



COMMONWEALTH OF
PUERTO RICO
 Environmental Quality Board

**TITLE V OPERATIONAL PERMIT
 AIR QUALITY AREA
 ENVIRONMENTAL QUALITY BOARD**



Permit Number	PFE-TV-4953-07-1101-2475
Date of Receipt of Application	November 30, 2001
Final Issuance or Effective Date	June 16, 2016
Expiration Date	June 16, 2021

In accordance with the provisions of Part VI of the Regulations for the Control of Atmospheric Pollution (RCAP) and the provisions of the Code of Federal Regulations (CFR) Title 40, Part 70 we authorize:

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**MUNICIPALITY OF ARECIBO LANDFILL
 ARECIBO, PUERTO RICO**

hereinafter referred to as the **MAL** or the **permittee**, is authorized to operate a stationary source of air pollutants contaminants consisting of emissions units described in this permit. Until such time as this as this permit expires, or is modified or revoked, the permittee may generate pollutant emissions to the atmosphere resulting from processes and activities directly related to, and associated with emission sources, in compliance with the requirements, limitations and conditions of this permit, until its expiration date or until such is modified or revoked.

The conditions of the permit are enforceable by the federal and state governments. Those requirements that are enforceable only by the state government will be identified as such in the permit. A copy of the permit shall be kept on-site at the above mentioned facility at all times.

Cruz A. Matos Environmental Agencies Building
 State Road 8838, El Cinco Sector, Rio Piedras, PR 00926
 Postal Address: P.O. Box 11488, Santurce, PR 00910
 Tel 787-767-8181, Fax 787-756-5906
www.jca.pr.gov

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A circled '80' above Section VII.
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Section I - General Information

A. Information about the facility

Name of the Owner: Municipality of Arecibo

Postal Address: P.O. Box 1086
Arecibo, P.R. 00613

Name of the Installation: Municipality of Arecibo Landfill

Location of the Installation: Road PR-682 Interior
Factor Ward, Garrochales Sector
Arecibo, Puerto Rico, 00682

Responsible Official: Hon. Carlos M. Molina Rodríguez
Mayor, Municipality of Arecibo

Telephone: 787-878-7715

Technical Contact Person: Rey O. Contreras
President
Landfill Technologies of Arecibo, Corp.

Postal Address: P.O. Box 1322
Gurabo, P.R. 00778

Telephone: 787-273-7639

Fax: 787-273-8315

Primary SIC Code: 4953

B. Process Description

The Municipality of Arecibo Landfill (MAL) or Sanitary Landfill System (SLS) is an active municipal solid wastes landfill that began operations in 1973 and is projected to continue operation until 2030. An increase in the design capacity of the landfill and the construction of a Gas Collection and Control System was authorized in 2011.

The MAL is located on Road PR-682 Interior in the Factor Ward, Garrochales Sector, in Arecibo. Landfill Technologies administers the Municipal Sanitary Landfill System of Arecibo.

Solid wastes are hauled by trucks and other transportation vehicles and unloaded in the MAL work area (dump site). Once unloaded, excavators and compactors spread and compact the wastes. The compacted wastes are covered with dirt at the close of each work day.

The decomposition of encapsulated wastes in the landfill produces gas (landfill gas). The gas consists of methane (CH₄), carbon dioxide (CO₂) and other non-methane organic compounds (NMOC). The gas generated in the MAL is collected through an active gas collection system routed to two enclosed flares.

The Municipality of Arecibo Landfill is subject to Title V permit requirements because it has a design capacity of more than 2.5 million megagrams and 2.5 million cubic meters, because it is a major source because it exceeds 100 tons/year of carbon monoxide (CO), and because it exceeds 100,000 per year of greenhouse gases (GHGs) expressed as carbon dioxide equivalent (CO₂e).

Section II - Description of the emission units

The emission units regulated under this permit are:

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Emission Unit	Description	Control Equipment
EU-1	<p align="center">Active Municipal Sanitary Landfill System</p> <p>The landfill accepts municipal solid wastes since 1973. It has a design capacity of 6,352,750 megagrams. It is estimated that the annual wastes acceptance rate will decrease from 227,275 Mg/year in 2010 to 133,793.5 Mg/year in 2011, with 1,050 scfm maximum landfill gas generation. Estimated closure year: 2030.</p>	<p align="center">CD-1 and CD-2 Active Landfill Gas Collection System routed to two enclosed flares.</p>
CD-1 and CD-2	<p align="center">Active Landfill Gas Collection System Routed to Two Enclosed Flares</p> <p>Enclosed flares A and B. Manufacturer: ABUTEC Model: HFP3.0</p> <ul style="list-style-type: none"> • Process landfill at the following rates: <ul style="list-style-type: none"> • Flare A: 333 scfm • Flare B: 600 scfm • Heat input rate: <ul style="list-style-type: none"> • Flare A: 10MMBtu/hr • Flare B: 22.50MMBtu/hr. • Output temperature: 1,500 °F • Startup fuel: Propane at a rate of 35.7 lb/hr • Velocity: 0.47 ft³/sec. 	-

Emission Unit	Description	Control Equipment
	<ul style="list-style-type: none"> • Stack: <ul style="list-style-type: none"> • Height = 24.0' • Diameter = 4.0' • Maximum hours of operation: 8,760 hr/year • Minimum destruction efficiency for NMOC: 98.5% • Minimum Temperature.¹ 	

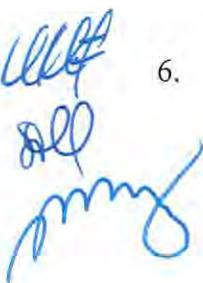
Section III – General Permit Conditions

1. **Sanctions and Penalties:** The permittee must comply with all terms, conditions, requirements, limitations and restrictions established in this permit. Any violation to the terms of this permit is subject to administrative, civil or criminal measures, as established in Section 16 of the Environmental Public Policy Act (Law No. 416 of September 22, 2004, as amended).
2. **Right of Entry:** As specified under Rules 103 and 603(c)(2) of the RCAP, the permittee shall allow the Board or an authorized representative, upon presentation of credentials and other documents as may be required by law, to perform the following activities:
 - a. Enter upon the permittee premises where an emission source is located or where emissions related activities are conducted, or where records must be kept under the conditions of this permit, under the RCAP, or under the Clean Air Act;
 - b. Have access to and copy, at reasonable times, any records that must be kept under the conditions of the permit, under the RCAP, or under the Clean Air Act;
 - c. Inspect and examine any facility, equipment (including monitoring and air pollution control equipment), practices or operations (including QA/QC methods) regulated or required under this permit; as well as sampling emissions of air quality and fuels; and
 - d. As authorized by the Clean Air Act and the RCAP, to sample or monitor, at reasonable times, substances or parameters for the purpose of assuring compliance with the permit or other applicable requirements.

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¹ The prevailing minimum temperature is the temperature set during the initial flare operational test or that set in the most recent test approved by the Board, as established by applicable regulations.

3. **Sworn Statement or Affidavit:** All reports required pursuant Rule 103(D) of the RCAP (i.e., semiannual monitoring reports and annual compliance certification) should be submitted together with a sworn statement or affidavit by the Responsible Official or a duly authorized representative. Such sworn statement or affidavit shall attest to the truth, correctness and completeness of such records and reports.
4. **Data Availability:** As specified under Rule 104 of the RCAP, all emission data obtained by or submitted to the EQB, including data reported pursuant to Rule 103 of the RCAP, as well as that obtained in any other way, shall be available for public inspection and may also be made available to the public in any additional manner that the EQB may deem appropriate.
5. **Emergency Plan:** As specified under Rule 107 of the RCAP, the permittee shall have available an Emergency Plan which must be consistent with adequate safety practices, and provides for the reduction or retention of the emissions from the plant during periods classified by the EQB as air pollution alerts, warnings or emergencies. These plans shall identify the emission sources, include the reduction to be accomplished for each source, and the means by which such reduction will be accomplished. These plans will be available for any authorized representative of the EQB at any time.
6. **Air Pollution Control Equipment:** The permittee shall comply with Rule 108 of the RCAP, as follows:
 - a. All air pollution control equipment or control measures shall provide for continuous compliance with applicable rules and regulations. Such equipment or measures shall be installed, maintained, and operated according to those conditions imposed by this Title V permit, within the specified operating limitations of the manufacturer.
 - b. The collected material from air pollution control equipment shall be disposed in accordance with applicable rules and regulations. The removal, manipulation, transportation, storage, treatment or disposal will be done in such or manner that shall not to produce environmental degradation, and in accordance with applicable rules and regulations.
 - c. The Board may require, when deemed appropriate to safeguard the health and welfare of human beings, the installation and maintenance of additional, complete and separate air pollution control equipment of a capacity equal to the capacity of the primary control equipment. Furthermore, the Board may require that such additional air pollution control equipment be operated continuously and conjunctionally with the primary air pollution control equipment.



- d. All air pollution control equipment shall be operated at all times while the source being controlled is in operation.
- e. In the case of a shutdown of air pollution control equipment for the necessary scheduled maintenance, the intent to shutdown such equipment shall be reported to the Board at least three days prior to the planned shutdown. Such prior notice shall include, but is not limited to the following:
 - 1. Identification of the specific source to be taken out of service with its location and permit number.
 - 2. The expected length of time that the air pollution control equipment will be out of service.
 - 3. The nature and quantity of emissions of air pollutants likely to be permitted during the shutdown period.
 - 4. Measures such as the use of off-shift labor and equipment that will be taken to minimize the length of the shutdown period.
 - 5. The reasons why it will be impossible or impractical to shutdown the operating source during the maintenance period.

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- 7. **Compliance Certification:** As specified under Rule 602(c)(2)(ix)(C) of the RCAP, the permittee shall submit each year a compliance certification. This certification must be submitted to both the Board and the Environmental Protection Agency (EPA)² no later than April 1st covering the previous calendar year. The compliance certification shall include, but is not limited to, the information required under Rule 603(c) of the RCAP as follows:
 - a. The identification of each term or condition of the permit that is the basis of the certification; and
 - b. The compliance status. Each deviation shall be identified and taken into account in the compliance certification; and
 - c. A statement indicating whether the compliance was continuous or intermittent; and

² The certification to the EQB shall be mailed to: Manager, Air Quality Area, P.O. Box 11488, San Juan, P.R. 00910. The certification to the EPA shall be mailed to: Chief, Enforcement and Superfund Branch, CEPD, US EPA-Region II, City View Plaza – Suite 7000, #48 Rd. 165 Km 1.2 Guaynabo, P.R. 00968-8069.

- d. The methods or other means used for determining the compliance status with each term and condition, currently and over the reporting period consistent with sections (a)(3)-(5) of Rule 603 of the RCAP; and
 - e. Identification of possible exceptions to compliance, any periods which compliance is required and in which an excursion or exceedance as defined under 40 CFR Part 64 (CAM) occurred; and
 - f. Such other facts as the Board may require to determine the compliance status of a source.
8. **Regulation Compliance:** As specified under Rule 115 of the RCAP, any violation to the RCAP, or to any other applicable rule or regulation, shall be grounds for the Board to suspend, modify, or revoke any relevant permit, approval, variance or other authorization issued by the Board.
9. **Location Approval:** As specified under Rule 201 of the RCAP, nothing in this permit shall be interpreted as authorizing the location or construction of a major stationary source, or the modification of a major stationary source, or a major modification of a significant source, without obtaining first a location approval from the Board and without first demonstrating compliance with the National Ambient Air Quality Standards (NAAQS). This permit does not allow the construction of new minor sources without the required permit under Rule 203 of the RCAP.
10. **Objectionable Odors:** As specified under Rule 420 of the RCAP, the permittee shall not cause or permit emissions to the atmosphere of any matter which produces an *objectionable* odor that can be perceived in an area other than that designated for industrial purposes. If objectionable odors are detectable beyond the property perimeter, and complaints are received, the permittee shall investigate and take measures to minimize and/or eliminate the objectionable odors, if necessary. [This condition is enforceable only by the State]
11. **Permit Renewal Applications:** As established under Rule 602 (a)(1)(iv) of the RCAP, the permittee shall submit a permit renewal application applications for permit renewal shall be submitted at least 12 months prior to the date of permit expiration. A responsible official must certify all required applications consistent with paragraph (c)(3) of Rule 602 of the RCAP.

