AIR AND RADIATION ADMINISTRATION
DRAFT PART 70 OPERATING PERMIT

DOCKET #24-027-00326

COMPANY: Howard County Department of Public Works
Alpha Ridge Landfill

LOCATION: 2350 Marriottsville Road
Marriottsville, MD 21104

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ITEM DESCRIPTION

MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION
AIR QUALITY PERMITS PROGRAM

TITLE V/ PART 70 OPERATING PERMIT PROGRAM PERMIT OVERVIEW

Origin of the Title V/ Part 70 Operating Permit

Title V of the Clean Air Act (amended) requires each state to implement a federally enforceable operating permit program for major sources of air pollution. This program, the Part 70 Permit Program, also known as the Title V Permit Program, is designed to provide a comprehensive administrative document (Part 70 Permit) that will identify all air emissions sources at a given facility with the applicable federal regulations, and will establish the methodology by which the owner/operator will demonstrate compliance. Required testing, monitoring, record-keeping, and reporting for each emissions source are identified, including regulation citation. This Operating Permit is a five-year renewable permit. A responsible official for each facility subject to a Part 70 Operating Permit is required annually to certify compliance with each applicable requirement for that facility.

The Department has had an Air Quality Operating Permit program for many years. The State-Only enforceable permit conditions and applicable regulations listed in Air Quality Permits to Construct issued to a facility will be incorporated into the Title V Operating Permit in a separate section. The Department will continue to enforce these state-only requirements. The Title V/ Part 70 Operating permit will supersede a facility's current State Permit to Operate upon issuance.

Title V/ Part 70 Program Operating permits are not for new construction, and do not add any new emissions limitations, standards, or work practices on an affected facility. There may, however, be additional testing, record keeping, monitoring, and reporting requirements. A few facilities which were not subject to Maryland's existing State Permit to Operate Program will be subject to the requirements of the Part 70 Program. The Part 70 Program is based on a facility's potential to emit regulated air pollutants. The State Permit to Operate program is based on types of sources specifically listed in the Code of Maryland Regulations (COMAR). For these few facilities which were not required to receive a state Permit to Operate but are subject to a Title V/ Part 70 permit, there will be the additional burdens of certifying emissions annually and paying an annual emissions-based permit fee.

Title V/ Part 70 Permit Issuance Process

The Department will undertake a technical review of the Title V application and will prepare a draft Permit and Fact Sheet. The Fact Sheet will explain the basis and technical analysis used by the Department to develop federally enforceable permit conditions, including the required testing, monitoring, record keeping, and reporting provisions for each emissions unit at the permitted facility. The Fact Sheet will also include a description of the facility operations and the current compliance status with applicable requirements. If there are any discrepancies between the Title V/ Part 70 permit application and the draft permit, the Fact Sheet will contain a discussion of the inconsistencies and the final resolution.

The Title V / Part 70 Program provides the public, adjacent states, and EPA the opportunity to review and submit comments on draft Title V Permits. The public may also request a public hearing on the draft permit. Dockets containing a facility's permit application, supporting documents, draft Permit and Fact Sheet will be available for review both at MDE headquarters located at 1800 Washington Boulevard, Baltimore, MD and a public library near the facility's location.

Public Participation Process

The initial step of the Title V/ Part 70 public participation process is the publication of a notice of intent to issue a Part 70 Permit and opportunity for concerned citizens to submit written comments and/ or request a public hearing. The Department will publish the notice at least one time in the legal section of a newspaper of general circulation in the area where the facility is located. The Notice will provide the description of the facility for which a Part 70 permit has been drafted, the location of the docket which contains the application and draft permit conditions with supporting documentation, and the requirements for requesting a public hearing. The applicant is responsible for all costs incurred in the publication of this legal notice. The Department will also send notification to adjacent states, local public officials and interested parties, will include the notice in the docket at the library, and post the notice to the Department's website.

The public will have 30 days from the date the notice appears in the newspaper to submit written comments to the Department, or to request in writing a public hearing. Adjacent states will have 30 days from the receipt of notification to submit written comments to the Department.

A request for a public hearing must be made in writing within the 30-day comment period. Comments and hearing requests should be sent to the attention of the Air Quality Permits Program Manager, Air and Radiation Administration, 1800 Washington Boulevard, Suite 720, Baltimore, MD 21230-1720.

Public Hearing

The purpose of a public hearing is to give interested parties the opportunity to submit comments for the record which are germane to the draft federally enforceable permit conditions. Comments submitted at the hearing, or in writing to the Department during the comment period, should address errors and deficiencies in the permit such as unidentified emissions units, incorrect or deficient regulation citation, deficient record keeping, monitoring, reporting or testing requirements and unresolved compliance issues.

If a public hearing is requested, the Department will make arrangements with the facility to schedule a hearing and will send notification of the hearing to public officials, interested parties, and the EPA, and will place a notice on the MDE Air Permits Program web page that will indicate the date, time, and place of the public hearing. The Department will publish a notice of the scheduled hearing in the same newspaper in which the opportunity notification appeared, at least one time and at least 30 days prior to the hearing. The notice will state the date, time, and location of the hearing. After the public comment period has closed, the Department will review

the formal testimony as part of the final review and prepare a Response to Comments document which will be sent to the EPA along with the draft Part 70 permit and Fact Sheet.

Testimony on state-only requirements will be kept on file at the Department as part of the formal record, however, state-only rules and regulations are not federally enforceable, and therefore are not within the scope of the EPA review. The Department will keep a record of the identity of the commenters, their statements, a summary of the issues raised during the public comment period, and the Response to Comments document for at least five years.

Citizen Petition to EPA to Object to Permit Issuance

Interested parties may petition the EPA to object to the Part 70 Permit if the EPA has not already objected, within 60 days after the 45-day EPA review period has ended. The petition period will be posted on the EPA website. The EPA will only consider objections to the federally enforceable provisions of the draft permit which were raised with reasonable specificity during the public comment period, unless: (1) the petitioner demonstrates that it was impractical to raise the objections within the public comment period, or (2) the grounds for the objection arose after the comment period. If the EPA agrees with the petition, the Department will reopen, revise, or revoke the permit.

Applicant Objection to Permit Issuance and Recourse

If the applicant objects to the federally enforceable permit conditions contained in the issued Title V Operating permit, it has 15 days from receipt of the issued Permit to request a contested case hearing. More information on that can be found in 40CFR70, and COMAR 26.11.02,.03.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION

NOTICE OF INTENT TO ISSUE PART 70 OPERATING PERMIT, OPPORTUNITY TO SUBMIT WRITTEN COMMENTS OR TO REQUEST A PUBLIC HEARING

The Department of the Environment, Air and Radiation Administration (ARA) has completed its review of the application for a renewal Part 70 Operating Permit submitted by Howard County MD for the Alpha Ridge Landfill located in Marriottsville, MD. The municipal solid waste landfill facility includes a landfill gas (LFG) collection system, a LFG-fired reciprocating internal combustion engine, one (1) horizontal grinder powered by a 755 bhp diesel internal combustion engine, and one (1) 4,000 gallon above ground gasoline storage tank.

The applicant is represented by:

Mr. Mark DeLuca, P.E., Chief
Bureau of Environmental Services
Howard County Department of Public Works
9801 Broken Land Parkway
Columbia, MD 21046

The Department has prepared a draft Part 70 Operating Permit for review and is now ready to receive public comment. A docket containing the application, draft permit, and supporting documentation is available for review on the Department's website, under the Air Quality Permits Program link. Due to COVID restrictions, the docket will only be available online.

Docket #24-027-0364, Alpha Ridge Landfill may be viewed here:
https://mde.maryland.gov/programs/Permits/AirManagementPermits/Pages/title5draftpermits.aspx

Interested persons may submit written comments or request a public hearing on the draft permit. Written comments must be received by the Department no later than 30 days from the date of this notice. Requests for a public hearing must be submitted in writing and must also be received by the Department no later than 30 days from the date of this notice.

Comments and requests for a public hearing will be accepted by the Department if they raise issues of law or material fact regarding applicable requirements of Title V of the Clean Air Act, and/or regulations implementing the Title V Program in Maryland found in COMAR.

A Request for public hearing shall include the following:

1) The name, mailing address, and telephone number of the person making the request;

2) The names and addresses of any other persons for whom the person making the request if representing; and

3) The reason why a hearing is requested, including the air quality concern that forms the basis for the request and how this concern relates to the person making the request.

All written comments and requests for a public hearing should be directed to the attention of Ms. Shannon Heafey, Title V Coordinator, Air Quality Permits Program, Air and Radiation Administration via email at Shannon.heafey@maryland.gov.

George S. Aburn, Jr., Director
Air and Radiation Administration

DRAFT PERMIT

Lawrence J. Hogan, Jr.
Governor

Ben Grumbles
Secretary

Air and Radiation Management Administration
1800 Washington Boulevard, Suite 720
Baltimore, MD 21230

[ ] Construction Permit

[X] Part 70 Operating Permit

PERMIT NO. 24-027-0364

DATE ISSUED

PERMIT FEE To be paid in accordance with COMAR 26.11.02.19B(b)

EXPIRATION DATE April 30, 2025

LEGAL OWNER & ADDRESS

Howard County Department of Public Works
6751 Columbia Gateway Drive, Suite 514
Columbia, MD, 21046
Attn: Mr. Mark DeLuca, P.E., Deputy Director
Chief, Bureau of Environmental Services

SITE

Alpha Ridge Landfill
2350 Marriottsville Road
Marriottsville, MD 21104
Howard County
AI # 1357

SOURCE DESCRIPTION

Municipal solid waste landfill.

This source is subject to the conditions described on the attached pages.

Program Manager

Director, Air and Radiation Management Administration

ALPHA RIDGE LANDFILL
2350 MARRIOTTSVILLE ROAD
MARRIOTTSVILLE, MD 21104
DRAFT PART 70 OPERATING PERMIT NO. 24-027-0364

SECTION I SOURCE IDENTIFICATION

1. DESCRIPTION OF FACILITY

Alpha Ridge Landfill (ARL) is located at 2350 Marriottsville Road, Marriottsville, Maryland serving Howard County. The landfill is owned and operated by the county. It currently accepts municipal solid waste (MSW) for burial and transfer off-site, yard waste to be processed through a grinder for manufacture of mulch and compost, and recyclables which are shipped offsite for processing. No hazardous, liquids, or infectious waste is accepted for burial. The landfill is comprised of an unlined cell and a lined cell. The unlined cell is closed and located in the northwest portion of the landfill property with an approximate size of 68 acres which opened in 1980 and closed in 1993. In late 1997 and early 1998, a final cover system consisting of a geomembrane on the top area surrounded by a low permeability soil cap around the perimeter was installed. The lined cell is located east of the closed, unlined cell. It began receiving MSW in March 1993 and is currently the active area of the landfill. The SIC code for the landfill is 4953.

The landfill has an existing active landfill gas (LFG) collection system on both the closed, unlined cell and the lined, active cell. The LFG collection system in the closed, unlined cell is comprised of 72 vertical extraction wells, 4 perimeter leachate trench tie-ins, and 3 horizontal collectors. The active cell has 13 vertical extraction wells and 3 leachate manhole tie-ins on the east side of the cell. The LFG collection system from both cells is connected to a header pipe that conveys collected LFG to a blower/flare station. Upon exiting the blower, the LFG is delivered to a flare. On June 2012 the County installed one (1) 1,059 kW LFG fired reciprocating internal combustion engine (GE Jenbacher) to generate electricity. The most recent stack test for this unit was performed on September 20, 2018. Test results showed that the internal combustion engine is in compliance with the required emission limits stated in the permit. Due to the installation and operation of the internal combustion engine, the original onsite flare was modified to reduce its capacity from 2,230 standard cubic feet per minute (scfm) of LFG to 800 cfm to accommodate for the lower amount of LFG needing flaring.

Additional emission units at the site include one (1) horizontal grinder powered by a 755 bhp diesel internal combustion engine, and a gasoline dispensing facility with one (1) 4,000 gallon above ground gasoline storage tank.

A landfill is automatically subject to Part 70 operating permit requirements, if it has a design capacity of at least 2.5 million megagrams (2.75 million tons), regardless of whether it is a major stationary source. ARL has a design capacity which is greater than the 2.75 million tons threshold, making it subject to the Title V permitting requirements. The refuse-in-place as of 2019 is 3,021,847 tons.

The current Title V permit for Alpha Ridge expired on April 30, 2020 and has been administratively extended during the coronavirus pandemic. The Department received a Part 70 renewal permit application for Alpha Ridge Landfill which was logged in on May 2, 2019. An administrative completeness review was conducted and the application was deemed to be complete. The completeness determination letter was sent on June 13, 2019 granting the facility an application shield.

2. FACILITY INVENTORY LIST

Emissions Unit Number	MDE Registration Number	Emissions Unit Name and Description	Date of Registration
EU-01	9-0205	MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm.	Began receiving waste 1980.
EU-03	9-0364	One (1) 1,059 kW LFG fired reciprocating internal combustion engine (GE Jenbacher) to generate electricity.	June 2012
EU-04	9-0369	One (1) horizontal grinder, powered by a 755 bhp diesel-fired internal combustion engine.	November 2012
EU-05	9-0379	One (1) 4,000 gallon above-ground gasoline storage tank, and a gasoline dispensing facility.	May 2015

SECTION II GENERAL CONDITIONS

1. DEFINITIONS

[COMAR 26.11.01.01] and [COMAR 26.11.02.01]

The words or terms in this Part 70 permit shall have the meanings established under COMAR 26.11.01 and .02 unless otherwise stated in this permit.

2. ACRONYMS

ARA Air and Radiation Administration
BACT Best Available Control Technology
Btu British thermal unit
CAA Clean Air Act
CAM Compliance Assurance Monitoring
CEM Continuous Emissions Monitor
CFR Code of Federal Regulations
CO Carbon Monoxide
COMAR Code of Maryland Regulations
EPA United States Environmental Protection Agency
FR Federal Register
gr grains
HAP Hazardous Air Pollutant
MACT Maximum Achievable Control Technology
MDE Maryland Department of the Environment
MVAC Motor Vehicle Air Conditioner
NESHAPS National Emission Standards for Hazardous Air Pollutants
NO_x Nitrogen Oxides
NSPS New Source Performance Standards
NSR New Source Review
OTR Ozone Transport Region
PM Particulate Matter
PM10 Particulate Matter with Nominal Aerodynamic Diameter of 10 micrometers or less
ppm parts per million
ppb parts per billion
PSD Prevention of Significant Deterioration
PTC Permit to construct
PTO Permit to operate (State)
SIC Standard Industrial Classification
SO_2 Sulfur Dioxide
TAP Toxic Air Pollutant
tpy tons per year
VE Visible Emissions
VOC Volatile Organic Compounds

3. EFFECTIVE DATE

The effective date of the conditions in this Part 70 permit is the date of permit issuance, unless otherwise stated in the permit.

4. PERMIT EXPIRATION

[COMAR 26.11.03.13B(2)]

Upon expiration of this permit, the terms of the permit will automatically continue to remain in effect until a new Part 70 permit is issued for this facility provided that the Permittee has submitted a timely and complete application and has paid applicable fees under COMAR 26.11.02.16.

Otherwise, upon expiration of this permit the right of the Permittee to operate this facility is terminated.

5. PERMIT RENEWAL

[COMAR 26.11.03.02B(3)] and [COMAR 26.11.03.02E]

The Permittee shall submit to the Department a completed application for renewal of this Part 70 permit at least 12 months before the expiration of the permit. Upon submitting a completed application, the Permittee may continue to operate this facility pending final action by the Department on the renewal.

The Permittee, upon becoming aware that any relevant facts were omitted or incorrect information was submitted in the permit application, shall submit such supplementary facts or corrected information no later than 10 days after becoming aware that this occurred. The Permittee shall also provide additional information as necessary to address any requirements that become applicable to the facility after the date a completed application was submitted, but prior to the release of a draft permit. This information shall be submitted to the Department no later than 20 days after a new requirement has been adopted.

6. CONFIDENTIAL INFORMATION

[COMAR 26.11.02.02G]

In accordance with the provisions of the State Government Article, Sec. 10-611 et seq., Annotated Code of Maryland, all information submitted in an application shall be considered part of the public record and available for inspection and copying, unless the Permittee claims that the information is confidential when it is submitted to the Department. At the time of the request for inspection or copying, the Department will make a determination with regard to the confidentiality of the information.

The Permittee, when requesting confidentiality, shall identify the information in a manner specified by the Department and, when requested by the Department, promptly provide specific reasons supporting the claim of confidentiality. Information submitted to the Department without a request that the information be deemed confidential may be made available to the public. Subject to approval of the Department, the Permittee may provide a summary of confidential information that is suitable for public review. The content of this Part 70 permit is not subject to confidential treatment.

7. PERMIT ACTIONS

[COMAR 26.11.03.06E(3)] and [COMAR 26.11.03.20(A)]

This Part 70 permit may be revoked or reopened and revised for cause. The filing of an application by the Permittee for a permit revision or renewal; or a notification of termination, planned changes or anticipated noncompliance by the facility, does not stay a term or condition of this permit.

The Department shall reopen and revise, or revoke the Permittee's Part 70 permit under the following circumstances:

a. Additional requirements of the Clean Air Act become applicable to this facility and the remaining permit term is 3 years or more;

b. The Department or the EPA determines that this Part 70 permit contains a material mistake, or is based on false or inaccurate information supplied by or on behalf of the Permittee;

c. The Department or the EPA determines that this Part 70 permit must be revised or revoked to assure compliance with applicable requirements of the Clean Air Act; or

d. Additional requirements become applicable to an affected source under the Federal Acid Rain Program.

8. PERMIT AVAILABILITY

[COMAR 26.11.02.13G]

The Permittee shall maintain this Part 70 permit in the vicinity of the facility for which it was issued, unless it is not practical to do so, and make this permit immediately available to officials of the Department upon request.

9. REOPENING THE PART 70 PERMIT FOR CAUSE BY THE EPA

[COMAR 26.11.03.20B]

The EPA may terminate, modify, or revoke and reissue a permit for cause as prescribed in 40 CFR §70.7(g)

10. TRANSFER OF PERMIT

[COMAR 26.11.02.02E]

The Permittee shall not transfer this Part 70 permit except as provided in COMAR 26.11.03.15.

11. REVISION OF PART 70 PERMITS – GENERAL CONDITIONS

[COMAR 26.11.03.14] and [COMAR 26.11.03.06A(8)]

a. The Permittee shall submit an application to the Department to revise this Part 70 permit when required under COMAR 26.11.03.15 -.17.

b. When applying for a revision to a Part 70 permit, the Permittee shall comply with the requirements of COMAR 26.11.03.02 and .03 except that the application for a revision need include only information listed that is related to the proposed change to the source and revision to the permit. This information shall be sufficient to evaluate the proposed change and to determine whether it will comply with all applicable requirements of the Clean Air Act.

c. The Permittee may not change any provision of a compliance plan or schedule in a Part 70 permit as an administrative permit amendment or as a minor permit modification unless the change has been approved by the Department in writing.

d. A permit revision is not required for a change that is provided for in this permit relating to approved economic incentives, marketable permits, emissions trading, and other similar programs.

12. SIGNIFICANT PART 70 OPERATING PERMIT MODIFICATIONS

[COMAR 26.11.03.17]

The Permittee may apply to the Department to make a significant modification to its Part 70 Permit as provided in COMAR 26.11.03.17 and in accordance with the following conditions:

a. A significant modification is a revision to the federally enforceable provisions in the permit that does not qualify as an administrative permit amendment under COMAR 26.11.03.15 or a minor permit modification as defined under COMAR 26.11.03.16.

b. This permit does not preclude the Permittee from making changes, consistent with the provisions of COMAR 26.11.03, that would make the permit or particular terms and conditions of the permit irrelevant, such as by shutting down or reducing the level of operation of a source or of an emissions unit within the source. Air pollution control equipment shall not be shut down or its level of operation reduced if doing so would violate any term of this permit.

c. Significant permit modifications are subject to all requirements of COMAR 26.11.03 as they apply to permit issuance and renewal, including the requirements for applications, public participation, and review by affected states and EPA, except:

   (1) An application need include only information pertaining to the proposed change to the source and modification of this permit, including a description of the change and modification, and any new applicable requirements of the Clean Air Act that will apply if the change occurs;

   (2) Public participation, and review by affected states and EPA, is limited to only the application and those federally enforceable terms and conditions of the Part 70 permit that are affected by the significant permit modification.

d. As provided in COMAR 26.11.03.15B(5), an administrative permit amendment may be used to make a change that would otherwise require a significant permit modification if procedures for enhanced preconstruction review of the change are followed that satisfy the requirements of 40 CFR 70.7(d)(1)(v).

e. Before making a change that qualifies as a significant permit modification, the Permittee shall obtain all permits-to-construct and approvals required by COMAR 26.11.02.

f. The Permittee shall not make a significant permit modification that results in a violation of any applicable requirement of the Clean Air Act.

g. The permit shield in COMAR 26.11.03.23 applies to a final significant permit modification that has been issued by the Department, to the extent applicable under COMAR 26.11.03.23.

