFGMP developed to address all of the requirement in 30 TAC §330 Subchapter I, the City must also comply with other applicable federal and state air quality regulations.

- 40 CFR Part 60, Subpart WWW
- 40 CFR Part 60, Subpart XXX
- 40 CFR Part 63, Subpart A, 63.6(e)(3)
- 30 TAC §330 Subchapter U

1.0 GENERAL SITE INFORMATION

The type and frequency of routine methane monitoring of the facility implemented is determined based on the following conditions and layout.

1.1 Site Conditions

30 TAC §330.371(b)(1)(A)-(C)

A more detailed discussion of soil, hydrogeologic, and hydraulic conditions surrounding the facility is presented in Part III4, Geology Report.

1.1.1 Soil Conditions

The soils within vicinity of the facility are predominantly sandy loam and have similar soil properties. They are well drained because of high infiltration rates and lack natural drainage features.

1.1.2 Hydrogeologic Conditions

Groundwater occurs primarily within the upper water bearing unit at the site which is composed of sands/silty sands; separated from lower aquifers by underlying clay, which acts as an aquiclud.

1.1.3 Hydraulic Conditions

Groundwater within the currently permitted area of TCEQ Permit MSW-956B has a very low hydraulic gradient with variable flow directions with an estimated groundwater flow rate of 7.4 feet per year. In the expansion area to be included in TCEQ Permit MSW-956C, groundwater flow is predominantly towards the east, northeast, or southeast in subdued conformance to topography with an estimate groundwater flow rate of 2.0 feet per year.

1.2 Facility Layout

30 TAC §§330.371(b)(1)(D) & 330.371(b)(1)(E)

A more detailed discussion of the facility layout is presented in Part II, Waste Acceptance Plan, Existing Conditions Summary, and Facility Layout.

1.2.1 Facility Structures

No enclosed on-site facility structures are located within the facility's property boundary that have a potential for LFG migration to accumulate – the closest enclosed structure to the facility is a maintenance building located approximately 1,050 ft south of the permit boundary. For the purpose of this LFGMP, methane monitoring for enclosed facility structures with potential for LFG migration to accumulate is discussed.

1.2.2 Utility Lines and Pipelines

1.2.2.1 Utility Lines

Two underground utility lines cross the facility's property boundary. One City owned sanitary sewer line crosses the west property boundary along Encinitos Road and another crosses the south property boundary adjacent to the entrance road into the facility.

1.2.2.2 Pipelines

Four pipelines either cross or run along the facility's boundary. One gas pipeline easement granted to Texas Gas Service, a division of One Gas, Inc. for future pipeline construction crosses the east property boundary and midway along the north property boundary. Another gas production pipeline easement granted to Vernon E. Faulconer, Inc. for future construction crosses the midway along the north property boundary adjacent to the aforementioned pipeline. A landfill gas pipeline from the Landfill Gas Treatment Facility TCEQ Permit MSW-48038 crosses the facility's western property boundary north of Encinitos Road. In addition, an existing interstate gas pipeline owned by Texas Gas Service, a division of One Gas, Inc., without a dedicated easement, is centered along the southern facility boundary.

2.0 LANDFILL GAS MONITORING PLAN

The objectives of this plan are to provide a site-specific approach for monitoring for the presence of landfill gas along the facility property boundary and to monitor the potential for gas accumulation within on-site enclosed structures.

2.1 Permanent Monitoring Network

30 TAC §§330.371(h)(1) & 330.371(h)(2)

The facility has demonstrated a presence of methane gas above a concentration of 0.5 percent by volume and requires a permanent monitoring system. The permanent monitoring network includes monitoring probes, utility trench gas vents, and any enclosed on-site structures where potential gas buildup would be of concern as depicted on Figure III6-1, Permanent Landfill Gas Monitoring Network.

2.1.1 Monitoring Probes

An expansion of the network of permanently installed gas monitoring probes (GP's) to detect potential LFG migration is concurrent with landfill development at discussed in Part II, Waste Acceptance Plan, Existing Conditions Summary, and Facility Layout. The current monitoring probe network is comprised of 27 monitoring probes. As the facility develops, 12 will be abandoned and 26 additional will be installed totaling 41 monitoring probes with a spacing no greater than 600 feet.

Gas monitoring probes are located along the facility boundary with an exception of GP-105 through GP-109 and GP-119 through GP-122 where they are located within 500 feet from the waste footprint along the

point of compliance for the groundwater monitoring wells as described in Part III5, Groundwater Characterization and Monitoring Report for accessibility. The installation of gas monitoring probes GP-39 through GP-43 are pending based on future construction of Cells 5B, 6B, 7A, and 7B. If these gas monitoring probes GP-39 through GP-43 are installed prior to approval of this application, they will be abandoned with existing gas monitoring probes installed directly north of Units 1–6. Existing gas monitoring probes west of Unit 5 and south of Units 1–6 are to remain or may be relocated to accommodate drainage improvements provided in Part III2, Surface Water Drainage Report where the distance between gas monitoring probes is no greater than 600 feet.

Gas monitoring probes to be installed must be a screened to a depth equal to the seasonal low groundwater table or the maximum depth of waste as measured within 1,000 feet of the monitoring point, whichever is shallower. The seasonal low groundwater table is at a lower elevation than the maximum bottom of waste as demonstrated on Figure III6-1, Permanent Landfill Gas Monitoring Network, therefore gas monitoring probes to be installed shall have a screen depth elevation equal to the seasonal low groundwater table.