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12. **Permit Duration:** As specified under Rule 603 of the RCAP, the following terms will apply during the duration of this permit:
- a. **Expiration:** This authorization shall have a fixed term of 5 years since the effective date. The expiration date will be automatically extended until the Board approves or denies a renewal application (Rule 605(c)(4)(ii) of the RCAP) but only in those cases where the permittee submits a complete renewal application at least twelve (12) months before the expiration date. [Rules 603 (a)(2), 605 (c)(2), and 605(c)(4) of the RCAP]
 - b. **Permit Shield:** As specified under Rule 605(c)(4)(i) of the RCAP, the permit shield may be extended until the time the permit is renewed if a timely and complete renewal application is submitted.
 - c. In case that this permit is subject to any challenge by third parties, the permit shall remain in effect until the time it is revoked by a court of law with jurisdiction in the matter.
13. **Recordkeeping Requirement:** As established under Rule 603(a)(4)(ii) of the RCAP, the permittee shall retain records of all required monitoring data and support information for a period of 5 years from the date of the monitoring sample, measurement, report, or application.
14. **Semiannual Monitoring Reports/Samplings:** As established under Rule 603(a)(5)(i) of the RCAP, the permittee shall submit reports to the EQB of all required monitoring every 6 months, or more frequently if required by the Board or any other underlying applicable requirement. These reports cover two major elements. The first element is the summary of all periodic monitoring / sampling required in this permit. The second element requires that all deviations from permit conditions are clearly identified, summarized and reported to the Board. All instances of deviations from permit requirements must be clearly identified in such reports. All required reports must be certified by a responsible official as established under Rule 602(c)(3) of the RCAP. The report covering the period from January through June shall be submitted no later than October 1st of the same year and the report covering the period from July through December shall be submitted no later than April 1st of the following year. Once the guidelines are developed by the Board, the permittee must use them to complete these reports.
15. **Deviations Reporting due to Emergencies:** According to Rule 603(a)(5)(ii)(a) of the RCAP, any deviation resulting from an upset (such as sudden malfunction or breakdown) or emergency conditions, as defined in Rule 603(e) of the RCAP, must be reported within the next 2 working days from the time the emission limits are exceeded due to the emergency, if the permittee wishes to assert the affirmative defense authorized under Rule 603 (e) of the RCAP. If the permittee raises the emergency defense upon an

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enforcement action, the permittee shall demonstrate that such deviation happens due to an emergency and that the Board was adequately notified. If such emergency deviation last for more than 24 hours, the affected units may be operated until the end of the cycle or 48 hours, whichever occurs first. The Board may only extend the operation of an emission source in excess of 48 hours, if the source demonstrates to the Board's satisfaction that the National Air Quality Standards have not been exceeded and that there is no risk to the public health.

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16. **Deviation Reporting (Hazardous Air Pollutants):** The source shall act as specified in its Emergency Response Plan (established in Rule 107 (C) of the RCAP), when such Plan has shown no significant impact on an area other than those that have been designated for industrial purposes or will cease operations immediately if there is a significant impact on an area other than those that have been designated for industrial purposes (state-only enforceable condition). In accordance with Rule 603(a)(5)(ii)(b) of the RCAP, the Board shall be notified within the next 24 hours if a deviation that results in the release of emissions of hazardous air pollutants for more than an hour in excess of the applicable limit occurs. For the discharge of any regulated air pollutant that continues for more than 2 hours in excess of the applicable limit, the permittee shall notify the Board within 24 hours of the deviation. The permittee shall submit to the Board, within 7 days of the deviation, a detailed written report which includes probable causes, time and duration of the deviation, remedial action taken and the steps you are following to prevent recurrence.
17. **Severability Clause:** As specified under Rule 603(a)(6) of the RCAP, the clauses in this permit are severable. In the event of a successful challenge to any portion of the permit in an administrative or judicial forum, or in the event any of its clauses is held to be invalid, all other portions of the permit shall remain valid and effective, including those related to emission limits, terms and conditions, be they specific or general, as well as monitoring, record keeping and reporting requirements.
18. **Permit Noncompliance:** According to Rule 603(a)(7)(i) of the RCAP, the permittee must comply with all conditions of the permit. Permit noncompliance constitutes a violation of the RCAP and will be grounds for taking the appropriate enforcement action, impose sanctions, revoke, terminate, modify, and/or reissue the permit, or to deny a permit renewal application.
19. **Defense not Allowed:** As specified under Rule 603(a)(7)(ii) of the RCAP, the permittee shall not allege as a defense in an enforcement action, that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
20. **Permit Modification and Revocation:** As specified under Rule 603(a)(7)(iii) of the RCAP, the permit may be modified, revoked, reopened, reissued, or terminated for cause according to the Law of Uniform Administrative Procedures. The filing of a request by

the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.

21. **Property Rights:** As specified under Rule 603(a)(7)(iv) of the RCAP, this permit does not convey any property rights of any sort, nor does it grant any exclusive privilege.
22. **Obligation to Furnish Information:** As specified under Rule 603(a)(7)(v) of the RCAP, the permittee shall furnish to the EQB, within a reasonable time, any information that the EQB may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the EQB copies of documents related to this permit.
23. **Changes in Operating Scenarios:** As specified in Rule 603(a)(10) of the RCAP, the permittee shall, contemporaneously with making a change from one operating scenario to another, record in a log the scenario under which it is operating. This record shall be kept onsite at all times.
24. **Prohibition on Default Issuance:** As specified under Rule 605(d) of the RCAP, it shall never be considered that a permit has been issued by default as a result of the EQB's failure to take final action on a permit application within 18 months. The EQB's failure to issue a final permit within 18 months should be treated as a final action solely for the purpose of obtaining judicial review in a state court.
25. **Administrative Permit Amendments and Permit Modifications:** As specified under Rule 606 of the RCAP, the permit shall not be amended nor modified unless the permittee complies with the requirements for administrative permit amendments and permit modifications as described in the RCAP.
26. **Permit Reopening:** As specified under Rule 608(a)(1), this permit shall be reopened and revised under the following circumstances:
 - a. Whenever additional applicable requirements under any law or regulation become applicable to the permittee, when the remaining permit term is of 3 or more years. Such reopening shall be completed 18 months after promulgation of said applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions have been extended pursuant to Rule 605(c)(4)(i) or Rule 605(c)(4)(ii) of the RCAP.

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- b. Whenever the EQB or the EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emission standards or other terms or conditions of the permit.
- c. Whenever the EQB or the EPA determines that the permit must be revised or revoked to assure compliance with the applicable requirements.
27. **Changes in Name or Responsible Official:** This permit is issued to **Municipality of Arecibo Landfill**. In the event that the company and/or facility change its name, the responsible official must submit an administrative amendment to this permit to reflect the change in name. If the event that the responsible official changes, the new responsible official must submit no later than 30 days after the change, an administrative amendment including a sworn statement in which he/she accepts and promises to comply with all the conditions of this permit.
28. **Changes in Ownership:** This permit is issued to **Municipality of Arecibo Landfill**. In the event that the company and/or facility is transferred to a different owner or change operational control and the Board determines that no other change in the permit is necessary, the new responsible official must submit an administrative amendment. The administrative amendment shall include a sworn statement in which the new responsible official accepts and promises to comply with all the conditions of this permit, and a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittee. This is not applicable if the Board determines that changes to the permit are necessary.
29. **Renovation Work/ Demolition:** The permittee shall comply with the provisions set forth in 40 CFR §61.145 and §61.150, and Rule 422 of the RCAP, and Regulations for the Processing of General Permits (General Permit for the Handling of Asbestos Containing Materials) when doing renovation or demolition activities of asbestos containing materials at the facility. The permittee is not authorized to receive asbestos containing materials in the sanitary landfill system.
30. **Risk Management Plan:** If during the effectiveness of this permit, the permittee is subject to the 40 CFR part 68, the permittee shall submit a Risk Management Plan according with the compliance schedule in the 40 CFR part 68.10. If during the effectiveness of this permit, the permittee is subject to the 40 CFR part 68, the permittee shall submit a compliance certification with the requirements of part 68 as part of the annual compliance certification required under 40 CFR part 70, including the recordkeeping and the Risk Management Plan.
31. **General Duty:** The permittee has the general obligation of identifying hazards which may result from accidental releases of any controlled substance under section 112(r) of the Clean Air Act or any other extremely hazardous substance in a process, using



appropriate hazard assessment techniques, designing, maintaining, and operating a safe facility and minimizing the consequences of accidental releases if they occur as required in section 112(r)(1) of the Act and Rule 107(D) of the RCAP.

32. Requirements for Refrigerants (Climatologic and Stratospheric Ozone Protection):

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- a. In the event that the permittee has equipment or appliances, including air conditioning units, which use Class I or II refrigerants as defined in 40 CFR part 82, subpart A, Appendices A and B, the permittee shall take the necessary measures to ensure that all maintenance, service or repair services performed are done so according to the practices, certification and personnel requirements, disposition requirements, and recycling and/or recovery equipment certification requirements specified under 40 CFR part 82, subpart F.
 - b. Owners/ operators of appliances normally containing 50 or more pounds of refrigerant must keep records of refrigerant purchased and added to such appliances pursuant to 40 CFR §82.166.
 - c. Service on Motor Vehicles: If the permittee performs a service on motor (fleet) vehicles when this service involves ozone-depleting substance refrigerant (or regulated substitute substance) in the motor vehicle air conditioner (MVAC), the permittee is subject to all the applicable requirements as specified in 40 CFR part 82, subpart B, Servicing of Motor Vehicle Air Conditioners. The term motor vehicle as used in subpart B does not include a vehicle in which final assembly of the vehicle has not been completed. The term MVAC as used in subpart B does not include the air-tight sealed refrigeration system used as refrigerated cargo or system used on passenger buses using HCFC-22 refrigerant.

33. Labeling of Products Using Ozone-Depleting Substances: The permittee shall comply with the standards for labeling of products using ozone-depleting substances pursuant to 40 CFR part 82, subpart E.

- a. All containers in which a class I or class II substance is stored or transported, all products containing a class I substance, and all products directly manufactured with a class I substance must bear the required warning statement if it is being introduced into interstate commerce pursuant to 40 CFR §82.106.
- b. The placement of the required warning statement must comply with the requirements pursuant to 40 CFR §82.108.
- c. The form of the label bearing the required warning statement must comply with the requirements pursuant to 40 CFR §82.110.

- d. No person may modify, remove, or interfere with the required warning statement except as described in 40 CFR §82.112.
34. **Roof Surface Coating:** Pursuant to Rule 424 of the RCAP, the permittee shall not cause or permit the roof surface coating by applying hot tar or any other coating material containing organic compounds without previous notification to the Board. The use of used oil or hazardous waste for roof surface coating is prohibited. This rule will not apply to activities where tar or sealing material is applied without heat and such material is asbestos-free. [State enforceable only]
35. **Storage Tanks:** The permittee shall keep records of all fuel oil storage tanks showing the dimensions of each tank and an analysis showing the capacity of each tank. This documentation shall be readily available at any time for inspection of the Board personnel and shall be kept onsite for the life of the tank.
36. **Compliance Clause:** Under no circumstances does compliance with this permit exempt the permittee from complying with all other applicable state or federal laws, regulations, permits, administrative orders or applicable court orders
37. **Emissions Calculations:** The permittee shall submit, on or before April 1st of each year, the actual or permissible emissions calculations for the previous natural year. The emissions calculations shall be submitted on the forms prepared by the Board for this purpose and the responsible official must certify all the information submitted as true, correct and representative of the permitted activity included in the permit.
38. **Annual Fee:** As specified under Rule 610 of the RCAP, the permittee must submit an annual payment based on the emissions calculations for each regulated pollutant. The payment will be based on their actual emissions at a rate of \$37.00 per ton, unless the Board decides otherwise as permitted under Rule 610(b)(2)(iv) of the RCAP. This payment for the previous year must be made on or before June 30 of each year.
39. **New or Amended Regulation:** Whether a federal or state regulation is promulgated or amended and the facility is affected by it, the owner or operator shall comply with the requirements of the new or amended regulation. The Board will provide a specified and reasonable period of time so the permittee reach compliance with the amendments or new regulations.
40. **Reports:** Unless a permit condition establishes otherwise, any requirement of information submittal to the Board shall be addressed to: Manager, Air Quality Area, P.O. Box 11488, San Juan, P.R. 00910.

