September 30, 2024
SCS Project No. 16224009.00

Air Permits Division, TCEQ *(filed via STEERS)*
GSR Section, MSWLF Review Team (MC-163)
12100 Park 35 Circle, Building C, Third Floor
Austin, Texas 78753

Subject: Subchapter U Standard Permit Revision
City of Laredo Landfill
Laredo, Webb County, Texas
Standard Permit Number: 80765, Renewal Date: 10/3/2026
Operating Permit Number: O-2371, Renewal Date: 9/28/2025
Landfill Permit Number: MSW-1693B
TCEQ Air Account No. WE-0264-D
RN102327582, CN600131908

TCEQ, Air Permits Division, GSR Section, MSWLF Review Team:

On behalf of City of Laredo, SCS Engineers is submitting this Subchapter U Municipal Solid Waste Landfill Standard Permit Revision application (30 TAC § 330, Subchapter U) for the City of Laredo Landfill (Site). The site is a Type I municipal solid waste landfill. Based on the most recent 2023 Standard Permit Certification revision, the sources currently permitted at the facility are as follows:

- Landfill (waste mass);
- Open flare;
- One diesel storage tank (3,000-gallon);
- Leachate tank (20,000-gallon); and
- Fugitive particulate emissions from landfill operations.

This certification is being processed to update the following:

- Update the landfill's emissions calculations to assume a conservatively low 50% collection rate for potential landfill gas emissions, and to divide into fugitive and non-fugitive emissions;
- Update the landfill's earthmoving equipment emissions and provide the earthmoving equipment emissions calculations;
- Add emissions calculations for the new emergency generator "EMERGGEN2";
- Update the prior flare to now be "FLARE2" which recently replaced it. Past the name change no emissions changes were made to the flare potential emissions; and
- Additionally, in Attachment B, on the Subchapter U checklist, recycling has been changed to be a "no" since it occurs off-site.

The supporting information regarding the revision certification application outlined in this letter includes the following:

- Attachment A – Standard Permit Certification;
- Attachment B – Standard Permit Checklist;

- Attachment C – Revised Emissions Calculations; and
- Attachment D – Waste Industry Air Coalition Report.

The existing permitted emissions, emissions changes, and revised pollutant totals are shown in Table 1.

Table 1 – Emissions Revisions

Emissions (tpy)	VOC	HAPs	NO_x	CO	SO_2	PM_{10}	$PM_{2.5}$
Existing	8.53	6.47	26.81	122.20	52.47	15.63	9.39
Revision Change	7.64	2.69	0.08	0.02	0.01	9.07	3.73
Modified Total	16.17	9.16	26.89	122.22	52.48	24.70	13.12

Our proposed Maximum Allowable Emissions Rate Table (MAERT) for your consideration, based on the potential emissions, is included as Table 1 on the first page of the emissions calculations in Attachment C.

A Title V permit revision is being processed concurrently under a separate cover for the same changes and to acknowledge this submittal. We understand that this certification has also been forwarded to TCEQ Region 16 and TCEQ's Waste Permits Division since this was submitted within STEERS, and that a hard copy does not need to be sent to them.

Please do not hesitate to contact Isabella Aguirre at (817) 358-6103 if you have any questions or comments.

Sincerely,

Isabella Aguirre
Sr. Project Professional
SCS ENGINEERS

David Mezzacappa
Sr. Project Advisor
SCS ENGINEERS

Attachments

cc: TCEQ, Waste Permits Division (via STEERS)
Mr. Arnaldo Lanese, Air Section Manager, TCEQ Region 16 (via STEERS)
Mr. Alejandro Benavides, City of Laredo
Mr. John Porter, City of Laredo (e-copy)

ATTACHMENT A

STANDARD PERMIT CERTIFICATION

Texas Commission on Environmental Quality
Standard Permit Certification Municipal Solid Waste Landfills and Transfer Stations Application

I.	**Company Identifying Information**
A.	Company Name: City of Laredo
B.	Primary Account Number: WE-0264-D
C.	Customer Reference Number: CN600131908
D.	Regulated Entity Number: RN102327582
II.	**Site Information**
A.	Site/Area Name: City of Laredo Landfill
B.	Delivery Address: 6912 HWY 359
City: Laredo	
State: Texas	
ZIP Code: 78043	
C.	Physical Location: 6912 HWY 359
City: Laredo	
State: Texas	
ZIP Code: 78043	

Texas Commission on Environmental Quality
Standard Permit Certification Municipal Solid Waste Landfills and Transfer Stations Application

III. Application and Certification Submittal Type *(Place an "X" in the appropriate boxes.)*	
Preconstruction New Source Review Authorization/Certification	**List Registration Number(s)**
☐ Previous Standard Exemption/Permit by Rule (PBR) claims (attach detailed list of facilities, rule dates, and applicability demonstration) - *no changes or new authorizations*	
☐ PBR § 106.534 claim (attach PBR § 106.534 checklist)	
☐ PBR claims for additional units (attach detailed list of facilities, PBRs, and applicability/checklists) Previous § 116 Subchapter F, Standard Permit (SP) Registration (optional submittal).	
☐ Previous § 116 Subchapter F, Standard Permit (SP) Registration (optional submittal).	
☐ New § 330, Subchapter U, SP Initial Certification (attach checklist).	
☒ § 330 SP Amendment to Certification (attach detailed list of changes and checklist).	**80765**
☐ § 330 SP Renewal Certification (attach checklist).	

III. Application and Certification Submittal Type *(Place an "X" in the appropriate boxes.) (continued)*	
Federal Standards and Requirements (Optional Submittals as Applicable)	
☐ NSPS WWW Initial Design Capacity Report	
☐ NSPS WWW Amended Design Capacity Report	
☐ NSPS XXX Initial Design Capacity Report	
☐ NSPS XXX Amended Design Capacity Report	
Change of Information Only	**List Registration Certification and Permit Number**
☐ Ownership/Name Change (attach Core Data Form)	
☐ Change of Responsible Official (RO) and /or Duly Authorized Representative (DAR) or Change of RO and/or DAR contact information **only**. (If so, complete only this form.)	
Voiding of Authorizations	**List Registration Certification and Permit Number(s)**
☐ PBR Void	
☐ § 116 SP Void	
☐ § 330 SP Void	
Justification/Reason for PBR, § 116 SP, and § 330 SP Voids (attach additional pages if needed)	
IV. Additional Attachments and Information (check all that apply)	
Attachment:	**Number of Checklist for Unit Type:**
☐ PBR §106.534 Checklist	
☐ PBR §106._____ Checklist	
☒ SP §330 Checklist	**1 (Attachment B)**
☐ NMOC Emissions Excel Spreadsheet	
☐ Initial Design Capacity Report	
☐ NMOC Emission Report	

IV. Additional Attachments and Information (check all that apply) *(continued)*	
Attachment:	**Number of Checklist for Unit Type:**
☐ Revised NMOC Emission Rate Report (Tier 2)	
☐ Closure Report	
☐ Annual or Semi-Annual Reports	
☐ Flare Performance Test Waiver Request	
☐ GOP Checklist	
☐ Stationary Internal Combustion Engines	
☐ Stationary Turbines	
☐ Process Heaters	
☐ Loading and Unloading Operations	
☐ Process Vents	
☐ Degreasing Units	
☐ PBR §106._____	
☒ Emission Calculations	**Tables 1, 3, 5, 7 (Attachment C)**
☐ NSPS WWW Applicability Checklist	
☐ NSPS XXX Applicability Checklist	
☐ Amended Design Capacity Report	
☐ Gas Collection and Control System Design Plan	
☐ Revised NMOC Emission Rate Report (Tier 3)	
☐ Control Equipment Removal Report	
☐ Initial Performance Test Report for Control System	
☐ Request Alternate Means of Control (AMOC) Gas Collection and Control System	
☐ Flares	
☐ Boiler/Steam Generation	
☐ Storage Tanks	
☐ MSWLF/Waste Disposals	
☐ Surface Coating	
☐ Oil/Water Separators	
☐ Revised NMOC Emission Rate Report (Tier 4)	

V. Responsible Official (RO) Identifying Information
A. RO Name: (☒ Mr. ☐ Mrs. ☐ Ms. ☐ Dr.) John Porter
B. RO Title: Director of Environmental Services
C. Employer Name: City of Laredo
D. Mailing Address: 619 Reynolds Street
City: Laredo
State: Texas
ZIP Code: 78040
Telephone No.: (956) 791-1653
Fax No.:
Email Address: jporter@ci.laredo.tx.us
E. Effective Date: 3/1/2021
VI. Duly Authorized Representative (DAR) Identifying Information
A. DAR Name: (☒ Mr. ☐ Mrs. ☐ Ms. ☐ Dr.) Alejandro Benavides
B. DAR Title: Solid Waste Superintendent
C. Employer Name: City of Laredo
D. Mailing Address: 6912 Highway 359
City: Laredo
State: Texas
ZIP Code: 78044
Telephone No.: (956) 326-1106
Fax No.: (956) 796-1105
Email Address: ABenavides@ci.laredo.tx.us
E. Effective Date: 9/28/2020