Table III6-1: Permanent Landfill Gas Monitoring Probes

Gas Probe ID	Site Grid Northing[1]	Site Grid Easting[1]	Seasonal Low Groundwater Elevation[2] (ft-msl)	Comments
GP-24	18	2,094	67.1	Existing to Remain
GP-25R	17	1,177	66.2	Existing to Remain
GP-26	21	93	65.5	Existing to Remain
GP-27R	362	11	65.7	Existing to Remain
GP-28	768	17	66.0	Existing to Remain
GP-29	1,158	15	66.4	Existing to Remain
GP-30	1,601	14	66.5	Existing to Remain
GP-31	1,952	13	68.0	Existing to Remain
GP-34	18	643	65.8	Existing to Remain
GP-35	18	1,688	67.1	Existing to Remain
GP-44	18	4,861	68.8	Existing to Remain
GP-45	18	4,232	69.7	Existing to Remain
GP-46	18	3,688	67.8	Existing to Remain
GP-47	18	3,147	67.4	Existing to Remain
GP-48	18	2,611	67.0	Existing to Remain
GP-101	2,443	203	71.2	Proposed to be Installed
GP-102	2,443	743	69.8	Proposed to be Installed
GP-103	2,443	1,283	69.1	Proposed to be Installed
GP-104	2,443	1,823	69.0	Proposed to be Installed
GP-105	2,443	2,363	68.6	Proposed to be Installed
GP-106	2,443	2,895	68.3	Proposed to be Installed
GP-107	2,727	3,180	68.4	Proposed to be Installed

Gas Probe ID	Site Grid Northing[1]	Site Grid Easting[1]	Seasonal Low Groundwater Elevation[2] (ft-msl)	Comments
GP-108	3,272	3,180	68.4	Proposed to be Installed
GP-109	3,824	3,180	68.1	Proposed to be Installed
GP-110	4,076	3,524	67.7	Proposed to be Installed
GP-111	4,076	4,105	67.4	Proposed to be Installed
GP-112	4,078	4,694	66.7	Proposed to be Installed
GP-113	4,079	5,279	63.9	Proposed to be Installed
GP-114	4,080	5,864	61.0	Proposed to be Installed
GP-115	3,800	6,284	59.6	Proposed to be Installed
GP-116	3,302	6,379	60.3	Proposed to be Installed
GP-117	2,695	6,497	61.2	Proposed to be Installed
GP-118	2,130	6,607	62.6	Proposed to be Installed
GP-119	1,955	7,028	61.2	Proposed to be Installed
GP-120	1,396	7,132	63.7	Proposed to be Installed
GP-121	814	7,239	66.4	Proposed to be Installed
GP-122	224	7,350	67.9	Proposed to be Installed
GP-123	18	6,841	68.7	Proposed to be Installed
GP-124	18	6,261	68.4	Proposed to be Installed
GP-125	18	5,676	68.2	Proposed to be Installed
GP-126	18	5,091	68.6	Proposed to be Installed
GP-32	2050	486	67.7	Existing to be Abandoned
GP-33	2050	882	67.6	Existing to be Abandoned
GP-18	2048	1408	67.3	Existing to be Abandoned
GP-19R	2038	2045	66.5	Existing to be Abandoned
GP-36	2059	2612	66.1	Existing to be Abandoned
GP-37	2057	3153	67.4	Existing to be Abandoned
GP-38	2057	3692	67.8	Existing to be Abandoned

Notes:
1. Locations provided are approximate.
2. Seasonal low groundwater elevations determined from groundwater level data collected in Part III4E, Historical Groundwater Elevations.

2.1.1.1 Monitoring Probe Installation

Borings for monitoring probes will be performed by drillers registered in the State of Texas, drilled with a hollow-stem auger and sampled with a split-tube sampler, logged, and supervised by either a qualified professional geologist or a registered professional engineer.

These monitoring probes, fabricated of 1- to 2-inch diameter polyvinyl chloride (PVC) material, will be constructed with a solid riser pipe that extends from approximately 3 feet above ground level to approximately 5 feet below ground level and a screened section extending to the final depth. The annular space will be filled with sand or pea gravel approximately 6 inches above the screened section, topped with

approximately 6 inches of clean backfill and an 18- to 24-inch bentonite seal, and completed with a continuous cement seal extending from a minimum 12 inches below the ground surface to form a nominal 6-inch thick, 4-ft-by-4-ft concrete apron at the surface. The probes will be protected as necessary with bollards.

A typical gas monitoring probe detail is provided in Figure III6-2, Typical Gas Monitoring Probe and Utility Trench Gas Vent Details. The specifications depicted are typical and adjustments may be necessary at the time of installation based on an evaluation of actual field conditions. Construction summaries of installed gas monitoring probes will placed into the site operating record.

2.1.1.2 Monitoring Probe Inspection and Maintenance

The condition of the monitoring probes will be inspected and noted during monitoring periods. If any damage is discovered, the monitoring probe shall be promptly repaired. Barhole sampling may be used to supplement monitoring probe data as a backup plan for a damaged monitoring probe. Any monitoring probes that are irreparable or need relocation shall be decommissioned and replaced at a location where the distance between gas monitoring probes is less than 600 feet or as close to the original location as possible.