41. **Reservation of Rights:** Except as expressly provided in this Title V permit:

- a. Nothing herein shall prevent Board or the EPA from taking administrative enforcement measures or seeking legal or equitable relief to enforce the terms of the Title V permits, including but not limited to the right to seek injunctive relief, and imposition of statutory penalties and/or fines.
- b. Nothing herein shall be construed to limit the rights of the Board or the EPA to undertake any criminal enforcement activity against the permittee or any person.
- c. Nothing herein shall be construed to limit the authority the Board or the EPA to undertake any actions in response to conditions that present an imminent and substantial endangerment to public health or welfare, or the environment
- d. Nothing herein shall be construed to limit the permittee's rights to administrative hearing and judicial appeal of termination/ revocation/ disputes over modification/ denial actions in accordance with regulations and the Environmental Public Policy Act.

42. **Source Modifications without a permit revision:** The permittee may make changes to the source in accordance with paragraphs (a), (b) and (c) of Rule 607 of the RCAP, as follows:

(a) Source changes -

- (1) Permitted sources may make Section 502(b)(10) changes without requiring a permit revision, if the changes are not modifications under any provision of Title I of the Act and the changes do not exceed the emissions allowable under the permit (whether expressed therein as a rate of emissions or in terms of total emissions).
 - (i) For each such change, the facility must provide the Administrator and the Board with written notification in advance of the proposed changes, which shall be seven (7) days. The written notification shall include a brief description of the change within the permitted facility, the date on which the change will occur, any change in emissions, and any permit term or condition that is no longer applicable as a result of the change. The source, the Board, and EPA shall attach each such notice to their copy of the relevant permit.

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- (ii) The permit shield described in paragraph (d) of Rule 603 shall not apply to any change made pursuant to section (a)(1) of Rule 607.
- (2) Permitted sources may trade increases and decreases in emissions in the permitted facility for the same pollutant, where the permit provides for such emissions trades without requiring a permit revision and based on the 7-day notice prescribed in section (a)(2) of Rule 607. This provision is available in those cases where the permit does not already provide for such emissions trading.
- (i) Under paragraph (a)(2) of Rule 607, the written notification required shall include such information as may be required by the provision in the Puerto Rico State Implementation Plan (PR-SIP) authorizing the emissions trade, including when the proposed change will occur, a description of each such change, any change in emissions, the permit requirements with which the source will comply using the emissions trading provisions of the PR-SIP, and the pollutants emitted subject to the emissions trade. The notice shall also refer to the provisions with which the source will comply in the PR- SIP and that provide for the emissions trade.
- (ii) The permit shield described in paragraph (d) of Rule 603 shall not extend to any change made under section (a)(2) of Rule 607. Compliance with the permit requirements that the source will meet using the emissions trade shall be determined according to requirements of the applicable implementation plan authorizing the emissions trade.
- (3) If a permit applicant requests it, the Board shall issue permits that contain terms and conditions (including all terms required under sections (a) and (c) of Rule 603 to determine compliance) allowing for the trading of emissions increases and decreases in the permitted facility solely for the purpose of complying with a federally-enforceable emissions cap. Such a cap must be established in the permit independent of otherwise applicable requirements. The permit applicant shall include in its application proposed replicable procedures and permit terms that ensure the emissions trades are quantifiable and enforceable. The Board shall not be required to include in the emissions trading provisions any emissions units for which emissions are not quantifiable or for which there are no replicable procedures to enforce the emissions

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trades. The permit shall also require compliance with all applicable requirements.

- (i) Under section (a)(3) of Rule 607, the written notification required shall state when the change will occur and shall describe the changes in emissions that will result and how these increases and decreases in emissions will comply with the terms and conditions of the permit.
- (ii) The permit shield described in paragraph (d) of Rule 603 may extend to terms and conditions that allow such increases and decreases in emissions.

(b) Off-Permit Changes. The Board may allow changes that are not addressed or prohibited by the permit and/or State Law.

(1) A permitted facility may make changes without obtaining a permit revision if such changes are not addressed or prohibited by the permit, other than those described in paragraph (c) of Rule 607.

(i) Each such change shall meet all applicable requirements and shall not violate any existing permit term or condition.

(ii) Sources must provide contemporaneous written notice to the Board and EPA of each such change, except for changes that qualify as insignificant under paragraph (c)(1) of Rule 602. Such written notice shall describe each such change, including the date, any change in emissions, pollutants emitted and any applicable requirement that would apply because of the change.

(iii) The change shall not qualify for the shield under paragraph (d) of Rule 603.

(iv) The permittee shall keep a record describing changes made at the source that result in emissions of a regulated air pollutant subject to an applicable requirement, but not otherwise regulated under the permit, and the emissions resulting from those changes.

(c) A permitted facility cannot make changes without a permit revision if such changes are modifications under any provision of Title I of the Act.

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43. (a) The permittee may make changes under section 502(b)(10) of the Act without requiring a permit revision if such changes:
- (1) are not modifications under any provision of Title I of the Act,
 - (2) do not exceed the allowable emissions under the permit,
 - (3) do not result in the emission of any pollutant not previously emitted,
 - (4) do not violate any applicable requirement or contravene federally enforceable terms and permit conditions such as monitoring (including test methods), recordkeeping, reporting and compliance certification requirements,
 - (5) are not changes under Title I of the Act to an emission limit, a work practice or a voluntary emission cap.
- (b) Rule 203 of the RCAP is required for any construction or modification of an emission source. For purposes of part II of the RCAP, a modification is defined as any physical change in, change in the method of operation or a change in type of fuel used of an existing stationary source, that would result in a net increase in that stationary source's potential to emit any air pollutant (subject to any standard), or which results in the emission of any pollutant (subject to an standard) not previously emitted. A physical change shall not include routine maintenance, repair and the replacement of any equipment having the same capacity, equal efficiency or greater environmental benefit to be used for the same purpose.
- (c) The written notification addressed in condition 42(a)(1)(i) refers to changes covered under condition 42 (a)(1). Changes not covered will be processed under the requirements of Rule 203 of the RCAP.
- (d) Any emission trading as provided in condition 42(a)(2) above will not be authorized if the facility does not provide the reference to the PR-SIP provisions authorizing such emissions trading.
- (e) If the permittee requests so, the Board may allow the emission trading in the facility solely for the purpose of complying with a federally-enforceable emissions cap. The application shall be based in replicable procedures and shall include permit terms that ensure the emission trades are quantifiable, replicable and enforceable.

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- (f) Off-permit changes will not be exempt from complying with the requirements and procedures of Rule 203 of the RCAP, if applicable.

Section IV - Allowable Emissions

- A. The emissions described in the table below represent the allowable emissions at the time of the permit application and will be used solely for payment purposes.

Pollutants	Allowable Emissions (tons/year)
PM ₁₀	4.68
SO ₂	12.3
NO _x	11.04
CO	206.6
NMOC	174.16
VOC (combustion)	3.39
HAPs	5.32
CO _{2e}	158,264.54

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- B. According to EQB Resolution RI-06-02³, emission calculations shall be based on the actual emissions of **MAL**; although calculations based on the allowable emissions will be accepted. If **MAL** decides to perform calculations based on allowable emission, **MAL** shall pay the same per charge per ton that as the facilities that decide to do the calculation based on actual emissions.
- C. According to Rule 610(a) of the RCAP, when the **MAL** requests a modification, or minor administrative change to its Title V permit, the source will only pay the charges associated with increases in emissions (if any) per ton, based on the change and not based on the total fees paid previously paid according to Rule 610(a) of the RCAP.
- D. According to EQB Resolution R-04-04-1⁴, to determine the modification and renewal charges, **MAL** shall calculate allowable emission with factors k , L_0 and C_{NMOC} established under Section 60.754(a)(1)(i) of 40 CFR or specific k and C_{NMOC} values as determined by sections 60.754(a)(3)(i) or 60.754(a)(4) of 40 CFR.

³ EQB Resolution – Payment Procedure for Title V operating charges and Title V operating charges and Title V permit renewal charges, issued on March 20, 2006

⁴ EQB Resolution – Consultation to the Government Board about the annual calculation of the gas emissions to the atmosphere for Sanitary Landfills, issued on February 27, 2004.

- E. According to EQB Resolution R-12-17-5⁵, those sources that must include or estimate GHG emission are exempt from payment for Greenhouse Gases (expressed as CO₂e) in conformity with the Tailoring Rule for Title V permits until the Board issues a final determination stating the emission charges or any other charges if needed or by repeal of this Resolution R-12-17-5, whichever comes first.

Section V - Specific Permit Conditions

A. Compliance with Rule 402 of the RCAP (Open Burning) for EU-1

1. According to Rule 402(D) of the RCAP, the **MAL** shall not allow the open burning of refuse, tires or any other solid waste disposed in EU-1. In order to comply, the **MAL** must prepare and obtain immediate approval of the following operating procedures, within 90 days from the effective date of this permit:
 - a. A fire abatement plan to control any open burning in the property or by the sanitary landfill boundaries.
 - b. The fire abatement plan must have the concurrence of the State and Municipal Fire Departments.

B. Unit EU-1

1. The **MAL** shall not cause or permit the discharge of visible emissions of fugitive dust beyond the boundary line of the property on which the emissions originate [Rule 404(B) of the RCAP]
2. The permittee must perform visible daily observations during the operation of the Sanitary Landfill System (SLS) to determine compliance with the visible emission limits mentioned in condition B.1.
3. The permittee shall keep records of the results of visible daily observations. These records shall be kept on-site and be made available for review to EQB and EPA personnel.
4. The **MAL** must use dust suppression measures, as needed, to comply with the limits mentioned in condition B.1 of this section.
5. The **MAL** must record the daily use of dust suppression equipment for processes that are manually operated and intermittent. For example: the operation of water trucks to spray roads. This record must be accessible at any time within the facilities for review by EQB and EPA technical personnel.

⁵ EQB Resolution, PR Tailoring Requirements for Greenhouse Gases (GHGs) – Payment exemption issued on September 7, 2012.

6. The **MAL** must keep appropriate and operational dust suppression equipment at the SLS at all times.
7. The **MAL** must cover open bodied trucks transporting materials likely to give rise to airborne dust at all times when in motion. [Rule 404(A)(4) of the RCAP]
8. When reasonable, the **MAL** must pave roadways and their maintenance in a clean conditions. [Rule 404(A)(6) of the RCAP]
9. The **MAL** shall promptly remove of earth or other material from paved streets onto which earth or other material has been transported by trucking or earth moving equipment, by erosion by water, or by other means. [Rule 404(A)(7) of the RCAP]
10. Every areas, lot or part of a piece of land intended for parking with a capacity greater than 900 square feet must be paved with concrete, asphalt, equivalent hard surface or chemical stabilization, on all its accesses and internal roads where unpaved traffic adjoin paved roadways and parking areas. [Rule 404(D) of the RCAP]
11. The **MAL** shall retain all required records and support information for a period of 5 years from the date of registration.
12. The maximum design capacity of the **Arecibo Sanitary Landfill System** (Municipality of Arecibo Landfill) will not exceed **6,352,750 megagrams**.
13. The construction permit PFE-07-0304-0336-I-II-III-C is granted under the specifications established in the Design Plan for the approved Gas Collection and Extraction System. In case of any discrepancy between the Design Plan and the construction permit, the descriptions and conditions of the construction permit will prevail. Any change in the footprint, initial capacity, and control equipment not included in the approved Design Plan must be submitted to this Board for evaluation requesting a review or modification of the construction permit PFE-07-0304-0336-I-II-III-C, as applicable.
14. The **MAL** must review the Design Plan every five (5) years to ensure that the maximum landfill gas flow is covered by existing control equipment.