Texas Commission on Environmental Quality
Application and Certification Form for Municipal Solid Waste
Landfills and Transfer Stations

VII. Certification of Truth, Accuracy, and Completeness
All representations in this Certification are conditions upon which stationary sources will operate in compliance with all Texas Commission on Environmental Quality and the U.S Environmental Protection Agency regulations governing air pollution, and that this Certification further affirms that no stationary source is authorized by a New Source Review case-by-case permit under the provisions of 30 TAC § 116.110.
I, Alejandro Benavides *(Name printed or typed)*
certify that, based on information and belief formed after reasonable inquiry, the statements and information stated above and contained in the attached documents are true, accurate, and complete. I further state that to the best of my knowledge and belief, the project for which application is made will not in any way violate any provision of the Texas Water Code (TWC), Chapter 7, Texas Clean Air Act (TCAA), as amended, or any of the air quality rules and regulations of the Texas Commission on Environmental Quality or any local governmental ordinance or resolution enacted pursuant to the TCAA. I further state that I have read and understand TWC §§ 7.177-7.183, which defines CRIMINAL OFFENSES for certain violations, including intentionally or knowingly making or causing to be made false material statements or representations in this application, and TWC §§ 7.187, pertaining to CRIMINAL PENALTIES. The attached GOP Checklists identify the applicable regulatory requirements for each unit or facility, and the attachment of the indicated GOP checklists to this Certification form certifies that the owner will comply with each regulatory requirement identified by the checklist.
Responsible Official (RO)
Signature:
Title:
Date:
Duly Authorized Representative (DAR)
Signature: Certified via STEERS
Title: Solid Waste Superintendent
Date: 9/30/2024

ATTACHMENT B

STANDARD PERMIT CHECKLIST

Texas Commission on Environmental Quality
Title 30 Texas Administrative Code (30 TAC) §330, Subchapter U
Standard Permit Checklist
Municipal Solid Waste Landfills (MSWLF) and Transfer Stations

General Information		
Site Name: City of Laredo Landfill		
CN: 600131908		
RN: 102327582		
The following checklist was developed by the Texas Commission on Environmental Quality (TCEQ), Air Permits Division, to assist applicants in determining whether or not a facility meets all of the applicable requirements. Please note that sites currently authorized under 30 TAC § 116.621 that continue to qualify for that standard, and have not been "modified" as defined in 40 Code of Federal Regulations Part 60, Subpart WWW or Subpart XXX, whichever is applicable, (40 CFR Part 60, Subpart WWW or Subpart XXX) may remain authorized under the standard permit until the site registration is to be renewed. At that time, the owner/operator is required to comply with either this subchapter (30 TAC §§ 330.981-330.995) or obtain a permit under 30 TAC § 116.111 (relating to General Application). Submit this checklist and all attachments along with a copy of the site's "Certification" to the Waste Permits Division (2 copies), regional office (1 copy) and appropriate air pollution control program having jurisdiction over the site (1 copy).		
30 TAC §330.983 Definitions		**Response**
Check the most appropriate answer.		
Please specify the Category of the MSWLF: Category 1 MSWLFs - landfills with a design capacity less than 2.5 million megagrams (MMg) by mass or 2.5 million cubic meters (M^3) by volume that operate in accordance with **40 CFR Part 60, Subpart WWW**; **40 CFR Part 60, Subpart XXX;** or **30 TAC 113, Subchapter D**, or		☐ YES ☒ NO
Category 2 MSWLFs - landfills with a design capacity greater than or equal to 2.5 MMg and 2.5 million cubic meters and a calculated uncontrolled non-methane organic compound (NMOC) emission rate less than 50 Mg per year, and operates in accordance with **40 CFR Part 60, Subpart WWW**; **40 CFR Part 60, Subpart XXX;** or **30 TAC 113,Subchapter D**, or		☐ YES ☒ NO
Category 3 MSWLFs - landfills with a design capacity greater than or equal to 2.5MMg and 2.5 million cubic meters and a calculated uncontrolled NMOC emission rate greater than or equal to 50 Mg per year that operate in accordance with **40 CFR Part 60, Subpart WWW**; **40 CFR Part 60, Subpart XXX; 40 CFR Part 63, Subpart AAAA**; or **30 TAC 113, Subchapter D** as applicable?		☒ YES ☐ NO **40 CFR Part 60, Subpart XXX**
Regulation	**40 CFR §330.985 Applicability and Exceptions**	**Response**
(b)	If "YES," to any of the above questions continue.	
(b)	If "NO," This Standard Permit **cannot authorize** the site.	
(c)	Is the site covered under one or more of the following types of MSWLFs defined in 30 TAC § 330.5?	☒ YES ☐ NO

Texas Commission on Environmental Quality
Title 30 Texas Administrative Code (30 TAC) §330, Subchapter U
Standard Permit Checklist
Municipal Solid Waste Landfills (MSWLF) and Transfer Stations

Regulation	30 TAC §330.985 Certification Requirements	Response
Check all that apply. ☒ Type I ☐ Type I AE ☐ Type IV ☐ Type IV - AE ☐ Type V Transfer Station		
If "YES," continue.		
If "NO," This Standard Permit cannot authorize the facility.		
Regulation	**30 TAC §330.985 Certification Requirements**	**Response**
(a)	Is the site a Type IV or Type IV-AE landfill?	☐ YES ☒ NO
Note: Type IV or Type IVAE landfills are exempt from the certification requirements of 30 TAC § 330.987.		
If "YES," go to 30 TAC § 330.989 General Requirements.		
If "NO," continue.		
(c)	Is the **certification** for the air emissions from the site based on the maximum capacity of the landfill for a certification period of 10 years or longer and based on EPA landfill LandGEM modeling, AP-42 methods, or other modeling approved by the USEPA with maximum capacity and modeling results based on the last year of the certification period?	☒ YES ☐ NO
Note: LandGEM can be used to calculate transfer station emissions		
If NO, attach a written explanation.		
	Certification longer than 10 years?	☐ YES ☒ NO
If "YES," number of years:	_____	
(c)	Does the MSWLF site trigger a gas collection control system (GCCS) during its Certification period?	☒ YES ☐ NO
If "YES" What is the estimated date the GCCS will be required? *Was required 6/6/2023*		
Note: The gas collection and control system design plan (GCCSDP) must be approved prior to construction according to NSPS WWW or NSPS XXX requirements, whichever is applicable.		

Texas Commission on Environmental Quality
Title 30 Texas Administrative Code (30 TAC) §330, Subchapter U
Standard Permit Checklist
Municipal Solid Waste Landfills (MSWLF) and Transfer Stations

Regulation	30 TAC § 330.987 Certification Requirements	Response
(d)	Is the following supporting documentation included in MSWLF or MSWLF and transfer stations certification?	☒ YES ☐ NO
(1)	the basis and quantification of emission estimates (See AP-42 to determine methods for estimating emissions, or other methods approved by the USEPA);	☒ YES ☐ NO
(2)	sufficient information to demonstrate that the project and or site will comply with all applicable conditions of this subchapter; and	☒ YES ☐ NO
(3)	a description of any equipment and related processes.	☐ YES ☒ NO
Note: Attach associated documents with this checklist. If this is a renewal certification and there have been no changes to the site, any facilities, or calculation of the emissions has not changed from the original submittals, it is not necessary to submit associated documentation		
If "YES," to all of the above continue.		
If "NO," to any of the above attach written explanation. **No changes of any equipment or related process with this certification.**		
(e)(1)	Note: If the existing municipal solid waste landfill site is modified, (which has a valid permit under 30 TAC § 116.621) and, as a result, the site no longer meets the existing standard permit under 30 TAC § 116.621 (relating to Municipal Solid Waste Landfills), the owner or operator shall certify the site under 30 TAC Chapter 330 at the time your site is modified.	
(e)(2)	Is the site a new MSWLF?	☐ YES ☒ NO
If "YES," A certification for the initial construction is required to be submitted at least 120 days prior to building or installation of any structure that may emit air contaminants.		
If "NO," continue.		
Note: New facilities or changes to existing facilities at the site that do not cause the site to become ineligible for this standard permit can be authorized by:		
Independently claiming a Permit by Rule (PBR) under 30 TAC Chapter 106 or a Standard Permit under 30 TAC Chapter 116, subchapter F, (including all registrations, fees, and documentation), or		
Including the claim of the PBR or Standard Permit with the initial issuance or a modification of the certification, are both exempt from the registration and fee requirements normally required by permits by rule and standard permits; and all claims by PBR or Standard permits shall be administratively incorporated at the next MSW standard permit certification renewal or modification for the site. The original PBR or Standard Exemption requirements will not change when it is administratively incorporated.		
For an initial issuance or a certification of a modification that include a PBR or Standard Permit registration, answer the following:		
Is the site located in a designated non-attainment area, and the updates are less than five tons per year of any criteria air contaminant?		☐ YES ☐ NO ☒ NA