2.1.2 Utility Trench Gas Vents

30 TAC §330.371(i)

Utility trench gas vents will be installed along the facility's property boundary where two sanitary sewer lines, two gas pipeline easements, and two existing gas pipelines cross.

Two underground utility lines cross the facility's property boundary. One City owned sanitary sewer line crosses the west property boundary along Encinitos Road and another crosses the south property boundary adjacent to the entrance road into the facility. Utility trench gas vents will be installed where they cross the facility boundary for monitoring designated as GV-1 and GV-2 respectively.

One gas pipeline easement granted to Texas Gas Service, a division of One Gas, Inc. for future pipeline construction crosses the east property boundary, GV-4, and midway along the north property boundary, GV-3. A gas production pipeline easement granted to Vernon E. Faulconer, Inc. for future construction crosses the eastern limit of the north property boundary, GV-5, adjacent to the aforementioned pipeline. A landfill gas pipeline from the Landfill Gas Treatment Facility TCEQ Permit MSW-48038 crosses the facility's western property boundary north of Encinitos Road, GV-6, and the facility's southern property boundary north of the LFGTF, GV-7. In addition, an existing interstate gas pipeline owned by Texas Gas Service, a division of One Gas, Inc., without a dedicated easement, is centered along the southern facility boundary.

Although this pipeline does not cross the facility boundary, utility trench gas vents will be installed at the west and east corners of southern facility boundary for monitoring, GV-8 and GV-9, respectively.

2.1.3 Enclosed Facility Structures

30 TAC §330.371(i)

No enclosed on-site facility structures are located within the facility's property boundary that have a potential for LFG migration to accumulate – the closest enclosed structure to the facility is a maintenance building located approximately 1,050 ft south of the permit boundary. Any existing on-site mobile structures are elevated above the existing ground and adequately vented below; therefore, eliminating the potential for LFG migration to accumulate.

2.2 Monitoring Frequency

30 TAC §§330.371(b)(2), 330.371(d), 330.371(j), 330.371(k)(1) & 330.371(k)(2)

The minimum frequency of methane monitoring shall be quarterly for the operating life of the landfill and the post-closure care period, unless directed otherwise by the executive director of the Texas Commission on Environmental Quality (TCEQ). All monitoring probes and any on-site enclosed structures shall be sampled for methane during the monitoring period. Sampling for specified trace gases may be required by the TCEQ when there is a possibility of acute or chronic exposure due to carcinogenic or toxic compounds. The TCEQ may require more frequent monitoring upon notification and may establish alternative schedules for demonstrating compliance with 30 TAC §330.371(b). The City of Edinburg (City) shall monitor more frequently those locations where monitoring results indicate that landfill gas migration is occurring or is accumulating in structures.

2.3 Sampling Methods

2.3.1 Monitoring Probes and Utility Trench Gas Vents

Methane monitoring during landfill operations will be performed using portable equipment. A hand-held Landtec GA-90 Infra-Red Gas Analyzer, a Landtec Gem 2000, or a similar instrument, which is capable of measuring methane gas concentrations in an oxygen deficient environment, may be used to measure methane gas concentrations at the site. Prior to sampling, calibration of the methane monitoring equipment will be verified using standard calibration gas. The type of gas monitoring equipment utilized at the facility will vary over the operational life and post-closure periods; therefore, manufacturers' specifications are not included with this plan. Monitoring data collected will be recorded on the typical form provided in Appendix III6A, Example Gas Monitoring Data Form.

2.3.2 Enclosed Facility Structures

As discussed in §2.1.3, there are no enclosed on-site facility structures located within the facility's property boundary. However if any enclosed facility structures are constructed having a potential for LFG migration to accumulate; they will be monitored with either a portable equipment or a stationary continuous combustible gas monitor, which activates an audible alarm when preset combustible gas concentrations are exceeded. If the alarms are used, they will be calibrated to detect methane concentrations below 1.25 percent by volume and will be maintained and tested in accordance with the manufacturer's recommendations.

2.4 Contingency Plan

30 TAC §330.371(c)-(1)

If confirmed methane gas detection levels exceeding 1.25 percent by volume in facility structures (excluding gas control or recovery system components); and/or 5 percent by volume in monitoring points, probes, subsurface soils, or other matrices at the facility boundary; the City shall immediately take all necessary steps to ensure protection of human health and notify the TCEQ, local and county officials, emergency officials, and the public.

2.4.1 Action for Enclosed Facility Structures

If methane gas levels exceeding 1.25 percent by volume has been detected in enclosed facility structures (excluding gas control or recovery system components), the structure will be immediately evacuated and the Site Manager (SM), or other appropriate personnel, will be notified. Personnel (except for monitoring personnel) will not be allowed to re-enter the affected enclosed structure until a determination of the structure's safety is completed.

2.4.2 Action for Perimeter Monitoring at the Facility Boundary

If methane gas levels exceeding 5 percent by volume has been detected at the perimeter points, probes, subsurface soils, or other matrices at the facility boundary as defined in §3.1.1, Monitoring Probes of this LFGMP, the SM, or other appropriate personnel, will be notified immediately. The immediate emergency response measure will be for the SM, or other appropriate personnel, to determine if nearby enclosed structures are at risk and if evacuation of the enclosed structures is necessary.

2.4.3 Notification Procedures

Upon detection of methane gas exceedance, the executive director of the TCEQ, the TCEQ Region 15 office, local and county officials, emergency officials, and the public shall be notified by phone call, voicemail, email, or facsimile.