C. Conditions according to Part 60, Subpart WWW of Title 40 of the Code of Federal Regulations (40 CFR), Standards of Performance for Municipal Solid Waste Landfills

1. The **MAL** shall comply with all applicable requirements of the Standards of Performance for Municipal Solid Waste Landfill of Subpart WWW, Part 60, Title 40 of the Code of Federal Regulations (40 CFR) for unit EU-1.
2. The permittee shall install and operate a gas collection and control system that meets all applicable requirements of 40 CFR, Part 60, Subpart WWW. [PFE-07-0304-0336-I-II-III-C]

3. The permittee shall submit to the Environmental Protection Agency (EPA), with copy to the Environmental Quality Board (EQB), a collection and control system design plan prepared by a professional engineer, within one year of having calculated a Non-Methane Organic Compounds (NMOC) emission rate of 50 megagrams or more per year under section 60.754 of 40 CFR. [40 CFR §60.752(b)(2)(i)]
 - a. The collection and control system design plan shall include any alternative to the operational standard, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions of §§ 60.753 through 60.758 of 40 CFR, proposed by the owner or operator. [40 CFR §60.752(b)(2)(i)(B)]
 - b. The EPA shall review the information submitted under paragraphs (b)(2)(i)(A), (B) and (C) of 40 CFR Section 60.752 and either approve it, disapproved it, or request that additional information be submitted. [40 CFR §60.752(b)(2)(i)(D)]
4. The permittee shall install a collection and control system that captures the gas generated within the landfill within 30 months after the first annual report in which the emission rate equals or exceeds 50 megagrams per year, unless Tier 2 or Tier 3 sampling demonstrates that the emission rate is less than 50 megagrams per year, as specified in §60.757(c)(1) or (2) of 40 CFR. [40 CFR Section 60.752(b)(2)(ii)]
5. The MAL shall route all the collected gas to a control system that complies with the following requirements:
 - a. The enclosed combustion chambers (flares CD-1 and CD-2) shall be designed and operated to reduce the NMOC by 98% weight percent or reduce the outlet NMOC concentration to less than 20 parts per million by volume, dry basis as hexane at 3% oxygen. The reduction efficiency or parts per million by volume shall be established by an initial performance test using the test methods specified in §60.754(d) of 40 CFR. [40 CFR §60.752(b)(2)(iii)(B)]
6. The owner or operator shall operate the collection and control device installed to comply with in accordance with the provisions of §§60.753, 60.755 and 60.756 of 40 CFR [40 CFR §60.752(b)(2)(iv)]
7. The collection and control system may be capped or removed reaching the following conditions [40 CFR §60.752(b)(2)(v)]:
 - a. The landfill shall be a closed landfill as defined in §60.751 of 40 CFR. A closure report shall be submitted to the EPA with copy to the Board as provided in section 60.757(d) of 40 CFR [40 CFR §60.752(b)(2)(v)(A)]
 - b. The collection and control system shall have been in operation a minimum of 15 years; and [40 CFR §60.752(b)(2)(v)(B)]
 - c. Following the procedures specified in Section 60.754(b) of 40 CFR, the calculated NMOC gas produced by the landfill shall be less than 50 megagrams per year on

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three successive test dates. The test dates shall be no less than 90 days apart, and no more than 180 days apart. [40 CFR §60.752(b)(2)(v)(C)]

d. Submit a closure letter to the Board. [PFE-07-0304-0336-I-II-III-C]

8. The permittee shall operate the collection system such that gas is collected from each area, cell, or group of cells in the MSW landfill in which solid waste has been in place for 5 years or more if active; or 2 years or more if closed or at final grade. [40 CFR §60.753(a)]

9. The permittee shall operate the collection system with negative pressure at each wellhead except under the following conditions [40 CFR §60.753(b)]:

(a) A fire or increase well temperature. The owner or operator shall record instances when positive pressure occurs in efforts to avoid a fire. These records shall be submitted with an annual report as provided in section 60.757(f)(1);

(b) Use of a geomembrane or synthetic cover. The owner or operator shall develop acceptable pressure limits in the design plan;

(c) A decommissioned well. A well may experience a static positive pressure after shut down to accommodate for declines flows. All design changes shall be approved by the EPA.

10. The permittee shall operate each interior wellhead in the collection system with a landfill gas temperature less than 55 °C and with either a nitrogen level less than 20 percent or an oxygen level less than 5%. The owner or operator may establish a higher operating temperature, nitrogen, or oxygen value at a particular well. A higher operating value demonstration shall show supporting data that the elevated parameter does not cause fires or significantly inhibit anaerobic decomposition by killing methanogens. [40 CFR §60.753(c)]

a. The nitrogen level shall be determined using Method 3C, unless an alternative test method is established as allowed by § 60.752(b)(2)(i) of 40 CFR.

b. According to 40 CFR section 60.753(c), unless an alternative test method is established as allowed by section 60.752(b)(2)(i) of 40 CFR, the oxygen shall be determined by an oxygen meter using Method 3A or 3C except that:

i. The span shall be set so that the regulatory limit is between 20 and 50% of the span;

ii. A data recorder is not required;

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- iii. Only two calibration gases are required, a zero and span, and ambient air may be used as the span;
 - iv. A calibration error check is not required;
 - v. The allowable sample bias, zero drift, and calibration drift are $\pm 10\%$.
11. The permittee shall operate the collection system so that the methane concentration is less than 500 parts per million (ppm) above background at the surface of the landfill. To determine if this level is exceeded, the owner or operator shall conduct surface testing around the perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals and where visual observations indicate elevated concentrations of landfill gas, such as distressed vegetation and cracks or seeps in the cover. The owner or operator may establish an alternative traversing pattern that ensures equivalent coverage. A surface monitoring design plan shall be developed that includes a topographical map with the monitoring route and the rationale for any site-specific deviations from the 30 meter intervals. Areas with steep slopes or other dangerous areas may be excluded from the surface testing. [40 CFR §60.753(d)]
12. The permittee shall operate the system such that all collected gases are vented to the control system (CD-1 and CD-2) designed and operated in compliance with section 60.752(b)(2)(iii) of 40 CFR. In the event the collection and control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour. [40 CFR §60.753(e)]
13. The permittee shall operate the control (CD-1 and CD-2) at all times when the collected gas is routed to the system. [40 CFR §60.753(f)]
14. According to section 60.753(g) of 40 CFR, if monitoring demonstrates that the operational requirements in sections 60.753(b), (c), or (d) of 40 CFR are not met, corrective action⁶ shall be taken as specified in section 60.755(a)(3) through (5) or section 60.755(c) of 40 CFR. If corrective actions are taken as specified in section 60.755 of 40 CFR, the monitored exceedance is not a violation of the operational requirements in section 60.753(g) of 40 CFR.
15. The SLS owner or operator shall calculate the NMOC emission rate using the equations provided in section 60.754 of 40 CFR. The SLS owner or operator will compare the NMOC mass emission rate with the standard CONM 50 megagrams year.

⁶ The monitoring results showing that the operational requirements were not met shall be documented before taking corrective action. The corrective action must be documented as well.

16. The owner or operator may use other methods to determine the NMOC concentration or a site-specific k as an alternative to the methods required in section 60.754(a)(3) and (a)(4) if the method has been approved by the EPA as provided in section 60.754(a)(5) of 40 CFR.
17. After the installation of a collection and control system in compliance with section 60.755 of 40 CFR, the owner or operator shall calculate the NMOC emission rate for purposes of determining when the system can be removed. [40 CFR §60.754(b)]
18. **Comparison of Prevention of Significant Deterioration (PSD) Levels.** The owner or operator of a MSW landfill shall estimate the NMOC emission rate for comparison to the PSD major source and significance levels in §§51.166 or 52.21 of 40 CFR, using the Federal Environmental Protection Agency Compilation of Air Pollutants Emission Factors (AP-42) or other EPA approved measurement procedures. [40 CFR §60.754 (c)]
19. As established in section 60.754(d) of 40 CFR, for the performance test required in section 60.752(b)(2)(iii)(B) of 40 CFR, Method 25, 25C, or Method 18 of appendix A of 40 CFR Part 60 must be used to determine compliance with the 98% by weight efficiency or the 20 ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the EPA as provided by section 60.752(b)(2)(i)(B) of 40 CFR. Method 3 or 3A shall be used to determine oxygen for correcting the NMOC concentration as hexane to 3%. In case where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane) Method 25A should be used in place of Method 25. If using Method 18 of appendix A, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). The equation in section 60.754(d) of 40 CFR shall be used to calculate efficiency.
20. Except as provided in section 60.752(b)(2)(i)(B), the specified methods in paragraphs (a)(1) through (a)(6) of this section shall be used to determine whether the gas collection system is in compliance with section 60.752(b)(2)(ii) of 40 CFR.
 - a. For the purposes of calculating the maximum expected gas generation flow rate from the landfill to determine compliance with section 60.752(b)(2)(ii)(A)(1) of 40 CFR. The k and L_0 kinetic factors should be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42) or other site specific values demonstrated to be appropriate and approved by the EPA. If k has been determined as specified in section 60.754(a)(4) of 40 CFR, the value of k determined from the test shall be used. A value of no more than 15 years shall be used for the intended use period of the gas moving equipment. The active life of the landfill is the age of the landfill plus the estimated number of years until closure.
 - i. For sites with unknown year-to-year solid waste acceptance rate the equation provided in section 60.755(a)(1)(i) of 40 CFR shall be used.

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- ii. For sites with known year-to-year solid waste acceptance rate the equation provided in section 60.755(a)(1)(ii) of 40 CFR shall be used.
 - iii. If a collection and control system has been installed, actual flow data may be used to project the maximum expected gas generation flow rate instead of, or in conjunction with, the equations in 60.755(a)(1)(i) and 60.755(a)(1)(ii) of 40 CFR. If the landfill is still accepting waste, the actual measured flow data will not equal the maximum expected gas generation rate, so calculations using the equations in 60.755(a)(1)(i) or 60.755(a)(1)(ii) of 40 CFR or other methods shall be used to predict the maximum expected gas generation rate over the intended period of use of the gas control system equipment.
- b. For the purposes of determining sufficient density of gas collectors for compliance with section 60.752(b)(2)(ii)(A)(2) of 40 CFR, the owner or operator shall design a system of vertical wells, horizontal collectors, or other collection devices, satisfactory to the EPA and the Board, capable of controlling and extracting gas from all portions of the landfill sufficient to meet all operational and performance standards.
- c. For the purpose of demonstrating whether the gas collection system flow rate is sufficient to determine compliance with section 60.752(b)(2)(ii)(A)(3) of 40 CFR, the owner or operator shall measure gauge pressure in the gas collection header at each individual well, monthly. If a positive pressure exists, action shall be initiated to correct the exceedance within 5 calendar days, except for the three conditions allowed under Section 60.753(b) of 40 CFR. If negative pressure cannot be achieved without excess air infiltration within 15 calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial measurement of positive pressure. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline⁷ for corrective the exceedance may be submitted to the EPA, with copy to the Board for approval. [The permittee must send a copy to the Board of this request of an alternative timeline and EPA's response to this request]. [40 CFR 60.755(a)(3)]
- d. Owners or operators are not required to expand the system as required in section 60.755(a)(3) of 40 CFR during the first 180 days after gas collection system startup.
- e. For the purpose of identifying whether excess air infiltration into the landfill is occurring, the owner or operator shall monitor each well monthly for temperature and nitrogen or oxygen as provided in section 60.753(c) of 40 CFR. If a well exceeds one of these operating parameters, action shall be initiated to correct the exceedance within 5 calendar days. If correction of the exceedance cannot be achieved within 15

⁷ The permittee shall send a copy to the Board of the document presented to the EPA to invoke the alternative to present an alternate itinerary and copy of the answer from EPA.

calendar days of the first measurement, the gas collection system shall be expanded to correct the exceedance within 120 days of the initial exceedance. Any attempted corrective measure shall not cause exceedances of other operational or performance standards. An alternative timeline⁷ for corrective the exceedance may be submitted to the EPA, with copy to the Board for approval.

- f. An owner or operator seeking to demonstrate compliance with section 60.752(b)(2)(ii)(A)(4) of 40 CFR through the use of a collection system not conforming to the specifications provided in section 60.759 of 40 CFR shall provide information satisfactory to the EPA with copy to the Board as specified in section 60.752(b)(2)(i)(C) of 40 CFR demonstrating that off-site migration is being controlled.
21. For purposes of compliance with section 60.753(a) of 40 CFR, each owner or operator of a controlled landfill shall place each well or design component as specified in the approved design plan as provided in section 60.752(b)(2)(i) of 40 CFR. Each well shall be installed no later than 60 days after the date on which the initial solid waste has been in place for a period of 5 years or more if active; or 2 years or more if closed or at final grade.
22. According to section 60.755(c) of 40 CFR, the following procedures shall be used for compliance with the surface methane operational standards as provide in §60.753(d).
- a. After installation of the collection system, the owner or operator shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or at site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in section 60.755(d) of 40 CFR.
- b. The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the SLS at a distance of at least 30 meters from the perimeter wells.
- c. Surface emission monitoring shall be performed in accordance with section 4.3.1 of Method 21 of Appendix A of 40 CFR, Part 60, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions.
- d. Any reading of 500 parts per million (ppm) or more above background at any location shall be recorded as a monitored exceedance and the actions specified here shall be taken. As long as the specified actions are taken, the exceedance is not a violation of the operational requirements of Section 60.753(d) of 40 CFR.