13. MINOR PERMIT MODIFICATIONS

[COMAR 26.11.03.16]

The Permittee may apply to the Department to make a minor modification to the federally enforceable provisions of this Part 70 permit as provided in COMAR 26.11.03.16 and in accordance with the following conditions:

a. A minor permit modification is a Part 70 permit revision that:

(1) Does not result in a violation of any applicable requirement of the Clean Air Act;

(2) Does not significantly revise existing federally enforceable monitoring, including test methods, reporting, record keeping, or compliance certification requirements except by:

(a) Adding new requirements,

(b) Eliminating the requirements if they are rendered meaningless because the emissions to which the requirements apply will no longer occur, or

(c) Changing from one approved test method for a pollutant and source category to another;

(3) Does not require or modify a:

(a) Case-by-case determination of a federally enforceable emissions standard,

(b) Source specific determination for temporary sources of ambient impacts, or

(c) Visibility or increment analysis;

(4) Does not seek to establish or modify a federally enforceable permit term or condition for which there is no corresponding underlying applicable requirement of the Clean Air Act, but that the Permittee has assumed to avoid an applicable requirement to which the source would otherwise be subject, including:

(a) A federally enforceable emissions standard applied to the source pursuant to COMAR 26.11.02.03 to avoid classification as a Title I modification; and

(b) An alternative emissions standard applied to an emissions unit pursuant to regulations promulgated under Section 112(i)(5) of the Clean Air Act

(5) Is not a Title I modification; and

(6) Is not required under COMAR 26.11.03.17 to be processed as a significant modification to this Part 70 permit.

b. Application for a Minor Permit Modification

The Permittee shall submit to the Department an application for a minor permit modification that satisfies the requirements of COMAR 26.11.03.03 which includes the following:

(1) A description of the proposed change, the emissions resulting from the change, and any new applicable requirements that will apply if the change is made;

(2) The proposed minor permit modification;

(3) Certification by a responsible official, in accordance with COMAR 26.11.02.02F, that:

(a) The proposed change meets the criteria for a minor permit modification, and

(b) The Permittee has obtained or applied for all required permits-to-construct required by COMAR 26.11.03.16 with respect to the proposed change;

(4) Completed forms for the Department to use to notify the EPA and affected states, as required by COMAR 26.11.03.07-.12.

c. Permittee's Ability to Make Change

(1) For changes proposed as minor permit modifications to this permit that will require the applicant to obtain a permit to construct, the permit to construct must be issued prior to the new change.

(2) During the period of time after the Permittee applies for a minor modification but before the Department acts in accordance with COMAR 26.11.03.16F(2):

(a) The Permittee shall comply with applicable requirements of the Clean Air Act related to the change and the permit terms and conditions described in the application for the minor modification.

(b) The Permittee is not required to comply with the terms and conditions in the permit it seeks to modify. If the Permittee fails to comply with the terms and conditions in the application during this time, the terms and conditions of both this permit and the application for modification may be enforced against it.

d. The Permittee is subject to enforcement action if it is determined at any time that a change made under COMAR 26.11.03.16 is not within the scope of this regulation.

e. Minor permit modification procedures may be used for Part 70 permit modifications involving the use of economic incentives, marketable permits, emissions trading, and other similar approaches, but only to the extent that the minor permit modification procedures are explicitly provided for in regulations approved by the EPA as part of the Maryland SIP or in other applicable requirements of the Clean Air Act.

14. ADMINISTRATIVE PART 70 OPERATING PERMIT AMENDMENTS

[COMAR 26.11.03.15]

The Permittee may apply to the department to make an administrative permit amendment as provided in COMAR 26.11.03.15 and in accordance with the following conditions:

a. An application for an administrative permit amendment shall:

(1) Be in writing;

(2) Include a statement certified by a responsible official that the proposed amendment meets the criteria in COMAR 26.11.03.15 for an administrative permit amendment, and

(3) Identify those provisions of this part 70 permit for which the amendment is requested, including the basis for the request.

b. An administrative permit amendment:

(1) Is a correction of a typographical error;

(2) Identifies a change in the name, address, or phone number of a person identified in this permit, or a similar administrative change involving the Permittee or other matters which are not directly related to the control of air pollution;

(3) requires more frequent monitoring or reporting by the Permittee;

(4) Allows for a change in ownership or operational control of a source for which the Department determines that no other revision to the permit is necessary and is documented as per COMAR 26.11.03.15B(4);

(5) Incorporates into this permit the requirements from preconstruction review permits or approvals issued by the Department in accordance with COMAR 26.11.03.15B(5), but only if it satisfies 40 CFR 70.7(d)(1)(v);

(6) Incorporates any other type of change, as approved by the EPA, which is similar to those in COMAR 26.11.03.15B(1)—(4);

(7) Notwithstanding COMAR 26.11.03.15B(1)—(6), all modifications to acid rain control provisions included in this Part 70 permit are governed by applicable requirements promulgated under Title IV of the Clean Air Act; or

(8) Incorporates any change to a term or condition specified as State-only enforceable, if the Permittee has obtained all necessary permits-to-construct and approvals that apply to the change.

c. The Permittee may make the change addressed in the application for an administrative amendment upon receipt by the Department of the application, if all permits-to-construct or approvals otherwise required by COMAR 26.11.02 prior to making the change have first been obtained from the Department.

d. The permit shield in COMAR 26.11.03.23 applies to administrative permit amendments made under Section B(5) of COMAR 26.11.03.15 , but only after the Department takes final action to revise the permit.

e. The Permittee is subject to enforcement action if it is determined at any time that a change made under COMAR 26.11.03.15 is not within the scope of this regulation.

15. OFF-PERMIT CHANGES TO THIS SOURCE

[COMAR 26.11.03.19]

The Permittee may make off-permit changes to this facility as provided in COMAR 26.11.03.19 and in accordance with the following conditions:

a. The Permittee may make a change to this permitted facility that is not addressed or prohibited by the federally enforceable conditions of this Part 70 permit without obtaining a Part 70 permit revision if:

   (1) The Permittee has obtained all permits and approvals required by COMAR 26.11.02 and .03;

   (2) The change is not subject to any requirements under Title IV of the Clean Air Act;

   (3) The change is not a Title I modification; and

   (4) The change does not violate an applicable requirement of the Clean Air Act or a federally enforceable term or condition of the permit.

b. For a change that qualifies under COMAR 26.11.03.19, the Permittee shall provide contemporaneous written notice to the Department and the EPA, except for a change to an emissions unit or activity that is exempt from the Part 70 permit application, as provided in COMAR 26.11.03.04. This written notice shall describe the change, including the date it was made, any change in emissions, including the pollutants emitted, and any new applicable requirements of the Clean Air Act that apply as a result of the change.

c. Upon satisfying the requirements of COMAR 26.11.03.19, the Permittee may make the proposed change.

d. The Permittee shall keep a record describing:

   (1) Changes made at the facility that result in emissions of a regulated air pollutant subject to an applicable requirement of the Clean Air Act , but not otherwise regulated under this permit; and

(2) The emissions resulting from those changes.

e. Changes that qualify under COMAR 26.11.03.19 are not subject to the requirements for Part 70 revisions.

f. The Permittee shall include each off-permit change under COMAR 26.11.03.19 in the application for renewal of the part 70 permit.

g. The permit shield in COMAR 26.11.03.23 does not apply to off-permit changes made under COMAR 26.11.03.19.

h. The Permittee is subject to enforcement action if it is determined that an off-permit change made under COMAR 26.11.03.19 is not within the scope of this regulation.

16. ON-PERMIT CHANGES TO SOURCES

[COMAR 26.11.03.18]

The Permittee may make on-permit changes that are allowed under Section 502(b)(10) of the Clean Air Act as provided in COMAR 26.11.03.18 and in accordance with the following conditions:

a. The Permittee may make a change to this facility without obtaining a revision to this Part 70 permit if:

(1) The change is not a Title I modification;

(2) The change does not result in emissions in excess of those expressly allowed under the federally enforceable provisions of the Part 70 permit for the permitted facility or for an emissions unit within the facility, whether expressed as a rate of emissions or in terms of total emissions;

(3) The Permittee has obtained all permits and approvals required by COMAR 26.11.02 and .03;

(4) The change does not violate an applicable requirement of the Clean Air Act;

(5) The change does not violate a federally enforceable permit term or condition related to monitoring, including test methods, record keeping, reporting, or compliance certification requirements;

(6) The change does not violate a federally enforceable permit term or condition limiting hours of operation, work practices, fuel usage, raw material usage, or production levels if the term or condition has been established to limit emissions allowable under this permit;

(7) If applicable, the change does not modify a federally enforceable provision of a compliance plan or schedule in this Part 70 permit unless the Department has approved the change in writing; and

(8) This permit does not expressly prohibit the change under COMAR 26.11.03.18.

b. The Permittee shall notify the Department and the EPA in writing of a proposed on-permit change under COMAR 26.11.03.18 not later than 7 days before the change is made. The written information shall include the following information:

(1) A description of the proposed change;

(2) The date on which the change is proposed to be made;

(3) Any change in emissions resulting from the change, including the pollutants emitted;

(4) Any new applicable requirement of the Clean Air Act; and

(5) Any permit term or condition that would no longer apply.

c. The responsible official of this facility shall certify in accordance with COMAR 26.11.02.02F that the proposed change meets the criteria for the use of on-permit changes under COMAR 26.11.03.18.

d. The Permittee shall attach a copy of each notice required by condition b. above to this Part 70 permit.

e. On-permit changes that qualify under COMAR 26.11.03.18 are not subject to the requirements for part 70 permit revisions.

f. Upon satisfying the requirements under COMAR 26.11.03.18, the Permittee may make the proposed change.

g. The permit shield in COMAR 26.11.03.23 does not apply to on-permit changes under COMAR 26.11.03.18.

h. The Permittee is subject to enforcement action if it is determined that an on-permit change made under COMAR 26.11.03.18 is not within the scope of the regulation or violates any requirement of the State air pollution control law.

17. FEE PAYMENT

[COMAR 26.11.02.16A(2) & (5)(b)]

a. The fee for this Part 70 permit is as prescribed in Regulation .19 of COMAR 26.11.02.

b. The fee is due on and shall be paid on or before each 12-month anniversary date of the permit.

c. Failure to pay the annual permit fee constitutes cause for revocation of the permit by the Department.

18. REQUIREMENTS FOR PERMITS-TO-CONSTRUCT AND APPROVALS

[COMAR 26.11.02.09.]

The Permittee may not construct or modify or cause to be constructed or modified any of the following sources without first obtaining, and having in current effect, the specified permits-to-construct and approvals:

a. New Source Review source, as defined in COMAR 26.11.01.01, approval required, except for generating stations constructed by electric companies;

b. Prevention of Significant Deterioration source, as defined in COMAR 26.11.01.01, approval required, except for generating stations constructed by electric companies;

c. New Source Performance Standard source, as defined in COMAR 26.11.01.01, permit to construct required, except for generating stations constructed by electric companies;

d. National Emission Standards for Hazardous Air Pollutants source, as defined in COMAR 26.11.01.01, permit to construct required, except for generating stations constructed by electric companies;

e. A stationary source of lead that discharges one ton per year or more of lead or lead compounds measured as elemental lead, permit to construct required, except for generating stations constructed by electric companies;

f. All stationary sources of air pollution, including installations and air pollution control equipment, except as listed in COMAR 26.11.02.10, permit to construct required;

g. In the event of a conflict between the applicability of (a.— e.) above and an exemption listed in COMAR 26.11.02.10, the provision that requires a permit applies.

h. Approval of a PSD or NSR source by the Department does not relieve the Permittee obtaining an approval from also obtaining all permits-to-construct required b y (c.— g.) above.

19. CONSOLIDATION OF PROCEDURES FOR PUBLIC PARTICIPATION

[COMAR 26.11.02.11C] and [COMAR 26.11.03.01K]

The Permittee may request the Department to authorize special procedures for the Permittee to apply simultaneously, to the extent possible, for a permit to construct and a revision to this permit.

These procedures may provide for combined public notices, informational meetings, and public hearings for both permits but shall not adversely affect the rights of a person, including EPA and affected states, to obtain information about the application for a permit, to comment on an application, or to challenge a permit that is issued.

These procedures shall not alter any existing permit procedures or time frames.

20. PROPERTY RIGHTS

[COMAR 26.11.03.06E(4)]

This Part 70 permit does not convey any property rights of any sort, or any exclusive privileges.

21. SEVERABILITY

[COMAR 26.11.03.06A(5)]

If any portion of this Part 70 permit is challenged, or any term or condition deemed unenforceable, the remainder of the requirements of the permit continues to be valid.

22. INSPECTION AND ENTRY

[COMAR 26.11.03.06G(3)]

The Permittee shall allow employees and authorized representatives of the Department, the EPA, and local environmental health agencies, upon presentation of credentials or other documents as may be required by law, to:

a. Enter at a reasonable time without delay and without prior notification the Permittee's property where a Part 70 source is located, emissions-related activity is conducted, or records required by this permit are kept;

b. Have access to and make copies of records required by the permit;

c. Inspect all emissions units within the facility subject to the permit and all related monitoring systems, air pollution control equipment, and practices or operations regulated or required by the permit; and

d. Sample or monitor any substances or parameters at or related to the emissions units at the facility for the purpose of determining compliance with the permit.

23. DUTY TO PROVIDE INFORMATION

[COMAR 26.11.03.06E(5)]

The Permittee shall furnish to the Department, within a reasonable time specified by the Department, information requested in writing by the Department in order to determine whether the Permittee is in compliance with the federally enforceable conditions of this Part 70 permit, or whether cause exists for revising or revoking the permit. Upon request, the Permittee shall also furnish to the Department records required to be kept under the permit.

For information claimed by the Permittee to be confidential and therefore potentially not discloseable to the public, the Department may require the Permittee to provide a copy of the records directly to the EPA along with a claim of confidentiality.

The Permittee shall also furnish to the Department, within a reasonable time specified by the Department, information or records requested in writing by the Department in order to determine if the Permittee is in compliance with the State-only enforceable conditions of this permit.

24. COMPLIANCE REQUIREMENTS

[COMAR 26.11.03.06E(1)] and [COMAR 26.11.03.06A(11)] and [COMAR 26.11.02.05]

The Permittee shall comply with the conditions of this Part 70 permit. Noncompliance with the permit constitutes a violation of the Clean Air Act, and/or the Environment Article Title 2 of the Annotated Code of Maryland and may subject the Permittee to:

a. Enforcement action,

b. Permit revocation or revision,

c. Denial of the renewal of a Part 70 permit, or

d. Any combination of these actions.

The conditions in this Part 70 permit are enforceable by EPA and citizens under the Clean Air Act except for the State-only enforceable conditions.

Under Environment Article Section 2-609, Annotated Code of Maryland, the Department may seek immediate injunctive relief against a person who violates this permit in such a manner as to cause a threat to human health or the environment.

25. CREDIBLE EVIDENCE

Nothing in this permit shall be interpreted to preclude the use of credible evidence to demonstrate noncompliance with any term of this permit.

26. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE

[COMAR 26.11.03.06E(2)]

The need to halt or reduce activity in order to comply with the conditions of this permit may not be used as a defense in an enforcement action.

27. CIRCUMVENTION

[COMAR 26.11.01.06]

The Permittee may not install or use any article, machine, equipment or other contrivance, the use of which, without resulting in a reduction in the total weight of emissions, conceals or dilutes emissions which would otherwise constitute a violation of any applicable air pollution control regulation.

28. PERMIT SHIELD

[COMAR 26.11.03.23]

A permit shield as described in COMAR 26.11.03.23 shall apply only to terms and conditions in this Part 70 permit that have been specifically identified as covered by the permit shield. Neither this permit nor COMAR 26.11.03.23 alters the following:

a. The emergency order provisions in Section 303 of the Clean Air Act, including the authority of EPA under that section;

b. The liability of the Permittee for a violation of an applicable requirement of the Clean Air Act before or when this permit is issued or for a violation that continues after issuance;

c. The requirements of the Acid Rain Program, consistent with Section 408(a) of the Clean Air Act;

d. The ability of the Department or EPA to obtain information from a source pursuant to Maryland law and Section 114 of the Clean Air Act; or

e. The authority of the Department to enforce an applicable requirement of the State air pollution control law that is not an applicable requirement of the Clean Air Act.

29. ALTERNATE OPERATING SCENARIOS

[COMAR 26.11.03.06A(9)]

For all alternate operating scenarios approved by the Department and contained within this permit, the Permittee, while changing from one approved scenario to another, shall contemporaneously record in a log maintained at the facility each scenario under which the emissions unit is operating and the date and time the scenario started and ended.

SECTION III PLANT WIDE CONDITIONS

1. PARTICULATE MATTER FROM CONSTRUCTION AND DEMOLITION

[COMAR 26.11.06.03D]

The Permittee shall not cause or permit any building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne.

2. OPEN BURNING

[COMAR 26.11.07]

Except as provided in COMAR 26.11.07.04, the Permittee shall not cause or permit an open fire from June 1 through August 31 of any calendar year. Prior to any open burning, the Permittee shall request and receive approval from the Department.

3. AIR POLLUTION EPISODE

[COMAR 26.11.05.04]

When requested by the Department, the Permittee shall prepare in writing standby emissions reduction plans, consistent with good industrial practice and safe operating procedures, for reducing emissions creating air pollution during periods of Alert, Warning, and Emergency of an air pollution episode.

4. REPORT OF EXCESS EMISSIONS AND DEVIATIONS

[COMAR 26.11.01.07] and [COMAR 26.11.03.06C(7)]

The Permittee shall comply with the following conditions for occurrences of excess emissions and deviations from requirements of this permit, including those in Section VI – State-only Enforceable Conditions:

a. Report any deviation from permit requirements that could endanger human health or the environment, by orally notifying the Department immediately upon discovery of the deviation;

b. Promptly report all occurrences of excess emissions that are expected to last for one hour or longer by orally notifying the Department of the onset and termination of the occurrence;

c. When requested by the Department the Permittee shall report all deviations from permit conditions, including those attributed to malfunctions as defined in COMAR 26.11.01.07A, within 5 days of the request by submitting a written description of the deviation to the Department. The written report shall include the cause, dates and times of the onset and termination of the deviation, and an account of all actions planned or taken to reduce, eliminate, and prevent recurrence of the deviation;

d. The Permittee shall submit to the Department semi-annual monitoring reports that confirm that all required monitoring was performed, and that provide accounts of all deviations from permit requirements that occurred during the reporting periods. Reporting periods shall be January 1 through June 30 and July 1 through December 31, and reports shall be submitted within 30 days of the end of each reporting period. Each account of deviation shall include a description of the deviation, the dates and times of onset and termination, identification of the person who observed or discovered the deviation, causes and corrective actions taken, and actions taken to prevent recurrence. If no deviations from permit conditions occurred during a reporting period, the Permittee shall submit a written report that so states.

e. When requested by the Department, the Permittee shall submit a written report to the Department within 10 days of receiving the request concerning an occurrence of excess emissions. The report shall contain the information required in COMAR 26.11.01.07D(2).

5. ACCIDENTAL RELEASE PROVISIONS

[COMAR 26.11.03.03B(23)] and [40 CFR 68]

Should the Permittee become subject to 40 CFR 68 during the term of this permit, the Permittee shall submit risk management plans by the date specified in 40 CFR 68.150 and shall certify compliance with the requirements of 40 CFR 68 as part of the annual compliance certification as required by 40 CFR 70.

The Permittee shall initiate a permit revision or reopening according to the procedures of 40 CFR 70.7 to incorporate appropriate permit conditions into the Permittee's Part 70 permit.

6. GENERAL TESTING REQUIREMENTS

[COMAR 26.11.01.04]

The Department may require the Permittee to conduct, or have conducted, testing to determine compliance with this Part 70 permit. The Department, at its option, may witness or conduct these tests. This testing shall be done at a reasonable time, and all information gathered during a testing operation shall be provided to the Department.

7. EMISSIONS TEST METHODS

[COMAR 26.11.01.04]

Compliance with the emissions standards and limitations in this Part 70 permit shall be determined by the test methods designated and described below or other test methods submitted to and approved by the Department.

Reference documents of the test methods approved by the Department include the following:

a. 40 CFR 60, appendix A

b. 40 CFR 51, appendix M

c. The Department's Technical Memorandum 91-01 "Test Methods and Equipment Specifications for Stationary Sources", (January 1991), as amended through Supplement 3, (October 1, 1997)

8. EMISSIONS CERTIFICATION REPORT

[COMAR 26.11.01.05-1] and [COMAR 26.11.02.19C] and [COMAR 26.11.02.19D]

The Permittee shall certify actual annual emissions of regulated pollutants from the facility on a calendar year basis.

a. The certification shall be on forms obtained from the Department and submitted to the Department not later than April 1 of the year following the year for which the certification is required;

b. The individual making the certification shall certify that the information is accurate to the individual's best knowledge. The individual shall be:

(1) Familiar with each source for which the certifications forms are submitted, and

(2) Responsible for the accuracy of the emissions information;

c. The Permittee shall maintain records necessary to support the emissions certification including the following information if applicable:

(1) The total amount of actual emissions of each regulated pollutant and the total of all regulated pollutants;

(2) An explanation of the methods used to quantify the emissions and the operating schedules and production data that were used to determine emissions, including significant assumptions made;

(3) Amounts, types and analyses of all fuels used;

(4) Emissions data from continuous emissions monitors that are required by this permit, including monitor calibration and malfunction information;

(5) Identification, description, and use records of all air pollution control equipment and compliance monitoring equipment including:

(a) Significant maintenance performed,
(b) Malfunctions and downtime, and
(c) Episodes of reduced efficiency of all equipment;

(6) Limitations on source operation or any work practice standards that significantly affect emissions; and

(7) Other relevant information as required by the Department.

9. COMPLIANCE CERTIFICATION REPORT

[COMAR 26.11.03.06G(6) and (7)]

The Permittee shall submit to the Department and EPA Region III a report certifying compliance with each term of this Part 70 permit including each applicable standard, emissions limitation, and work practice for the previous calendar year by April 1 of each year.

a. The compliance certification shall include:

   (1) The identification of each term or condition of this permit which is the basis of the certification;

   (2) The compliance status;

   (3) Whether the compliance was continuous or intermittent;

   (4) The methods used for determining the compliance status of each source, currently and over the reporting period; and

   (5) Any other information required to be reported to the Department that is necessary to determine the compliance status of the Permittee with this permit.

b. The Permittee shall submit the compliance certification reports to the Department and EPA simultaneously.

10. CERTIFICATION BY RESPONSIBLE OFFICIAL

[COMAR 26.11.02.02F]

All application forms, reports, and compliance certifications submitted pursuant to this permit shall be certified by a responsible official as to truth, accuracy, and completeness. The Permittee shall expeditiously notify the Department of an appointment of a new responsible official.

The certification shall be in the following form:

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

11. SAMPLING AND EMISSIONS TESTING RECORDKEEPING

[COMAR 26.11.03.06C(5)]

The Permittee shall gather and retain the following information when sampling and testing for compliance demonstrations:

a. The location as specified in this permit, and the date and time that samples and measurements are taken;

b. All pertinent operating conditions existing at the time that samples and measurements are taken;

c. The date that each analysis of a sample or emissions test is performed and the name of the person taking the sample or performing the emissions test;

d. The identity of the Permittee, individual, or other entity that performed the analysis;

e. The analytical techniques and methods used; and

f. The results of each analysis.