- Executive Director, MC124
  Municipal Solid Waste Permits Section
  Waste Permits Division
  Texas Commission on Environmental Quality
  PO Box 13087
  Austin, TX 78711-3087
  512-239-1000 (Phone)

- Regional Director
  Texas Commission on Environmental Quality, Region 15
  1804 W Jefferson Ave
  Harlingen, TX 78550-5247
  956-425-6010 (Phone)
  956-412-5059 (Fax)

- Director, Department of Public Works
  City of Edinburg
  415 University Drive
  Edinburg, TX 78541
  956-388-8210 (Phone)
  956-383-7111 (Fax)

- Fire Chief
  City of Edinburg
  212 W. McIntyre St.
  Edinburg, TX 78541
  (956) 383-7691 (Phone)
  (956) 289-1853 (Fax)

- Hidalgo County Emergency Management Coordinator
  100 E. Cano St., 2nd floor
  Edinburg, TX 78539
  (956) 318-2615
  (956) 289-7889

In addition to the above notifications, property owners within 1,000 feet of the methane gas exceedance and the public will be notified. Such notification should include both verbal and follow up written communication. The notice should inform them about the developing situation at the facility, including which monitoring points are involved and the actions being taken. Records of those contacts must be maintained in the facility's site operating record as required by 30 TAC §330.125.

2.4.4 Source of Methane Gas Detection Evaluation

The City shall determine the source of confirmed methane gas detection levels by considering monitoring data collected from adjacent monitoring points within the permanent monitoring network as defined in §3.1, Permanent Monitoring Network of this LFGMP. To supplement monitoring data, barhole sampling may be used to delineate the extent of methane gas releases and identify its source. Possible sources include LFG migration, gas pipelines as described in §2.2.2, Utility Line and Pipelines of this LFGMP, or from decomposition of organic materials outside the facility's waste disposal units.

2.4.5 Recording

30 TAC §330.371(c)(2)

Within seven days of detection, the City will place in the site operating record the concentration of methane gas levels detected and a description of the steps taken to protect human health. If the source of methane gas detection is determined to be other than LFG migration, the City shall submit to the TCEQ a detailed evaluation identifying the source and corrective measures.

2.4.6 Landfill Gas Remediation Plan

30 TAC §330.371(c)(3) & §330.371(d)

If the source of methane gas releases determined to be LFG migration, the City shall implement Appendix III6B, Landfill Gas Remediation Plan (LFGRP) within 60 days of detection, place a copy of the plan in the site operating record, provide a copy to the TCEQ, and notify the TCEQ that the plan has been implemented. The notification shall describe the nature and extent of the problem and the proposed remedy. After review, the executive director may require additional remedial measures and may establish alternative schedules for demonstrating compliance with 30 TAC §330.371(c).

If modifications to the LFGRP are required for effective remediation, a revised LFGRP shall be submitted to the TCEQ as a permit modification pursuant to 30 TAC §305.70. The modification may propose a variety of changes to the site operations, and depending on the nature of the remedial action, different provisions of the §305.70 modification rule may apply. The City shall implement the modified LFGRP for methane gas releases within 60 days of detection and should not wait until the permit modification is issued.

3.0 LANDFILL GAS MANAGEMENT AND CONTROL PLAN

30 TAC §330.371(g)-(1)

The potential for LFG migration is affected by pressure gradients caused by LFG generation and existing site conditions discussed in §1.1, Site Conditions of this LFGMP. Porous soils such as sand and gravel allow greater lateral gas migration than finer grained soils such as clay. Waste disposal units are engineered with a lining and cover system and a gas collection and control system (GCCS) that mitigate the potential for LFG migration.

The facility has constructed an approved GCCS, depicted in Figure III6-3, Existing Landfill Gas Collection and Control System designed to actively extract LFG from within the waste for control of odor and LFG migration and for compliance with federal and state air quality regulations. The GCCS consists of vertical and horizontal gas extraction wells installed within waste over constructed disposal areas. Each gas extraction well is connected to lateral piping that convey gas flow to larger header piping around the

perimeter of the landfill. An applied vacuum pulls the LFG from the extraction wells into the header piping, which conveys the LFG to the landfill gas treatment facility (LFGTF).

The Edinburg Landfill Gas Treatment Facility TCEQ Permit MSW-48038, is a Type IX facility located south of the property boundary as depicted on Figure III6-3, Existing Landfill Gas Collection and Control System. The LFGTF removes water, carbon dioxide, volatile organic compounds (VOCs), sulfur compounds, oxygen, and other trace compounds from the LFG and then compresses and delivers the LFG to an interstate pipeline for beneficial use. Any "off-gas" from the treatment process is sent to a thermal oxidizer for combustion. If the LFGTF is shut down for maintenance or emergencies, LFG is directed to a utility flare for combustion.

3.1 Gas Collection and Control System Design

30 TAC §330.371(g)(2)

Ongoing expansion of the GCCS will be installed in phases based on waste placement, landfill sequencing, and regulatory requirements. Existing system components will be maintained, replaced, or expanded at the facility as system requirements change. Based on Non-methane Organic Compound (NMOC) calculations performed, the facility is subject to the GCCS installation, operation, and reporting requirements as set forth in 40 CFR Part 60, Subpart WWW & XXX. Pursuant to 30 TAC §305.70(j)(22), notification of changes made to the landfill gas collection system shall be sent within 30 days to the executive director of the TCEQ and the TCEQ Region 15 office. The notification will include an as-constructed record drawing of GCCS development with component locations such as extraction wells, lateral and header piping, condensate sumps, etc. Upon receipt of the notification, the executive director will determine if submittal of a permit modification is required.