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- i. The location of each monitored exceedance shall be marked and the location recorded.
- ii. Cover maintenance or adjustments to the vacuum of the adjacent wells to increase the gas collection in the vicinity of each exceedance shall be made and the location shall be re-monitored within 10 calendar days of detecting the exceedance.
- iii. Any location that initially showed an exceedance but has a methane concentration of 500 ppm methane above background at the 10-day re-monitoring, shall be re-monitored 1 month from the initial exceedance. If the 1-month re-monitoring shows a concentration less than 500 parts per million above background, no further monitoring of that location is required until the next quarterly monitoring period. If the 1-month re-monitoring shows an exceedance, the actions specified in the next paragraph shall be taken.
- iv. For any location where monitored methane concentration equals or exceeds 500 parts per million above background three times within a quarterly period, a new well or other collection device shall be installed within 120 calendar days of the initial exceedance. An alternative remedy to the exceedance, such as upgrading the blower, header pipes, or control device, and a corresponding timeline for installation may be submitted to the EPA for approval with a copy to the Board, and no monitoring is required until the action takes place.
- iv. The owner or operator shall implement a program to monitor for cover integrity and implement cover repairs as necessary on a monthly basis.

23. Each owner or operator seeking to comply with section 60.755(c) of 40 CFR, shall comply with the following instrumentation specifications and procedures for surface emission monitoring devices according to section 60.755(d) of 40 CFR:

- a. The portable analyzer shall meet the instrument specifications provided in section 3 of Method 21 of Appendix A of Part 60 of 40 CFR, except that "methane" shall replace all references to VOC.
- b. The calibration gas shall be methane, diluted to a nominal concentration of 500 parts per million in air.
- c. To meet the performance evaluation requirements in section 3.1.3 of Method 21 of Appendix A of Part 60 of 40 CFR, the instrument evaluation procedures of section 4.4 of Method 21 of Appendix A of Part 60 of 40 CFR shall be used.

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- d. The calibration procedures provided in section 4.2 of Method 21 of Appendix A of Part 60 of 40 CFR shall be followed immediately before commencing a surface monitoring survey.
24. The provisions of Subpart WWW of Part 60 of 40 CFR apply at all times, except during periods of start-up, shutdown, or malfunction⁸, provided that the duration of start-up, shutdown, or malfunction shall not exceed 5 days for collection systems and shall not exceed 1 hour for treatment or control devices.
25. **Monitoring of Active Gas Collection Systems:** According to section 60.756 of 40 CFR, except as provided in section 60.752(b)(2)(i)(B) of 40 CFR, each owner or operator seeking to comply with §60.752(b)(ii)(A) for an active gas collection system shall install a sampling port and a thermometer, other temperature measuring device, or an access port for temperature measurements at each wellhead and:
- a. Measure the gauge pressure in the gas collection header on a monthly basis as provided in section 60.755(a)(3) of 40 CFR; and
- b. Monitor nitrogen or oxygen concentration in the landfill gas on a monthly basis as provided in section 60.755(a)(5) of 40 CFR; and
- c. Monitor temperature of the landfill gas on a monthly basis as provided in section 60.755(a)(5) of 40 CFR.
26. **Monitoring for the enclosed combustion chamber (flares CD-1 and CD-2):** According to section 60.756(b) of 40 CFR, the owner or operator shall calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:
- a. A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ± 1 percent of the temperature being measured expressed in degrees Celsius or $\pm 0.5^\circ$ Celsius, whichever is greater.
- b. A device that records flow to bypass of the control devices. The owner or operator shall either:
- i. Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or
- ii. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the

⁸ It refers to the existing definition of malfunction as defined in Subpart A of Part 60 of 40 CFR.

valve is maintained in the closed position and that the gas flow is not diverted through the bypass line.

27. Except as provided in section 60.752(b)(2)(i)(B) of 40 CFR, the owner or operator seeking to install a collection system that does not meet the specifications in section 60.759 of the 40 CFR, or seeking to monitor alternative parameters to those required by section 60.753(b)(2)(iii) through 60.756 of 40 CFR, shall provide information satisfactory to the EPA with a copy to the Board, describing the design and operation of the collection system, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The EPA may specify additional appropriate monitoring procedures, as provided in section 60.752(b)(2)(i)(B) and (C) of 40 CFR.
28. Each owner or operator seeking to demonstrate compliance with section 60.755(c) of 40 CFR, shall monitor surface concentrations of methane according to the instrument specifications and procedures provided in section 60.755(d) of 40 CFR. Any closed landfill that has no monitored exceedances of the operational standard in three consecutive quarterly monitoring periods may skip to annual monitoring. Any methane reading of 500 ppm or more above background detected during the annual monitoring returns the frequency for that landfill to quarterly monitoring.
29. Except as provided in Section 60.752(b)(2)(i)(B) of 40 CFR, each owner or operator shall submit an NMOC emission rate report to the EPA with copy to the Board, initially and annually thereafter, except as provided for in section 60.757(b)(1)(ii) or (b)(3) of 40 CFR. The EPA or the Board may request such additional information as may be necessary to verify the reported NMOC emission rate. The owner or operator must submit annual reports of the NMOC emission rate thereafter.
30. According to section 60.757(b)(1) of 40 CFR, the NMOC emission rate report shall contain an annual or 5-year estimate of the NMOC emission rate calculated using the formula and procedures provided in section 60.754(a) or (b) of 40 CFR, as applicable.
31. According to section 60.757(b)(1)(ii) of 40 CFR, if the estimated NMOC emission rate as reported in the annual report to the EPA and the Board is less than 50 megagrams per year in each of the next 5 consecutive years, the owner or operator may elect to submit an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report. This estimate shall include the current amount of solid waste-in-place and the estimated waste acceptance rate for each year of the 5 years for which an NMOC emission rate is estimated. All data and calculations upon which this estimate is based shall be provided to the EPA with copy to the Board. This estimate shall be revised at least once every 5 years. If the actual waste acceptance rate exceeds the estimated waste acceptance rate in any year reported in the 5-year estimate, a revised 5-year estimate shall be submitted to the EPA with copy to the Board. The revised estimate shall cover the 5-year period beginning with the year in which the actual waste acceptance rate exceeded the estimated waste acceptance rate.

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32. According to section 60.757(b)(2) of 40 CFR, the NMOC emission rate report shall include all the data, calculations, sample reports and measurements used to estimate the annual or 5-year emissions.
33. According to section 60.757(b)(3) of 40 CFR, each owner or operator is exempted from the requirements of paragraphs (b)(1) and (2) of section 60.757, after the installation of a collection and control system in compliance with section 60.752(b)(2) of 40 CFR, during such time as the collection and control system is in operation and in compliance with sections 60.753 and 60.755 of 40 CFR.
34. The owner or operator of a controlled Sanitary Landfill System shall submit a closure report to the EPA with copy to the Board within 30 days of waste acceptance cessation, according to section 60.757(d) of 40 CFR. The EPA or the Board may request additional information as may be necessary to verify that permanent closure has taken place in accordance with the requirements of 40 CFR section 258.60. If a closure report has been submitted to the EPA with copy to the Board, no additional wastes may be placed into the landfill without filing a notification of modification as described under section 60.7(a)(4) of 40 CFR.
35. Once the collection and control system is installed in compliance with established rules, the owner or operator shall calculate the NMOC emission rate using the equations in section 60.754 of 40 CFR to determine when the system can be removed.
36. The owner or operator of a controlled Sanitary Landfill System shall submit an equipment removal report to the Board 30 days prior to removal or cessation of operation of the control equipment CD-1, CD-2 and CD-3, according to section 60.757(e) of 40 CFR. The equipment removal report shall contain all of the following items:
- A copy of the closure report submitted in accordance with section 60.757(2)(d) of 40 CFR;
 - A copy of the initial performance test report demonstrating that the 15 year minimum control period has expired; and
 - Dated copies of three successive NMOC emission rate reports demonstrating that the landfill is no longer producing 50 megagrams or greater of NMOC per year
37. According to section 60.757(e)(2) of 40 CFR, the EPA and the Board may request such additional information as may be necessary to verify that all of the conditions for removal in section 60.752(b)(2)(v) of 40 CFR have been met.
38. According to section 60.757(f) of 40 CFR, the owner or operator of a landfill seeking to comply with section 60.752(b)(2) of 40 CFR using an active collection system designed in accordance with section 60.752(b)(2)(ii) of 40 CFR shall submit to the EPA with copy to the Board, annual reports of the recorded information described below. The initial

annual report shall be submitted within 180 days of installation and start-up of the collection and control system, and shall include the initial performance test report required under section 60.8 of 40 CFR. For enclosed combustion devices and flares, reportable exceedances are defined under section 60.758(c)..

- a. Value and length of time for exceedance of applicable parameters monitored under section 60.756(a), (b), (c), and (d) of 40 CFR.
- b. Description and duration of all periods when the gas stream is diverted from the control device through a bypass line or the indication of bypass flow as specified under section 60.756 of 40 CFR.
- c. Description and duration of all periods when the control device was not operating for a period exceeding 1 hour and length of time the control device was not operating.
- d. All periods when the collection system was not operating in excess of 5 days.
- e. The location of each exceedance of the 500 parts per million methane concentration as provided in section 60.753(d) of 40 CFR and the concentration recorded at each location for which an exceedance was recorded in the previous month.
- f. The date of installation and the location of each well or collection system expansion added pursuant to sections (a)(3), (b), and (c)(4) of 60.755 of 40 CFR.

39. Each owner or operator seeking to comply with section 60.752(b)(2)(iii) of 40 CFR shall include the following information with the initial performance test report required under §60.8 of 40 CFR.

- a. A diagram of the collection system showing collection system positioning including all wells, horizontal collectors, surface collectors, or other gas extraction devices, including the locations of any areas excluded from collection and the proposed sites for the future collection system expansion;
- b. The data upon which the sufficient density of wells, horizontal collectors, surface collectors, or other gas extraction devices and the gas mover equipment sizing are based;
- c. The documentation of the presence of asbestos or nondegradable material for each area from which collection wells have been excluded based on the presence of asbestos or nondegradable material;

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- d. The sum of the gas generation flow rates for all areas from which collection wells have been excluded based on nonproductivity and the calculations of gas generation flow rate for each excluded area; and
- e. The provisions for increasing gas mover equipment capacity with increased gas generation flow rate, if the present gas mover equipment is inadequate to move the maximum flow rate expected over the life of the landfill ; and
- f. The provisions for the control of off-site migration.

40. All SLS that are required to meet the condition above must inform the Board of its milestones towards complying with the increments of progress within 60 days after meeting each of the increments of progress of the compliance schedule.

41. Except as provided in section 60.752(b)(2)(i)(B) of 40 CFR, each owner or operator of a MSW landfill subject to the provisions of section 60.752(b) of 40 CFR shall keep for at least 5 years up-to-date, readily accessible, on-site records of the design capacity report which triggered §60.752(b), the current amount of solid waste in-place, and the year-by-year waste acceptance rate. Off-site records may be maintained if they are retrievable within 4 hours. Either paper copy or electronic formats are acceptable.