Regulation	30 TAC § 330.987 Certification Requirements	Response
Is the site located in an attainment area, and the updates are less than 25 tons per year of any criteria air contaminant?		☐ YES ☐ NO ☒ NA
If "NO," to any of the above, you have 30 days to update the certification.		
If "NA," to all of the above, continue.		
New facilities or changes to existing facilities at the MSW site which do not cause a site to become ineligible for this standard permit, that sites certification shall be submitted if any of the following conditions (A), (B), or (C) below apply:		
(A) update the site certification within one year of constructing new facilities or modifications if the cumulative amount of emissions resulting from the new facilities or modifications is:		
(i) less than five (5) tons per year of any criteria air contaminant for sites located in a designated nonattainment area; or		☐ APPLICABLE ☒ NA
(ii) less than 25 tons per year of any criteria air contaminant for sites located in an attainment area;		☒ APPLICABLE ☐ NA
(B) update the site certification within 30 days of constructing new facilities or modifications if the site is not considered an existing major source in accordance with prevention of significant deterioration review or **nonattainment new source review**, and the cumulative amount of emissions for these changes is:		
(i) greater than or equal to five (5) tons per year of any criteria air contaminant for sites located in a designated nonattainment area; or		☐ APPLICABLE ☒ NA
(ii) greater than or equal to 25 tons per year of any criteria air contaminant for sites located in attainment areas; or		☐ APPLICABLE ☒ NA
(C) update the site certification at least 30 days prior to the change, including any applicable major source netting demonstration as specified in 30 TAC § 116.150 (relating to New Major Source or Major Modification in Ozone Nonattainment Areas), if the site is considered an existing major site in accordance with prevention of significant deterioration review or nonattainment new source review, and the cumulative amount of emissions for changes is:		
(i) greater than or equal to five (5) tons per year of any criteria air contaminant for sites located in a designated nonattainment area; or		☐ APPLICABLE ☒ NA
(ii) greater than or equal to 25 tons per year of any criteria air contaminant for sites located in an attainment area.		☐ APPLICABLE ☒ NA
Regulation	**30 TAC § 330.989 General Requirements**	**Response**
See General Conditions that apply to all MSW Air Standard Permits Authorized under 30 TAC §§ 330.981-330.995		

Texas Commission on Environmental Quality
Title 30 Texas Administrative Code (30 TAC) §330, Subchapter U
Standard Permit Checklist Municipal Solid Waste Landfills (MSWLF) and Transfer Stations

Regulation	30 TAC § 330.991 Technical and Operational Requirements for all MSWLF	Response
Note: The following stationary sources are authorized by this standard permit. Please check all that apply to the site.		
(A)(1)	Recycling (e.g., crushing glass, shredding, or crushing aluminum, light bulb crushing, wood chipping, or mulching)?	☐ YES ☒ NO ☐ NA
Briefly describe:		
Tons per day of each recyclable:		
Tons per year of each recyclable:		
(a)(2)(A)	Transfer station(s) located at a MSWLF site?	☐ YES ☒ NO ☐ NA
(a)(2)(B)	Transfer stations not located at a MSWLF that retain less than or equal to 1000 tons of waste overnight?	☐ YES ☐ NO ☒ NA
(a)(2)(B)	Transfer stations not located at a MSWLF that retain over 1000 tons of waste overnight?	☐ YES ☐ NO ☒ NA
Note: If the MSWLFTS retains over 1000 tons of waste overnight the site shall meet all of the following.		
☐	Waste holding area covered by a ventilated building.	
☐	The vertical exhaust vent located at least 16 feet above ground level.	
☐	The minimum capacity of the exhaust vent 45,000 cubic feet per minute.	
Note: If the Transfer station does not meet the above requirements, this Standard Permit cannot authorize the facility and the Transfer Station will need to seek air authorization under 30 TAC §116.111.		
Note: Waste solidification/stabilization operations shall control dry fine powdery materials (particulate matter emissions) during loading/unloading, transporting, and mixing operations. Controls to minimize particulate emissions may include loading and storing in enclosed containers or mixing and unloading under conditions where materials cannot become airborne.		
(a)(3)(A)	Does the MSWLF site conduct waste solidification/stabilization operations in such a manner as to control dry fine powdery materials: particulate matter emissions?	☐ YES ☐ NO ☒ NA
Note: Dry fine powdery materials include, but are not limited to fly ash, cement kiln dust, hydrated lime, and fine sawdust.		
(a)(5)	Odor control mist spray systems?	☐ YES ☒ NO
If "YES," please answer the following **Optional** questions.		
If "NO," skip to the next section 30 TAC § 330.991(a)(6).		
Does the site use odor control compounds from any of the following companies?		☐ YES ☒ NO

Texas Commission on Environmental Quality
Title 30 Texas Administrative Code (30 TAC) §330, Subchapter U
Standard Permit Checklist
Municipal Solid Waste Landfills (MSWLF) and Transfer Stations

Regulation	30 TAC § 330.991 Technical and Operational Requirements for all MSWLF	Response
Check all that apply. ☐ Air With Car, L.L.C. ☐ Benzaco Scientific, Ltd. ☐ Enzymatic Odor Solutions, Inc. ☐ GE Betz, Inc.		
If "NO," list compound name, manufacturer, concentration of sprayed compound, each nozzle spraying rate, and attach MSDS sheet for the manufacturers compound.		
Manufacturer: _____		
Compound: _____		
Concentration as sprayed: _____		
Nozzle spraying rate in gallons/hour: _____		
Attach MSDS Sheets for each compound used.		
Note: There will be no visible emissions that leave the property in excess of 30 seconds for any six-minute period.		
(a)(6)	Note: Any other facility or group of facilities that meets a permit by rule under Chapter 106 or a standard permit under 30 TAC § 116, Subchapter F with the exception of activities listed in 30 TAC § 330.985(d)(2) are authorized under this standard permit.	
Leachate and/or landfill gas condensate activities shall be conducted as follows:		
(a)(7)(A)	Leachate and/or landfill gas condensate recirculated at a rate of 100,000 gallons per day or less and in accordance with 30 TAC § 330.177 (relating to Leachate and Gas Condensate Recirculation).	☐ YES ☐ NO ☒ NA
(a)(7)(B)	Leachate and/or landfill gas condensate stored in tanks and/or evaporation ponds lined in accordance with 30 TAC § 330.331(b) (relating to Design Criteria) and of 30 TAC § 330.17 (relating to Technical Guidelines).	☒ YES ☐ NO ☐ NA
Fuel storage tanks meeting the following:		
(a)(8)(A)	Tanks containing gasoline, diesel fuel, or kerosene?	☒ YES ☐ NO ☐ NA
(a)(8)(B)	Permanent gasoline tanks located at least 500 feet from any off-property receptor?	☐ YES ☐ NO ☒ NA
(a)(8)(C)	Total annual throughput of gasoline for all tanks not exceeding 20,000 gallons per year unless a vapor balance system as defined in 30 TAC § 115.10 (relating to Definitions) is used?	☐ YES ☐ NO ☒ NA

Regulation	30 TAC § 330.991 Technical and Operational Requirements for all MSWLF	Response
Fuel storage tanks meeting the following: *(continued)*		
(a)(8)(D)	Records are maintained of annual fuel throughput?	☒ YES ☐ NO ☐ NA
(a)(9)	Tire shredding operations that do not exceed 11 tons per hour?	☐ YES ☐ NO ☒ NA
Note: Records are required to be maintained in order to verify compliance.		
(a)(10)	Bioremediation pads which are located at least 165 feet from any off-property receptor.	☐ YES ☐ NO ☒ NA
Regulation	**Gas Collection and Control System (GCCS) Control Devices**	**Response**
GCCS that is designed to route total collected landfill gas to one (or more) of the following control devices.		
Check all that apply.		
(a)(11)(A)	Flare(s) that satisfies the requirements of and operates in accordance with 40 CFR Part 60 Subpart WWW or Subpart XXX, (40 CFR § 60.18), as applicable;	☒ YES ☐ NO ☐ NA
(a)(11)(B)	Landfill gas-fired stationary, reciprocating internal combustion engine or a landfill gas-fired turbine not used to generate electricity, that satisfies all of the requirements of 30 TAC § 106.4(a)(1) (relating to Requirements for Permitting by Rule) and 30 TAC § 106.512 (relating to Stationary Engines and Turbines);	☐ YES ☐ NO ☒ NA
(a)(11)(C)	Landfill gas-fired stationary electric generating unit that satisfies all of the requirements of 30 TAC Chapter 116, Subchapter F:	☐ YES ☐ NO ☒ NA
(a)(11)(D)	Landfill gas-fired boiler, heater, or other combustion unit, not including stationary, reciprocating internal combustion engines or turbines, that satisfies the maximum heat input and nitrous oxide requirements of 30 TAC § 106.4(a)(1) and 30 TAC § 106.183 (relating to Boilers, Heaters, and Other Combustion Devices) and applicable sections of 30 TAC Chapter 117 (relating to Control of Air Pollution from Nitrogen Compounds);	☐ YES ☐ NO ☒ NA
(a)(11)(E)	Pollution control project that satisfies all the requirements of 30 TAC § 116.617 (relating to Standard Permits for Pollution Control Projects).	☐ YES ☐ NO ☒ NA
Note: *Any facility or process added under this subsection is not considered a new production facility for the purposes of 30 TAC § 116.617*;		