As additional waste is placed, additional GCCS components will be installed to enhance gas recovery and control NMOC emissions. The GCCS may be installed prior to the regulatory timeframe to control odors or potential methane migration. Components will be installed in a manner that protects the integrity of the liner, leachate collection, and final cover systems and any components that penetrate the final cover system will be sealed appropriately to minimize the intrusion of water and air into the waste. A conceptual layout of a GCCS at final closure is depicted on Figure III6-4, Conceptual Landfill Gas Collection and Control System at Final Closure.

3.2 GCCS Components

The GCCS will provide for the control of the LFG migration from the site and will include:

- Vertical and horizontal extraction wells
- Lateral and header piping system including condensate sumps

- Landfill gas blower flare station

3.2.1 Extraction Wells

Vertical extraction wells will be installed through intermediate cover soils and/or final cover system into the underlying waste and terminate at a minimum of 15 feet above the bottom of waste. These wells, fabricated of either a high-density polyethylene (HDPE) or polyvinyl chloride (PVC) material, will be constructed with perforations or slots on the lower portion of pipe and embedded in aggregate backfill.

Horizontal extraction wells will be installed laterally within the waste. These wells, fabricated of either a high-density polyethylene (HDPE) or polyvinyl chloride (PVC) material, will be constructed with 20 feet of solid pipe and with perforations or slots for the remaining length embedded in aggregate backfill.

A wellhead will be attached to the top of each extraction well to monitor and control the rate of LFG extraction. The wellhead will include a valve used to control gas flow, access, and sample ports for measuring pressure, vacuum, flow, gas composition, and for collecting LFG samples. Extraction well details are presented on Figure III6-5, Landfill Gas Collection and Control System – Extraction Well Details.

3.2.2 Lateral and Header Piping System

The lateral piping from the extraction wells are connected to larger header piping around the perimeter of landfill to convey gas flow to the LFGTF. This HDPE piping is installed below the intermediate cover or the final cover system to avoid damage by ongoing landfill operations. To remove condensate accumulations within the piping system, condensate knockouts and condensate sumps are installed incrementally along the landfill perimeter header piping. Condensate collected is then discharged into a sanitary sewer line for treatment at the City's POTW. Lateral and header piping details are presented on Figure III6-6, Landfill Gas Collection and Control System – Lateral and Header Piping Details.

3.2.3 Landfill Gas Blower Flare Station

A LFG blower-flare station with a candlestick flare are used for combustion of the LFG. The LFG blower-flare station will include the following components:

- An inlet knockout vessel to remove suspended particles and entrained liquid from the LFG;
- A flow meter to record the LFG flow;
- Blower/compressor equipment to create vacuum and withdraw the LFG from the landfill;
- Automatic valves to prevent backflow of air into the LFG collection system;
- A flame arrestor to prevent the flame from entering the LFG collection system piping;
- Flare with temperature thermocouples and pilot for destruction of the gas; and
- Miscellaneous electrical controls for automatic startup and shutdown, and monitoring equipment.

3.2.4 Surficial Landfill Gas Collection and Control System

In Part III7, Closure Plan components of a synthetic grass alternate final cover system, Closure Turf®, and procedures for design, construction, testing, and documentation are described. With use of Closure Turf® or equivalent, a surficial GCCS can be incorporated into the aforementioned GCCS or installed as a standalone application.

The surficial GCCS incorporates the use of surficial collection strips and a surficial collection foot as detailed in Figure III6-7, Landfill Gas Collection and Control System – Surficial GCCS for Synthetic Grass Alternative Details. Surficial collection strips are used for LFG conveyance, allow for the proper flow of gas without causing ballooning, and provide a high flow capacity and a larger radius of influence for gas collection and control. The surficial collection foot serves as a wellhead base, geomembrane interface and gas conveyance path from the strips to the collection wellhead. Surficial collection wells will be connected to the existing GCCS system lateral and header piping system. In the event of malfunction, relief valves can discharge excess pressure to maintain the structural integrity of the surficial GCCS.

3.3 GCCS Monitoring and Maintenance

Operational activities include periodic monitoring of the GCCS. Wellfield technicians visually check active extraction wells for excessive settlement, well head integrity, and to verify the condition of seals, monitoring ports, and connections. Condensate sump pumps are inspected for leaks and liquid levels within the condensate sumps are checked if there is reduction of gas flow or loss of vacuum in the lateral and header piping system. Blower flare station components are checked as needed.

To balance the extraction well field, technicians will adjust gas flow rates from the extraction wells to minimize air intrusion into the waste and for regulatory compliance. All monitoring and maintenance reports will be maintained in the site operating record. The procedures for inspection, measurement, record keeping, and maintenance of the GCCS are as required by 40 CFR Part 60, Subpart WWW & XXX and 40 CFR Part 63, Subpart A, 63.6(e)(3).