12. GENERAL RECORDKEEPING

[COMAR 26.11.03.06C(6)]

The Permittee shall retain records of all monitoring data and information that support the compliance certification for a period of five (5) years from the date that the monitoring, sample measurement, application, report or emissions test was completed or submitted to the Department.

These records and support information shall include:

a. All calibration and maintenance records;

b. All original data collected from continuous monitoring instrumentation;

c. Records which support the annual emissions certification; and

d. Copies of all reports required by this permit.

13. GENERAL CONFORMITY

[COMAR 26.11.26.09]

The Permittee shall comply with the general conformity requirements of 40 CFR 93, Subpart B and COMAR 26.11.26.09.

14. ASBESTOS PROVISIONS

[40 CFR 61, Subpart M]

The Permittee shall comply with 40 CFR 61, Subpart M when conducting any renovation or demolition activities at the facility.

15. OZONE DEPLETING REGULATIONS

[40 CFR 82, Subpart F]

The Permittee shall comply with the standards for recycling and emissions reduction pursuant to 40 CFR 82, Subpart F, except as provided for MVACs in subpart B:

a. Persons opening appliances for maintenance, service, repair, or disposal shall comply with the prohibitions and required practices pursuant to 40 CFR 82.154 and 82.156.

b. Equipment used during the maintenance, service, repair or disposal of appliances shall comply with the standards for recycling and recovery equipment pursuant to 40 CFR 82.158.

c. Persons performing maintenance, service, repairs or disposal of appliances shall be certified by an approved technician certification program pursuant to 40 CFR 82.161.

d. Persons performing maintenance, service, repairs or disposal of appliances shall certify with the Administrator pursuant to 40 CFR 82.162.

e. Persons disposing of small appliances, MVACS, and MVAC-like appliances as defined in 40 CFR 82.152, shall comply with record keeping requirements pursuant to 40 CFR 82.166.

f. Persons owning commercial or industrial process refrigeration equipment shall comply with the leak repair requirements pursuant to 40 CFR 82.156.

g. Owners/operators of appliances normally containing 50 or more pounds of refrigerant shall keep records of refrigerant purchased and added to such appliances pursuant to 40 CFR 82.166.

16. ACID RAIN PERMIT

Not applicable

SECTION IV PLANT SPECIFIC CONDITIONS

This section provides tables that include the emissions standards, emissions limitations, and work practices applicable to each emissions unit located at this facility. The Permittee shall comply with all applicable emissions standards, emissions limitations and work practices included herein.

The tables also include testing, monitoring, record keeping and reporting requirements specific to each emissions unit. In addition to the requirements included here in **Section IV**, the Permittee is also subject to the general testing, monitoring, record keeping and reporting requirements included in **Section III –Plant Wide Conditions** of this permit.

Unless otherwise provided in the specific requirements for an emissions unit, the Permittee shall maintain at the facility for at least five (5) years, and shall make available to the Department upon request, all records that the Permittee is required under this section to establish. **[Authority: COMAR 26.11.03.06C(5)(g)]**

The ARL is currently subject to the following requirements:

Table IV – 1	
1.0	**Emissions Unit Number(s) – EU-01** MDE Registration No. 9-0205 MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm.
1.1	**Applicable Standards/Limits:** Alpha Ridge Landfill is subject to the testing, record keeping, and reporting requirements indicated below.
1.2	**Testing Requirements:** “If the resulting NMOC mass emission rate is less than 50 megagrams per year, the owner or operator shall submit a periodic estimate of the emission rate report as provided in §60.757(b)(1) and retest the site-specific NMOC concentration every 5 years using the methods specified in this section.” **[COMAR 26.11.19.20D3(a)]**
1.3	**Monitoring Requirements:** The Permittee shall monitor the following information:

	(a) Operating hours for the flaring system. (b) The operating temperature for the flaring system. (c) The total landfill gas flow rate as part of the annual emission certification. **[Reference: MDE Reg. No. 9-0205]**
1.4	**Record Keeping Requirements:** The Permittee shall keep all the records required under this permit for at least five years and shall make such records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]**
1.5	**Reporting Requirements:** If the Permittee increases the maximum design capacity of the Alpha Ridge Landfill after November 1, 1997, the Permittee shall amend and resubmit the design capacity report within 90 days of the issuance of an air quality Permit to Construct or a permit from the MDE Land Management Administration that authorizes the increase or any other change that increases the maximum design capacity of the landfill. **[Reference: COMAR 26.11.19.20D(2)]** The Permittee shall estimate the annual NMOC emission rate calculated using the formula and procedures as described in 40 CFR §60.754(a). The Permittee shall prepare and submit an updated NMOC emission rate report by November 1 of each year. A less frequent emission rate report may be submitted upon approval by the Department in accordance with COMAR 26.11.19.20D(6). **[Reference: COMAR 26.11.19.20D(3)(a) & COMAR 26.11.19.20D(6)]** The Permittee may, upon approval by the Department, submit a combined report to satisfy the NMOC reporting requirements and the annual Emissions Certification requirements. Such report shall be submitted by April 1 of each year for the previous calendar year. **[Reference: COMAR 26.11.19.20D(7)]**

Table IV – 1A	
1A.0	**Emissions Unit Number(s) – EU-01** MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm. **[MDE Reg. No. 9-0205]**
1A.1	**Applicable Standards/Limits:** A. **Control of Visible Emissions** **COMAR 26.11.06.02C(2) – Visible Emission Standards**. "In Areas III and IV a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers." **COMAR 26.11.06.02A(2) – General Exceptions**. The visible emissions standards in §C of this regulation do not apply to emissions during start-up and process modifications or adjustments, or occasional cleaning of control equipment, if: (a) The visible emissions are not greater than 40 percent opacity; and (b) The visible emissions do not occur for more than 6 consecutive minutes in any 60-minute period." B. **Control of Particulate Matter** **Particulate Matter from Confined Sources** **[COMAR 26.11.06.03B(2)(a)]** – "A person may not cause or permit to be discharged into the outdoor atmosphere from any other installation, particulate matter in excess of 0.03 gr/SCFD (68.7 mg/dscm)." C. **Operational Standards** The Permittee shall operate and maintain the flare system in accordance with the manufacturer's recommendations. **[Reference: MDE PTC No. 13-9-0193]**
1A.2	**Testing Requirements:** A. **Control of Visible Emissions** The Permittee shall follow the Monitoring procedures in Section 1A.3.A. B. **Control of Particulate Matter** The Permittee shall follow the Monitoring procedures in Section 1A.3.B. C. **Operational Standards** The Permittee shall follow the Monitoring procedures in Section 1A.3.C.

1A.3	**Monitoring Requirements:** A. **Control of Visible Emissions** The Permittee shall properly operate and maintain the flare in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** B. **Control of Particulate Matter** The Permittee shall perform preventive maintenance on the flare once per month or as recommended by the equipment manufacturer. **[Reference: COMAR 26.11.03.06C]** C. **Operational Standards** The Permittee shall continuously monitor the landfill gas flow rate and the flare combustion temperature. **[Reference: COMAR 26.11.03.06C]** The Permittee shall conduct regular monitoring at least once a week of the blower and flare system to ensure proper operation of the landfill gas extraction system. **[Reference: COMAR 26.11.03.06C]**.
1A.4	**Record Keeping Requirements:** A. **Control of Visible Emissions** The Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** B. **Control of Particulate Matter** The Permittee shall maintain a log of the maintenance performed on the flare and make the logs available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** C. **Operational Standards** The Permittee shall maintain records of the landfill gas flow rate and flare combustion temperature results of the weekly monitoring of the blower and flare system**[Reference: COMAR 26.11.03.06C].**
1A.5	**Reporting Requirements:** A. **Control of Visible Emissions** The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, “Report of Excess Emissions and Deviations. B. **Control of Particulate Matter**

	The Permittee shall make records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** C. **Operational Standards** The Permittee shall make records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]**

The Alpha Ridge Landfill will be subject to the following requirements, if calculated NMOC emissions increase to 55 tons per year or more:

Table IV – 1B	
1B.0	**Emissions Unit Number(s) – EU-1 Cont'd** MDE Registration No. 9-0205 MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm.
1B.1	**Applicable Standards/Limits**: **Subpart AAAA – National Emission Standard for Hazardous Air Pollutants: Municipal Solid Waste Landfills**. **Applicability** "You are subject to this subpart if you own or operate a MSW landfill that has accepted since November 8, 1987 or has additional capacity for waste disposition and meets any one of the three criteria in paragraphs (a)(1) through (3) of this section: (3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan that applies to your landfill." **[Reference: 40 CFR §63.1935(a)(3)]** "If your landfill is an existing affected source and is an area source meeting the criteria in §63.1935(a)(3), you must comply with the requirements in §§63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of

	subpart WWW, the Federal plan, or EPA approved and effective State or tribal plan that applies to your landfill or by January 16, 2004, whichever occurs later." **[Reference: 40 CFR §63.1945(f)]** **Standards** "If you are required by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan to install a collection and control system, you must comply with the requirements in §§63.1960 through 63.1985 and with the general provisions of this part specified in table 1 of this subpart." **[Reference: 40 CFR §63.1955(b)]** **General and Continuing Compliance Requirements** "Compliance is determined in the same way it is determined for 40 CFR Part 60, subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, 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. If a deviation occurs, you have failed to meet the control device operating conditions described in this subpart and have deviated from the requirements of this subpart. Finally, you must develop and implement a written SSM plan according to the provisions in 40 CFR 63.6(e)(3). A copy of the SSM plan must be maintained on site. Failure to write, implement, or maintain a copy of the SSM plan is a deviation from the requirements of this subpart." **[Reference: 40 CFR §63.1960]**
1B.2	**Testing Requirements:** See General and Continuing Compliance Requirements
1B.3	**Monitoring Requirements:** See General and Continuing Compliance Requirements
1B.4	**Record Keeping Requirements:** "Keep records and reports as specified in 40 CFR Part 60, Subpart WWW, or in the Federal plan, EPA approved State plan or tribal plan that implements 40 CFR Part 60, Subpart Cc, whichever applies to your landfill, with one exception: You must submit the annual report described in 40 CFR 60.757(f) every 6 months." **[Reference: 40 CFR §63.1980(a)]** "You must also keep records and reports as specified in the general provisions of 40 CFR Part 60 and this part as shown in Table 1 of this

	subpart. Applicable records in the general provisions include items such as SSM plans and the SSM plan reports." **[Reference: 40 CFR §63.1980(b)]**
1B.5	**Reporting Requirements:** See General and Continuing Compliance Requirements

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Table IV – 2	
2.0	**Emissions Units – EU-03** MDE Reg. No. 9-0364 One (1) 1,059 kW LFG fired reciprocating internal combustion engine (GE Jenbacher) to generate electricity, manufactured on April 28, 2011 and installed in June 2012.
2.1	**Applicable Standards/Limits:** **A. Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). – [40 CFR 60, Subpart JJJJ]** All applicable terms, provisions, emissions standards, testing, monitoring, record keeping, and reporting requirements included in federal New Source Performance Standards (NSPS) promulgated under 40 CFR 60, Subparts A and Subpart JJJJ for Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE), Section 60.4233, including the following: Section e: "Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011, that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators

may meet the CO certification (not field testing) standard for which the engine was certified."

A summary of the EPA emission standards for this engine is shown in Table 1 of this preamble."

Excerpt from Table 1 to Subpart JJJJ of Part 60 "NOx, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥ 100 HP (except gasoline and rich burn LPG), stationary SI landfill/digester gas engines, and stationary emergency engines > 25 HP.

			Emission standards (g/HP-hr)		
Engine type & fuel	Maximum Engine Power	Manufacture Date	NO_x	CO	VOC
Landfill/Digester Gas (except lean burn 500≥ 130 < 1,350)	HP≥ 500	Dec 14, 2010	2.0	5.0	1.0

The Permittee shall meet the emission limits shown in Table 1, 40 CFR 60 Subpart JJJJ, over the entire life of the engine.

B. <u>National Emissions Standards for Hazardous Air Pollutants (NESHAP)</u>. – [40 CFR 63, Subpart ZZZZ]

§ 63.6585 Am I subject to this subpart?

"You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand. (a) …. (c) An area source of HAP emissions is a source that is not a major source."

§ 63.6590 What parts of my plant does this subpart cover?
This subpart applies to each affected source.

Section c: *Stationary RICE subject to Regulations under 40 CFR Part 60*.

"An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or **40 CFR part 60 subpart JJJJ, for spark ignition engines**. No further requirements apply for such engines under this part.

(1) A new or reconstructed stationary RICE located at an area source;"

All reports and notifications required under 40 CFR 60 or 63, Subpart JJJJ, and ZZZZ, respectively shall be submitted to the Compliance Program of the Department's Air and Radiation Administration.

C. <u>Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment</u>. – [COMAR 26.11.09.05E]

"(1) Definitions. For the purpose of this section:

(a) "Idle" means the condition during which the engine is not performing the useful network that enables the piece of equipment to accomplish its designated purpose.

(b) "Internal combustion engine" (hereafter "engine") means all engines except those used for propulsion of ships or vehicles licensed to operate upon the public highway within the State, or engines employed solely for agricultural and recreational purposes unless they are an integral part of a stationary installation.

(2) Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

(3) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

(4) Exceptions:

(a) Section E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

	(b) Section E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods: (i) Engines that are idled continuously when not in service: 30 minutes; (ii) All other engines: 15 minutes. (c) Section E(2) and (3) does not apply while maintenance, repair, or testing is being performed by qualified mechanics."
2.2	**Testing Requirements:** **A. Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). – [40 CFR 60, Subpart JJJJ]** In accordance with 40 CFR § 60.4243(b), "the Permittee must conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance." **B. National Emissions Standards for Hazardous Air Pollutants (NESHAP). – [40 CFR 63, Subpart ZZZZ]** See NSPS requirements. **C. Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment. – [COMAR 26.11.09.05B]** See Monitoring requirements in Section 2.3.C.
2.3	**Monitoring Requirements:** **A. Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). – [40 CFR 60, Subpart JJJJ]** (1) On an annual basis, the Permittee shall monitor the engine exhaust gas for NOx and CO using hand-held instrumentation. **[Reference: COMAR 26.11.03.06C]** (2) The Permittee shall monitor the following parameters for the engine/generator set: (a) total electrical output from the engine; and

	(b) the total hours of operation and reason for operations the engine. **[Reference: COMAR 26.11.03.06C]** (3) The Permittee shall install a non-resettable hour meter. (4) In accordance with the manufacturer's specifications and recommendations, the Permittee shall operate the engine/generator at all times to ensure compliance with the emission limits in Table 1 to Subpart JJJJ of Part 60. The Permittee shall use an air-to-fuel ratio (AFR) controller in a manner that ensures proper operation of the engine and control device in order to minimize emissions at all times. **B. <u>National Emissions Standards for Hazardous Air Pollutants (NESHAP)</u>. – [40 CFR 63, Subpart ZZZZ]** See NSPS requirements. **C. <u>Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment</u>. – [COMAR 26.11.09.05B]** The Permittee shall monitor, and properly operate and maintain, the engines in such a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]**
2.4	**<u>Record Keeping Requirements</u>:** <u>Note</u>: All records must be maintained for a period of 5 years. **[Reference: COMAR 26.11.03.06C(5)(g)]** **A. <u>Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE)</u>. – [40 CFR 60, Subpart JJJJ]** In accordance with 40 CFR §60.4245 (a), the owners or operators of stationary SI ICE must keep records of the information in paragraphs (a) through (d) of this section. (a) All notifications submitted to comply with this subpart and all documentation supporting any notification. (b) Maintenance conducted on the engine. (c) If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90 and 1048.

	(d) If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to § 60.4243(a)(2), documentation that the engine meets the emission standards. The Permittee shall also keep a record of the hours of operation that are recorded through the non-resettable hour meter as well as documentation of the type of operation (e.g., emergency, testing, emergency demand response). **B. <u>National Emissions Standards for Hazardous Air Pollutants (NESHAP)</u>. – [40 CFR 63, Subpart ZZZZ]** See NSPS requirements. **C. <u>Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment</u>. – [COMAR 26.11.09.05B]** The Permittee shall maintain records of any event showing visible emissions originating from the engines and the actions taken to correct such events. **[Reference: COMAR 26.11.03.06C]**
2.5	**<u>Reporting Requirements</u>:** **A. <u>Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE)</u>. – [40 CFR 60, Subpart JJJJ]** The Permittee must comply with applicable federal requirements. In accordance with 40 CFR §60.4245(d), "owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in § 60.4244 within 60 days after the test has been completed." A report including all the analytical data gathered by the Permittee and/or emission testing company must be provided to ARA. **B. <u>National Emissions Standards for Hazardous Air Pollutants (NESHAP)</u>. – [40 CFR 63, Subpart ZZZZ]** See NSPS requirements. **C. <u>Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment</u>. – [COMAR 26.11.09.05B]** The Permittee report incidents of visible emissions and the corrective actions taken in accordance with the Permit Condition 4, Section III, "Report of Excess Emissions and Deviations." **[Reference: COMAR 26.11.01.07]** and **[COMAR 26.11.03.06C(7)]**

Table IV – 3	
3.0	**Emissions Unit Number(s) – EU-04** MDE Reg. No. 9-0369 One (1) horizontal grinder, powered by a 755 bhp diesel-fired internal combustion engine, installed on November 2012.
3.1	**Applicable Standards/Limits:** **A. Control of Visible Emissions** (1) **Control of Visible Emission for grinding process** **[COMAR 26.11.06.02C(2)]** "In Areas III and IV, a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers." **Exception – [COMAR 26.11.06.02A(2)]** "The visible emissions standards in C of this regulation do not apply to emissions during start-up and process modification or adjustments, or occasional cleaning of control equipment, if: (a) The visible emissions are not greater than 40 percent opacity; and (b) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period." **FOR ENGINE ONLY** (2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment** **[COMAR 26.11.09.05E]** (1) "Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity. (2) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity. (3) Exceptions.

	(a) Section E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system. (b) Section E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods: (i) Engines that are idled continuously when not in service: 30 minutes; (ii) All other engines: 15 minutes. (c) Section E(2) and (3) does not apply while maintenance, repair, or testing is being performed by qualified mechanics." **FOR ENGINE ONLY** **B. <u>Control of Sulfur Oxides from Fuel Burning Equipment</u> [COMAR 26.11.09.07A(2)]** "A person may not burn, sell, or make available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds the following limitations: (b) Distillate fuel oils, 0.3 percent;" **C. <u>Operational Limit</u>** (a) The engine, which powers the horizontal grinder, shall operate no more than 2,496 hours for any 12-month rolling period. **[MDE Permit No. 027-00364-9-0369]** (b) The engine shall be a nonroad engine, as defined in 40 CFR §1068.30, unless the Permittee complies with the stationary engine requirements of 40 CFR 60, Subpart III or Subpart JJJJ and 40 CFR 63, Subpart ZZZZ, as applicable, for the engine.
3.2	**<u>Testing Requirements</u>:** **A. <u>Control of Visible Emissions</u>** (1) **<u>Control of Visible Emissions for grinding process</u>** See monitoring requirements. **FOR ENGINE ONLY**

	(2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment** See monitoring requirements. **B. Control of Sulfur Oxides from Fuel Burning Equipment** See monitoring requirements. **C. Operational Limit** See monitoring requirements.
3.3	**Monitoring Requirements:** **A. Control of Visible Emissions** (1) **Control of Visible Emissions for grinding process** The Permittee shall properly operate and maintain the horizontal grinder in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** **FOR ENGINE ONLY** (2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment** The Permittee shall properly operate and maintain engine in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** **B. Control of Sulfur Oxides from Fuel Burning Equipment** The Permittee shall obtain a certification from the fuel supplier indicating that the fuel oil complies with the limitation on sulfur content of the fuel oil. **[Reference: COMAR 26.11.03.06C]** **C. Operational Limit** The Permittee shall monitor the operating hours for the engine that drives the horizontal grinder. **[Reference: PTC-00364-9-0369]**
3.4	**Record Keeping Requirements:** **A. Control of Visible Emissions** (1) **Control of Visible Emissions for grinding process** See reporting requirements. **FOR ENGINE ONLY** (2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment**

	The Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** **B. Control of Sulfur Oxides from Fuel Burning Equipment** The Permittee shall retain annual fuel supplier certifications stating that the fuel oil is in compliance with this regulation must be maintained for at least 5 years. **[Reference: COMAR 26.11.09.07C]** **C. Operational Limit** The Permittee shall maintain records of the operating hours for the engine that drives the horizontal grinder. **[Reference: COMAR 26.11.03.06C]**
3.5	**Reporting Requirements:** **A. Control of Visible Emissions** (1) **Control of Visible Emissions for grinding process** The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations. **FOR ENGINE ONLY** (2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment** The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviation **B. Control of Sulfur Oxides from Fuel Burning Equipment** The Permittee shall report the amount of fuel oil combusted as part of the annual emission certification. **C. Operational Limit** The Permittee shall report the engine operating hours as part of the annual emission certification.