Regulation	Gas Collection and Control System (GCCS) Control Devices	Response
(a)(11)(F)	Gas treatment system that processes the collected gas to produce a product or by-product for subsequent sale or use. All emissions from any atmospheric vent from the gas treatment system shall be subject to the requirements of 40 CFR § 60.752(b)(2)(iii)(A) or (B) or 40 CFR § 60.762(b)(2)(iii)(A) or (B).	☐ YES ☐ NO ☒ NA
(a)(12)	Temporary rock crushers used exclusively for cell construction.	☐ YES ☐ NO ☒ NA
Note: Temporary rock crushers shall satisfy all of the requirements for the Air Quality Standard Permit for Temporary Rock Crushers.		
(f)	*Note: MSW landfill cell(s) which contain Class I industrial nonhazardous waste greater than 20% by weight or volume shall have a GCCS associated with the location of the Class I waste. The GCCS is subject to the provisions of 30 TAC § 330.995 (relating to Recordkeeping and Reporting Requirements for all Municipal Solid Waste Landfill Sites).*	
Regulation	**30 TAC § 330.993 Additional Requirements for Owner and/or Operators of Category 3 MSWLF**	**Response**
	Is the landfill site classified as a Category 3 MSWLF?	☒ YES ☐ NO ☐ NA
If “YES,” continue.		
If “NO,” go to 30 TAC § 330.995 Recordkeeping and Reporting Requirements for all MSWLF Sites.		
(a)	Does the MSWLF comply with the applicable provisions of 40 CFR §§ 60.752 - 60.759?	☐ YES ☐ NO ☒ NA
(a)	Does the MSWLF comply with the applicable provisions of 40 CFR §§ 60.762 - 60.769?	☒ YES ☐ NO ☐ NA
(a)	Does the MSWLF comply with the applicable provisions of 40 CFR, Part 63, Subparts A?	☒ YES ☐ NO ☐ NA
(a)	Does the MSWLF comply with the applicable provisions of 40 CFR, Part 63, Subpart AAAA?	☒ YES ☐ NO ☐ NA
(a)(1)	Has the landfill GCCS(s) been capped or removed from the site?	☐ YES ☒ NO ☐ NA
If “NO,” go to 30 TAC § 330.993(b).		
If “YES,” continue.		

Texas Commission on Environmental Quality
Title 30 Texas Administrative Code (30 TAC) §330, Subchapter U
Standard Permit Checklist
Municipal Solid Waste Landfills (MSWLF) and Transfer Stations

Regulation	30 TAC § 330.993 Additional Requirements for Owner and/or Operators of Category 3 MSWLF	Response
If "YES," is the MSWLF permanently closed in accordance with 30 TAC Chapter 330, Subchapter K (relating to Closure and Post-Closure), and		
(a)(2)	Has the conditions of 40 CFR § 60.752 (b)(2)(v) been met, and a closure report has been submitted to the TCEQ Air Permits Division in accordance with 40 CFR § 60.757(d)?	☐ YES ☐ NO ☐ NA
(a)(2)	Has the conditions of 40 CFR § 60.762 (b)(2)(v) been met, and a closure report has been submitted to the TCEQ Air Permits Division in accordance with 40 CFR § 60.767(e)?	☐ YES ☐ NO ☐ NA
If "YES," to both of the above, continue.		
If "NO," to both of the above, this Standard Permit cannot authorize the facility.		
(b)	*Note: You shall monitor the methane concentration at the surface of your site on a quarterly basis, as specified in 40 CFR § 60.755(c) or 40 CFR § 60.765(c), whichever is applicable.*	
(c)	*Note: You shall monitor the GCCS in accordance with 40 CFR § 60.756 or 40 CFR § 60.766, whichever is applicable.*	
Note: The MSWLF owner or operator shall maintain additional records for the site specified in 40 CFR Part 60, Subpart WWW (in accordance with the provisions of 40 CFR § 60.758, (Recordkeeping Requirements), or 40 CFR 63 Subpart AAAA, or 40 CFR 60 Subpart A, including but not limited to the following, as applicable:		
(c)	An Initial Design Capacity Report as required by 40 CFR § 60.757(a)(2), or an Amended Design Capacity Report required by *40 CFR § 60.757(a)(3)*	
(c)(1)	Submit and retain records of the non-methane organic compound (NMOC) emission rates, in accordance with 40 CFR § 60.757(b)	
(c)(2)	Within 90 days of exceeding 2.5 million Mg and 2.5 million cubic meters; and	
(c)(2)	Annually using the procedures specified in 40 CFR § 60.754(a)(1), or	
(c)(2)	Every five years using the procedures of 40 CFR § 60.757(b)(1)(ii)	
(d)	*Note: Submit a semi-annual compliance report to the TCEQ Office of Compliance and Enforcement, in accordance with the provisions of 40 CFR § 63.1980 for only category 3 landfill that are subject to MACT AAAA.*	

ATTACHMENT C

REVISED EMISSIONS CALCULATIONS

TABLE 1
SUMMARY OF POTENTIAL EMISSIONS AND PROPOSED MAERT TABLE
CITY OF LAREDO LANDFILL, WEBB COUNTY, TEXAS

ESTIMATED EMISSIONS														
EPN/Emission Source	VOC		HAPs		NO_X		CO		SO_2		PM_{10}		$PM_{2.5}$	
	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
Existing Emissions (Not Modified)														
TANKS/ Aggregated Tanks	0.13	0.56	0.13	0.56	-	-	-	-	-	-	-	-	-	-
FLARE2/ Utility Flare	0.07	0.33	0.73	3.22	6.12	26.81	27.90	122.20	11.98	52.47	1.53	6.69	1.53	6.69
New or Revised Emissions														
LANDFILL/ Landfill Gas Emissions and Earthmoving Equipment (Fugitive)[1]	1.74	7.64	0.61	2.69	-	-	-	-	-	-	4.11	18.00	1.46	6.42
LANDFILL/ Landfill Gas Emissions (Non-Fugitive)[1]	1.74	7.64	0.61	2.69	-	-	-	-	-	-	-	-	-	-
EMERGGEN2/ Emergency Generator	<0.01	0.01	-	-	0.02	0.08	<0.01	0.02	<0.01	0.01	<0.01	0.01	<0.01	0.01
TOTAL EMISSIONS:	**3.68**	**16.17**	**2.08**	**9.16**	**6.14**	**26.89**	**27.90**	**122.22**	**11.98**	**52.48**	**5.64**	**24.70**	**2.99**	**13.12**
MAXIMUM OPERATING SCHEDULE:	**Hours/Day**		**24**		**Days/Week**		**7**	**Weeks/Year**		**52**	**Hours/Year**		**8,760**	

[1] Except for hazardous air pollutants, fugitive emissions are not counted towards major source limits.