3.4 Backup Plan for Breakdowns

30 TAC §330.371(g)(3)

The backup plan, in the event of possible failure or inadequate performance of the GCCS will consist of an evaluation of the system and implementation of measures to restore the system to an acceptable level of performance. The evaluation is based on performance data collected during the operation of the GCCS and any potential inadequacy discovered will be promptly corrected. If any equipment or parts required for operation of the GCCS are determined to be ineffective and need repair or replacement; backup equipment including a rental flare, blower skid, flowmeters, and any other needed equipment or parts may be used until its replacement is ready for service.

The procedures for inspection, measurement, record keeping, and maintenance of the GCCS are as required by 40 CFR Part 60, Subpart WWW – Standards of Performance for Municipal Solid Waste Landfills and 40 CFR Part 63, Subpart A, 63.6(e)(3) – Startup, Shutdown, and Malfunction Plan.

SITE

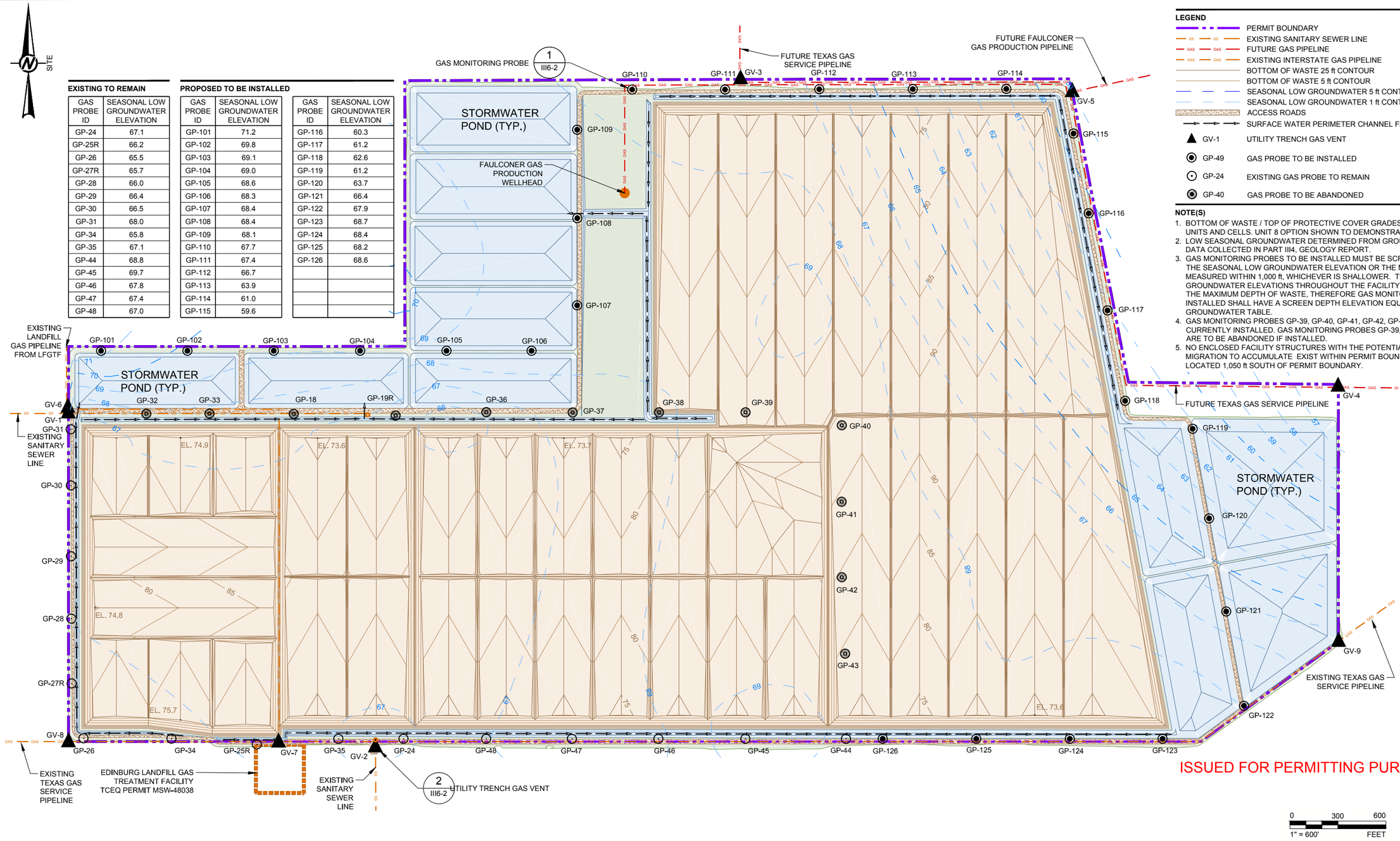
EXISTING TO REMAIN

GAS PROBE ID	SEASONAL LOW GROUNDWATER ELEVATION
GP-24	67.1
GP-25R	66.2
GP-26	65.5
GP-27R	65.7
GP-28	66.0
GP-29	66.4
GP-30	66.5
GP-31	68.0
GP-34	65.8
GP-35	67.1
GP-44	68.8
GP-45	69.7
GP-46	67.8
GP-47	67.4
GP-48	67.0

PROPOSED TO BE INSTALLED

GAS PROBE ID	SEASONAL LOW GROUNDWATER ELEVATION
GP-101	71.2
GP-102	69.8
GP-103	69.1
GP-104	69.0
GP-105	68.6
GP-106	68.3
GP-107	68.4
GP-108	68.4
GP-109	68.1
GP-110	67.7
GP-111	67.4
GP-112	66.7
GP-113	63.9
GP-114	61.0
GP-115	59.6