42. Except as provided in section 60.752(b)(2)(i)(B) of 40 CFR, each owner or operator of a controlled landfill shall keep up-to-date, readily accessible records for the life of the control equipment of the data listed below as measured during the initial performance test or compliance determination. Records of subsequent tests or monitoring shall be maintained for a minimum of 5 years. Records of the control device vendor specifications shall be maintained until removal.

a. Where an owner or operator of a Municipal SLS seeks to demonstrate compliance with section 60.702(b)(2)(ii) of 40 CFR:

- i. The maximum expected gas generation flow rate as calculated in section 60.755(a)(1) of 40 CFR. The owner or operator may use another method to determine the maximum gas generation flow rate, if the method has been approved by the EPA.
- ii. The density of wells, horizontal collectors, surface collectors, or other gas extraction devices determined using the procedures specified in section 60.759(a)(1) of 40 CFR.

b. Where an owner or operator of a Municipal SLS seeks to demonstrate compliance with section 60.752(b)(2)(iii) of 40 CFR through use of an enclosed combustion device other than a boiler or process heater with a design heat input capacity equal to or greater than 44 megawatts:

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- i. The average combustion temperature measured at least every 15 minutes and averaged over the same time period of the performance test.
 - ii. The percent reduction of NMOC determined as specified in section 60.752(b)(2)(iii)(B) of 40 CFR achieved by the control device.
 - c. Except as provided in section 60.752(b)(2)(i)(B), each owner or operator of a controlled landfill shall keep for 5 years up-to-date, readily accessible continuous records of the equipment operating parameters specified to be monitored in section 60.756 of 40 CFR as well as up-to-date, readily accessible records for periods of operation during which the parameter boundaries established during the most recent performance test are exceeded.
 - d. **The following constitute exceedances** that shall be recorded and reported under section 60.757(f) of 40 CFR:
 - i. For enclosed combustors (CD-1 and CD-2), **all 3-hour periods of operation during which the average combustion temperature was more than 28°C below the average combustion temperature during the most recent performance test at which compliance with section 60.752(b)(2)(iii) of 40 CFR was determined.**
- 43. According to section 60.758(c)(2) of 40 CFR, each owner or operator of a Municipal SLS shall keep up-to-date, readily accessible continuous records of the indication of flow to the control device or the indication of bypass flow or records of monthly inspections of car-seals or lock-and-key configurations used to seal bypass lines, specified under Section 60.756 of 40 CFR.
- 44. Except as provided in section 60.752(b)(2)(i)(B) of 40 CFR, each owner or operator of a Municipal SLS shall keep for the life of the collection system an up-to-date, readily accessible plot map showing each existing and planned collector in the system and providing a unique identification location label for each collector.
 - a. Each owner or operator of a Municipal SLS shall keep up-to-date, readily accessible records of the installation date and location of all newly installed collectors as specified under section 60.755(b) of 40 CFR.
 - b. Each owner or operator of a Municipal SLS shall keep readily accessible documentation of the nature, date of disposition, amount, and location of asbestos-containing or nondegradable waste excluded from collection as provided in section 60.759(a)(3)(i) of 40 CFR as well as any nonproductive areas excluded from collection as provided in section 60.759(a)(3)(ii) of 40 CFR.
- 45. Except as provided in section 60.752(b)(2)(i)(B) of 40 CFR, each owner or operator of a Municipal SLS shall keep for at least 5 years up-to-date, readily accessible records of all collection and control system exceedances of the operational standards in section 60.753

of 40 CFR, the reading in the subsequent month whether or not the second reading is an exceedance, and the location of each exceedance.

46. According to section 60.759(a) of 40 CFR, each owner or operator seeking to comply with section 60.752(b)(2)(i) of 40 CFR shall site active collection wells, horizontal collectors, surface collectors, or other extraction devices at a sufficient density throughout all gas producing areas using the following procedures unless alternative procedures have been approved by the EPA as provided in section 60.752(b)(2)(i)(C) and (D) of 40 CFR:

- a. The collection devices within the interior and along the perimeter areas shall be certified to achieve comprehensive control of surface gas emissions by a professional engineer. The following issues shall be addressed in the design: depths of refuse, refuse gas generation rates and flow characteristics, cover properties, gas system expandability, leachate and condensate management, accessibility, compatibility with filling operations, integration with closure end use, air intrusion control, corrosion resistance, fill settlement, and resistance to the refuse decomposition heat.
- b. The sufficient density of gas collection devices determined in paragraph (a)(1) of section 60.759(a)(1) of 40 CFR shall address landfill gas migration issues and augmentation of the collection system through the use of active or passive systems at the landfill perimeter or exterior.
- c. The placement of gas collection devices determined in paragraph (a)(1) of section 60.759(a)(1) of 40 CFR shall control all gas producing areas, except as provided below.
 - i. Any segregated area of asbestos or nondegradable material may be excluded from collection if documented as provided under section 60.758(d). The documentation shall provide the nature, date of deposition, location and amount of asbestos or nondegradable material deposited in the area, and shall be provided to the EPA and the Board upon request.
 - ii. Any nonproductive area of the landfill may be excluded from control, provided that the total of all excluded areas can be shown to contribute less than 1 percent of the total amount of NMOC emissions from the landfill. The amount, location, and age of the material shall be documented and provided to the EPA and the Board upon request. A separate NMOC emissions estimate shall be made for each section proposed for exclusion, and the sum of all such sections shall be compared to the NMOC emissions estimate for the entire landfill. Emissions from each section shall be computed using the equation described in section 60.759(a)(3)(ii) of 40 CFR.

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iii. The values for k , L_0 and C_{NMOC} determined in field testing shall be used if field testing has been performed in determining the NMOC emission rate or the radii of influence (this distance from the well center to a point in the landfill where the pressure gradient applied by the blower or compressor approaches zero). If field testing has not been performed, the default values for k , L_0 and C_{NMOC} provided in section 60.754(a)(1) or the alternative values from section 60.754(a)(5) of 40 CFR shall be used. The mass of nondegradable solid waste contained within the given section may be subtracted from the total mass of the section when estimating emissions provided the nature, location, age, and amount of the nondegradable material is documented as provided in section 60.759(a)(3)(i) of 40 CFR.

47. According to Section 60.759(b) of the RCAP, each owner or operator seeking to comply with section 60.752(b)(2)(i)(A) shall construct the gas collection devices using the following equipment or procedures:

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- a. The landfill gas extraction components shall be constructed of polyvinyl chloride (PVC), high density polyethylene (HDPE) pipe, fiberglass, stainless steel, or other nonporous corrosion resistant material of suitable dimensions to: convey projected amounts of gases; withstand installation, static, and settlement forces; and withstand planned overburden or traffic loads. The collection system shall extend as necessary to comply with emission and migration standards. Collection devices such as wells and horizontal collectors shall be perforated to allow gas entry without head loss sufficient to impair performance across the intended extent of control. Perforations shall be situated with regard to the need to prevent excessive air infiltration.
 - b. Vertical wells shall be placed so as not to endanger underlying liners and shall address the occurrence of water within the Sanitary Landfill System. Holes and trenches constructed for piped wells and horizontal collectors shall be of sufficient cross-section so as to allow for their proper construction and completion including, for example, centering of pipes and placement of gravel backfill. Collection devices shall be designed so as not to allow indirect short circuiting of air into the cover or refuse into the collection system or gas into the air. Any gravel used around pipe perforations should be of a dimension so as not to penetrate or block perforations.
 - c. Collection devices may be connected to the collection header pipes below or above the Sanitary Landfill System surface. The connector assembly shall include a positive closing throttle valve, any necessary seals and couplings, access couplings and at least one sampling port. The collection devices shall be constructed of PVC, HDPE, fiberglass, stainless steel, or other nonporous material of suitable thickness.

48. According to section 60.759(c) of 40 CFR, the owner or operator seeking to comply with section 60.752(b)(2)(i)(A) of 40 CFR shall convey the landfill gas to a control system in compliance with §60.752(b)(2)(iii) of 40 CFR, through the collection header pipes(s). The gas mover equipment shall be sized to handle the maximum gas generation flow rate expected over the intended use period of the gas moving equipment using the following procedures:

- a. For existing collection systems, the flow data shall be used to project the maximum flow rate. If no flow data exists, the procedures in section 60.759(c)(2) of 40 CFR shall be used.
- b. For new collection systems, the maximum flow rate shall be in accordance with Section 60.755(a)(1).

D. Conditions according to 40 CFR, Part 63, Subpart AAAA National Emission Standards for Hazardous Air Pollutants (NESHAP): Municipal Solid Waste Landfills

1. The permittee must comply with the requirements of 40 CFR part 60, subpart WWW, according to Section 63.1955(a)(1) of 40 CFR.
2. The permittee shall comply with the requirements in §§63.1960 through 63.1985 of 40 CFR and with the general provisions specified in Table 1 of 40 CFR, Subpart AAAA [40 CFR §63.1955(b)]
3. For approval of collection and control systems that include any alternatives to the operational standards, test methods, procedures, compliance measures, monitoring, recordkeeping or reporting provisions, you must follow the procedures in Section 60.752(b)(2) of 40 CFR [40 CFR §63.1955(c)]
 - a. If alternatives have already been approved under 40 CFR Subpart WWW or the Federal plan, or EPA approved and effective State plan, these alternatives can be used to comply with the requirements of Subpart AAAA of 40 CFR, **except** that all affected source must comply with the SSM requirements in Subpart A of the part 63 as specified in Table 1 of Subpart AAAA of 40 CFR.
 - i. The installation must submit compliance reports every 6 months as specified in section 63.1980(a) and (b) of 40 CFR, including information on all deviations that occurred during the 6-month reporting period.
 - ii. Deviations for continuous emission monitors or numerical continuous parameter monitors must be determined using a 3 hour⁸ monitoring block average.
 - b. Compliance with Subpart AAA of 40 CFR is determined in the same way it is determined for 40 CFR part 60, Subpart WWW, including performance testing,

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monitoring of the collection system, continuous parameter monitoring, and other credible evidence. [40 CFR §63.1960]

- c. Continuous parameter monitoring data, collected under 40 CFR 60.756(b)(1), (c)(1) and (d) of Subpart WWW, are used to demonstrate compliance with the operating conditions for control systems.
 - i. If a deviation occurs, you have failed to meet the control device operating conditions described in Subpart AAAA of 40 CFR part 63.
4. The permittee must develop a **written** SSM Plan according to the provisions in 40 CFR 63.6(e)(3) of 40 CFR. [40 CFR §63.1960]
 - a. A copy of the SSM plan must be maintained on site.
 - b. Failure to write or maintain a copy of the SSM Plan is a deviation from the requirements of Subpart AAAA of 40 CFR, part 63.
 - i. A deviation occurs when the control device operating parameter boundaries described in 40 CFR 60.758(c)(1) of subpart WWW are exceeded [40 CFR §63.1965(a)]
 - ii. A deviation occurs when 1 hour or more of the hours during the 3-hour⁹ block averaging period does not constitute a valid hour of data. [40 CFR §63.1965(b)]
 1. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour.
 - iii. A deviation occurs when the SSM plan is not developed or maintained on site. [40 CFR §63.1965(c)]
5. The permittee must keep records and reports as specified in 40 CFR part 60, Subpart WWW, **except** that the permittee must submit the annual report described in section 60.757(f) of 40 CFR every **6 months**. [40 CFR §63.1980(a)]
6. The permittee must keep records and reports as specified in the general provision of 40 CFR, Part 60 and in Table 1 of Subpart AAAA of 40 CFR, part 63. [40 CFR §63.1980(b)]

⁹ Averages are calculated in the same way as they are calculated in 40 CFR Part 60, Subpart WWW, **except** that the data collected during the events listed in sections 63.1975(a), (b), (c), and (d) of 40 CFR are not to be included in any average computed under Subpart AAAA of 40 CFR.

E. OTHER SPECIFIC CONDITIONS

CD-1 and CD-2 Enclosed Gas Flares

Performance Test

1. A performance test shall be performed within 180 days from the construction or installation of the collection system and achievement of final compliance. [PFE-07-0304-0336-I-II-III-C]
 - a. According to Rule 106(C) of the RCAP, the permittee must submit to the Board at least 30 days prior to the start of the test, a detailed test protocol describing all test equipment, procedures, and Quality Assurance (QA) measures to be utilized. The protocol must be specific for the test, facility, operating conditions and parameters to be measured. The protocol should include, at a minimum, the following:
 - i. Stack diagram showing test ports, their distances from upstream and downstream disturbances, the stack diameter and planned sampling equipment and monitoring locations.
 - ii. A determination of the presence and degree of cyclonic flow.
 - iii. The propose number or sampling traverse points, sampling time at each point, and total sampling volume.
 - iv. A detailed description of all sampling, sample recovery, and analytical procedures. The entire procedure in the case of nonstandard procedures or modification should be described with justification and necessary data for backup. Options offered by the Reference Method should be selected and justified.
 - v. Any special conditions for the preparation of the sampling equipment and containers to avoid sample contamination.
 - vi. Samples of forms to be used to record sample history, sampling conditions and equipment operating conditions.
 - vii. Methodology for measurement of equipment operating conditions, including production rate, fuel flow rate, process data and pollution control data, all to be recorded at a minimum of 15 minute intervals.
 - viii. If more than one sampling train is to be used, detailed description of the relevant sequencing and logistics.