TABLE 3
AIR POLLUTANT EMISSION ESTIMATES FROM LANDFILL AND FLARE
CITY OF LAREDO LANDFILL
WEBB COUNTY, TEXAS

A	B	C	D	E	F	G	H	I
			EMISSIONS ESTIMATES					
Pollutant	Molecular Weight (g/Mol)	Average Concentration Found In LFG (ppmv) (2)	LFG Generation (tons/yr) (3)	LFG Routed to Flare (tons/yr)	Flare Control Efficiency (4)	LFG Emissions from Flare (tons/yr) (5)	Fugitive Emissions from Landfill (tons/yr) (9)	Non-Fugitive Emissions from Landfill (tons/yr) (10)
Hazardous Air Pollutants (HAPs) (1)								
1,1,1-Trichloroethane (methyl chloroform)	133.41	0.168	0.034	0.046	98.0%	9.18E-04	0.009	0.009
1,1,2,2-Tetrachloroethane	167.85	0.070	0.018	0.024	98.0%	4.81E-04	0.004	0.004
1,1-Dichloroethane (ethylidene dichloride)	98.97	0.741	0.112	0.150	98.0%	3.00E-03	0.028	0.028
1,1-Dichloroethene (vinylidene chloride)	96.94	0.092	0.014	0.018	98.0%	3.65E-04	0.003	0.003
1,2-Dichloroethane (ethylene dichloride)	98.96	0.120	0.018	0.024	98.0%	4.86E-04	0.005	0.005
1,2-Dichloropropane (propylene dichloride)	112.99	0.023	0.004	0.0053	98.0%	1.06E-04	0.001	0.001
Acrylonitrile	53.06	0.036	0.003	0.0039	99.7%	1.17E-05	0.001	0.001
Benzene	78.11	0.972	0.116	0.155	99.7%	4.66E-04	0.029	0.029
Carbon disulfide	76.13	0.320	0.037	0.050	98.0%	9.98E-04	0.009	0.009
Carbon tetrachloride	153.84	0.007	0.002	0.0022	99.7%	6.61E-06	0.000	0.000
Carbonyl sulfide	60.07	0.183	0.017	0.023	98.0%	4.50E-04	0.004	0.004
Chlorobenzene	112.56	0.227	0.039	0.052	98.0%	1.05E-03	0.010	0.010
Chloroethane (ethyl chloride)	64.52	0.239	0.024	0.032	98.0%	6.31E-04	0.006	0.006
Chloroform	119.39	0.021	0.004	0.0051	98.0%	1.03E-04	0.001	0.001
Chloromethane (methyl chloride)	50.49	0.249	0.019	0.026	98.0%	5.15E-04	0.005	0.005
Dichlorobenzene (1,4-Dichlorobenzene)	147.00	1.607	0.361	0.484	98.0%	9.67E-03	0.090	0.090
Dichloromethane (Methylene Chloride)	84.94	3.395	0.440	0.590	98.0%	1.18E-02	0.110	0.110
Ethylbenzene	106.16	6.789	1.101	1.476	99.7%	4.43E-03	0.275	0.275
Ethylene dibromide (1,2-Dibromoethane)	187.88	0.046	0.013	0.018	98.0%	3.54E-04	0.003	0.003
Hexane	86.18	2.324	0.306	0.410	99.7%	1.23E-03	0.076	0.076
Mercury	200.61	0.00029	-	-	-	0.00012	-	-
Methyl ethyl ketone	72.11	10.557	1.163	1.559	99.7%	4.68E-03	0.291	0.291
Methyl isobutyl ketone	100.16	0.750	0.115	0.154	99.7%	4.61E-04	0.029	0.029
Perchloroethylene (tetrachloroethylene)	165.83	1.193	0.302	0.405	98.0%	8.10E-03	0.076	0.076
Toluene	92.13	25.400	3.574	4.791	99.7%	1.44E-02	0.893	0.893
Trichloroethylene (trichloroethene)	131.40	0.681	0.137	0.183	98.0%	3.66E-03	0.034	0.034
Vinyl chloride	62.50	1.077	0.103	0.138	98.0%	2.76E-03	0.026	0.026
Xylenes	106.16	16.582	2.688	3.604	99.7%	1.08E-02	0.672	0.672
Hydrochloric Acid (6)	36.45	42.000	-	-	-	3.13E+00	-	-
Total HAPs	**-**	**-**	**10.762**	**14.429**	**-**	**3.2166**	**2.690**	**2.690**
Criteria Air Pollutants								
Total VOCs (7)	86.18	232.05	30.54	40.95	99.2%	0.33	7.64	7.64
HAPS, non-VOCs	-	-	0.78	1.04	-	3.16	0.19	0.19
Sulfur Dioxide (SO_2) (6)	64.06	400.00	-	-	-	52.47	-	-
Carbon Monoxide (CO) (10)	-	-	-	-	-	122.20	-	-
Nitrogen Oxides (NO_x) (10)	-	-	-	-	-	26.81	-	-
Particulates (PM_{10}) (10)	-	-	-	-	-	6.69	-	-
Other Regulated Air Pollutants								
Ethane (6)	30.07	889.0	40.82	54.74	99.7%	0.164	10.21	10.21
NMOCs as Hexane (8)	86.18	595.0	78.31	104.99	99.2%	0.840	19.58	19.58

NOTES TO TABLE 3:

(1) Listed Hazardous Air Pollutants (HAPs) are among compounds commonly found in landfill gas (LFG), as presented in AP-42 (11/98), Tables 2.4-1and 2.4-2.

(2) Average concentrations of pollutants in LFG are based on Waste Industry Air Coalition Values (provided in Attachment D), except Mercury and HCl, which use values listed on AP-42, Tables 2.4-

(3) Based on average concentrations of compounds found in LFG and an estimated LFG generation of 2,238 scfm (2026), based on EPA's LandGEM 3.02 and using the k and Lo values recommended in AP-42 (11/98) for conventional sites (0.02 and 100 m3/Mg, respectively). A copy of the LandGEM model is provided in Attachment E.

(4) Typical control efficiency for flares, as found in AP-42 (11/98), Table 2.4-3.

(5) (LFG to flare) * (1-control efficiency) = LFG emissions from flare.

(6) Concentrations of HCl and Ethane are from AP-42 (11/98), Section 2.4.4. Concentration of SO_2 is conservatively set to 400 ppmv.

(7) According to AP-42 (11/98), Table 2.4-2, Note C, VOC content at MSW sites with no co-disposal equals 39% by weight of total NMOC concentration.

(8) Based on AP-42 (11/98), Table 2.4-2, the average NMOC concentration as hexane for a site with no co-disposal is 595 ppmv.

(9) Fugitive Landfill Emissions represent the 25% of generation that cannot be reasonably collected per EPA guidance. Non-fugitive landfill emissions include any of the remaining portion of generation for conservativeness assuming no landfill gas collection or destruction.

(10) Flare Emission factors for PM10 are from AP-42 (11/98), Table 2.4-5. Emission factors for CO and NOx (in lb/MMBtu) are from Manufacturer's Specifications.

(11) For conservativeness, the flare is permitted assuming a flow of 3,000 scfm to match it's maximum capacity. Conversely, to maximize potential landfill emissions during the permit period, a conservatively low collection rate of 50% of the overall generated landfill gas is assumed.

MODEL INPUT VARIABLES:

Methane Content of LFG assumed to be	50.0%	the higher heating value of methane (1,012 Btu/cf) is used in this calculation
Landfill Gas Generation Rate (3)	2,238	scfm (from LandGEM Model)
Maximum Capacity of the Flare	3,000	scfm
Operational Landfill Gas To Flare	3,000	scfm (Based on the Flare Capacity)

FLARE EMISSIONS FACTORS:

Pollutant	Emission factor (10)
CO	0.3100 lb/MMBtu
NO_x	0.0680 lb/MMBtu
PM	0.0010 lb/hr/dscfm

EXAMPLE CALCULATIONS

(HAPs, VOCs, NMOCs)

LFG Generation [tons/year] = (Molecular Weight of Compound [g/mol]) * (Concentration of Compound [ppm]/1,000,000) * (LFG Generation Rate [cfm])
* (525,600 min/yr) * (1 ton/2,000 lb) * (1 lb/453.6 g) * (1 mol/24.04 L @ STP) * (28.32 L/1 cf)

LFG To Flare [tons/year] = (Molecular Weight of Compound [g/mol]) * (Concentration of Compound [ppm]/1,000,000) * (LFG to Flare [cfm])
* (525,600 min/yr) * (1 ton/2,000 lb) * (1 lb/453.6 g) * (1 mol/24.04 L @ STP) * (28.32 L/1 cf)

LFG Emissions From Flare = (LFG To Flare [tons/year]) * (1 - Control Efficiency)

Fugitive Emissions From Landfill = (LFG Generation [tons/year]) * 50%

Non-Fugitive Emissions From Landfill = (LFG Generations [tons/year]) - (LFG To Flare [tons/year]) - (Fugitive Emissions From Landfill [tons/year])

Total LFG Emissions from Flare and Landfill = (Fugitive Emissions From Landfill) + (Non-Fugitive Emissions From Landfill) + (LFG Emissions From Flare)

(HCL, Mercury)

LFG Generation [tons/year] = (Molecular Weight of Compound [g/mol]) * (Concentration of Compound [ppm]/1,000,000) * (LFG Generation Rate [cfm])
* (525,600 min/yr) * (1 ton/2,000 lb) * (1 lb/453.6 g) * (1 mol/24.04 L @ STP) * (28.32 L/1 cf)

(SO_2)