Table IV – 4	
4.0	**<u>Emissions Unit Number(s)</u> – EU-05** MDE Reg. No. 9-0379 One (1) 4,000 gallon above ground gasoline storage tank and a gasoline dispensing facility, installed on May 2015.
4.1	**<u>Applicable Standards/Limits</u>:** **<u>Control of VOCs</u>** **[COMAR 26.11.13.04C] – Small Storage Tanks**. (1) "**Applicability**. This section applies to a person who owns or operates: (a) A gasoline storage tank that has a tank capacity greater than 2,000 gallons but less than 40,000 gallons; or (b) A gasoline tank truck used to transfer gasoline into a storage tank that is listed in Sec. C(1)(a) of this regulation. (2) **Stage I Vapor Recovery**. An owner or operator of a gasoline tank truck or an owner or operator of a stationary storage tank subject to this regulation may not cause or permit gasoline to be loaded into a stationary tank unless the loading system is equipped with a vapor balance line that is properly installed, maintained and used." **[COMAR 26.11.13.04D] – General Standards**. "A person may not cause or permit a gasoline or VOC having a TVP of 1.5 psia (10.3 kilonewtons/square meter) or greater to be loaded into any truck, railroad tank car, or other contrivance unless the: (1) Loading connections on the vapor lines are equipped with fittings that have no leaks and that automatically and immediately close upon disconnection to prevent release of gasoline or VOC from these fittings; and (2) Equipment is maintained and operated in a manner to prevent avoidable liquid leaks during loading and unloading operations."
4.2	**<u>Testing Requirements</u>:** **<u>Control of VOCs</u>**

	See monitoring requirements.
4.3	**<u>Monitoring Requirements</u>:** **<u>Control of VOCs</u>** The Permittee shall monitor the fuel drop to verify that the Stage 1 vapor balance system is used at least once every six (6) months. In addition, at least once every six (6) months during a delivery, the Permittee shall monitor a fuel drop for liquid spills and check the hose fittings and connections for leaks and proper operation. **[Reference: COMAR 26.11.03.06C]**
4.4	**<u>Record Keeping Requirements</u>:** **<u>Control of VOCs</u>** Control of VOC Emissions: The Permittee shall maintain a record of the semi-annual inspection results, gasoline loading and unloading operations for liquid leaks and spills, and that the loading connections are leak tight and automatically close. **[Reference: COMAR 26.11.03.06C]** NOTE: All records must be maintained for a period of 5 years. **[Reference: COMAR 26.11.03.06.C (5)(g)]**
4.5	**<u>Reporting Requirements</u>:** **<u>Control of VOCs</u>** The Permittee shall report incidents of release of volatile organic compounds in accordance with Permit Condition 4, Section III, Plant Wide Condition, “Report of Excess Emissions and Deviations.

TABLE 1 OF SUBPART AAAA OF PART 63.—APPLICABILITY OF NESHAP GENERAL PROVISIONS TO SUBPART AAAA

Part 63 Citation	Description	Explanation
63.1(a)	Applicability: general applicability of NESHAP in this part.	Affected sources are already subject to the provisions of paragraphs (a)(10)–(12) through the same provisions under 40 CFR, part 60 subpart A.
63.1(b)	Applicability determination for stationary sources.	
63.1(e)	Title V permitting.	

Part 63 Citation	Description	Explanation
63.2	Definitions.	
63.4	Prohibited activities and circumvention	Affected sources are already subject to the provisions of paragraph (b) through the same provisions under 40 CFR, part 60 subpart A.
63.5(b)	Requirements for existing, newly constructed, and reconstructed sources.	
63.6(e)	Operation and maintenance requirements, startup, shutdown and malfunction plan provisions.	
63.6(f)	Compliance with nonopacity emission standards .....……	Affected sources are already subject to the provisions of paragraphs (f)(1) and (2)(i) through the same provisions under 40 CFR, part 60 subpart A.
63.10(b)(2)(i)–(b)(2)(v)	General recordkeeping requirements.	
63.10(d)(5)	If actions taken during a startup, shutdown and malfunction plan are consistent with the procedures in the startup, shutdown and malfunction plan, this information shall be included in a semi-annual startup, shutdown and malfunction plan report. Any time an action taken during a startup, shutdown and malfunction plan is not consistent with the startup, shutdown and malfunction plan, the source shall report actions taken within 2 working days after commencing such actions, followed by a letter 7 days after the event.	
63.12(a)	These provisions do not preclude the State from adopting and enforcing any standard, limitation, etc., requiring permits, or requiring emissions reductions in excess of those specified.	

SECTION V INSIGNIFICANT ACTIVITIES

This section provides a list of insignificant emissions units that were reported in the Title V permit application. The applicable Clean Air Act requirements, if any, are listed below the insignificant activity.

(1) No. 2 Fuel burning equipment using gaseous fuels or no. 1 or no. 2 fuel oil, and having a heat input less than 1,000,000 Btu (1.06 gigajoules) per hour;

The two (2) Fuel burning units are subject to the following requirements: one (1) 250,000 BTU/hr oil furnace by Ducane (Model DM25), and one (1) 2 gallons per hour oil furnace by Jackson & Church (Model 0L 280 S23 RH).

[COMAR 26.11.09.05A(2)] – Fuel Burning Equipment.
"In Areas III and IV a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers."

[COMAR 26.11.09.05A(3)] – Exceptions.
"Section A(1) and (2) of this regulation do not apply to emissions during load changing, soot blowing, startup, or adjustments or occasional cleaning of control equipment if:
(a) The visible emissions are not greater than 40 percent opacity; and
(b) The visible emissions do not occur for more than 6 consecutive minutes in any sixty minute period."

(2) No. 7 Stationary internal combustion engines with an output less than 500 brake horsepower (373 kilowatts) and which are not used to generate electricity for sale or for peak or load shaving;

The seven (7) internal combustion engines are subject to the following requirements: one (1) 75 kW diesel powered standby generator by Olympian (Model HX75P1); one (1) 80 kW diesel powered standby generator by Cummins (Model DFSAE-5880030); one (1) 80 kW diesel powered standby generator by Onan (Model 80DGDA); one (1) 105 kW diesel powered standby generator by Generac; one (1) diesel powered trommel screener by McCloskey (Model 516RE); one (1) diesel powered 130 hp trommel screener by Powerscreen; and one (1) 445 hp diesel powered horizontal grinder by Vermeer (Model HG4000)

[COMAR 26.11.09.05E(2)] – Stationary Internal Combustion Engine Powered Equipment.

"(2) Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity."

"(3) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity."

"(4) Exceptions.

(a) Section E(2) of this regulation does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(b) Section E(2) of this regulation does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(i) Engines that are idled continuously when not in service: 30 minutes;

(ii) All other engines: 15 minutes.

(c) Section E(2) and (3) of this regulation do not apply while maintenance, repair, or testing is being performed by qualified mechanics."

Note: Engines listed in this section that are not listed as generators are not subject to National Emission Standards for Hazardous Air Pollutants for Stationary CI Reciprocating Internal Combustion Engines because they are considered non-road engines. At any point in which they can no longer be considered non-road engines, they must meet the requirements in 40 CFR, Subpart 63 for stationary engines.

THESE REQUIREMENTS APPLY TO THE FOLLOWING UNITS:

One (1) 75 kW diesel powered standby generator by Olympian (Model HX75P1); one (1) 80 kW diesel powered standby generator by Cummins (Model DFSAE-5880030); one (1) 80 kW diesel powered standby generator by Onan (Model 80DGDA).

National Emission Standards for Hazardous Air Pollutants
40 CFR, Part 63, Subpart ZZZZ – National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines

1. The Permittee shall comply with the following requirement, except during periods of startup (Table 2 d to Subpart ZZZZ of Part 63—Requirements for Existing Stationary RICE Located at Area Sources of HAP Emissions):

(a) Change the oil and filter every 500 hours of operation or annually, whichever comes first;

(b) Inspect the air cleaner every 1,000 hours of operation or annually, whichever comes first; and replace as necessary; and

(c) Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.
[Reference: 40 CFR §63.6603(a), §63.6625(h), and Table 2d to 40 CFR 63, Subpart ZZZZ]

2. The Permittee must operate and maintain the engine according to the manufacturer's emission-related written instructions or the Permittee must develop their own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. [**Reference: 40 CFR §63.6625(e), §63.6640(a), and Table 6 to 40 CFR 63, Subpart ZZZZ**]

3. The Permittee has the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Table 2d of 40 CFR 63, Subpart ZZZZ. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2d. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5.

   If all of these condemning limits are not exceeded, the Permittee is not required to change the oil. If any of the limits are exceeded, the Permittee must change the oil within 2 business days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the Permittee must change the oil within 2 business days or before commencing operation, whichever is later. The Permittee must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine. **[Reference: 40 CFR §63.6625(i)]**

THESE REQUIREMENTS APPLY TO THE FOLLOWING UNIT:

One (1) 105 kW diesel powered standby generator by Generac

New Source Performance Standards
40 CFR, Part 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

1. The Permittee shall comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.

   [Reference: 40 CFR §60.4205(b)]

2. The Permittee must purchase diesel fuel that meets the requirements of 40 CFR §80.510(b) for nonroad diesel fuel.

   [Reference: 40 CFR §60.4207(b)]

3. The Permittee must install a non-resettable hour meter prior to startup of the engine.

   [Reference: 40 CFR §60.4209(a)]

4. The Permittee must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 over the entire life of the engine.

   [Reference: 40 CFR §60.4206]

5. The Permittee must do all of the following:

   a. Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;

   b. Change only those emission-related settings that are permitted by the manufacturer; and

   c. Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply.

   [Reference: 40 CFR §60.4211(a)]

6. The Permittee must comply with the emission standards of §60.4204(b) or §60.4205(b) by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's emission-related specifications.

   [Reference: 40 CFR §60.4211(c)]

7. The Permittee must operate the emergency stationary ICE according to the following requirements. If you do not operate the engine according to the following requirements, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

   a. There is no time limit on the use of emergency stationary ICE in emergency situations.

   b. You may operate your emergency stationary ICE for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine, for a maximum of 100 hours per calendar year.

   c. Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response. Except as provided in 40 CFR §60.4211(f)(3)(i), the 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.

      [Reference: 40 CFR §60.4211(f)]

(3) Containers, reservoirs, or tanks used exclusively for:

(a) No. 3 Unheated storage of VOC with an initial boiling point of 300 °F (149 °C) or greater;

(b) No. 5 Storage of Numbers 1, 2, 4, 5, and 6 fuel oil and aviation jet engine fuel;

(4) any other emissions unit, not listed in this section, with a potential to emit less than the "de minimus" levels listed in COMAR 26.11.02.10X (list and describe units):

No. 1 Air stripper for groundwater treatment system

(5) any other emissions unit at the facility which is not subject to an applicable requirement of the Clean Air Act (list and describe):

No. 1 Portable Ingersol Rand diesel air compressor, 100 psi

SECTION VI STATE-ONLY ENFORCEABLE CONDITIONS

The Permittee is subject to the following State-only enforceable requirements:

1. Applicable Regulations:

(A) **COMAR 26.11.06.08** – Nuisance.
"An installation or premises may not be operated or maintained in such a manner that a nuisance or air pollution is created. Nothing in this regulation relating to the control of emissions may in any manner be constructed as authorizing or permitting the creation of, or maintenance of, nuisance or air pollution."

(B) **COMAR 26.11.06.09** – Odors.
"A person may not cause or permit the discharge into the atmosphere of gases, vapors, or odors beyond the property line in such a manner that a nuisance or air pollution is created."

(C) **COMAR 26.11.15.05A** – Control Technology Requirement.
"A person may not construct, reconstruct, operate, or cause to be constructed, reconstructed, or operated any new installation or new source that will discharge a toxic air pollutant to the atmosphere without installing and operating T-BACT."

(D) **COMAR 26.11.15.06A** – Ambient Impact Requirement.
(1) "Except as provided in Sec. A(2), of this regulation, a person may not construct, modify, or operate or cause to be constructed, modified, or operated any new installation or source without first demonstrating to the satisfaction of the Department using procedures established in this chapter that total allowable emissions from the premises of each toxic air pollutant discharged by the new installation or source will not unreasonably endanger human health; and

(2) If a new installation or source will discharge a TAP that is not listed in COMAR 26.11.16.07, and will be part of an existing premises, then emissions of that TAP from existing sources or existing installations on the premises may be omitted from a screening analysis unless the TAP is added to COMAR 26.11.16.07."

2. Record Keeping and Reporting:

The Permittee shall submit to the Department, by April 1 of each year during the term of this permit, a written certification of the results of an analysis of emissions of toxic air pollutants from the Permittee's facility during the previous calendar year. The analysis shall include either:

(a) a statement that previously submitted compliance demonstrations for emissions of toxic air pollutants remain valid; or

(b) a revised compliance demonstration, developed in accordance with requirements included under COMAR 26.11.15 & 16, that accounts for changes in operations, analytical methods, emissions determinations, or other factors that have invalidated previous demonstrations.

PART 70 OPERATING PERMIT FACT SHEET
ALPHA RIDGE LANDFILL
2350 MARRIOTTSVILLE ROAD, MARRIOTTSVILLE, MD 21104
PART 70 OPERATING PERMIT NO. 24-027-0364

BACKGROUND

Alpha Ridge Landfill (ARL) is located at 2350 Marriottsville Road, Marriottsville, Maryland and serves Howard County. The landfill is owned and operated by the County. The SIC code for the landfill is 4953. It currently accepts municipal solid waste (MSW) for burial and transfer off-site, yard waste to be processed through a grinder for manufacture of mulch and compost, and recyclables which are shipped offsite for processing. No hazardous, liquids, or infectious waste is accepted for burial. The landfill is comprised of an unlined cell and a lined cell. The unlined cell is closed and located in the northwest portion of the landfill property with an approximate size of 68 acres which opened in 1980 and closed in 1993. In late 1997 and early 1998, a final cover system consisting of a geomembrane on the top area surrounded by a low permeability soil cap around the perimeter was installed. The lined cell is located east of the closed, unlined cell. It began receiving MSW in March 1993 and is currently the active area of the landfill.

The landfill has an existing active landfill gas (LFG) collection system on both the closed, unlined cell and the lined, active cell. The LFG collection system in the closed, unlined cell is comprised of 72 vertical extraction wells, 4 perimeter leachate trench tie-ins, and 3 horizontal collectors. The active cell has 13 vertical extraction wells and 3 leachate manhole tie-ins on the east side of the cell. The LFG collection system from both cells is connected to a header pipe that conveys collected LFG to a blower/flare station. Upon exiting the blower, the LFG is delivered to a flare. On June 2012, the County installed one (1) 1,059 kW LFG fired reciprocating internal combustion engine (GE Jenbacher) to generate electricity. The most recent stack test for this unit was performed on September 20, 2018. Test results showed that the internal combustion engine is in compliance with the required emission limits stated in the permit. The next stack testing is tentatively scheduled for March 2020. Due to the installation and operation of the internal combustion engine, the original onsite flare was physically modified and its capacity was turned down from 2,230 standard cubic feet per minute (scfm) of LFG to 800 cfm to accommodate for the lower amount of LFG needing flaring.

Additional emission units at the site include one (1) horizontal grinder powered by a 755 bhp diesel internal combustion engine and a gasoline dispensing facility with one (1) 4,000 gallon above ground gasoline storage tank.

The current Title V permit for Alpha Ridge expired on April 30, 2020 and has been administratively extended during the coronavirus pandemic. The Department received a Part 70 renewal permit application for Alpha Ridge Landfill which was logged in on May 2, 2019. An administrative completeness review was conducted and the application was deemed to be complete. The completeness determination letter was sent on June 13, 2019 granting the facility an application shield.

Howard County conducted a sampling procedure to determine site-specific non-methane organic compounds (NMOC) concentration and to estimate NMOC emissions (Tier II testing). The applicant is required under COMAR 26.11.19.20E to retest the site-specific NMOC concentration every 5 years. The most recent site-specific Tier II testing was conducted on June 14, 2018 with a resulting average NMOC concentration of 18.1 ppmv as hexane. At this concentration, the NMOC emissions were calculated to be .7389 Mg for the year 2019.

As of July 2018 test date, Tier 2 analysis demonstrated that NMOC emission rates are and will be less than the 55-ton per year (50 Mg) threshold for the next 5 years. When NMOC emissions are calculated to be at 55 ton (50 Mg) per year or greater, the installation of collection and control systems at the landfill would be required in accordance with COMAR 26.11.19.20G(1). Although not required by regulation, the Permittee voluntarily installed a landfill gas collection system and now burns LFG through an internal combustion engine for electricity generation or combusts it through a flare.

A landfill is automatically subject to Part 70 operating permit requirements, if it has a design capacity of at least 2.5 million megagrams (2.75 million tons), regardless of whether or not it is a major stationary source. ARL has a design capacity which is greater than the 2.75 million tons threshold, making it subject to the Title V permitting requirements. The refuse-in-place as of 2019 is 3,021,849 tons.

The U.S. EPA published in the Federal Register on March 12, 1996 the New Source Performance Standards (NSPS) for new or recently modified municipal solid waste (MSW) landfills under 40 CFR 60 Subpart WWW, as amended on June 16, 1998. A MSW landfill with a design capacity of 2.5 million megagrams or more is affected by the NSPS if it is a new MSW landfill, or if it is an existing MSW landfill that has been modified or reconstructed on or after May 30, 1991. Otherwise, Emissions Guidelines apply if it is an existing MSW landfill that has accepted waste since November 8, 1987 or that has capacity available for future. At this time, ARL is subject to state regulations approved in accordance with Emission Guidelines regulations under 40 CFR 60, Subpart Cc.

The following Tables 1 and 2 summarize the actual emissions from the Alpha Ridge Landfill based on its Annual Emission Certification Reports:

Table 1: Actual Emissions

Year	NOx (TPY)	SOx (TPY)	PM10 (TPY)	CO (TPY)	VOC (TPY)
2018	4.9	0.4	0.4	21.8	0.9
2017	5.6	0.6	0.5	31.2	4.1
2016	7.3	0.7	0.6	25.6	4.0
2015	9.1	0.6	0.6	28.9	2.4
2014	11.7	0.7	0.7	40.7	2.5

Table 2: Summary of projected NMOC generation rates*

Year	NMOC (Mg/yr)
2020	0.7136
2021	0.6896
2022	0.6668
2023	0.6450

* NMOC emissions are reported in the Title V application using measured NMOC concentration values from Tier 2 report in the LANDGEM model

PERMIT CHANGES

The current Title V permit has been modified to remove emissions unit 2 (EU-02), which covered roadways and earthmoving activities within the landfill premises. The Permittee requested this modification and stated its reasons which are summarized in Section 3C of the current Title V permit application. As stated in Section 3C, the landfill currently receives significantly less waste when compared to the disposal rates stated in previous renewal cycles. Therefore, the reduction in disposal rates significantly reduced fugitive emissions from roadways and earthmoving activities. In addition, the Permittee stated several additional reasons to support this request as summarized: Some roads that were previously gravel are now paved, and the current estimate of distance traveled on unpaved roads is 317 miles, down from 10,600 miles. Other landfills in Maryland are not subject to this requirement, and the county code already requires that inspections to ensure compliance with dust emissions are conducted quarterly. Furthermore, COMAR 26.11.06.03D provides the Department with the authority to regulate dust emissions generated at a regulated facility without the need of issuing specific emission unit number.

MACT

EPA promulgated national emission standards for hazardous air pollutants for existing and new municipal solid waste (MSW) landfills- 40 CFR Part 63- Subpart AAAA. Alpha Ridge Landfill is subject to these MACT requirements because it is a MSW landfill that has accepted waste since November 8, 1987 and is an area source landfill that has a design capacity equal to or greater than 2.5 million cubic meters that was not permanently closed as of January 16, 2003. Alpha Ridge Landfill must comply with the MACT requirements when the facility's NMOC emissions exceed 50 Mg/year. Projected emissions through 2023 will be less than 1 Mg/yr.

CAM Analysis

Compliance Assurance Monitoring (CAM) applies to any emission unit at a Title V source that meets the following criteria:

- The emission unit is subject to a federally enforceable emission limit or standard for a regulated pollutant;

- The emission unit uses a control device to achieve compliance with any such emission limitation;

- The emission unit has the potential to emit pre-control device emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount , in tons per year required for a source to be classified as a major source and must not otherwise be exempt from CAM.

Alpha Ridge Landfill is not a major source of air pollutants, but it has a design capacity which is greater than the 2.75 million tons threshold, making it subject to the Title V permitting requirements. However, the ARL voluntarily installed a LFG control system to capture methane emissions produced through waste decomposition. The landfill itself is not subject to limitations on the emissions of particulates, sulfur oxides, nitrogen oxides, or VOCs. In addition, potential uncontrolled emission levels are well below the major threshold.

The ARL maintains a flare, an internal combustion engine, a horizontal grinder, and a gasoline tank at the premises. These emission units are subject to limitations on the emissions of particulate, sulfur oxides, nitrogen oxides, and/or VOC; however there are no control devices employed to control particulate, sulfur oxides, nitrogen oxides, or VOC. CAM requirements, therefore, are not applicable to these units.

GREENHOUSE GAS (GHG) EMISSION STATEMENT

Alpha Ridge Landfill emits the following greenhouse gases (GHGs) related to Clean Air Act requirements: carbon dioxide and methane. These GHGs originate from various processes (i.e., waste decomposition and landfill gas fugitives) contained within the facility premises applicable to ARL. The facility has not triggered Prevention of Significant Deterioration (PSD) requirements for GHG emissions; therefore, there are no applicable GHG Clean Air Act requirements.

GHG emissions were based on emission estimates using default data entered in the US EPA LandGEM model, version 3.02 (see Table 3 shown below). Future emission certifications will show more accurate levels once site specific data are gathered in the future years. Furthermore, the Permittee shall quantify facility wide GHG emissions and report them in accordance with Section 3 of the Part 70 permit.

The following Table 3 summarizes the actual emissions from ARL based on emission estimates using the LandGEM model and information submitted in the Part 70 Permit Application:

Table 3: Greenhouse Gases Emissions Summary (Year 2018)

GHG	Conversion factor	2018 tpy CO_{2eq}
Carbon dioxide, CO_2	1	9,496
Methane, CH_4	25	37,150
Nitrous Oxide, N_2O	298	11.92
Total GHG, CO_{2e}		46,658

Note: N_2O, HFCs, PFCs, and SF_6 emissions from fugitive LFG are not quantified due to the absence of AP-42 emission factors.

EMISSION UNIT IDENTIFICATION

The following emission units have been identified at Alpha Ridge Landfill, as requirements:

Table 4: Emission Unit Identification

Emissions Unit Number	MDE Registration Number	Emissions Unit Description	Date of Registration
EU-01	9-0205	MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm.	Began receiving waste 1980.
EU-03	9-0364	One (1) 1,059 kW LFG fired reciprocating internal combustion engine (GE Jenbacher) to generate electricity.	June 2012
EU-04	9-0369	One (1) horizontal grinder, powered by a 755 bhp diesel-fired internal combustion engine.	November 2012
EU-05	9-0379	One (1) 4,000 gallon above-ground gasoline storage tank and a gasoline dispensing facility.	May 2015

AN OVERVIEW OF THE PART 70 PERMIT

Section I of the Part 70 Permit contains a brief description of the facility and an inventory list of the emissions units for which applicable requirements are identified in Section IV of the permit.