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- ix. If Continuous Emission Monitors (CEMs) are to be used, detailed description of the operating and data logging procedures.
- b. According to Rule 106(D) of the RCAP the owner or operator shall provide the Board at least 15 days of prior written notification of any test required by the Board, to afford the EQB the opportunity to have an observer present. Results of any stack test done in the absence of an EQB's approved protocol will not be accepted.
- c. Two copies of the emission test reports shall be submitted by the permittee to the Board within 60 days after the performance of the emission test. The report should include at a minimum, the following:
- i. A summary of emission rates, isokinetic sampling rates, operational level and any other relevant process, fuel, or control device parameters monitored during the test.
 - ii. All field data collected, including legible copies of field data sheets (raw data) and any transcribed or computer data sheet that may be relevant.
 - iii. All laboratory data, including blanks, tare weighs, calibration data, quality assurance samples, and results of the analyses.
 - iv. All calculations used in the determinations of emission rates, process rates, or other factors relevant to the test results, compliance, etc.
- d. According to Rule 106(F) of the RCAP, during the tests, the source must be operated at its maximum rated capacity or based on representative performance of the affected facility; understanding that; after proving compliance with any applicable emission limit, the Board may restrict the operation of the source at the capacity reached during the performance tests.
2. The facility shall ensure that gas flares CD-1 and CD-2 (Flares A and B) are operated and receive adequate maintenance as required by the manufacturer of the equipment. They must be operated and maintained in accordance with manufacturer specifications and best engineering practices. [PFE-07-0304-0336-I-II-III-C]
3. Gas flares CD-1 and CD-2 (Flares A and B) shall be operated at all times when emissions may be vented through them. [PFE-07-0304-0336-I-II-III-C]
4. The gas flares will be operated such that they do not produce visible emissions as determined by Test Method 22 of 40 CFR Part 60 Test Method 22, Appendix A, except for a period of no more than 5 minutes in any consecutive 2 hour period but in compliance with Rule 403 of the RCAP. [PFE-07-0304-0336-I-II-III-C]

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5. The gas flares CD-1 and CD-2 (Flares A and B) must be operated with a pilot flame at all times. The presence of a pilot flame shall be determined using a thermocouple or any other equivalent method to determine the presence of a flame. [PFE-07-0304-0336-I-II-III-C]]
6. The thermocouple or equivalent device shall be operated and maintained as follows:
 - a. The permittee shall operate the thermocouple or equivalent device and provide maintenance consistent with manufacturing specifications or written procedures that provide a method to ensure that the device obtains exact data.
 - b. The permittee shall record the results of each inspection, calibration and validation performed on the thermocouple or equivalent device.
 - c. The permittee shall keep records of thermocouple or equivalent device malfunction, repair, monitoring of system damage, calibration verifications.
 - d. The permittee shall keep records for all periods when the thermocouple did not function. [PFE-07-0304-0336-I-II-III-C]
7. The following gas flares records shall be kept for at least 5 years in an accessible location:
 - a. The permittee shall record on an hourly basis if the monitor was operating continuously and if the pilot was lit for each hour.
 - b. The permittee shall record the moment and time when the pilot was not lit or the monitor was not in operation.
 - c. The permittee shall report semiannually the moment and time the pilot was off. [PFE-07-0304-0336-I-II-III-C]
8. The calorific value of the gases burned in the gas flares will be 300 Btu/scf or greater. This real value shall be calculated using the following equation:

$$H_T = K \cdot \sum_{i=1}^n C_i H_i \text{ where:}$$

H_T = net caloric value of the sample in MJ/scm, where the net enthalpy of the exhaust gas is based on combustion at 25°C and 760 mmHg, but the standard temperature for determining the value of a mole is 20°C.

$$K = 1.740 \times 10^{-7} \frac{\text{gmol} \cdot \text{MJ}}{\text{ppm} \cdot \text{scm} \cdot \text{kcal}} \text{ (constant)}$$

C_i = Concentration of component i in ppm on a wet basis, organic measured by Method 18 of 40 CFR Part 60 Appendix A and measured for hydrogen and carbon monoxide by the ASTM Method D1946-77.

H_i = Net heat of combustion of component i in kcal /g mol at 25°C and 760 mmHg.

9. Gas Flares CD-1 and CD-2 (Flares A and B) will be operated with a gas output velocity less than 22.71 meters/sec (75.4 ft/sec). The actual velocity will be determined by dividing the volumetric flow rate (in units of temperature and standard pressure), as determined by Reference Methods 2, 2A, 2C or 2D, as appropriate, of 40 CFR, Part 60, Appendix A. [PFE-07-0304-0336-I-II-III-C]
10. The maximum allowed velocity, V_{max} , for air assisted gas flares CD-1 and CD-2 (Flares A and B) shall be determined based on the following equation:

$$V_{max} = 8.706 + 0.7084 (H_T)$$

where,

V_{max} = maximum allowed velocity (m/sec)

8.706 = constant (m/sec)

0.7084 = constant (m*g mol / kcal*sec)

H_T = net combustion value (kcal/g mol) as determined previously in condition 60.

11. The flow of auxiliary propane fuel shall be 0.08 lbs/hr or 0.0189 gal/hr (0.00252 scfh). [PFE-07-0304-0336-I-II-III-C]
12. The permittee shall keep a record indicating all the operation periods when the pilot flame of gas Flares CD-1 and CD-2 (Flares A and B) was not present. [PFE-07-0304-0336-I-II-III-C]
13. The permittee shall submit a semiannual report along with the report required under the III.14 condition of this permit to the Board indicating where all periods of operation where the pilot flame gas torches CD-1 and CD-2 (A and torches B) they were not present. If there were moments where the pilot was not present during that period, he sends a letter to the Board stating this fact. [PFE-07-0304-0336-I-II-III-C]
14. The permittee shall maintain all records, design specifications and detailed diagrams of gas flares CD-1 and CD-2 (Flares A and B) accessible at the facility. The documents shall be kept until such time as the equipment is replaced or removed permanently from service. [PFE-07-0304-0336-I-II-III-C]

15. The permittee shall characterize, on a quarterly basis, the condensate generated in vertical wells and the gas collection system in general to determine condensate composition and whether it exhibits any risk characteristics according to the RCAP, the Hazardous Solid Wastes Regulations or 40 CFR, Part 261. [PFE-07-0304-0336-I-II-III-C]
16. If there is condensate evaporation in vertical wells, the permittee shall calculate the fugitive emissions of Hazardous Air Pollutants as defined in the RCAP. [PFE-07-0304-0336-I-II-III-C]
17. The **Municipality of Arecibo Landfill** shall keep the files of all the sampling data required and support information for a period of 5 years from the date of sampling, measurement, the sample report or the sampling application. The support information will include all calibration and maintenance files and all charts produced by the continuous monitoring instruments and copies of all the reports required by the permit. [RCAP Rule 603(a)(4)(ii)]

Table 1 - Monitoring, Maintenance of Records and Reports

Continuous Monitoring	The flares must have a constant measurement of the presence of a flame and the gas flow to the control device.
Monthly Monitoring	The permittee shall: <ol style="list-style-type: none"> 1. Measure gauge pressure in the gas collection header. 2. Measure nitrogen or oxygen content in LFG, and 3. Measure temperature of LFG.
Quarterly Monitoring	Surface Methane Concentrations using EPA Method 21.
Maintenance of Records	The permittee shall have on-site, readily accessible: <ul style="list-style-type: none"> ▪ Records of the maximum design capacity ▪ Amount of solid wastes in place ▪ Performance/compliance tests ▪ Equipment operating parameters/exceedance ▪ Year-by-year waste acceptance rate for a period of at least 5 years ▪ Equipment manufacturer specifications records shall be kept until removal of the GCCS. ▪ A plot map showing all existing and planned collection devices must be kept for the life of the GCCS. ▪ The date and location of any newly installed collectors. <p>Documentation shall be kept with regards to the nature, amount, location and date of placement of any nondegradable waste excluded from the GCCS.</p>

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Table 1 - Monitoring, Maintenance of Records and Reports	
Reports	The reports must also be submitted to the EQB and EPA. The annual report shall contain all the recorded information listed from 40 CRF §60.757(f)(1) through (f)(6).
	The performance test when required shall be submitted with the annual report and contain the information listed in 40 CRF §60.757(g)(1) through (g)(6).
	An equipment removal report must be submitted to EPA 30 days prior to the removal or cessation of any control equipment and contain the information listed in 40 CRF §60.757(e)(1)(i) through (e)(1)(iii).

F. CONDITIONS ESTABLISHED BY THE ENVIRONMENTAL PROTECTION AGENCY¹⁰ IN THE CONDITIONAL APPROVAL OF THE LANDFILL GAS COLLECTION AND CONTROL SYSTEM DESIGN INCLUDED IN THE CONSTRUCTION PERMIT PFE-07-0304-0336-I-II-III-C

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1. The annual waste acceptance rate is estimated to decrease from 227,275 Mg/year in 2010 to 133,793.5 Mg/year in 2011. If the actual annual waste acceptance rate exceeds the estimated annual waste acceptance rate, the closure date is sooner than 2030 and the maximum gas generation rate will be greater than 1,050 ft³/min. The annual waste acceptance rate must be reported in the annual waste acceptance rate limits as well as the design capacity of the landfill.
 2. The MAL shall install the three blower of 400ft³/min before the Gas Control System begins operation. The EPA must be given 10 days prior notification, with copy to the Board regarding their installation.
 3. The capacity of the two flares (Flares A: 10.0 MMBtu/hr and Flare B: 18.0 MMBtu/hr)(Flares CD-1 and CD-2 respectively) equates to 333 ft³/min and 600 ft³/min respectively. This was calculated using the average landfill gas heat content of 500 Btu/hr which assumes 50% methane in the SLS. The total 933 ft³/min capacity is not sufficient to meet the maximum gas generation rate that is reported to be 1,050 ft³/min. The capacity of the flares must be capable of handling the maximum gas generation rate prior to the maximum rate be attained.
 4. The permittee shall install an initial set of vertical wells at the site to collect the landfill gas of the majority of existing wells. Following the initial installation vertical wells will be constructed progressively as waste placement continues. Plans are to install 85 vertical extraction wells.

¹⁰ Document: Arecibo Landfill Gas Collection and Control System Design Plan Conditional Approval. EPA letter from May 13, 2011.

5. The **MAL** shall comply with 40 CFR section 60.752(b)(2)(ii)(A)(2), which requires that SLS to collect gas from each area, cell, or group of cells in the landfill in which the initial solid waste has been placed for a period of 5 years or more, if active.
6. The **MAL** shall provide scheduled dates on when all the vertical wells, will be installed based on initial waste placement, to the EPA with copy to the EQB, 10 days prior to their installation.
 - a. After the dates of the installation of all the extraction wells, the **MAL** must monitoring surface methane for these areas.
 - b. The surface monitoring pathway drawing must be updated after each new installation of a vertical well and prior to the quarterly surface monitoring scan. The surface monitoring pathways drawings (S-100A and S-100B) provided in Appendix I of the Design and Specifications Plan of the Gas Control System, show the current and final monitoring pathways respectively.
7. The **MAL** may not monitoring of the methane surface emissions from the top of the cover vegetation. It must comply with 40 CFR, Section 60.755(c)(3).
8. The **MAL** is not authorized to use alternative procedures including wells abandoning and higher operational temperature. If the **MAL** is interested in any of these alternatives, it must submit the petition together with supporting documents to the EPA with a copy to the Board, which will decide whether to approve it or not.
9. All exclusions for surface emission monitoring including temporary and permanent access roads, slopes steeper than 3:1, areas disturbed to install or replace/maintained GCCS components, working face and area of truck traffic must be limited by coordinating when surface monitoring is performed.
10. Slope at the Arecibo landfill shall not be no steeper than 3:1.
11. The **MAL** will not have blanket approval for extension for all re-monitoring events. If re-monitoring cannot be conducted within 10 days due to inclement weather, the landfill must re-monitor soon thereafter and document it in the semi-annual report required in condition III.14 of this permit.
12. The **MAL** must notify the EPA and the EQB in writing of the date scheduled for emission source testing at least 10 business days prior to the test date.
13. The **MAL** must follow the monitoring, record maintenance, and reports specified in 40 CFR Part 60, Subpart WWW and in 40 CFR Part 60, Subpart AAAA for any alternative monitoring request denied by the EPA.