Emissions From Flare = (Molecular Weight of Compound [g/mol]) * (Concentration of Compound [ppm]/1,000,000) * (LFG to Flare [cfm])
* (525,600 min/yr) * (1 ton/2,000 lb) * (1 lb/453.6 g) * (1 mol/24.04 L @ STP) * (28.32 L/1 cf)

(CO, NOx)

LFG Emissions From Flare = (Methane Flow Rate to Flare [cfm]) * (Emission Factor [lb/mmBtu]) * (910 Btu/cubic ft of methane) * (1 ton/2000 lb)
* (1 mmBtu/1,000,000 Btu) * (525,600 min/year)

(PM)

LFG Emissions From Flare = (Methane Flow Rate to Flare [cfm]) * (Emission Factor [lb/hr/dscfm]) * (1 ton/2000 lb) * (8,760 hr/year)

TABLE 5
FUGITIVE EMISSIONS FROM EARTHMOVING OPERATIONS (EQUIPMENT)
CITY OF LAREDO LANDFILL
WEBB COUNTY, TEXAS

Emission Source:
Earthmoving and Landfilling Operation Emissions

This spreadsheet is divided into three sections for Bulldozing, Grading Operations, and Truck-Based Operations. This list of equipment below represents PTE calculations in 2026 and were conservatively based on actual 2023 emissions with an added factor-of-safety of 1.50. Bulldozing and Grading equations taken from AP-42 (11/98), Table 11.9-1; Truck-Based Loading and Unloading equations taken from AP-42 (11/98), Chapter 13.2.4.

Bulldozing Operations (Inclusive of one Dozers and one Compactors)

The emissions factors this operation in lbs/hr are based on the following equations:

TSP: $\frac{5.7*(s)^{1.2}}{(M)^{1.3}}$

PM10: $\frac{0.75*(s)^{1.5}}{(M)^{1.4}}$

PM2.5: $\frac{0.105*0.75*(s)^{1.2}}{(M)^{1.3}}$

where s = material silt content (%) and M = material moisture content (%) and assuming s = 6.9% and M = 12%

Therefore the emission factors for this operation are: 2.2885 (TSP), 0.4193 (PM10), and 0.2403 (PM2.5) [lbs/hr].
For conservativeness, it is assumed equipment runs 47,000 hours per year.

Therefore TSP emissions are as follows: (2.2885 lbs/hr)*(47,000 hours/yr)*(1 ton/2000 lbs) = 53.78 tons/year
Therefore PM10 emissions are as follows: (0.4193 lbs/hr)*(47,000 hours/yr)*(1 ton/2000 lbs) = 9.85 tons/year
Therefore PM2.5 emissions are as follows: (0.2403 lbs/hr)*(47,000 hours/yr)*(1 ton/2000 lbs) = 5.65 tons/year

Grading Operations (Inclusive of Graders and Scrapers)

The emissions factors this operation in lbs/VMT are based on the following equations:

TSP: $0.040*(S)^{2.5}$

PM10: $0.60*0.051*(S)^{2.0}$

PM2.5: $0.031*0.040*(S)^{2.5}$

where S = mean vehicle speed (mph) and assuming S = 5.0 mph

Therefore the emission factors for this operation is: 2.2361 (TSP), 0.7650 (PM10), and 0.0693 (PM2.5) [lbs/VMT].
For conservativeness, it is assumed equipment runs 2,000 hours per year.

Therefore TSP emissions are as follows: (2.2361 lbs/VMT)*(2,000 hours/yr)*(5.0 mph)*(1 ton/2000 lbs) = 22.36 tons/year
Therefore PM10 emissions are as follows: (0.7650 lbs/VMT)*(2,000 hours/yr)*(5.0 mph)*(1 ton/2000 lbs) = 7.65 tons/year
Therefore PM2.5 emissions are as follows: (0.0693 lbs/VMT)*(2,000 hours/yr)*(5.0 mph)*(1 ton/2000 lbs) = 0.69 tons/year

Truck-Based Loading and Unloading Operations (Representative of Excavators, Loaders, and Trucks)

The emissions factors this operation in lbs/ton are based on the following equations for each operation (loading or unloading):

TSP: $\frac{0.0032*0.74*(U/5)^{1.3}}{(M/2)^{1.4}}$

PM10: $\frac{0.0032*0.35*(U/5)^{1.3}}{(M/2)^{1.4}}$

PM2.5: $\frac{0.0032*0.053*(U/5)^{1.3}}{(M/2)^{1.4}}$

where U = mean wind speed (mph) and M = material moisture content (%) and assuming U = 10 mph and M = 3.2%

Therefore the emission factors for this operation is: 0.003020 (TSP), 0.001428 (PM10), and 0.000216 (PM2.5) [lbs/ton].
For conservativeness, based on conversations with site personnel, a maximum soil usage of 351,000 tons per year is assumed.

Therefore TSP emissions are as follows: 2*(0.003020 lbs/ton)*(351,000 tons/yr)*(1 ton/2000 lbs) = 1.060 tons/year
Therefore PM10 emissions are as follows: 2*(0.001428 lbs/ton)*(351,000 tons/yr)*(1 ton/2000 lbs) = 0.501 tons/year
Therefore PM2.5 emissions are as follows: 2*(0.000216 lbs/ton)*(351,000 tons/yr)*(1 ton/2000 lbs) = 0.076 tons/year

Total TSP Emissions From Earthmoving =	**77.20 tons/year**
Total PM10 Emissions From Earthmoving =	**18.00 tons/year**
Total PM2.5 Emissions From Earthmoving =	**6.42 tons/year**

TABLE 7
ENGINE EMISSIONS
CITY OF LAREDO LANDFILL
LAREDO, TEXAS

Emission Source: EMERGGEN2
One (1) 48.8 HP Diesel Emergency Engine

Regulated Pollutants Emergency Engine	Engine Rating (hp)	Hours of Operation (hrs/yr)	Emissions Factor (1) (lb/hp-hr)	Emissions (lbs/hr)	Emissions (tons/yr)
VOCs	49	100	0.002	0.121	0.006
NO_x	49	100	0.031	1.513	0.076
SO_x	49	100	0.002	0.100	0.005
CO	49	100	0.007	0.326	0.016
$PM_{2.5}$	49	100	0.002	0.107	0.005
PM_{10} (2)	49	100	0.002	0.107	0.005
TSP	49	100	0.002	0.107	0.005

NOTES:

(1) Emissions factors for criteria pollutants for diesel engines are from AP-42 (11/98) Table 3.3.1.

(2) For the purposes of calculating particulate emissions, PM10 = TSP & $PM_{2.5}$.

ATTACHMENT D

WASTE INDUSTRY AIR COALITION REPORT

Waste Industry Air Coalition
Comparison of Recent Landfill Gas Analyses with Historic AP-42 Values

by

Ray Huitric, County Sanitation Districts of Los Angeles County
Patrick Sullivan, SCS Engineers
Amy Tinker, SCS Engineers

January 2001

Summary

The Waste Industry Air Coalition (WIAC) is comprised of the Solid Waste Association of North America (SWANA) and the National Solid Wastes Management Association. Members of these associations have reported that the AP-42 landfill gas (LFG) defaults, derived from analyses made on average 13 years ago, overestimate the current trace LFG constituent levels.

The WIAC previously submitted three reports addressing LFG trace constituents. An initial report submitted in August 1999[1] showed a continuous long term hazardous air pollutants (HAP) decline at six California landfills (see LFG Constituent Declines below). HAP levels typically declined five fold or more over a ten year period. A second WIAC report was submitted November 1999[2] showing that Hydrogen Chloride levels in recent source tests are more than four times less that the AP-42 default. A third WIAC report was submitted in May 2000[3] showing that the average of recent non-methane organic compound (NMOC) analyses at 144 landfills was 30% less than the current AP-42 defaults.

This fourth report presents a nationwide WIAC survey of recent trace LFG constituent analyses. The WIAC obtained test results from 75 landfills that were made on average within the last two years. The WIAC survey found that the current trace constituent levels are two to four times less than the AP-42 defaults. For the compounds associated with greater health risk at high concentrations, the differences were yet larger. These findings support those from the previous three reports that the AP-42 defaults substantially overstate current LFG constituent levels.

The decline in LFG constituent levels over time may be due to a variety of factors including:

- improvement of analytical methodologies that better identify and quantify trace constituents;
- federal introduction of waste management regulations that strictly regulate hazardous waste disposal;
- federal introduction of municipal solid waste landfill regulations that detect and prevent disposal of unacceptable hazardous wastes; and
- industry transition to processes and products requiring less or no hazardous materials.