Section II of the Part 70 Permit contains the general requirements that relate to administrative permit actions. This section includes the procedures for renewing, amending, reopening, and transferring permits, the relationship to permits to construct and approvals, and the general duty to provide information and to comply with all applicable requirements.

Section III of the Part 70 Permit contains the general requirements for testing, record keeping and reporting; and requirements that affect the facility as a whole, such as open burning, air pollution episodes, particulate matter from construction and demolition activities, asbestos provisions, ozone depleting substance provisions, general conformity, and acid rain permit. This section includes the requirement to report excess emissions and deviations, to submit an annual emissions certification report and an annual compliance certification report, and results of sampling and testing.

Section IV of the Part 70 Permit identifies the emissions standards, emissions limitations, operational limitations, and work practices applicable to each emissions unit located at the facility. For each standard, limitation, and work practice, the permit identifies the basis upon which the Permittee will demonstrate compliance. The basis will include testing, monitoring, record keeping, and reporting requirements. The demonstration may include one or more of these methods.

Section V of the Part 70 Permit contains a list of insignificant activities. These activities emit very small quantities of regulated air pollutants and do not require a permit to construct or registration with the Department. For insignificant activities that are subject to a requirement under the Clean Air Act, the requirement is listed under the activity.

Section VI of the Part 70 Permit contains State-only enforceable requirements. Section VI identifies requirements that are not based on the Clean Air Act, but solely on Maryland air pollution regulations. These requirements generally relate to the prevention of nuisances and implementation of Maryland's Air Toxics Program.

REGULATORY AND TECHNICAL REVIEW/COMPLIANCE METHODOLOGY

Emission Unit: EU-01 Table IV-1

MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm. (**MDE Registration No. 9-0205)**

Applicable Standards and Limits

Alpha Ridge Landfill is subject to the testing, record keeping, and reporting requirements indicated below.

Compliance Demonstration

"If the resulting NMOC mass emission rate is less than 50 megagrams per year, the owner or operator shall submit a periodic estimate of the emission rate report as provided in §60.757(b)(1) and retest the site-specific NMOC concentration every 5 years using the methods specified in this section." **[Reference: COMAR 26.11.19.20D3(a)]**

The Permittee shall monitor the operating hours for the flaring system, the operating temperature for the flaring system, and the total landfill gas flow rate as part of the annual emission certification. **[Reference: MDE Reg. No. 9-0205]** As part of the record keeping requirements, the Permittee shall keep all the records required under this permit for at least five years and shall make such records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]**

If the Permittee increases the maximum design capacity of the Alpha Ridge Landfill after November 1, 1997, the Permittee shall amend and resubmit the design capacity report within 90 days of the issuance of an air quality Permit to Construct or a permit from the MDE Land and Materials Administration that authorizes the increase or any other change that increases the maximum design capacity of the landfill. **[Reference: COMAR 26.11.19.20D(2)]**

The Permittee shall estimate the annual NMOC emission rate calculated using the formula and procedures as described in 40 CFR §60.754(a). The Permittee shall prepare and submit an updated NMOC emission rate report by November 1 of each year. A less frequent emission rate report may be submitted upon approval by the Department in accordance with COMAR 26.11.19.20D(6). **[Reference: COMAR 26.11.19.20D(3)(a) & COMAR 26.11.19.20D(6)]**

The Permittee may, upon approval by the Department, submit a combined report to satisfy the NMOC reporting requirements and the annual Emissions Certification requirements. Such report shall be submitted by April 1 of each year for the previous calendar year. **[Reference: COMAR 26.11.19.20D(7)]**

Emission Unit: EU-01 Table IV-1A

MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm. (**MDE Registration No. 9-0205)**

Applicable Standards and Limits

A. **Control of Visible Emissions**

COMAR 26.11.06.02C(2) – Visible Emission Standards.
"In Areas III and IV a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers."

COMAR 26.11.06.02A(2) – General Exceptions.
The visible emissions standards in §C of this regulation do not apply to emissions during start-up and process modifications or adjustments, or occasional cleaning of control equipment, if:
(a) The visible emissions are not greater than 40 percent opacity; and
(b) The visible emissions do not occur for more than 6 consecutive minutes in any 60-minute period."

Compliance Demonstration
As part of the monitoring requirements, the Permittee shall properly operate and maintain the flare in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** The Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

B. **Control of Particulate Matter**

COMAR 26.11.06.03B(2)(a) – **Particulate Matter from Confined Sources**
"A person may not cause or permit to be discharged into the outdoor atmosphere from any other installation, particulate matter in excess of 0.03 gr/SCFD (68.7 mg/dscm)."

Compliance Demonstration
The Permittee shall perform preventive maintenance on the flare once per month or as recommended by the equipment manufacturer. The Permittee shall maintain a log of maintenance performed on the flare and make the logs available to the Department upon request.

C. **Operational Standards**

The Permittee shall operate and maintain the flare system in accordance with the manufacturer's recommendations. **[MDE Reg. No. 9-0205]**

Compliance Demonstration
The Permittee shall continuously monitor the landfill gas flow rate and the flare combustion temperature. The Permittee shall conduct regular monitoring at least once per week of the blower and flare system to ensure proper operation of the landfill gas extraction system. The Permittee shall maintain records of the landfill gas flow rate and flare combustion temperature results of the weekly monitoring of the blower and flare system. The Permittee shall make records available to the Department upon request.

The Alpha Ridge Landfill will be subject to the following requirements, if calculated NMOC emissions increase to 55 tons per year or more:

1B.MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm. **[MDE Registration No. 9-0205]**

Applicable Standards/Limits:

Subpart AAAA – National Emission Standard for Hazardous Air Pollutants: Municipal Solid Waste Landfills.

Applicability
"You are subject to this subpart if you own or operate a MSW landfill that has accepted since November 8, 1987 or has additional capacity for waste disposition and meets any one of the three criteria in paragraphs (a)(1) through (3) of this section: (3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m^3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan that applies to your landfill." **[Reference: 40 CFR §63.1935(a)(3)]**

"If your landfill is an existing affected source and is an area source meeting the criteria in §63.1935(a)(3), you must comply with the requirements in §§63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or EPA approved and effective State or tribal plan that applies to your landfill or by January 16, 2004, whichever occurs later." **[Reference: 40 CFR §63.1945(f)]**

Standards

"If you are required by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan to install a collection and control system, you must comply with the requirements in §§63.1960 through 63.1985 and with the general provisions of this part specified in table 1 of this subpart." **[Reference: 40 CFR §63.1955(b)]**

General and Continuing Compliance Requirements

"Compliance is determined in the same way it is determined for 40 CFR Part 60, subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, 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. If a deviation occurs, you have failed to meet the control device operating conditions described in this subpart and have deviated from the requirements of this subpart. Finally, you must develop and implement a written SSM plan according to the provisions in 40 CFR 63.6(e)(3). A copy of the SSM plan must be maintained on site. Failure to write, implement, or maintain a copy of the SSM plan is a deviation from the requirements of this subpart." **[Reference: 40 CFR §63.1960]**

Compliance Demonstration

"Keep records and reports as specified in 40 CFR Part 60, Subpart WWW, or in the Federal plan, EPA approved State plan or tribal plan that implements 40 CFR Part 60, Subpart Cc, whichever applies to your landfill, with one exception: You must submit the annual report described in 40 CFR 60.757(f) every 6 months." **[Reference: 40 CFR §63.1980(a)]**

"You must also keep records and reports as specified in the general provisions of 40 CFR Part 60 and this part as shown in Table 1 of this subpart. Applicable records in the general provisions include items such as SSM plans and the SSM plan reports." **[Reference: 40 CFR §63.1980(b)]**

Emission Unit: EU-03

One (1) 1,059 kW LFG fired reciprocating internal combustion engine (GE Jenbacher) to generate electricity, manufactured on April 28, 2011 and installed in June 2012. **[MDE Reg. No. 9-0364]**

Applicable Standards and Limits

A. Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE) – [40 CFR 60, Subpart JJJJ]

All applicable terms, provisions, emissions standards, testing, monitoring, record keeping, and reporting requirements included in federal New Source Performance Standards (NSPS) promulgated under 40 CFR 60, Subparts A and Subpart JJJJ for Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE), Section 60.4233, including the following:

Section e: "Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011, that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the CO certification (not field testing) standard for which the engine was certified."

A summary of the EPA emission standards for this engine is shown in Table 1 of this preamble."

Excerpt from Table 1 to Subpart JJJJ of Part 60 "NOx, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥ 100 HP (except gasoline and rich burn LPG), stationary SI landfill/digester gas engines, and stationary emergency engines > 25 HP.

			Emission standards (g/HP-hr)		
Engine type & fuel	Maximum Engine Power	Manufacture Date	NOx	CO	VOC
Landfill/Digester Gas (except lean burn 500≥ 130 < 1,350)	HP≥ 500	Dec 14, 2010	2.0	5.0	1.0

The Permittee shall meet the emission limits shown in Table 1, 40 CFR 60 Subpart JJJJ, over the entire life of the engine.

Compliance Demonstration

To comply with the testing requirements, the Permittee must conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, in accordance with 40 CFR § 60.4243(b). Testing will be performed to demonstrate compliance with the air pollutant concentration or emission standards listed in Section 1.1.A, of the Table 1 to Subpart JJJJ of Part 60, "Standards of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE)." In addition, the Permittee shall monitor the total electrical output from the engine/generator; and the total hours of operation from the engine/generator. To comply with the Record Keeping Requirements, the Permittee shall use the methods and procedures specified in §60.4245, in paragraphs (a) through (d). **[Reference: 40 CFR 60.4245]**. To comply with Reporting requirements, the Permittee shall follow the procedures listed in permit Section 1.5.A., "Reporting Requirements, Standards for Air Emissions." **[Reference: 40 CFR 60.4245(c) & (d)]**

B. National Emissions Standards for Hazardous Air Pollutants (NESHAP). – [40 CFR 63, Subpart ZZZZ]

§ 63.6585 Am I subject to this subpart?

"You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.
(a) …. (c) An area source of HAP emissions is a source that is not a major source."

§ 63.6590 What parts of my plant does this subpart cover?

This subpart applies to each affected source.

Section c: Stationary RICE subject to Regulations under 40 CFR Part 60.
"An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of **40 CFR part 60 subpart IIII, for compression ignition engines or 40 CFR part 60 subpart JJJJ, for spark ignition engines**. No further requirements apply for such engines under this part.
(1) A new or reconstructed stationary RICE located at an area source;"

All reports and notifications required under 40 CFR 60 or 63, Subpart JJJJ, and ZZZZ, respectively shall be submitted to the Compliance Program of the Department's Air and Radiation Administration.

Compliance Demonstration
See NSPS Requirements.

C. Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment. – [COMAR 26.11.09.05E]

"(1) Definitions. For the purpose of this section:
(a) "Idle" means the condition during which the engine is not performing the useful network that enables the piece of equipment to accomplish its designated purpose.

(b) "Internal combustion engine" (hereafter "engine") means all engines except those used for propulsion of ships or vehicles licensed to operate upon the public highway within the State, or engines employed solely for agricultural and recreational purposes unless they are an integral part of a stationary installation.

(2) Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

(3) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

(4) Exceptions:

(a) Section E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(b) Section E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(i) Engines that are idled continuously when not in service: 30 minutes;

(ii) All other engines: 15 minutes.

(c) Section E(2) and (3) does not apply while maintenance, repair, or testing is being performed by qualified mechanics."

Compliance Demonstration

To comply with the monitoring requirements, the Permittee shall monitor, and properly operate and maintain the engines in such a manner as to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** The Permittee shall maintain records of any event showing visible emissions originating from the engines, and the actions taken to correct such events. **[Reference: COMAR 26.11.03.06C]** To comply with the Record Keeping, and the Reporting Requirements, the Permittee shall use the methods and procedures as stated in Sections 1.4.A, and 1.5.A. **[Reference: 40 CFR 60.4245(c) & (d)]**. The Permittee reports incidents of visible emissions and the corrective actions taken in accordance with the Permit Condition 4, Section III, "Report of Excess Emissions and Deviations." **[Reference: COMAR 26.11.01.07]** and **[COMAR 26.11.03.06C(7)]**.

Emission Unit: **EU-04**

One (1) horizontal grinder, powered by a 755 bhp diesel-fired internal combustion engine, installed on November 2012. **[MDE Reg. No. 9-0369]**

The engine serving the horizontal grinder falls under the definition of "nonroad" internal combustion engine. The U.S. EPA defined a "stationary" internal combustion engine, as an engine that does not meet the definition of a "nonroad" engine. Nonroad engines are not subject to federal NSPS requirements under 40 CFR 60, Subpart IIII or Subpart JJJJ or federal NESAHP requirements under 40 CFR 63, Subpart ZZZZ.

The U.S. EPA defines a "nonroad" internal combustion engine in 40 CFR §1068.30, as an internal combustion engine that meets any of the following criteria:

(i) It is (or will be) used in or on a piece of equipment that is self-propelled or serves a dual purpose by both propelling itself and performing another function (such as garden tractors, off-highway mobile cranes and bulldozers).

(ii) It is (or will be) used in or on a piece of equipment that is intended to be propelled while performing its function (such as lawnmowers and string trimmers).

(iii) By itself or in or on a piece of equipment, it is portable or transportable, meaning designed to be and capable of being carried or moved from one location to another. Indicia of transportability include, but are not limited to, wheels, skids, carrying handles, dolly, trailer, or platform.

Applicable Standards/Limits:

A. Control of Visible Emissions

(1) **Control of Visible Emission for grinding process**
[COMAR 26.11.06.02C(2)]
"In Areas III and IV, a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers."

Exception – [COMAR 26.11.06.02A(2)]
"The visible emissions standards in C of this regulation do not apply to emissions during start-up and process modification or adjustments, or occasional cleaning of control equipment, if: (a) The visible emissions are not greater than 40 percent opacity; and (b) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period."

Compliance Demonstration
As part of the monitoring requirements, the Permittee shall properly operate and maintain the horizontal grinder in a manner to minimize visible emissions. **[Reference: COMAR 26.11.06.02C(2)]** As part of the reporting requirements, the Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

FOR ENGINE ONLY

(2) **Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment**
[COMAR 26.11.09.05E]

(1) "Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

(2) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

(3) Exceptions.

(a) Section E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(b) Section E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(i) Engines that are idled continuously when not in service: 30 minutes;
(ii) All other engines: 15 minutes.

(c) Section E(2) and (3) does not apply while maintenance, repair, or testing is being performed by qualified mechanics."

Compliance Demonstration
FOR THE GRINDER ONLY
As part of the monitoring requirements, the Permittee shall properly operate and maintain the horizontal grinder in a manner to minimize visible emissions. **[Reference: COMAR 26.11.03.06C]** As part of the reporting requirements, the Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

FOR THE ENGINE ONLY
As part of the monitoring requirements, the Permittee shall properly operate and maintain engine in a manner to minimize visible emissions. **[Reference: COMAR 26.11.09.05B]** As part of the recordkeeping requirements, the Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. **[Reference: COMAR 26.11.03.06C]** As part of the reporting requirements, the Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

FOR ENGINE ONLY

B. Control of Sulfur Oxides from Fuel Burning Equipment [COMAR 26.11.09.07A(1)]

"A person may not burn, sell, or make available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds the following limitations:

(c) Distillate fuel oils, 0.3 percent;"

Compliance Demonstration
As part of the monitoring requirements, the Permittee shall obtain a certification from the fuel supplier indicating that the fuel oil complies with the limitation on sulfur content of the fuel oil. **[Reference: COMAR 26.11.03.06C]** As part of the record keeping requirements, the Permittee shall retain annual fuel supplier certifications stating that the fuel oil is in compliance with this regulation must be maintained for at least 5 years. **[Reference: COMAR 26.11.09.07C]** As part of the reporting requirements, the Permittee shall report the amount of fuel oil combusted as part of the annual emission certification.

C. Operational Limit

The engine, which powers the horizontal grinder, shall operate no more than 2,496 hours for any 12-month rolling period.
[MDE Permit No. 027-0364-9-0369]

Compliance Demonstration
As part of the monitoring requirements, the Permittee shall monitor the operating hours for the engine that drives the horizontal grinder. **[Reference: PTC-00364-9-0369]** The Permittee shall maintain records of the operating hours for the engine that drives the horizontal grinder. **[Reference: COMAR 26.11.03.06C]** The Permittee shall report the engine operating hours as part of the annual emission certification.

Emission Unit: **EU-05**

One (1) 4,000 gallon above ground gasoline storage tank and a gasoline dispensing facility to be installed in May 2015. **[MDE Reg. No. 9-0379]**

Applicable Standards/Limits:

Control of Volatile Organic Compounds

[COMAR 26.11.13.04C] – Small Storage Tanks.

(1) "**Applicability**. This section applies to a person who owns or operates:
(a) A gasoline storage tank that has a tank capacity greater than 2,000 gallons but less than 40,000 gallons; or
(b) A gasoline tank truck used to transfer gasoline into a storage tank that is listed in Sec. C(1)(a) of this regulation.

(2) **Stage I Vapor Recovery**. An owner or operator of a gasoline tank truck or an owner or operator of a stationary storage tank subject to this regulation may not cause or permit gasoline to be loaded into a stationary tank unless the loading system is equipped with a vapor balance line that is properly installed, maintained and used."

[COMAR 26.11.13.04D] – General Standards.

"A person may not cause or permit a gasoline or VOC having a TVP of 1.5 psia (10.3 kilonewtons/square meter) or greater to be loaded into any truck, railroad tank car, or other contrivance unless the:

(1) Loading connections on the vapor lines are equipped with fittings that have no leaks and that automatically and immediately close upon disconnection to prevent release of gasoline or VOC from these fittings; and

(2) Equipment is maintained and operated in a manner to prevent avoidable liquid leaks during loading and unloading operations."

Compliance Demonstration
The Permittee shall monitor the fuel drop to verify that the Stage 1 vapor balance system is used at least once every six (6) months. In addition, at least once every six (6) months during a delivery, the Permittee shall monitor a fuel drop for liquid spills and check the hose fittings and connections for leaks and proper operation. **[Reference: COMAR 26.11.03.06C]** The Permittee shall maintain a record of the semi-annual inspection results, gasoline loading and unloading operations for liquid leaks and spills, and that the loading connections are leak tight and automatically close. **[Reference: COMAR 26.11.03.06C]** All records must be maintained for a period of 5 years. **[Reference: COMAR 26.11.03.06.C (5)(g)]** The Permittee shall report incidents of release of volatile organic compounds in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

COMPLIANCE SCHEDULE

The Alpha Ridge Landfill is currently in compliance with all applicable air quality regulations.

TITLE IV - ACID RAIN

The Acid Rain Program does not apply to Alpha Ridge Landfill.

TITLE VI - OZONE DEPLETING SUBSTANCES

The facility is currently complying with the applicable federal requirements in 40 CFR 82, 82.34(a); 82.42(a)(1); 82.42(b)(1), (2).

SECTION 112 (r) - ACCIDENTAL RELEASE

The facility is not subject to the requirements of Section 112 (r) of the Clean Air Act.

PERMIT SHIELD

Alpha Ridge Landfill did not request a permit shield in the application.

INSIGNIFICANT ACTIVITIES

This section provides a list of insignificant emissions units that were reported in the Title V permit application. The applicable Clean Air Act requirements, if any, are listed below the insignificant activity.

(1) No. 2 Fuel burning equipment using gaseous fuels or no. 1 or no. 2 fuel oil, and having a heat input less than 1,000,000 Btu (1.06 gigajoules) per hour;

The two (2) Fuel burning units are subject to the following requirements: one (1) 250,000 BTU/hr oil furnace by Ducane (Model DM25), and one (1) 2 gallons per hour oil furnace by Jackson & Church (Model 0L 280 S23 RH).

[COMAR 26.11.09.05A(1)] – Fuel Burning Equipment.
"In Areas III and IV a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers."

[COMAR 26.11.09.05A(3)] – Exceptions.
"Section A(1) and (2) of this regulation do not apply to emissions during load changing, soot blowing, startup, or adjustments or occasional cleaning of control equipment if:
(a) The visible emissions are not greater than 40 percent opacity; and
(b) The visible emissions do not occur for more than 6 consecutive minutes in any sixty minute period."

(2) No. 7 Stationary internal combustion engines with an output less than 500 brake horsepower (373 kilowatts) and which are not used to generate electricity for sale or for peak or load shaving;

The seven (7) internal combustion engines are subject to the following requirements: one (1) 75 kW diesel powered standby generator by Olympian (Model HX75P1); one (1) 80 kW diesel powered standby generator by Cummins (Model DFSAE-5880030); one (1) 80 kW diesel powered standby generator by Onan (Model 80DGDA); one (1) 105 kW diesel powered standby generator by Generac; one (1) diesel powered trommel screener by McCloskey (Model 516RE); one (1) diesel powered 130 hp trommel screener by Powerscreen; and one (1) 445 hp diesel powered horizontal grinder by Vermeer (Model HG4000).

[COMAR 26.11.09.05E(2)] – Stationary Internal Combustion Engine Powered Equipment.

"(2) Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity."

"(3) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity."

"(4) Exceptions.

(a) Section E(2) of this regulation does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(b) Section E(2) of this regulation does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(i) Engines that are idled continuously when not in service: 30 minutes;

(ii) All other engines: 15 minutes.

(c) Section E(2) and (3) of this regulation do not apply while maintenance, repair, or testing is being performed by qualified mechanics."

THESE REQUIREMENTS APPLY TO THE FOLLOWING UNITS:
one (1) 75 kW diesel powered standby generator by Olympian (Model HX75P1); one (1) 80 kW diesel powered standby generator by Cummins (Model DFSAE-5880030); one (1) 80 kW diesel powered standby generator by Onan (Model 80DGDA).

National Emission Standards for Hazardous Air Pollutants
40 CFR, Subpart 63 – Emergency Stationary CI Reciprocating Internal Combustion Engines.