GAS PROBE ID	SEASONAL LOW GROUNDWATER ELEVATION
GP-116	60.3
GP-117	61.2
GP-118	62.6
GP-119	61.2
GP-120	63.7
GP-121	66.4
GP-122	67.9
GP-123	68.7
GP-124	68.4
GP-125	68.2
GP-126	68.6



LEGEND

- PERMIT BOUNDARY
- EXISTING SANITARY SEWER LINE
- FUTURE GAS PIPELINE
- EXISTING INTERSTATE GAS PIPELINE
- BOTTOM OF WASTE 25 ft CONTOUR
- BOTTOM OF WASTE 5 ft CONTOUR
- SEASONAL LOW GROUNDWATER 5 ft CONTOUR
- SEASONAL LOW GROUNDWATER 1 ft CONTOUR
- ACCESS ROADS
- SURFACE WATER PERIMETER CHANNEL FLOW DIRECTION
- GV-1 UTILITY TRENCH GAS VENT
- GP-49 GAS PROBE TO BE INSTALLED
- GP-24 EXISTING GAS PROBE TO REMAIN
- GP-40 GAS PROBE TO BE ABANDONED

NOTE(S)

1. BOTTOM OF WASTE / TOP OF PROTECTIVE COVER GRADES SHOWN FOR WASTE DISPOSAL UNITS AND CELLS. UNIT 8 OPTION SHOWN TO DEMONSTRATE MAXIMUM DEPTH OF WASTE.
2. LOW SEASONAL GROUNDWATER DETERMINED FROM GROUNDWATER MONITORING WELL DATA COLLECTED IN PART III4, GEOLOGY REPORT.
3. GAS MONITORING PROBES TO BE INSTALLED MUST BE SCREENED TO A DEPTH EQUAL TO THE SEASONAL LOW GROUNDWATER ELEVATION OR THE MAXIMUM DEPTH OF WASTE AS MEASURED WITHIN 1,000 ft, WHICHEVER IS SHALLOWER. THE SEASONAL LOW GROUNDWATER ELEVATIONS THROUGHOUT THE FACILITY IS LOWER IN ELEVATION THAN THE MAXIMUM DEPTH OF WASTE, THEREFORE GAS MONITORING PROVES TO BE INSTALLED SHALL HAVE A SCREEN DEPTH ELEVATION EQUAL TO THE SEASONAL LOW GROUNDWATER TABLE.
4. GAS MONITORING PROBES GP-39, GP-40, GP-41, GP-42, GP-43, GP-44, AND GP-45 ARE NOT CURRENTLY INSTALLED. GAS MONITORING PROBES GP-39, GP-40, GP-41, GP-42, AND GP-43 ARE TO BE ABANDONED IF INSTALLED.
5. NO ENCLOSED FACILITY STRUCTURES WITH THE POTENTIAL FOR LANDFILL GAS MIGRATION TO ACCUMULATE EXIST WITHIN PERMIT BOUNDARY. CLOSEST BUILDING IS LOCATED 1,050 ft SOUTH OF PERMIT BOUNDARY.

ISSUED FOR PERMITTING PURPOSES ONLY

0 300 600
1" = 600' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
1	2017-11-07	RESPONSE TO TCEQ FIRST NOTICE OF DEFICIENCY	CEI	TNB	CGD	CEI
0	2017-07-21	PERMIT AMENDMENT APPLICATION SUBMITTAL	CEI	AA	JBF	CEI

SEAL

STATE OF TEXAS
CHAD E. IRELAND
99293
LICENSED
PROFESSIONAL ENGINEER
11/7/17

GOLDER ASSOCIATES INC.
TEXAS REGISTRATION F-2578

CLIENT
CITY OF EDINBURG SOLID WASTE MANAGEMENT

CONSULTANT
Golder Associates

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www.golder.com

PROJECT
EDINBURG REGIONAL DISPOSAL FACILITY
PERMIT AMENDMENT APPLICATION TCEQ PERMIT MSW-956C
EDINBURG, HIDALGO COUNTY, TEXAS