In view of the detected decline, it is strongly recommended that the AP-42 defaults be revised to reflect the current LFG constituent levels. From the California landfill results, showing a continuous long term declining trend in the LFG constituents, it can be reasonably anticipated that additional declines will occur. As a result, two further recommendations are offered. First, older AP-42 data should be purged, to eliminate unrepresentative results, and replaced with current data. The most recent AP-42 revision in 1995 only added new but did not purge older values. Second, U.S. EPA should recognize landfills as a unique source for which its AP-42 defaults will need to change over time. U.S. EPA should consider additional future updates of the AP-42 to address the anticipated declines.

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[1] "Documentation of Large MSW Landfill Gas Constituent Declines From US EPA AP-42 Default Values", Ray Huitric, County Sanitation Districts of Los Angeles County, and submitted by John Skinner, Executive Director and CEO, SWANA, on August 30, 1999.

[2] Correspondence titled "Submission of Hydrogen Chloride Test Data from Landfill Gas Fired Combustion Devices" dated November 1999 from Edwin P. Valis, Jr., Project Manager, EMCON to Roy Huntley, Emission Factor and Inventory Group, OAQPS, U.S. Environmental Protection Agency.

[3] Correspondence titled "Preliminary Data on Non-Methane Organic Compound (NMOC) Concentrations in Landfill Gas" dated May 9, 2000 from Edward W. Repa, Director of Environmental Programs, NSWMA to Roy Huntley, Emission Factor and Inventory Group, OAQPS, U.S. Environmental Protection Agency.

The WIAC will provide the analyses it collected to U.S. EPA for use in developing new AP-42 values. Since it is recognized that this process will require time, it is recommended that the U.S. EPA make the results contained in this report available on its Internet site as an interim reference.

Report Objectives

This report documents actual landfill gas concentrations for compounds of concern using a national database derived from laboratory analyses employing U.S. EPA standard methods. Herein we establish that differences between the data presented in this report and the current AP-42 default values warrant their full-scale review by U.S. EPA. WIAC believes that the data presented here far better represent current conditions for many compounds and that such a review is well warranted.

Procedures and Results

AP-42 data management procedures were applied to the portion of the WIAC data set having AP-42 default values. The data management procedures address, for example, data screening, air dilution, and data averaging methods. The results of these procedures follow.

Data Collection and Screening

WIAC collected LFG analyses from 75 landfills in sixteen states. This information was processed using U.S. EPA's AP-42 data management procedures. U.S. EPA uses a screening process to remove analytically unacceptable, poorly documented or questionable results.[4] A review of the collected data indicated that the sample analyses would likely pass the AP-42 data screening process. The reported samples were normal, untreated LFG derived from typical gas collection systems. The analytical methodologies appeared to be consistent with those accepted by U.S. EPA.

The analytical results were corrected for air dilution using fixed gas analyses (specifically, methane and carbon dioxide). Several samples lacked either or both methane and carbon dioxide and were excluded. Additionally, some results appeared to be default values (e.g., 50% methane and 50% carbon dioxide) or were unusually high; these were excluded as well. In all, analyses from 27 landfills were omitted from subsequent evaluations.

Data Rating

The data for compounds from the remaining 48 landfills were rated from "A" (strongest) to "E" (weakest) using U.S. EPA's rating system. This process largely depends on the number of 'good' results (A for 20 and up, B for 10 to 19, C for 6 to 9, D for 3 to 5, E for 1 to 2). U.S. EPA also adjusts the rating for a compound's variability. If the arithmetic standard deviation is twice or greater than EPA's default value, then the rating is decreased by one letter. Table 1 summarizes the WIAC rating results and compares these with U.S. EPA's AP-42 data set for 43 compounds.

[4] "EMISSION FACTOR DOCUMENTATION FOR AP-42 SECTION 2.4 MUNICIPAL SOLID WASTE LANDFILLS REVISED" Office of Air Quality Planning and Standards, Office of Air and Radiation, U.S. Environmental Protection Agency, Research Triangle Park, North Carolina 27711, August 1997; see Table 4-1

Table 1. Count of AP-42 compounds at each rating level (A is strongest; total of 43 compounds).

	Count	
Rating	WIAC	AP-42
A	12	4
B	14	21
C	2	8
D	6	6
E	9	4

The overall rating of the WIAC database is essentially the same as that for U.S. EPA's. For example when the letter grade is expressed as a numeric value (e.g., A = 1, B =2, etc.), the average ratings for the WIAC and U.S. EPA data sets are identical.

Nondetects

AP-42 directs that in general nondetect values should be halved then treated as "real" data. However if a nondetect exceeds by two times the maximum of the detects for a compound, then it should be discarded. It appears that the AP-42 guidance directs that this should be done on a facility-by-facility basis as well as on an emission category basis. However the guidance is unclear. A conservative approach was taken by eliminating only nondetects that were more than double the maximum detection among all facilities.

AP-42 also directs that if all values are nondetects then the result should be clearly indicated as such. U.S. EPA does not indicate which values reported within the LFG portion of AP-42 are nondetects.

Data Averaging

AP-42 specifies that data from a single landfill are to be arithmetically averaged. The result from each landfill is then further averaged using an arithmetic average, geometric mean, or median depending on whether the landfill data are normally distributed, lognormally distributed, or neither, respectively. The distribution type was determined for each compound using the probability plot correlation coefficient method.[5] Where fewer than four landfills reported a compound, the distribution type could not be determined. Instead, the distribution type originally used by U.S. EPA in AP-42 was employed. The distribution type was found to differ from U.S. EPA's for sixteen compounds.

The WIAC data set was averaged using both U.S. EPA's original and the newer WIAC's distribution types (see Table 2). The original distribution types were applied so that an "apples to apples" comparison was possible. Doing otherwise could either create or obscure differences between the data sets. The averages calculated based on U.S. EPA's and WIAC's averaging types are shown in the WIAC column labeled "1" and "2", respectively. Values in WIAC column 2 having a different distribution type are highlighted in gray. The results using the two data averaging methods are discussed in Data Summary below.

Codisposal Landfills

Because of detected statistical differences, EPA developed separate codisposal and municipal solid waste (MSW) only default AP-42 levels for toluene and benzene. All other default values

[5] This test was developed by J.J. Filliben in 1975 as reported in "Statistical Training Course for Ground-Water Monitoring Data Analysis", sponsored by the U.S. Environmental Protection Agency Office of Solid Waste, 1992.

were developed from the combined data sets. WIAC surveyed five codisposal sites and 70 MSW-only sites. The WIAC toluene and benzene data were separately analyzed by disposal site type. No significant differences were found between types of disposal sites for other compounds with one exception. Carbon tetrachloride was detected at one codisposal site but at none of the MSW-only disposal sites. The WIAC value for carbon tetrachloride includes the codisposal sites as these had only a slight effect on the calculated value. The value is reported in Table 2 as a 'nondetect' with a footnote indicating that it was found at one codisposal site.

Data Summary

The WIAC results are compared with AP-42 default concentrations in Table 2. WIAC 1 and 2 show the data prepared using past AP-42 and WIAC updated averaging methods, respectively (see Data Averaging above). The WIAC 1 and 2 concentrations are similarly reduced from AP-42 values by 76% and 80%, respectively. However simple alkane and alcohol compounds for which relatively few analyses were available disproportionately skewed the results. Omitting these compounds shows identical 56% overall reductions. Nearly identical reductions are also noted for aromatic (58%) and chlorinated (79%) compounds. Even though the AP-42 and WIAC averaging methods do not have any large overall effect, the two methods did lead to very significant differences for individual compounds (e.g., note those for 1,1,2,2-Tetrachloroethane).

Discussion

AP-42 and WIAC Differences

The differences between the AP-42 default values and the WIAC survey results may be traced to various factors. It was noted above that there are differences in the age of analyses between the AP-42 and WIAC data sets. Trends in LFG constituents have been well documented and are addressed in the next section. Apart from differences in the age of analyses, it was found that procedures used in U.S. EPA's preparation of the AP-42 defaults departed from the AP-42 guidance[6] in its use of nondetects and the minimum number of sources used for developing default values.

The guidance specifies that nondetects should be used in the development of default values. However all nondetects were discarded in at least one AP-42 update.[7] Nondetects may be discarded under certain circumstances specified by the guidance where these are much greater in magnitude than detects (doing otherwise would bias the default values high). However, the AP-42 documentation does not identify which values are detects or nondetects making it impossible to implement this procedure. Finally, the guidance states that default values developed entirely from nondetects should be clearly identified as such. Since nondetects are not documented, this procedure cannot be carried out.

[6] "Procedures for Preparing Emission Factor Documents" Office of Air quality Planning and Standards, Office of Air and Radiation, U.S. Environmental Protection Agency, Research Triangle Park, NC, November 1997 (EPA-454/R-95-015 REVISED).

[7] Phone communication (June 2000) with Stephen Roe, U.S. EPA contractor for past AP-42 revisions.

Table 2. WIAC results compared with AP-42 defaults. WIAC-1 values use AP-42 averaging methods. Some WIAC-2 values, grayed in column 2, use different methods (see text).