1. The Permittee shall comply with the following requirement, except during periods of startup (Table 2 d to Subpart ZZZZ of Part 63—Requirements for Existing Stationary RICE Located at Area Sources of HAP Emissions):
   (a) Change the oil and filter every 500 hours of operation or annually, whichever comes first;

   (b) Inspect the air cleaner every 1,000 hours of operation or annually, whichever comes first; and replace as necessary; and

   (c) Inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.
   [Reference: 40 CFR §63.6603(a), §63.6625(h), and Table 2d to 40 CFR 63, Subpart ZZZZ]

2. The Permittee must operate and maintain the engine according to the manufacturer's emission-related written instructions or the Permittee must develop their own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions. **[Reference: 40 CFR §63.6625(e), §63.6640(a), and Table 6 to 40 CFR 63, Subpart ZZZZ]**

3. The Permittee has the option of utilizing an oil analysis program in order to extend the specified oil change requirement in Table 2d of 40 CFR 63, Subpart ZZZZ. The oil analysis must be performed at the same frequency specified for changing the oil in Table 2d. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5.

If all of these condemning limits are not exceeded, the Permittee is not required to change the oil. If any of the limits are exceeded, the Permittee must change the oil within 2 business days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the Permittee must change the oil within 2 business days or before commencing operation, whichever is later. The Permittee must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine. **[Reference: 40 CFR §63.6625(i)]**

THESE REQUIREMENTS APPLY TO THE FOLLOWING UNIT:

One (1) 105 kW diesel powered standby generator by Generac

New Source Performance Standards
40 CFR, Part 60, Subpart IIII – Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

1. The Permittee shall comply with the emission standards for new nonroad CI engines in §60.4202, for all pollutants, for the same model year and maximum engine power for their 2007 model year and later emergency stationary CI ICE.
   [Reference: 40 CFR §60.4205(b)]

2. The Permittee must purchase diesel fuel that meets the requirements of 40 CFR §80.510(b) for nonroad diesel fuel.
   [Reference: 40 CFR §60.4207(b)]

3. The Permittee must install a non-resettable hour meter prior to startup of the engine.
   [Reference: 40 CFR §60.4209(a)]

4. The Permittee must operate and maintain stationary CI ICE that achieve the emission standards as required in §§60.4204 and 60.4205 over the entire life of the engine.
   [Reference: 40 CFR §60.4206]

5. The Permittee must do all of the following:

   (a) Operate and maintain the stationary CI internal combustion engine and control device according to the manufacturer's emission-related written instructions;

(b) Change only those emission-related settings that are permitted by the manufacturer; and

(c) Meet the requirements of 40 CFR parts 89, 94 and/or 1068, as they apply. **[Reference: 40 CFR §60.4211(a)]**

6. The Permittee must comply with the emission standards of §60.4204(b) or §60.4205(b) by purchasing an engine certified to the emission standards in §60.4204(b), or §60.4205(b) as applicable, for the same model year and maximum engine power. The engine must be installed and configured according to the manufacturer's emission-related specifications.

   [Reference: 40 CFR §60.4211(c)]

7. The Permittee must operate the emergency stationary ICE according to the following requirements. If you do not operate the engine according to the following requirements, the engine will not be considered an emergency engine under this subpart and must meet all requirements for non-emergency engines.

   (a) There is no time limit on the use of emergency stationary ICE in emergency situations.

   (b) You may operate your emergency stationary ICE for maintenance checks and readiness testing, provided that the tests are recommended by federal, state or local government, the manufacturer, the vendor, the regional transmission organization or equivalent balancing authority and transmission operator, or the insurance company associated with the engine, for a maximum of 100 hours per calendar year.

   (c) Emergency stationary ICE may be operated for up to 50 hours per calendar year in non-emergency situations. The 50 hours of operation in non-emergency situations are counted as part of the 100 hours per calendar year for maintenance and testing and emergency demand response. Except as provided in 40 CFR §60.4211(f)(3)(i), the 50 hours per calendar year for non-emergency situations cannot be used for peak shaving or non-emergency demand response, or to generate income for a facility to an electric grid or otherwise supply power as part of a financial arrangement with another entity.
   [Reference: 40 CFR §60.4211(f)]

(3) Containers, reservoirs, or tanks used exclusively for:

(a) No. 3 Unheated storage of VOC with an initial boiling point of 300 °F (149 °C) or greater

(b) No. 5 Storage of Numbers 1, 2, 4, 5, and 6 fuel oil and aviation jet engine fuel

(4) any other emissions unit, not listed in this section, with a potential to emit less than the "de minimus" levels listed in COMAR 26.11.02.10X (list and describe units):

No. 1 Air stripper for groundwater treatment system

(5) any other emissions unit at the facility which is not subject to an applicable requirement of the Clean Air Act (list and describe):

No. 1 Portable Ingersol Rand diesel air compressor, 100 psi

STATE-ONLY ENFORCEABLE CONDITIONS

The Permittee is subject to the following State-only enforceable requirements:

1. Applicable Regulations:

(A) **COMAR 26.11.06.08** – Nuisance.
"An installation or premises may not be operated or maintained in such a manner that a nuisance or air pollution is created. Nothing in this regulation relating to the control of emissions may in any manner be constructed as authorizing or permitting the creation of, or maintenance of, nuisance or air pollution."

(B) **COMAR 26.11.06.09** – Odors.
"A person may not cause or permit the discharge into the atmosphere of gases, vapors, or odors beyond the property line in such a manner that a nuisance or air pollution is created."

(C) **COMAR 26.11.15.05A** – Control Technology Requirement.
"A person may not construct, reconstruct, operate, or cause to be constructed, reconstructed, or operated any new installation or new source that will discharge a toxic air pollutant to the atmosphere without installing and operating T-BACT."

(D) **COMAR 26.11.15.06A** – Ambient Impact Requirement.

(1) "Except as provided in Sec. A(2), of this regulation, a person may not construct, modify, or operate or cause to be constructed, modified, or operated any new installation or source without first demonstrating to the satisfaction of the Department using procedures established in this chapter that total allowable emissions from the premises of each toxic air pollutant discharged by the new installation or source will not unreasonably endanger human health; and

(2) If a new installation or source will discharge a TAP that is not listed in COMAR 26.11.16.07, and will be part of an existing premises, then emissions of that TAP from existing sources or existing installations on the premises may be omitted from a screening analysis unless the TAP is added to COMAR 26.11.16.07."

2. Record Keeping and Reporting:

The Permittee shall submit to the Department, by April 1 of each year during the term of this permit, a written certification of the results of an analysis of emissions of toxic air pollutants from the Permittee's facility during the previous calendar year. The analysis shall include either:

(a) a statement that previously submitted compliance demonstrations for emissions of toxic air pollutants remain valid; or

(b) a revised compliance demonstration, developed in accordance with requirements included under COMAR 26.11.15 & 16, that accounts for changes in operations, analytical methods, emissions determinations, or other factors that have invalidated previous demonstrations.

MARYLAND DEPARTMENT OF THE ENVIRONMENT
AIR AND RADIATION ADMINISTRATION

NOTICE OF INTENT TO ISSUE PART 70 OPERATING PERMIT, OPPORTUNITY TO SUBMIT WRITTEN COMMENTS OR TO REQUEST A PUBLIC HEARING

The Department of the Environment, Air and Radiation Administration (ARA) has completed its review of the application for a renewal Part 70 Operating Permit submitted by Howard County MD for the Alpha Ridge Landfill located in Marriottsville, MD. The municipal solid waste landfill facility includes a landfill gas (LFG) collection system, a LFG-fired reciprocating internal combustion engine, one (1) horizontal grinder powered by a 755 bhp diesel internal combustion engine, and one (1) 4,000 gallon above ground gasoline storage tank.

The applicant is represented by:

Mr. Mark DeLuca, P.E., Chief
Bureau of Environmental Services
Howard County Department of Public Works
9801 Broken Land Parkway
Columbia, MD 21046

The Department has prepared a draft Part 70 Operating Permit for review and is now ready to receive public comment. A docket containing the application, draft permit, and supporting documentation is available for review on the Department's website, under the Air Quality Permits Program link. Due to COVID restrictions, the docket will only be available online.

Docket #24-027-0364, Alpha Ridge Landfill may be viewed here:
https://mde.maryland.gov/programs/Permits/AirManagementPermits/Pages/title5draftpermits.aspx

Interested persons may submit written comments or request a public hearing on the draft permit. Written comments must be received by the Department no later than 30 days from the date of this notice. Requests for a public hearing must be submitted in writing and must also be received by the Department no later than 30 days from the date of this notice.

Comments and requests for a public hearing will be accepted by the Department if they raise issues of law or material fact regarding applicable requirements of Title V of the Clean Air Act, and/or regulations implementing the Title V Program in Maryland found in COMAR.

A Request for public hearing shall include the following:

1) The name, mailing address, and telephone number of the person making the request;

2) The names and addresses of any other persons for whom the person making the request if representing; and

3) The reason why a hearing is requested, including the air quality concern that forms the basis for the request and how this concern relates to the person making the request.

All written comments and requests for a public hearing should be directed to the attention of Ms. Shannon Heafey, Title V Coordinator, Air Quality Permits Program, Air and Radiation Administration via email at Shannon.heafey@maryland.gov.

George S. Aburn, Jr., Director
Air and Radiation Administration

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
9801 Broken Land Parkway ■ Columbia, Maryland 21046 ■ 410-313-6444

Mark DeLuca, P.E., Deputy Director
Chief, Bureau of Environmental Services
mdeluca@howardcountymd.gov

FAX 410-313-6490
TDD 410-313-2323

April 30, 2019

Ms. Karen G. Irons, P.E.
Air & Radiation Management Administration
Air Quality Permits Program
Maryland Department of the Environment
1800 Washington Boulevard, Suite 720
Baltimore, Maryland 21230-1720

Subject: Application for Title V – Part 70 Operating Permit Renewal
Alpha Ridge Landfill, Howard County, Maryland

Dear Ms. Irons:

Enclosed please find two hard copies and one electronic copy of the application for renewal of the Part 70 Permit for the Alpha Ridge Landfill, Howard County, Maryland (ARL). Also included are copies of the most recent (2018) Annual Emissions Certification and Title V Compliance Certification for the ARL facility.

The current Title V – Part 70 Permit (Number 24-027-00364) expires in April 30, 2020. ARL requests an "application shield" as described in COMAR 26.11.03.01D, Application Shield. ARL will provide additional information as needed to obtain the "application shield". ARL also requests that a "permit shield" be placed in the Part 70 Permit as described in COMAR 26.11.03.23, Permit Shield in Part 70 permits.

Our point of contact for this matter is Ms. Niti Blackwell, (410) 313-6418. Please contact Ms. Blackwell or Mr. Vijay Apte at AECOM on (301) 820-3000 if additional information is required.

Very truly yours,

Mark DeLuca, P.E.
Chief, Bureau of Environmental Services

Enclosures

Part 70 Permit Renewal Application

Alpha Ridge Landfill
Marriottsville, Maryland

Title V Permit No. 24-027-00364

Prepared for

Howard County Department of Public Works
Bureau of Environmental Services
9801 Broken Land Parkway
Columbia, MD 21046

Prepared by

12420 Milestone Center Drive, Suite 150
Germantown, MD 20876

April 2019

Table of Contents

Application Completeness Checklist

VI . Application Completeness Checklist

The purpose of this part is to list the information required to achieve a Part 70 application shield.

Cover Page

(X) Name and address of owner or operator, including telephone number.

(X) Name and address of facility, including the plant manager's name and telephone number.

(X) A 24-hour emergency telephone number for air pollution matters.

Section 1 CERTIFICATION STATEMENTS

(X) The certification statement completed and signed by a responsible official.

Section 2 FACILITY DESCRIPTION SUMMARY

(X) A brief description of each of the source's process(es), including all applicable SIC codes and end products.

(X) Flow diagrams indicating all emissions units, emission points, and control devices.

(X) A plot plan of the entire facility.

(X) Emission Certification Report.

(X) General Emissions Information.

Section 3 EMISSIONS UNIT DESCRIPTIONS

This section must be completed for each emissions unit.

Part A

(X) Emissions unit number.

(X) Detailed description of unit, including all emission points.

(X) Federally enforceable limit(s) on the operating schedule.

(X) Fuel consumption information for any emissions unit that consumes fuel including the type of fuel, percent sulfur, and annual usage of fuel.

Part B

(X) A citation and description of each federally enforceable requirement, including all emission standards, for each emissions unit.

(X) A statement of compliance demonstration techniques for each requirement, including a description of monitoring, record keeping, reporting requirements, and test methods.

(X) The frequency of submittal of the compliance demonstration during the permit term.

Part C

(X) Emissions unit number.

( ) Permit to construct number.

( ) Emissions point number(s).

( ) Date(s) the permit to construct was issued.

( ) Condition number(s) as indicated on the permit to construct.

(X) Description of the permit condition(s) and the reason(s) why they are believed to be obsolete, extraneous, or insignificant.

Part D

( ) Description of all alternate operating scenarios that apply to an emissions unit.

( ) Number assigned to each scenario.

( ) Emissions unit number.

( ) Description of the operating parameters for the emissions unit and other information which describes the how the operation of the unit will change under the different scenario.

Part E

( ) A citation and description of each federally enforceable requirement triggered by an operating scenario, including all emission standards, for each emissions unit.

( ) As an attachment, the date and results of the most recent compliance demonstration for each emission standard and/or emissions certification report with relevant supporting documentation.

( ) A statement of compliance demonstration techniques for each requirement, including a description of monitoring, record keeping, reporting requirements, and test methods.

( ) The frequency of submittal of the compliance demonstration during the permit term.

Section 4 CONTROL EQUIPMENT

(X) The type of each piece of air pollution control equipment

(X) The capture and control efficiencies of the control equipment.

Section 5 SUMMARY SHEET OF POTENTIAL EMISSIONS

(X) Quantity of potential emissions for criteria pollutants and HAPs emitted in tons per year for each emissions unit.

(X) Fugitive emission estimations for the entire facility for criteria pollutants and HAPs emitted in tons per year.

(X) Basis for all emission calculations.

Section 6 AN EXPLANATION OF PROPOSED EXEMPTIONS FROM OTHERWISE APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

(X) An explanation of the proposed exemption.

Section 7 COMPLIANCE SCHEDULE FOR NONCOMPLYING EMISSIONS UNITS

( ) Identification of emissions unit(s) not in compliance, including the requirement being violated and the effective compliance date.

( ) Detailed description of methods to be used to achieve compliance.

( ) A schedule of remedial measures, including an enforceable sequence of actions with milestones.

Attachment

(X) Checklist of Insignificant Activities

( ) CAM Plan (If Applicable)

Part 70 Permit Application

Section 1 – Section 7

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard ● Baltimore MD 21230
(410) 537-3000 ● 1-800-633-6101 ● http://www.mde.state.md.us

PART 70 PERMIT APPLICATION FOR RENEWAL

AIR AND RADIATION MANAGEMENT ADMINISTRATION

Facilities required to obtain a Part 70 permit under COMAR 26.11.03.01 must complete and return this form. Applications are incomplete unless all applicable information required by COMAR 26.11.03.03 is supplied. Failure to supply additional information required by the Department to enable it to act on the application may result in loss of the application shield and denial of this application.

Owner and Operator:

Name of Owner or Operator: Howard County Department of Public Works Bureau of Environmental Services		
Street Address: 9801 Broken Land Parkway		
City: Columbia	State: MD	Zip Code: 21046
Telephone Number (410) 313-6444	Fax Number (410) 313-6490	

Facility Information:

Name of Facility: Alpha Ridge Landfill		
Street Address: 2350 Marriottsville Road		
City: Marriottsville	State: MD	Zip Code: 21104
Plant Manager: Wayne Souder	Telephone Number: (410) 313-5418	Fax Number: (410) 313-5416
24-Hour Emergency Telephone Number for Air Pollution Matters: (410) 313-2929		

List, on a separate page, the names and telephone numbers of other facility owners and persons with titles.

SECTION 1. CERTIFICATION STATEMENTS

1. Compliance Status with Applicable Enhanced Monitoring and Compliance Certification Requirements

The emissions units identified in this application are in compliance with applicable enhanced monitoring and compliance certification requirements.

2. Certification of Current Compliance with All Applicable Federally Enforceable Requirements

Except for the requirements identified in Section 7 of this application, for which compliance is not achieved, I hereby certify, based on information and belief formed after reasonable inquiry, that the facility is currently in compliance with all applicable federally enforceable requirements and agree that the facility will continue to comply with those requirements during the permit term.

You must complete a Section 7 form for each non-complying emissions unit.

3. Statement of Compliance with Respect to All New Applicable Requirements Effective During the Permit Term

I hereby state, based on information and belief formed after reasonable inquiry, that the facility agrees to meet, in a timely manner, all applicable federally enforceable requirements that become effective during the permit term, unless a more detailed schedule is expressly required by the applicable requirement.

4. Risk Management Plan Compliance

I hereby certify that, based on information and belief formed after reasonable inquiry, that a Risk Management Plan as required under □112(r) of the Clean Air Act:

[ ] has been submitted;

[ ] will be submitted at a future date; or

[**X**] does not need to be submitted.

5. Statement of Truth, Accuracy, and Completeness

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

RESPONSIBLE OFFICIAL:

X _____ 4/30/19

SIGNATURE DATE

Mark DeLuca, P.E.

PRINTED NAME

Chief, Bureau of Environmental Services

TITLE

SECTION 2. FACILITY DESCRIPTION SUMMARY

1. Major Activities of Facility

Briefly describe the major activities, including the applicable SIC Code(s) and end product(s).

Alpha Ridge Landfill (ARL) is a municipal solid waste landfill (SIC code 4953) serving Howard County, MD. The facility is located at 2350 Marriottsville Road, Marriottsville, Maryland in Howard County. ARL is operated by the Howard County Department of Public Works, Bureau of Environmental Services. The facility is permitted to receive municipal solid waste (MSW) under Refuse Disposal Facility Permit No. 2016-WMF-0110 issued by the Maryland Department of the Environment on 05/03/2016.

ARL includes an unlined cell and a lined cell. The unlined cell is located in the northwest portion of the ARL property. It is approximately 68 acres in size and opened in 1980 and closed in 1993. In late 1997 and early 1998, a final cover system consisting of a geomembrane on the top area, surrounded by a low permeability soil cap around the perimeter, was installed. The lined cell is located east of the closed, unlined cell. It began receiving municipal solid waste in March 1993 and is currently the active area of the ARL facility.

The design capacity of ARL is 6.76 million mega grams (Mg) (approximately 7.44 million tons) of MSW. This design capacity exceeds the threshold of 2.5 million Mg (2.8 million tons) or 2.5 million cubic meters which makes it subject to 40 CFR 60, subpart WWW and COMAR 26.11.03.02 requirements. Therefore, the County is required to apply for a Title V operating permit.

The County voluntarily installed a landfill gas (LFG) collection and control system in 1999. In 2012, the County installed a LFG-fired engine-generator (1,059 kW) for electric power generation. In addition, the County operates an 800 standard cubic feet per minute (scfm) John Zink ground enclosed flare to destroy excess LFG during normal operation and also act as a substitute for the engine when it is down for maintenance. Although the capacity of ARL makes it subject to the State of Maryland EG regulations (COMAR 26.11.19.20 – Control of Landfill Gas Emissions from Municipal Solid Waste Landfills), the County has demonstrated via Tier 2 testing in July 2018 that NMOC emissions are below the control threshold of 50 Mg/year and projected emissions will not exceed this threshold until the end of its useful life. The County will be required to conduct another Tier 2 testing in June 2023 (5 years); during the term of the renewal Part 70 Permit to demonstrate that ARL is still below the threshold.

Leachate from the operating cells drain by gravity to sumps, ultimately reaching a below-ground pumping stations. The leachate is then pumped to a 500,000 gallon above-ground leachate storage tank. Leachate is transported offsite for disposal at the Little Patuxent Water Reclamation Facility.

Please refer to the attached Figure 1 and Figure 2 for the site vicinity map and the overall site plan. Figure 2 presents locations of various emission units identified in the application.


Alpha Ridge Landfill
Figure 1 - Site Location Map
N
500
0
500
1000 ft

AECOM	Created By: AP Checked By: VA	Figure 2 ARL Site Plan and Emission Units Title V Permit Renewal Application	**Alpha Ridge Landfill** 2350 Marriottsville Road Marriottsville, MD 21104

2. Facility-Wide Emissions

A. This facility is required to obtain a Part 70 Operating Permit because it is: Check appropriate box:

[ ] Actual Major
[X] Potential Major·
[ ] Solid Waste Incineration Unit Requiring Permit Under § 129(e) of CAA

Pursuant to 40 CFR 60.752(b), facilities that have design capacities greater than 2.5 million Mg or cubic meters (such as Alpha Ridge Landfill), are subject to Part 70 Permitting requirements. The facility is currently a potential major due to allowable hours on the grinder and can operate below potential major threshold by accepting lower number of hours, if needed.