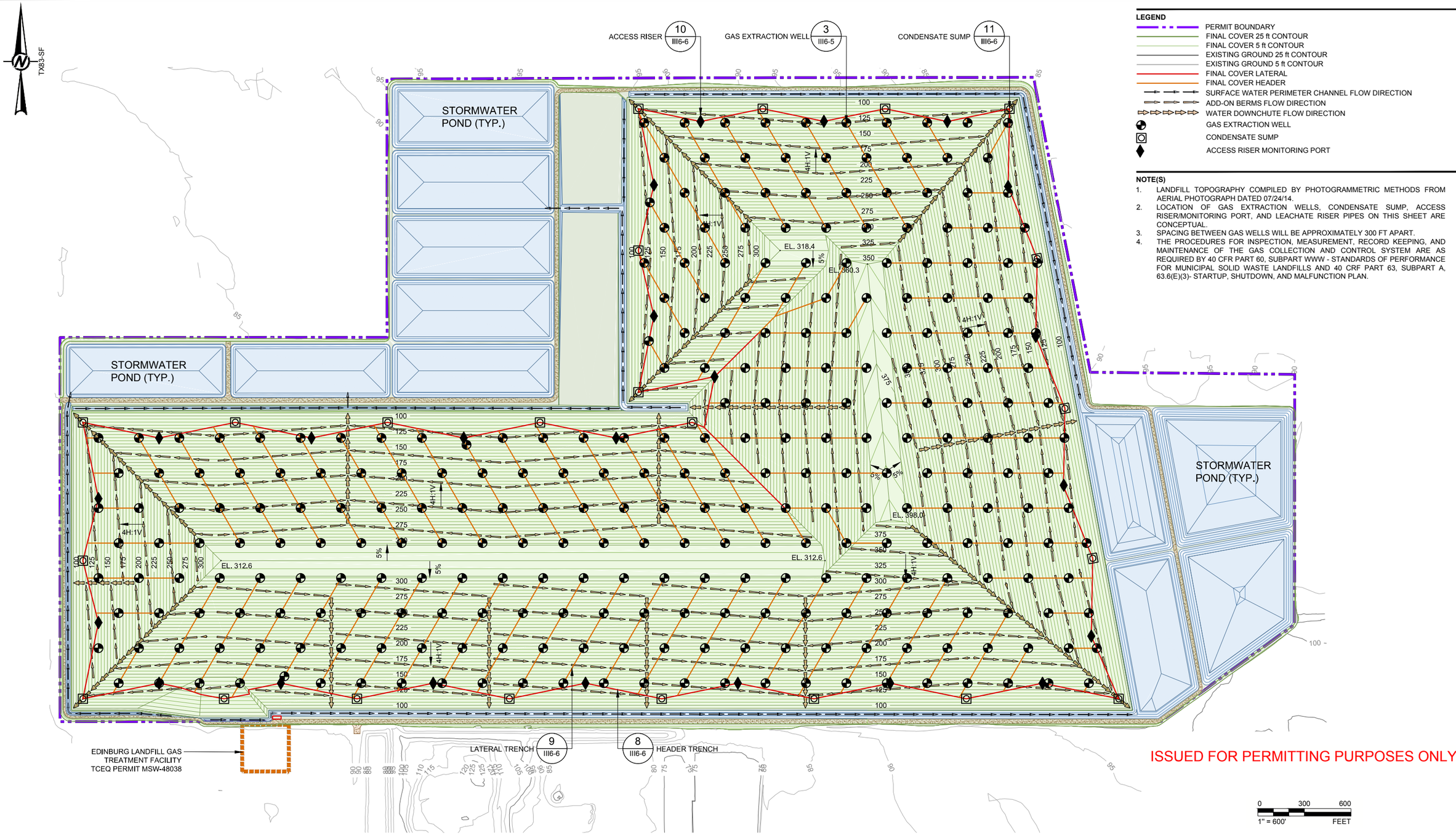
TITLE
PERMANENT LANDFILL GAS MONITORING NETWORK

PROJECT NO.	APPLICATION SECTION	REV.	FIGURE
1401491	III6	1	III6-1

REV. III6-1 of 7

Path: \\houston\drafting_2014\1401491 - city of edinburg\PRODUCTION\A - Permit Amendment Application\ | File Name: 1401491A109.dwg

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B
1 in
0



LEGEND

- PERMIT BOUNDARY
- FINAL COVER 25 ft CONTOUR
- FINAL COVER 5 ft CONTOUR
- EXISTING GROUND 25 ft CONTOUR
- EXISTING GROUND 5 ft CONTOUR
- FINAL COVER LATERAL
- FINAL COVER HEADER
- SURFACE WATER PERIMETER CHANNEL FLOW DIRECTION
- ADD-ON BERMS FLOW DIRECTION
- WATER DOWNCHUTE FLOW DIRECTION
- GAS EXTRACTION WELL
- CONDENSATE SUMP
- ACCESS RISER MONITORING PORT

NOTE(S)

1. LANDFILL TOPOGRAPHY COMPILED BY PHOTOGRAMMETRIC METHODS FROM AERIAL PHOTOGRAPH DATED 07/24/14.
2. LOCATION OF GAS EXTRACTION WELLS, CONDENSATE SUMP, ACCESS RISER/MONITORING PORT, AND LEACHATE RISER PIPES ON THIS SHEET ARE CONCEPTUAL.
3. SPACING BETWEEN GAS WELLS WILL BE APPROXIMATELY 300 FT APART.
4. THE PROCEDURES FOR INSPECTION, MEASUREMENT, RECORD KEEPING, AND MAINTENANCE OF THE GAS COLLECTION AND CONTROL SYSTEM ARE AS REQUIRED BY 40 CFR PART 60, SUBPART WWW - STANDARDS OF PERFORMANCE FOR MUNICIPAL SOLID WASTE LANDFILLS AND 40 CRF PART 63, SUBPART A, 63.6(E)(3)- STARTUP, SHUTDOWN, AND MALFUNCTION PLAN.

ISSUED FOR PERMITTING PURPOSES ONLY

0 300 600
1" = 600' FEET

REV.	YYYY-MM-DD	DESCRIPTION	DESIGNED	PREPARED	REVIEWED	APPROVED
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PROJECT
EDINBURG REGIONAL DISPOSAL FACILITY
PERMIT AMENDMENT APPLICATION TCEQ PERMIT MSW-956C
EDINBURG, HIDALGO COUNTY, TEXAS

TITLE
CONCEPTUAL GAS COLLECTION AND CONTROL SYSTEM AT FINAL CLOSURE

PROJECT NO.	APPLICATION SECTION	REV.		FIGURE
1401491	III6	1	4 of 7	III6-4