Compound	WIAC Sites	Concentration, ppmv		
		AP-42	WIAC-1	WIAC-2
1,1,1-Trichloroethane (methyl chloroform)	46	0.48	0.168	0.168
1,1,2,2-Tetrachloroethane	19	1.11	0.070	0.005
1,1-Dichloroethane (ethylidene dichloride)	45	2.35	0.741	0.741
1,1-Dichloroethene (vinylidene chloride)	45	0.2	0.092	0.092
1,2-Dichloroethane (ethylene dichloride)	47	0.41	0.120	0.120
1,2-Dichloropropane (propylene dichloride)	17	0.18	0.023	0.023
2-Propanol (isopropyl alcohol)	3	50.1	7.908	7.908
Acetone	8	7.01	6.126	7.075
Acrylonitrile	3	6.33	<0.036	<0.036
Benzene (Co-Disposal)	3	11.1	10.376	10.376
Benzene (No Co-Disposal)	44	1.91	0.972	0.972
Bromodichloromethane	7	3.13	<0.311	<0.264
Carbon disulfide	31	0.58	0.320	0.221
Carbon tetrachloride	37	0.004	<0.007*	<0.007*
Carbonyl sulfide	29	0.49	0.183	0.183
Chlorobenzene	46	0.25	0.227	0.227
Chlorodifluoromethane (Freon 22)	1	1.3	0.355	0.355
Chloroethane (ethyl chloride)	21	1.25	0.239	0.448
Chloroform	45	0.03	0.021	0.010
Chloromethane	8	1.21	0.249	0.136
Dichlorobenzene	34	0.21	1.607	1.448
Dichlorodifluoromethane (Freon 12)	19	15.7	1.751	0.964
Dichloromethane (Methylene Chloride)	47	14.3	3.395	3.395
Dimethyl sulfide (methyl sulfide)	34	7.82	6.809	6.809
Ethane	1	889	7.943	7.943
Ethanol	4	27.2	118.618	64.425
Ethyl mercaptan (Ethanethiol)	36	2.28	1.356	0.226
Ethylbenzene	26	4.61	6.789	6.789
Ethylene dibromide	30	0.001	<0.046	<0.005
Fluorotrichloromethane (Freon 11)	25	0.76	0.327	0.327
Hexane	4	6.57	2.324	2.063
Hydrogen sulfide	40	35.5	23.578	23.578
Methyl ethyl ketone	8	7.09	10.557	12.694
Methyl isobutyl ketone	7	1.87	0.750	0.750
Methyl mercaptan	36	2.49	1.292	1.266
Perchloroethylene (tetrachloroethylene)	48	3.73	1.193	1.193
Propane	1	11.1	14.757	19.858
Toluene (Co-Disposal)	3	165	37.456	37.456
Toluene (No Co-Disposal)	43	39.3	25.405	25.405
trans-1,2 Dichlorethene	1	2.84	0.051	0.051
Trichloroethylene (trichloroethene)	48	2.82	0.681	0.681
Vinyl Chloride	46	7.34	1.077	1.077
Xylenes	45	12.1	16.582	16.582

Note: "<" indicates that the compound was detected at none of the WIAC sites.

* Carbon Tetrachloride was detected at one codisposal site but at none of 35 MSW-only disposal sites.

The guidance also states that a minimum of ten sources should be used in developing a default value (use of fewer sources results in unreliable values). However several of the AP-42 defaults were developed from many fewer samples and sometimes just one sample. In view of the high variability observed between landfill test results, it is recommended that U.S. EPA carefully review its practices in developing AP-42 defaults with fewer than ten samples. At a minimum, defaults derived from limited data should be clearly identified and users cautioned as to their questionable reliability.

LFG Constituent Declines

Large, long term declines in LFG HAP values were documented in the August 1999 WIAC report. This report focused on four active and two closed landfills in Southern California. The decline at the active landfills was concurrent with implementation of waste-screening programs that prevented the disposal of incidental amounts of hazardous wastes present in the municipal solid waste stream starting in the early 1980's. U.S. EPA's Resource Conservation and Recovery Act (RCRA) rules for MSW landfills, implemented starting October 9, 1991 (40 CFR 258.20) also began requiring such exclusion programs on a nationwide basis. Additionally, the U.S. EPA established Subtitle C requirements per the 1984 RCRA amendments that set minimum treatment standards for listed wastes. This program ensured that the treatment residuals were placed in Subtitle C landfills. The combination of these programs likely reduced or eliminated incidental hazardous waste disposal in active MSW landfills.

An attempt was made to determine whether a similar long term decline could be detected at other active landfills represented in the AP-42 database. A comparison was made of those sites that were reported by both EPA and WIAC. However it was found that many of the AP-42 landfills had coded names. The only active sites identifiably the same were those already reported in the August 1999 report. It is recommended that U.S. EPA identify the coded AP-42 landfills so that a meaningful comparison could be made with the WIAC results.

The LFG HAP decline for the two closed landfills in the August 1999 report would be unrelated to improved hazardous waste management practices. However the anaerobic decomposition processes at these sites are likely to have brought about such declines through one or more mechanism. HAP compounds will tend to volatilize into newly generated anaerobic gases; the gases together with the trace constituents will ultimately exit the landfill, removing the HAP compounds. Additionally, anaerobic processes may destroy or transform some HAP compounds.

Another factor to consider in the decline of HAP compounds is the effect of improved laboratory methodologies in recent years. Areas of improvement include utilization of more sophisticated equipment and adoption of standardized procedures for all analytical aspects. Some of the improved procedures include sample container preparation, instrument calibration, and quality assurance acceptance criteria.

Equipment and procedure improvements reduce the scatter of data, increase data reliability, minimize compound misidentifications, and lower detection limits. Detection limits are especially important since several of the AP-42 compounds have few or no detections; improved detection limits would tend to lower the calculated AP-42 defaults. One laboratory submitting data for this report indicated that detection limits were more than halved in the last five years.

Urban Air Toxics Strategy

The U.S. EPA used AP-42 defaults for the recently completed Urban Air Toxics (UAT) Strategy. A review of the UAT findings based on the newer WIAC results is presented in Table 3. For all compounds detected in LFG, municipal landfills dropped in rank among industrial sources. The

drop was typically from sixth to at least thirteenth or more. Four of the nine compounds dropped from the ranking and rank no more than 17th. The average MSW landfill contribution per compound dropped from 13% to 1.5%. One of the more dramatic findings concerns U.S. EPA's original attribution of 84% of all 1,1,2,2-Tetrachloroethane emissions to landfills; the WIAC findings show that the landfill emission level is about 2% of all sources. These findings indicate that municipal landfills have markedly less emissions, compared to other industrial sources, than U.S. EPA previously estimated.

Table 3. Summary of changes to Urban Air Toxic (UAT) emission estimates based on changes from AP-42 defaults to current compound levels measured by WIAC.

	Annual Tons		Portion of UAT Inventory		Rank		Number of
Compound	AP-42	WIAC	AP-42	WIAC	AP-42	WIAC	Sources
1,1,2,2-Tetrachloroethane	216	1.0	84.08%	2.37%	1	5	16
1,2-Dichloropropane	23.6	3.0	3.59%	1.48%	6	8	12
Acrylonitrile	389	2.2	15.28%	0.10%	3	15	17
Benzene	173	87.9	3.86%	2.00%	11	13	17
Chloroform	4.17	1.3	4.94%	1.63%	6	9	17
Ethylene Dichloride	47	13.7	1.15%	0.34%	10	*	17
Methylene Chloride	1550	367	1.67%	0.40%	11	*	17
Tetrachloroethylene	717	229	0.59%	0.19%	6	*	17
Trichloroethylene	429	104	0.64%	0.16%	13	*	17
Vinyl Chloride	531	77.9	19.65%	3.46%	2	4	17
Vinylidene Chloride	22.5	10.3	10.10%	3.45%	4	5	14

* Landfill emissions are less than for other ranked sources.

Conclusions

WIAC conducted a national survey of recent LFG analyses. Recent results from 75 landfills were analyzed using AP-42 methodologies. The AP-42 defaults were found to typically overestimate current levels by two to four hundred percent. For some of the more health significant compounds, the differences were larger yet. The overestimated AP-42 values may potentially misdirect U.S. EPA's policy development. For example, the recently completed Urban Air Toxics Strategy appears to have substantially overestimated actual landfill emissions. Furthermore, the existing AP-42 default values may adversely impact individual landfills required to use these values.

As a result, WIAC believes that the AP-42 defaults should be revised to reflect the decline in LFG constituents. The most recent AP-42 revision in 1995 added new data to older values and averaged the combined data sets. This approach is appropriate only for data that does not trend. It is recommended that older data be purged and replaced using current data presented in this paper.