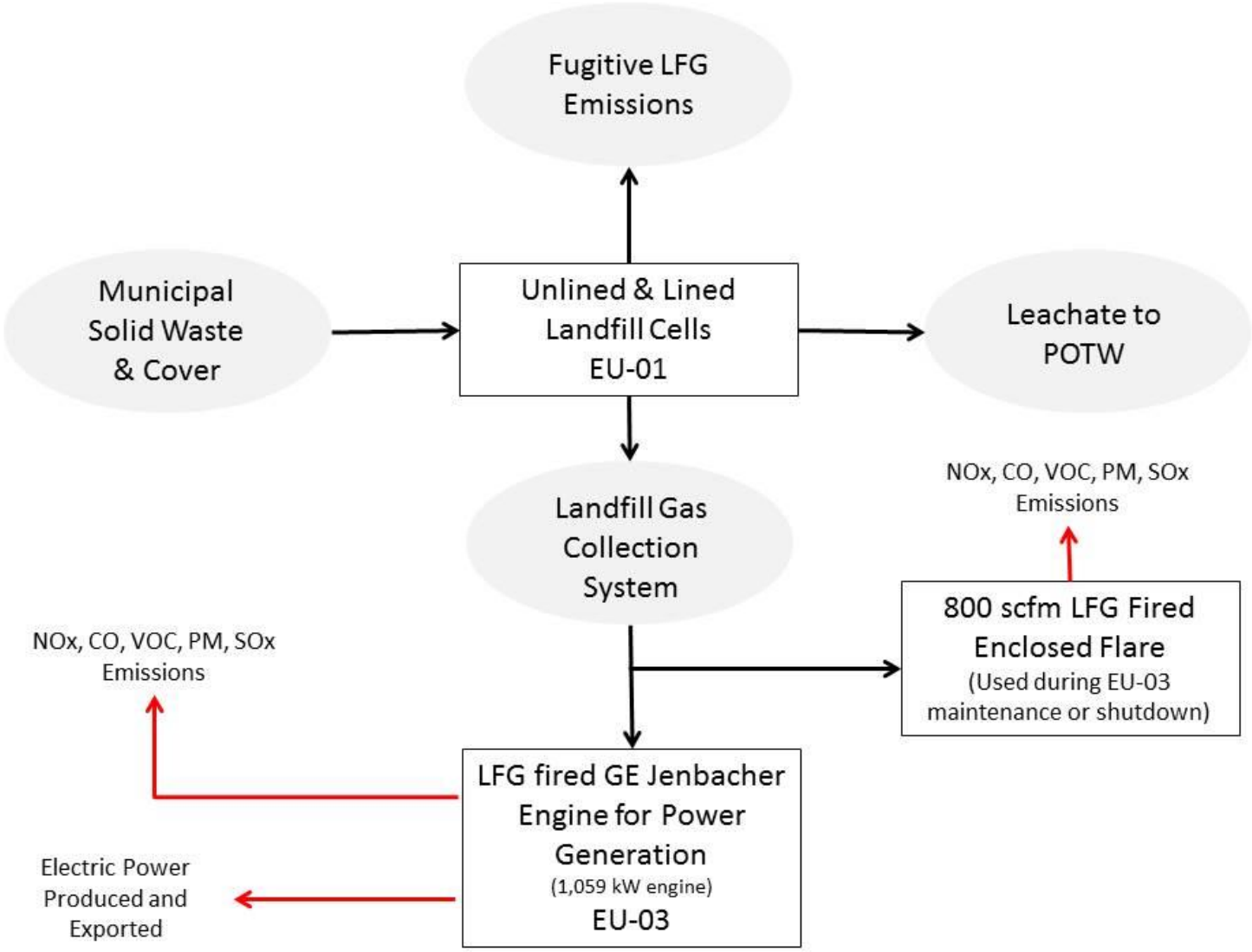
B. List the actual facility-wide emissions below:

Based on the CY 2018 Emission Certification Statement.

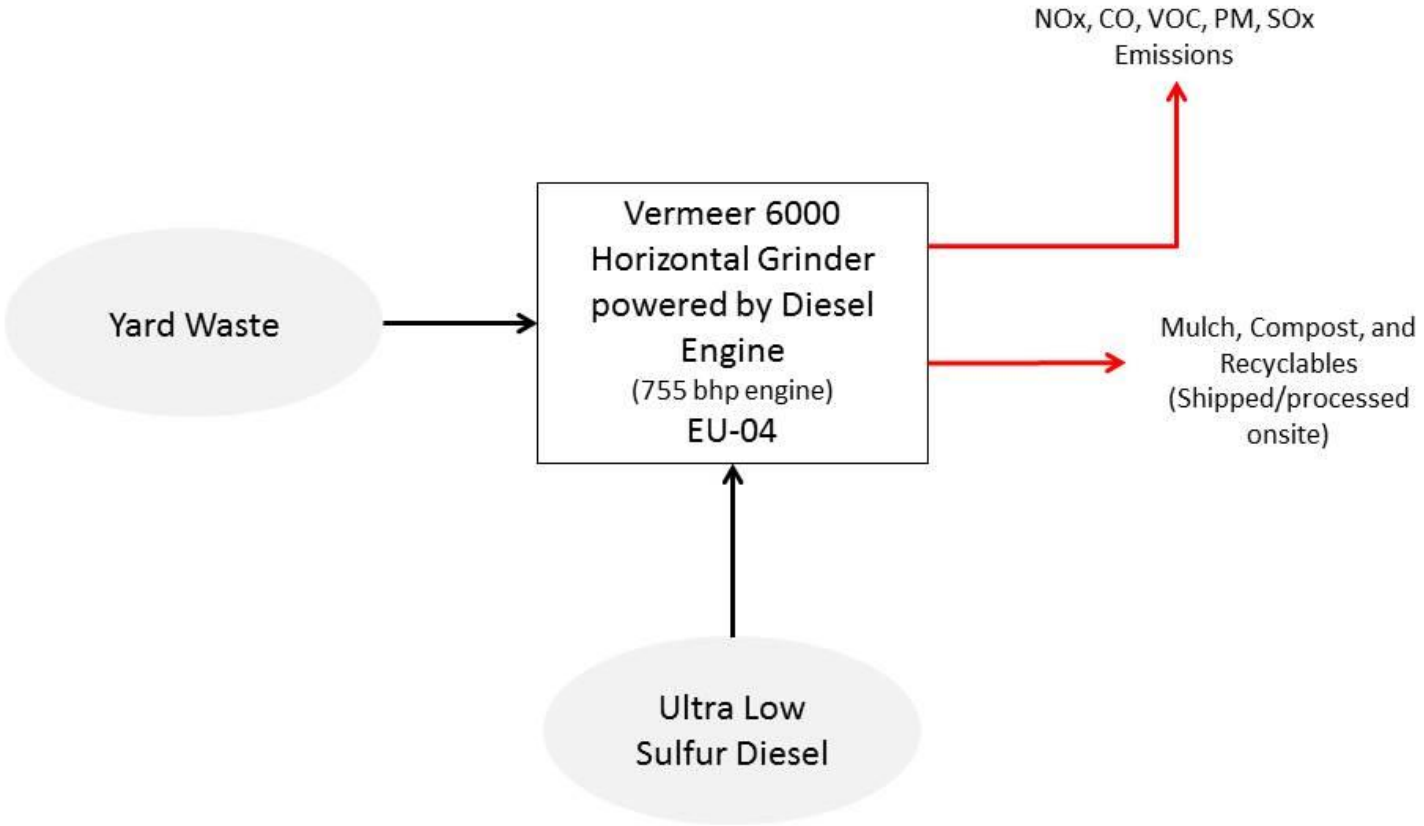
PM_{10} 1.15 NOx 4.97 VOC 0.83 SOx 0.48 CO 21.73 HAPs 0.30

3. Include With the Application:

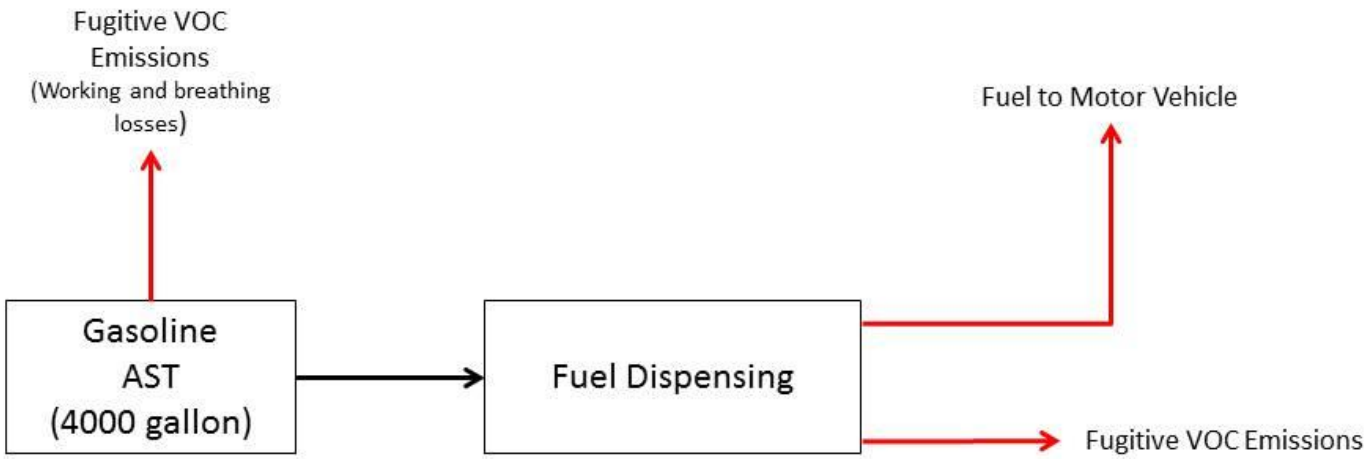
Flow Diagrams showing all emissions units, emission points, and control devices;
Emissions Certification Report (copy of the most recent submitted to the Department)



AECOM	Created By: AP Checked By: VA	Process Flow Diagram EU-01 and EU-03 Title V Permit Renewal Application	**Alpha Ridge Landfill** 2350 Marriottsville Road Marriottsville, MD 21104



AECOM	Created By: AP Checked By: VA	Process Flow Diagram EU-04 Title V Permit Renewal Application	**Alpha Ridge Landfill** 2350 Marriottsville Road Marriottsville, MD 21104



AECOM	Created By: AP Checked By: VA	Process Flow Diagram EU-05 Title V Permit Renewal Application	**Alpha Ridge Landfill** 2350 Marriottsville Road Marriottsville, MD 21104

SECTION 3A. EMISSIONS UNIT DESCRIPTIONS

1. Emissions Unit No.: EU-01 1a. Date of installation (month/year): Began receiving waste in 1980.	2. MDE Registration No.:(if applicable) 9-0205

3. Detailed description of the emissions unit, including all emission point(s) and the assigned number(s):

Emission unit EU01 consists of both the lined and unlined cells. The unlined cell is closed and was capped in the 1997-1998 construction season. The cap consists of a geomembrane on the top of the cell surrounded by a low permeability soil cover around the perimeter of the cell. The lined cell is active and currently receiving waste. The facility opens for business 8 hours a day and 6 days a week. Emission unit consists of landfill with an active landfill gas collection and control system with a flare rated at 800 scfm that exhausts through "ST01".

Although the facility is subject to the State of Maryland EG regulations (COMAR 26.11.19.20), Tier 2 testing has demonstrated that its' NMOC emissions are below 50 Mg/year so that the control requirements of COMAR 26.11.19.20 do not apply. Until the facility exceeds 50 MG/year NMOC emissions threshold, the newly promulgated Landfill NESHAP (40 CFR 63 Subpart AAAA – January 16, 2003) also do not apply. However, they are included in this application as a future applicable requirement.

4. Federally Enforceable Limit on the Operating Schedule for this Emissions Unit: ***Not Applicable***

General Reference: None

Continuous Processes: 24 hours/day 365 days/year

Batch Processes: _____ hours/batch _____ batches/day

_____ days/year

5. Fuel Consumption:

Type(s) of Fuel	% Sulfur	Annual Usage (specify units)
1. Not applicable		
2.		
3.		

6. Emissions in Tons: ***See attached Emissions Calculations.***

A. Actual Major: _____ Potential Major: _____ (note: before control device)

B. Actual Emissions: NOx 0.50 SOx 0.02 VOC 0.0 PM_{10} 0.14 HAPs 0.07

SECTION 3A. EMISSIONS UNIT DESCRIPTIONS

1. Emissions Unit No.: EU-03 1a. Date of installation (month/year): 06/2012	2. MDE Registration No.:(if applicable) 3-0364

3. Detailed description of the emissions unit, including all emission point(s) and the assigned number(s):

Emission unit EU03 includes a single reciprocating internal combustion engine-driven generator that exhausts through stack "ST02". The engine uses landfill gas as fuel to generate up to 1,059 kilowatts of renewable electric power.

4. Federally Enforceable Limit on the Operating Schedule for this Emissions Unit: ***Not Applicable***

General Reference: None

Continuous Processes: 24 hours/day 365 days/year

Batch Processes: _____ hours/batch _____ batches/day

_____ days/year

5. Fuel Consumption:

	Type(s) of Fuel	% Sulfur	Annual Usage (specify units)
1.	Landfill Gas	NA	183.96 million ft^3 (Maximum)
2.			
3.			

6. Emissions in Tons: ***See attached Emissions Calculations.***

A. Actual Major: _____ Potential Major: _____ (note: before control device)

B. Actual Emissions: NOx 3.14 SOx 0.04 VOC 0.02 PM_{10} 0.97 HAPs 0.16

SECTION 3A. EMISSIONS UNIT DESCRIPTIONS

1. Emissions Unit No.: EU-04 1a. Date of installation (month/year): 11/2012	2. MDE Registration No.:(if applicable) 9-0369

3. Detailed description of the emissions unit, including all emission point(s) and the assigned number(s):

Emission unit EU04 includes one portable horizontal grinder, powered by a diesel internal combustion engine rated @755 bhp exhausts through stack "ST03". The engine is fired by ultra-low sulfur diesel (ULSD).

4. Federally Enforceable Limit on the Operating Schedule for this Emissions Unit:

General Reference: None

Continuous Processes: _____ hours/day _____ days/year

Batch Processes: 8 hours/batch 1 batches/day

312 days/year 2,496 hours/year

5. Fuel Consumption:

	Type(s) of Fuel	% Sulfur	Annual Usage (specify units)
1.	ULSD	0.0015	59,904 gallons (Maximum)
2.			
3.			

6. Emissions in Tons: ***See attached Emissions Calculations.***

A. Actual Major: _____ Potential Major: _____ (note: before control device)

B. Actual Emissions: NOx 1.33 SOx 0.42 VOC 0 PM_{10} 0.04 HAPs 0

SECTION 3A. EMISSIONS UNIT DESCRIPTIONS

1. Emissions Unit No.: EU-05 1a. Date of installation (month/year): 08/2014	2. MDE Registration No.:(if applicable) 9-0379

3. Detailed description of the emissions unit, including all emission point(s) and the assigned number(s):

4,000 gallon above ground gasoline storage tank and a gasoline dispensing facility. Tanks emissions are vented through "ST04" and emissions from filling operation are fugitive.

4. Federally Enforceable Limit on the Operating Schedule for this Emissions Unit: ***Not Applicable***

General Reference: None

Continuous Processes: _____ hours/day _____ days/year

Batch Processes: _____ hours/batch _____ batches/day

_____ days/year

5. Fuel Consumption:

	Type(s) of Fuel	% Sulfur	Annual Usage (specify units)
1.	Gasoline		48,000 gallons (Maximum)
2.			
3.			

6. Emissions in Tons: ***See attached Emissions Calculations.***

A. Actual Major: _____ Potential Major: _____ (note: before control device)

B. Actual Emissions: NOx____ SOx____ VOC_0.82_ PM_{10}____ HAPs 0.06_

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** 60 CFR 63 Subpart AAAA

Briefly describe the Emission Standard/Limit or Operational Limitation:
Minimize emissions of hazardous air pollutants from the facility during periods of start-up, shutdown, and malfunction (SSM). **Note: This is a future applicable requirement and does not apply to the facility until NMOC emissions are greater than 50 Mg/year.**

Permit Shield Request: Yes

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:
[ ] Annual Compliance Certification:
[X] Semi-Annual Monitoring Report: **Future Applicable.**

Methods used to demonstrate compliance:

Monitoring: Reference 63.1955(a)(2) Describe: Comply with the requirements of the EPA approved and effective state plan.

Testing: Reference None Describe: No additional testing is required by this regulation.

Record Keeping: Reference 63.1980(a)&(b) Describe: Prepare a startup, shutdown and malfunction plan. Keep records of SSM events.

Reporting: Reference 63.10(d) Describe: Submit an immediate notification if SSM events do not follow SSM plan and excess emissions occur. Submit semi-annual SSM plan reports. Submit annual NSPS/EG report on a semi-annual basis.

Frequency of submittal of the compliance demonstration: None

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** COMAR 26.11.19.20 40 CFR 60 Subpart WWW

Briefly describe the Emission Standard/Limit or Operational Limitation:
This contains control of landfill gas emissions from MSW landfills. For existing MSW landfills with maximum design capacities greater than 2,750,000 tons, NMOC must annually be calculated and reported until its calculated NMOC emissions are equal to or greater than 55 tons/yr. **The Facility has demonstrated that it will emit less than 55 tons/year of NMOC for the next 5 years (Tier 2). Therefore, annual NMOC calculations will not be required unless the waste acceptance rate changes.**

Permit Shield Request: Yes

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:
[X] Annual Compliance Certification:.
[ ] Semi-Annual Monitoring Report:

Methods used to demonstrate compliance:

Monitoring: Reference N/A Describe: None

Testing: Reference 40 CFR 60.754(a)(3)(iii) Describe: The next retest shall be completed by June 14, 2023. Submit a test protocol at least 30 days prior to conducting the test. Submit test results within 60 days after completion of the test.

Record Keeping: Reference 40 CFR 60.758(a) & COMAR 26.11.03.06C Describe: Keep for at least 5 years up-to-date, readily accessible, on-site records of maximum design capacity, the current amount of solid waste in place, and year-by-year waste acceptance rate.

Reporting: Reference 40 CFR 60.752(b)(1)(ii) Describe: Submit annually an NMOC emission rate report to the EPA and the Department.

Reporting: Reference 40 CFR 60.752(b)(1)(i) & 60.757(b)(1)(ii) Describe: May elect to submit an estimate of the NMOC emission rate for the next 5-year period in lieu of the annual report if the estimated emission rate is less than 55 tons/year in each of the next five consecutive years.

Reporting: Reference 40 CFR 60.752(b)(1)(ii)(B) & 60.757 (d) Describe: Submit a closure report to the EPA and the Department within 30 days of waste acceptance cessation, if the landfill is permanently closed.

Frequency of submittal of the compliance demonstration: Every 5 Years

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** 40 CFR 60 Subpart WWW COMAR 26.11.19.20

Briefly describe the Emission Standard/Limit or Operational Limitation:
This contains control of landfill gas emissions from MSW landfills. For those landfills that emit greater than 55 tons/year NMOC emissions, calculated in accordance with 40 CFR 60.754, gas collection system must be installed. Landfill gas must be collected and routed to an open flare or control device that reduces NMOCs by at least 98 percent. **Note: This is a future applicable requirement and does not apply to the facility until NMOC emissions are greater than 55 tons/year.**

Permit Shield Request: Yes

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:
[X] Annual Compliance Certification: **Future Applicable**
[X] Semi-Annual Monitoring Report: **Future Applicable**

Methods used to demonstrate compliance:

Monitoring: Reference N/A Describe: None

Testing: Reference 40 CFR 60.754 Describe: Determine the site-specific NMOC concentration using Method 25C or Method 18. Determine the site-specific methane generation rate constant (k) using Method 2E.

Record Keeping: Reference 40 CFR 60.758 Describe: Keep for at least 5 years up-to-date, readily accessible, on-site records of 1) Maximum design capacity, the current amount of solid waste in place, and the year-by-year waste acceptance rate; 2) The equipment operating parameters; 3) The monitoring data; 4) All collection and control system exceedances of the operational standards.
Keep for life of the control equipment an up-to-date, readily accessible data of 1) The initial performance test; and 2) Plot map.

Reporting: Reference 40 CFR 60.757 Describe: Submit a closure report within 30 days of waste acceptance cessation. Submit semi-annual reports of the recorded information in accordance with 40 CFR 60.757(f).

Reporting: Reference 40 CFR 63 Subpart AAAA & COMAR 26.11.03.06(7)(1)(i) Describe: Submit an equipment removal report at least 30 days prior to removal or cessation of operation of the control equipment.

Frequency of submittal of the compliance demonstration: Every 5 Years

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** 40 CFR 60.754(a)

Briefly describe the Emission Standard/Limit or Operational Limitation:
If the resulting NMOC mass emission rate is less than 50 megagrams per year, the owner or operator shall submit a periodic estimate of the emission rate report and retest the site specific NMOC concentration every 5 years using approved methods.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference 40 CFR 60.757(b)(1) Describe: Submit a periodic estimate of the emission report.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** COMAR 26.11.03.06C

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall keep all the records required under this permit for at least five years and shall make such records available to the Department upon request.

Permit Shield Request:

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:
[X] Annual Compliance Certification:
[ ] Semi-Annual Monitoring Report:

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.03.06C Describe: Provide records upon request by the Department.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** COMAR 26.11.19.20D(2)

Briefly describe the Emission Standard/Limit or Operational Limitation:
If the Permittee increases the maximum design capacity of the landfill after November 1, 1997, the Permittee shall amend and resubmit the design capacity report within 90 days of the issuance of an air quality Permit to Construct or a permit from the MDE Waste Management Administration that authorizes changes affecting the maximum capacity of the landfill.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.19.20D(2) Describe: Provide report within 90 days to the Department.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** COMAR 26.11.19.20D(3)(a) & COMAR 26.11.19.20D(6)

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall estimate the annual NMOC emission rate calculated using the formula and procedures as described in 40 CFR 60.754(a). The Permittee shall prepare and submit an updated NMOC emission rate report by November 1 of each year. A less frequent emission rate report may be submitted upon approval by the Department.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.19.20D(6) Describe: Provide NMOC report November 1 of each year or on a less frequent basis upon approval by the Department.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** COMAR 26.11.19.20D(7)

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee may upon approval by the Department, submit a combined report to satisfy the NMOC reporting requirements and the annual Emissions Certification requirement. Such report shall be submitted by April 1 of each year for the previous calendar year.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.19.20D(7) Describe: May choose to combine NMOC report with Emissions Certification requirements and submit it by April 1 of each year.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** COMAR 26.11.06.02C(2)

Briefly describe the Emission Standard/Limit or Operational Limitation:
For facilities located in Area III, this regulation prohibits the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers. This prohibition does not apply to emissions during startup and process modifications or adjustments, or occasional cleaning of control equipment, which are not greater than 40 percent opacity for a period of not more than 6 consecutive minutes in any 60 minutes.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference COMAR 26.11.03.06C Describe: The Permittee shall properly operate and maintain the flare in a manner to minimize visible emissions.

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.01.07C Describe: Reporting will occur in the event of a violation. Immediate notification of the Department is required by telephone. A written report within five days of the incident shall be submitted to the Department. The report shall include the date and time of occurrence, source of the emissions, the cause and the actions taken to alleviate the situation.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** COMAR 26.11.06.03B(2)

Briefly describe the Emission Standard/Limit or Operational Limitation:
For facilities located in Area III, this regulation prohibits the discharge of particulate matter into the outdoor atmosphere from an installation in excess of 0.03 grains/SCFD.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference COMAR 26.11.03.06 Describe: The Permittee shall perform preventive Maintenance on the flare once per month or as recommended by the equipment manufacturer.

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.03.06C Describe: The Permittee shall make records available to the Department upon request.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-01 **General Reference:** PTC 13-9-0193

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall operate and maintain the flare system in accordance with the manufacturer's recommendation.