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Section VI - Insignificant Emission Units

The following activities shall be considered insignificant as long as the MAL meets the descriptions indicated below and is not subject to an applicable requirement.

Identification of the Emission Source	Units	Description (exemption base)
Engines of any waste transportation vehicle	-	Appendix B.3. iii. of the RCAP
External site maintenance activities, including yard maintenance, painting buildings, etc.	-	Appendix B.3.ii.(H) of the RCAP
Air conditioners	2	Rule 206(B)(1) of the RCAP
8 hp air compressor	1	Appendix B.3.xxiii. of the RCAP – Air compressors and pumps
Diesel storage tank (2,000 gallons)	1	Appendix B.3.ii.(N) of the RCAP – Storage tank with capacity of less than 10,000 gallons
Activities in maintenance workshops such as soldering equipment used as auxiliary to principal source equipment.	1	Appendix B.3.ii.(E) of the RCAP

Section VII - Permit Shield

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A. According to Rule 603(D) of the RCAP, compliance with the conditions of the permit shall be considered compliance with any other applicable requirement at the date it is issued, whenever said requirement is specifically identified in the permit.

(1) Non Applicable Requirements

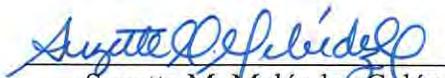
Inapplicable Requirements	Regulations	Reason for Inapplicability
Municipal Sanitary Landfill System Emission rates.	Part VII of the Regulations for the Control of Atmospheric Pollution.	A modified facility. It is affected by 40 CRF Part 60 Subpart WWW.

Section VIII - Permit Approval

Pursuant to the powers granted to the Environmental Quality Board by the Environmental Public Policy Act, Public Law Number 416 of September 22 of 2004, as amended, and after verifying the administrative file and compliance with the Uniform Administrative Procedures Act, Public Law Number 170 of August 12, 1988, as amended, the US Clean Air Act, the Puerto Rico Environmental Public Policy Act and the Regulations for the Control of Atmospheric Pollution of Puerto Rico, the Environmental Quality Board approves the permit subject to the terms and conditions stated therein.

In San Juan, Puerto Rico, June 6, 2016.

ENVIRONMENTAL QUALITY BOARD



Suzette M. Meléndez Colón
Vice President



Rebeca Acosta Pérez
Associate Member



Weldin F. Ortiz Franco
President

MUNICIPALITY OF ARECIBO LANDFILL
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APPENDIX

Appendix I Definitions and Abbreviations

A. Definitions

1. Law – Federal Clean Air Act, as amended, 42 U.S.C. 7401, et seq.
2. Responsible Official – See definition of Responsible Official in the Environmental Quality Board Regulations for the Control of Atmospheric Pollution (1995).
3. Regulations – Regulations for the Control of Atmospheric Pollution of the Environmental Quality Board.
4. Title V – Title V of the U.S. Clean Air Act (42 U.S.C 7661)

B. Abbreviations

AP-42 Compilation of Air Pollutant Emission Factors

Btu British Thermal Units

 C_{CONM} Concentration of Non Methane Compounds

CH₄ Methane

CO Carbon Monoxide

CO₂ Carbon Dioxide

CO_{2e} Carbon Dioxide Equivalent

NMOC Non Methane Organic Compounds

CFR Code of Federal Regulations

EPA Environmental Protection Agency

GHG Greenhouse Gases

HAP Hazardous Atmospheric Pollutants

EQB	Puerto Rico Environmental Quality Board
k	Methane generation rate constant
Mg	Megagrams
MAL	Municipal Arecibo Landfill
MMBtu	Million Btu
NESHAP	National Emissions Standards for Hazardous Air Pollutants
NNAQS	New Norms for Air Quality Sources
NSPS	New Source Performance Standards
NO _x	Nitrogen Oxides
NMHC	Non Methane Hydrocarbons
Pb	Lead
PM	Particulate matter
PM ₁₀	Particulate matter with aerodynamic mass diameter equal to or less than ten (10) microns.
PSD	Prevention of Significant Deterioration
RCAP	Regulations for the Control of Atmospheric Pollution
RMP	Risk Management Plan
SIC	Standard Industrial Classification
scfm	Standard cubic feet per meter

SLS Sanitary Landfill System

SO_x Sulfur Oxides

SO₂ Sulfur dioxide

MAL Arecibo Municipal Landfill

VOC Volatile Organic Compounds

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COMMONWEALTH OF
PUERTO RICO
Environmental Quality Board

STATEMENT OF BASIS – TITLE V PERMIT
MUNICIPALITY OF ARECIBO LANDFILL
PFE-TV-4953-07-1101-2475

The Environmental Quality Board (EQB) is issuing a Title V permit pursuant to Title 40 of the Code of Federal Regulations (CFR), Part 70 and Part VI of the Regulations for the Control of Atmospheric Pollution (RCAP) for the **Municipality of Arecibo Landfill (MAL)**. The facility is located on State Road PR-682 Interior, Factor Ward, Garrochales Sector, Arecibo, Puerto Rico. The EQB received an application for a Title V permit on November 30, 2001, which was amended in 2002.

The **Municipality of Arecibo Landfill** is an active Sanitary Landfill System receiving only non-hazardous solid wastes, including municipal, commercial and residual wastes. The **MAL** has been in operation since 1973 and it is estimated to reach its maximum capacity in 2030. Landfill Technologies operates the Municipality of Arecibo Sanitary Landfill System.

Solid wastes are hauled by trucks and other transport vehicles and deposited in the landfill work area (disposal area). Once unloaded, excavators and compactors spread and compact the wastes. They are covered with soil at the close of each work day. The decomposition of encapsulated wastes in the landfill produces gas (landfill gas). The gas consists of methane (CH₄), carbon dioxide (CO₂) and other non-methane organic compounds (NMOC). The gas generated is collected through an active gas collection system routed to two enclosed flares.

The **MAL** is subject to Title V permit requirements because it has a design capacity of more than 2.5 million megagrams and 2.5 million cubic meters, and because it is a major source because it exceeds 100 tons/year of carbon monoxide (CO) and greenhouse gases (GHGs) expressed as carbon dioxide equivalent (CO_{2e}), because it exceeds 100,000 tons. The landfill is subject to the applicable requirements of Title 40 of the Code of Federal Regulations, Part 60, Subpart WWW, New Source Performance Standards (NSPS) for municipal solid waste landfills; and Part 63, Subpart AAAA, National Emission Standards for Hazardous Air Pollutants (NESHAP) for municipal solid waste landfills.

Emission Units

The Emission Units section lists the significant emission units, related control equipment, if any, and the type of fuel. This section is a general description of the facility. The emission units are the following:

EU-1: Municipal Sanitary Landfill System. The landfill only accepts non-hazardous municipal solid wastes since 1973. It is estimated that the annual wastes acceptance rate will decrease from 227,275 Mg/year in 2010 to 133,793.5 Mg/year in 2011, with 1,050 scfm maximum landfill gas generation. In 2011 an increase in the design capacity of the landfill and the construction of a Gas Collection and Control System was authorized. It has a maximum design capacity of **6,352,750 megagrams** as established in the modification of June 22, 2011, to construction permit PFE-07-0304-0336-II-C. Control equipment: Two enclosed flares (CD-1 and CD-2).

CD-1 and CD-2: Active Landfill Gas Collection and Control System. The landfill gas is collected and directed to two enclosed flares. Flare CD-1 processes a maximum of 333 scfm with heat input of 10MMBtu/hr. Flare CD-2 processes a maximum of 600 scfm with heat input of 22.50MMBtu/hr. The auxiliary fuel used is propane.

Allowable Emissions

The emissions described in the table below represent the facility allowable emissions at the time of the permit application and will be used only for payment purposes. According to Rule 610(a) of the RCAP, when the **MAL** requests a modification, administrative change or minor modification of its Title V permit, the source will only pay those charges related with any emission increase (if any) per tonnage, based on the change and not based on the previously paid total changes in conformity with Rule 610(a) of the RCAP.

Pollutants	Allowable Emissions (tons/year)
PM ₁₀	4.68
SO ₂	12.3
NO _x	11.04
CO	206.6
NMOC	174.16
VOC (combustion)	3.39
HAPs	5.32
CO _{2e}	158,264.54

According to EQB Resolution RI-06-02¹, for annual certification, the emission calculations will be based on actual missions of the **MAL**; however, calculations based on the emissions allowable for the facilities will be accepted. If the **MAL** decides to realize the calculations based on the allowable emissions, **MAL** will pay the same charge per ton as the facilities that decide to make the

¹ EQB Resolution - Payment procedure for Title V operation fees and renewal fees for Title V permit of March 20, 2006.

calculations based on actual emissions. Also, according to EQB Resolution R-04-04-1², to determine the charge for modification and renewal, MAL shall calculate the emission with k , L_0 and C_{NMOC} as determined in Sections 60.754(a)(3)(1) and 60.754(a)(4) of 40 CFR.

According to EQB Resolution R-12-17-5³ those sources that must include or estimate GHGs emission are exempt from payment for Greenhouse Gases (expressed as CO_{2e}) in conformity with the Tailoring Rule for Title V permits until the Board issues a final determination stating the emission charges or any other charges if needed or by repeal of this Resolution R-12-17-5, whichever comes first.

Applicable Requirements

New Source Performance Standards (NSPS) for Municipal Solid Waste Landfills: 40 CFR, Part 60, Subpart WWW.

This emission source is subject to the performance standards of Subpart WWW because it was modified after May 30, 1991. The facilities that are subject to this subpart must install emissions controls if NMOC emissions are greater than or equal to 50 Mg per year. Also, this part requires the effective capture of the generated gas, minimize the underground gas migration outside the landfill limits and direct the collected gas to the minimize the underground gas migration outside the landfill limits and direct the collected gas to the enclosed flares (CD-1 and CD-2) that will be operated to reduce the NMOC by 98% by weight.

National Emission Standards for Hazardous Air Pollutants (NESHAP): Municipal Solid Waste Landfills - 40 CFR, Part 63, Subpart AAAA.

This subpart applies to area sources subject to the applicability requirements of 40 CFR, Part 60, Subpart WWW, that have a design capacity equal or greater than 2.5 million cubic meter (m³) and non-controlled NMOC estimated emission of 50 Mg per year or more. The control technologies chosen by the EPA are the same of Subpart WWW of 40 CFR, Part 60, therefore the MACT does not impose additional control requirements. The NESHAP imposes some additional requirements to determine compliance and reports that are necessary under section 112 of the Clean Air Act. This includes startup, shutdown and malfunctions (SSM) provisions, the use of continuous parameter monitoring data to determine compliance with operating condition requirements, and informing the deviations every 6 months instead of each year.

² EQB Resolution - Consultation with Government Board regarding annual calculation of Sanitary Landfill gas emissions to the atmosphere of February 27, 2004.

³ EQB Resolution - Tailoring Requirements for Greenhouse Gases (GHGs) - Payment exemption of September 7, 2012.

The following requirements do not apply to the following units:

- Emission Guidelines and Compliance Schedules for Municipal Sanitary Landfill Systems established under Part VII of the RCAP. The provisions of this part apply only to existing municipal sanitary landfill systems which construction, reconstruction or modification commenced before May 30, 1991.

The frequency of the reports for the compliance certification must be annual. Unless specifically established, all the terms and conditions of the Title V permit, including provisions designed to limit the emission capacity of the source, are enforceable by the EPA and by citizens, under the Federal Clean Air Act. The terms and conditions that are designated as enforceable only by the state, as indicated by the permit, are only enforceable by the EQB.

The EQB has determined that this Title V Operational Permit fulfills all the requirements of Part VI of the RCAP.

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