Permit Shield Request:

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:
[X] Annual Compliance Certification:
[ ] Semi-Annual Monitoring Report:

Methods used to demonstrate compliance:

Monitoring: Reference COMAR 26.11.03.06C Describe: The Permittee shall continuously monitor the landfill gas flow rate and the flare combustion temperature. The Permittee shall conduct regular monitoring at least once a week of the blower and flare system to ensure proper operation of the landfill gas extraction system.

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference COMAR 26.11.03.06C Describe: The Permittee shall maintain records of The landfill gas flow rate and flare combustion temperature results of the weekly monitoring of the blower and flare system.

Reporting: Reference None Describe: Not Applicable

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-03 **General Reference:** 40 CFR Part 60, Subpart JJJJ

Briefly describe the Emission Standard/Limit or Operational Limitation:
The short term emissions from the engine shall not exceed the following rates over the entire life of the engine:

NOx = 2.0 grams/HP-hr, CO = 5.0 grams/HP-hr, VOC = 1.0 grams/HP-hr

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference COMAR 26.11.03.06C Describe: On annual basis, the Permittee shall monitor the exhaust gas using the hand-held instrumentation to demonstrate compliance with the emission limits. The permittee shall monitor total electrical output from the engine and total hours of operation and reason for operations of the engine.

Testing: Reference 40 CFR 60.4243(b) Describe: The Permittee must conduct performance testing every 8,760 hours or 3 years, whichever comes first, to demonstrate compliance.

Record Keeping: COMAR 26.11.03.06C(5)(g) Describe: The owners or operators of stationary SI ICE must keep records of all notifications submitted to comply with this subpart and all documentation supporting any notification. The Permittee must maintain records of maintenance conducted on the engine and documentation that engine meets the emission standards.

Reporting: Reference 40 CFR 60.4245(d) Describe: Owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in 40 CFR 60.4244 within 60 days after the test has been completed. A report including all the analytical data gathered by the Permittee and/or emission testing company must be provided to ARMA.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-03 **General Reference:** 40 CFR Part 63, Subpart ZZZZ

Briefly describe the Emission Standard/Limit or Operational Limitation:
An area source that meets any of the criteria in (c)(1) through (7) of 40 CFR 43.6590 must meet the requirements of this part by meeting the requirements of 40 CFR Part 60, Subpart JJJJ for spark ignition engines. No further requirements apply for such engines under this part.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference 40 CFR 63, Subpart ZZZZ Describe: Complying with 40 CFR 60, Subpart JJJJ monitoring requirements satisfies requirements under this subpart. No additional monitoring required.

Testing: Reference 40 CFR 63, Subpart ZZZZ Describe: Complying with 40 CFR 60, Subpart JJJJ testing Requirements satisfies requirements under this subpart. No additional testing required.

Record Keeping: COMAR 26.11.03.06C(5)(g) Describe: The owners or operators of stationary SI ICE must keep records of all notifications submitted to comply with this subpart and all documentation supporting any notification. All records must be maintained for a period of 5 years.

Reporting: Reference 40 CFR 60.4245(d) Describe: Owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in 40 CFR 60.4244 within 60 days after the test has been completed. A report including all the analytical data gathered by the Permittee and/or emission testing company must be provided to ARMA.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-03 **General Reference:** COMAR 26.11.09.05E

Briefly describe the Emission Standard/Limit or Operational Limitation:
The regulation prohibits the discharge of emissions from any engine, operating at idle, at greater than 10 percent opacity. This does not apply to emissions during operating mode, when emissions at other than idle conditions, are prohibited at greater than 40 percent opacity.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[X] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference COMAR 26.11.03.06C Describe: The Permittee shall monitor, and properly operate and maintain,the engines in such a manner to minimize visible emissions.

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference COMAR 26.11.03.06C Describe: The Permittee shall maintain records of any event showing visible emissions originating from the engines and actions taken to correct such events.

Reporting: Reference COMAR 26.11.01.07 Describe: The Permittee report incidents of visible emissions and the corrective actions taken in accordance with the Permit Condition 4, Section III, "Report of Excess Emissions and Deviations."

Frequency of submittal of the compliance demonstration: Semi-Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-04 **General Reference:** COMAR 26.11.06.02C(2), COMAR 26.11.06.02A(2)

Briefly describe the Emission Standard/Limit or Operational Limitation:
For facilities located in Area III, this regulation prohibits the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers. This prohibition does not apply to emissions during startup and process modifications or adjustments, or occasional cleaning of control equipment, which are not greater than 40 percent opacity for a period of not more than 6 consecutive minutes in any 60 minutes.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference None Describe: Not Applicable

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-04 **General Reference:** COMAR 26.11.09.05E For Engine Only

Briefly describe the Emission Standard/Limit or Operational Limitation:
The regulation prohibits the discharge of emissions from any engine, operating at idle, at greater than 10 percent opacity. This does not apply to emissions during operating mode, when emissions at other than idle conditions, are prohibited at greater than 40 percent opacity.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.01.07 Describe: The Permittee shall report, in accordance with requirements under COMAR 26.11.01.07, occurrences of excess emissions to the Compliance Program of the Air and Radiation Management Administration.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-04 **General Reference:** PTC 027-0364-9-0369, Part D

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall only burn diesel fuel in the engine unless Permittee obtains approval for alternate fuel.

The engine must be properly operated and maintained in a manner to prevent visible emissions and shall not exceed 2,496 hours for any 12-month rolling period.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[X] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference PTC Part E Describe: Maintain operating hours for the engine powering the horizontal grinder.

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference PTC Part E(1)(a) Describe: The Permittee shall maintain for at least five (5) years and shall make available to the Department upon request, records of the operating hours for the engine powering the horizontal grinder.

Frequency of submittal of the compliance demonstration: Semi-Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

COMAR 26.11.09.07A(2)

Emissions Unit No.: EU-04 **General Reference:** For Engine Only

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall only burn diesel fuel with less than or equal to 0.3 percent by weight in the engine.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference PTC Part E Describe: Monitor amount of fuel oil combusted and obtain fuel supplier certification or fuel analysis on fuel sulfur content.

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference PTC Part E(1)(b)&(c) Describe: The Permittee shall maintain for at least five (5) years and shall make available to the Department upon request, records of the fuel oil combusted in the engine powering the horizontal grinder.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-05 **General Reference:** COMAR 26.11.13.04C

Briefly describe the Emission Standard/Limit or Operational Limitation:
Stage I Vapor Recovery. An owner or operator of a stationary gasoline storage tank subject to this regulation may not cause or permit gasoline to be loaded into a stationary tank unless the loading system is equipped with a vapor balance line that is properly installed, maintained and used.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[X] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference COMAR 26.11.03.06C Describe: The Permittee shall monitor the fuel drop to verify that the Stage I vapor balance system is used at least once a month.

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference COMAR 26.11.03.06C Describe: The Permittee shall maintain a record of monthly inspection results. All records must be maintained for a period of 5 years.

Reporting: Reference None Describe: The Permittee shall report incidents of release of volatile organic compounds in accordance with Permit Condition 4, Plant Wide Condition, "Report of Excess Emissions and Deviations."

Frequency of submittal of the compliance demonstration: Semi-Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-05 **General Reference:** COMAR 26.11.13.04D

Briefly describe the Emission Standard/Limit or Operational Limitation:
A person may not cause or permit a gasoline having a TVP of 1.5 psia or greater to be loaded into any truck, or other contrivances unless the 1) Loading connections on the vapor lines are equipped with fittings that have no leaks and that automatically and immediately close upon disconnection to prevent release of gasoline from these fittings; and 2) Equipment is maintained and operated in a manner to prevent avoidable liquid leaks during loading and unloading operations.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[X] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference COMAR 26.11.03.06C Describe: At least once a month during a delivery, the Permittee shall monitor a fuel drop for liquid spills and check the hose fittings and connections for leaks and proper operation.

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference COMAR 26.11.03.06C Describe: The Permittee shall maintain records of monthly inspection results, gasoline loading and unloading operations for liquid leaks and spills, and that the loading connections are leak tight and automatically close. All records must be maintained for a period of 5 years.

Reporting: Reference None Describe: The Permittee shall report incidents of release of volatile organic compounds in accordance with Permit Condition 4, Plant Wide Condition, "Report of Excess Emissions and Deviations."

Frequency of submittal of the compliance demonstration: Semi-Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: EU-05 **General Reference:** MDE GP for Small MV Refueling Facilities

Briefly describe the Emission Standard/Limit or Operational Limitation:
The facility may not allow gasoline to be handled in a manner that would result in vapor releases to the atmosphere for extended period of time. Measures to be taken include, but are not limited to: A) Minimize gasoline spills; B) Clean up spills as expeditiously as practicable; C) Cover all open gasoline containers and all gasoline storage tank fill-pipes with a gasketed seal when not in use; and D) Minimize gasoline sent to open waste collection systems such as oil/water separators.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[X] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: _____

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference MDE GP Describe: The Permittee shall maintain records documenting monthly gasoline throughput. All records must be maintained for a period of 5 years.

Reporting: Reference MDE GP Describe: The Permittee shall make available records documenting gasoline throughput within 24 hours of a request.

Frequency of submittal of the compliance demonstration: Semi-Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.06.03D

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall not cause or permit any building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: _____

Testing: Reference _____ Describe: _____

Record Keeping: Reference _____ Describe: _____

Reporting: Reference _____ Describe: _____

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.07

Briefly describe the Emission Standard/Limit or Operational Limitation:
Except as provided in COMAR 26.11.07.04, the Permittee may not cause or permit an open fire.

Prior to any open burning, the Permittee must request and receive approval from the Department.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference _____ Describe: _____

Testing: Reference _____ Describe: _____

Record Keeping: Reference None Describe: Maintain a copy of any requests and approvals for open burning.

Reporting: Reference _____ Describe: _____

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.05.04

Briefly describe the Emission Standard/Limit or Operational Limitation:
When requested by the Department, the Permittee shall prepare in writing standby emissions reduction plans, consistent with good industrial practice and safe operating procedures, for reducing emissions creating air pollution during periods of Alert, Warning, and Emergency of an air pollution episode.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.05.04E Describe: Standby emission reduction plans as required by this regulation shall be submitted to the Department upon request within 30 days of receipt of the request.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.03.06C(7)(a)(ii)

Briefly describe the Emission Standard/Limit or Operational Limitation:
Report any deviation from permit requirements that could endanger human health or the environment, by orally notifying the Department immediately upon discovery of the deviation.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.03.06C(7)(a)(ii) Describe: Immediate notification to the Department is required by telephone.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.01.07(C)(1)

Briefly describe the Emission Standard/Limit or Operational Limitation:
Promptly report all occurrences of excess emissions that are expected to last for one hour or longer by orally notifying the Department of the onset and termination of the occurrence.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.01.07(C)(2) Describe: Telephone reports shall contain the identity of the installation and person calling; the nature or characteristics of the emissions; the time of occurrence of the onset of the excess emissions and actual or estimated duration of the occurrence; and actual or probable cause of the excess emissions.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.01.07 and 26.11.03.06C(7)(a)(iii)

Briefly describe the Emission Standard/Limit or Operational Limitation:
When requested by the Department, the Permittee shall report all deviations from permit conditions, including those attributable to malfunctions as defined in COMAR 26.11.01.07A, within 5 days of the request by submitted a written description of the deviation to the Department. The written report must include the cause, dates and times of the onset and termination of the deviation, as well as the action planned or taken to reduce, eliminate, and prevent the recurrence of the deviation.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.03.06C(7) Describe: Written notification within five days of the Department's request.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.01.07(D)(1)

Briefly describe the Emission Standard/Limit or Operational Limitation:
When requested by the Department, the Permittee shall submit a written report to the Department within 10 days of receiving the request concerning an occurrence of excess emissions.

Permit Shield Request:

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:
[X] Annual Compliance Certification:
[ ] Semi-Annual Monitoring Report:

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.01.07D(2) Describe: The report shall contain the identity of the installation; the nature or characteristics of the emissions; the time of occurrence of the onset of the excess emissions and duration of the occurrence; actual or estimated quantity of excess emissions; and other details.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.03.03B(23), 40 CFR Part 68

Briefly describe the Emission Standard/Limit or Operational Limitation:
Should the Permittee become subject to 40 CFR Part 68 during the term of this permit, the owner or operator shall submit a risk management plan by the date specified in 40 CFR Part 68.10 and shall certify compliance with the requirements of 40 CFR Part 68 as part of the annual compliance certification. The Permittee shall initiate a permit revision or reopening according to the procedures of 40 CFR Part 70.7 to incorporate appropriate permit conditions into the Permittee's Part 70 Permit.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Maintain documentation of applicability determination.

Reporting: Reference None Describe: Submit a risk management plan, if applicable.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.02.19 C & D

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall certify actual annual emissions of regulated pollutants from the facility on a calendar year basis. The individual making the certification shall certify that the information is accurate to the individual's best knowledge.

Permit Shield Request:

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:
[X] Annual Compliance Certification:
[ ] Semi-Annual Monitoring Report:

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference COMAR 26.11.02.19C Describe: The Permittee shall maintain records necessary to support the emission certification.

Reporting: Reference COMAR 26.11.02.19D Describe: The annual emissions certification shall be on a form obtained from the Department and submitted by April 1 of each year.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.03.06G

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall submit a report certifying compliance with each term of this Part 70 permit including each applicable standard, emission limitation, and work practice. The compliance certification shall include: (1) identification of each permit condition, (2) compliance status, (3) intermittent or continuous compliance, (4) methods of determining compliance status, and (5) any other information required to be reported to the Department necessary for compliance determination.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference COMAR 26.11.03.06(C)(6) Describe: Maintain copies of all reports required by the permit.

Reporting: Reference COMAR 26.11.03.06(G) Describe: The compliance certification is due by April 1 of each year and must be submitted simultaneously to the Department and EPA Region III.

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.02.02F

Briefly describe the Emission Standard/Limit or Operational Limitation:
All application forms, reports, and compliance certifications submitted pursuant this permit shall be certified by a responsible official as to truth, accuracy, and completeness. The Permittee shall expeditiously notify the Department of an appointment of a new responsible official.

Permit Shield Request:

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:
[X] Annual Compliance Certification:
[ ] Semi-Annual Monitoring Report:

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference None Describe: Not Applicable

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.03.06(C)(5) and (6)

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall retain records of all monitoring data and support information that supports the compliance certification for a period of five years from the date that the monitoring sample, measurement, application, report or emissions test was completed or submitted to the Department.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference COMAR 26.11.03.06(C)(5) and (6) Describe: Maintain the required records for five (5) years.

Reporting: Reference None Describe: Not Applicable

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.01.06(C)(7)

Briefly describe the Emission Standard/Limit or Operational Limitation:
The permittee shall submit to the Department semi-annual monitoring reports that confirm that all required monitoring was performed and that provide accounts of all deviations (or no deviations) from permit requirements that occurred during the reporting periods. Reporting periods shall be January 1 through June 30 and July 1 through December 31.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[ ] Annual Compliance Certification:_____
[X] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference COMAR 26.11.03.06(C)(7)(a)(i) Describe: Each account of deviation shall include a description of the deviation, the dates and times of onset and termination, identification of the person who discovered deviation, causes and corrective actions taken, and actions taken to prevent recurrence. Reports shall be submitted within 30 days of the end of each reporting period.

Frequency of submittal of the compliance demonstration: Semi-Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.01.04

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Department may require the Permittee to conduct, or have conducted testing to determine compliance with the Part 70 permit. The Department, at its option, may witness or conduct these tests. This testing shall be done at a reasonable time, and all information gathered during a testing operation shall be provided to the Department.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:

[ ] Quarterly Monitoring Report:_____
[ ] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference 26.11.01.04 Describe: Test Methods used must be approved by the department. The reference methods approved by the Department include a) 40 CFR 60, Appendix A b) 40 CFR 51, Appendix M and c) Department's Technical Memorandum 91-01 "Test methods and Equipment Specifications for Stationary Sources" amended through supplement 3 (10/01/1997).

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference None Describe: Not Applicable

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.03.06C(5)

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall gather and retain specific information when sampling and testing for compliance demonstrations including a) location and date and time of sampling/measurements, b) operating conditions, c) name of person(s) collecting samples or conducting measurements or performing analysis, d) analytical techniques used, and e) results.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:

[ ] Quarterly Monitoring Report:_____
[ ] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference None Describe: Not Applicable

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** COMAR 26.11.03.06C(6)

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall retain all monitoring data and information that support the compliance certification for a period of five (5) years from the date that the monitoring, sample measurement, application, report or emissions test was completed or submitted to the Department.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:

[ ] Quarterly Monitoring Report:_____
[ ] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference None Describe: Not Applicable

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** 40 CFR 82, Subpart F

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall comply with the applicable standards for recycling and emissions reduction pursuant to 40 CFR 82, Subpart F.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference None Describe: Not Applicable

Frequency of submittal of the compliance demonstration: Annual

SECTION 3B. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Emissions Unit No.: Facility-Wide **General Reference:** 40 CFR Part 61, Subpart M

Briefly describe the Emission Standard/Limit or Operational Limitation:
The Permittee shall comply with 40 CFR Part 61, Subpart M when conducting any renovation or demolition activities at the facility.

Permit Shield Request: _____

Compliance Demonstration:

Check appropriate reports required to be submitted:
[ ] Quarterly Monitoring Report:_____
[X] Annual Compliance Certification:_____
[ ] Semi-Annual Monitoring Report: _____

Methods used to demonstrate compliance:

Monitoring: Reference None Describe: Not Applicable

Testing: Reference None Describe: Not Applicable

Record Keeping: Reference None Describe: Not Applicable

Reporting: Reference None Describe: Not Applicable

Frequency of submittal of the compliance demonstration: Annual

SECTION 3C. OBSOLETE, EXTRANEOUS, OR INSIGNIFICANT PERMIT CONDITIONS

List permit to construct conditions which should be considered to be obsolete, extraneous, or environmentally insignificant.

Emissions Unit No.: EU-02 **Permit to Construct No.** N/A

Emissions Point No.	Date Permit Issued	Condition No.	Brief Description of Condition and Reason for Exclusion
Fugitive	N/A		This is not a permitted or registered source by itself and is part of a landfill operation. The regulation cited for this emission unit was COMAR 26.11.06.03D which is already listed as a facility-wide permit condition. There are several reasons for removing this "emission unit" from the Title V permit as follows:

1. Previously estimated potential emission calculations were based on incorrect equations from Ap-42 that were changed in CY 2006 by US EPA. Also, some of the values used previously were incorrect and resulted in gross overestimation of potential fugitive emissions.

2. The landfill has reduced the annual amount of waste placed in the landfill significantly to less than 10,000 tons since 1999.

3. Most of the waste is delivered to a transfer station which is on a paved road and waste received is transferred to Annapolis Junction Transfer Station and ultimately disposed of at the King George Landfill in King George, Virginia.

4. Most of the waste received at the facility now segregated at the convenience center which is all on the paved road.

5. Previously there was some traffic that travelled on the unpaved road to composting area has now been paved with millings to minimize dust generation. Currently, traffic to composting waste is now restricted to paved roads.

6. Current estimate of travel miles on unpaved roads is 317 miles compared to approximately 10,600 miles estimated previously.

7. County code requires that quarterly inspections are made to ensure compliance with dust emissions minimization and the facility is already doing this to comply with the County code.

8. There are several other landfills in Maryland with Title V Permits, which do not have Paved and Unpaved Roads listed as a separate emission unit creating unnecessary burden on some which have been required to list this as an emission unit.

9. Typically, only permitted units are listed with permit conditions associated with them in the Title V permit in the main section of the permit. **Since paved/unpaved roads were never permitted by MDE as a separate emission unit, incorporating it as such in a Title V results in creating a new requirement which was not the original intent of USEPA when creating the regulation.** The potential emission calculations for the paved/unpaved roads have been included in the background documentation for your files and review.

SECTION 3D. ALTERNATE OPERATING SCENARIOS

Emissions Unit No.:_____

Briefly describe any alternate operating scenarios. Assign a number to each scenario for identification purposes.

NOT APPLICABLE

SECTION 3E. CITATION TO AND DESCRIPTION OF APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS FOR AN ALTERNATE OPERATING SCENARIO

Scenario No.: _____

Emissions Unit No.: _____ General Reference: _____

Briefly describe any applicable Emissions Standard/Limits/Operational Limitations:

NOT APPLICABLE

Compliance Demonstration

Methods used to demonstrate compliance:

Monitoring: Reference _____ Describe: _____

Testing: Reference _____ Describe: _____

Record Keeping: Reference _____ Describe: _____

Reporting: Reference _____ Describe: _____

Frequency of submittal of the compliance demonstration: _____

SECTION 4. CONTROL EQUIPMENT

1. Associated Emissions Units No. : EU-01	2. Emissions Point No.: ST01

3. Type and Description of Control Equipment:

Landfill gas collection system and enclosed flare. The enclosed flare has a design capacity of 800 standard cubic feet per minute (scfm).

4. Pollutants Controlled:	Control Efficiency:
VOCs & HAPs	98%

5. Capture Efficiency: Variable (calculated based on actual LFG burned vs LandGEM modeled LFG generation)

SECTION 5. SUMMARY SHEET OF POTENTIAL EMISSIONS

List all applicable pollutants in tons per year (tpy) pertaining to this facility. The Emissions Unit No. should be consistent with numbers used in Section 3. Attach a copy of all calculations.

Pollutant	NO_x	CO	VOC	SO_x	PM_{10}	HAPs
CAS Number	N/A	N/A	N/A	N/A	N/A	
Emissions Unit #EU-01	7.62	19.05	0.01	1.58	1.62	0.12
Emissions Unit #EU-03	8.51	42.53	2.84	0.39	2.13	0.02
Emissions Unit #EU-04	22.61	5.18	0.60	0.01	0.66	0.01
Emissions Unit #EU-05	-	-	1.00	-	-	0.07
Emissions Unit #						
Emissions Unit #						
Emissions Unit #						
Emissions Unit #						
Emissions Unit #						
Emissions Unit #						
Emissions Unit #						
Emissions Unit #						
Emissions Unit #						
Emissions Unit #						
Emissions Unit #						
Fugitive Emissions	0	0	0.28	0	1.67	0.02
Total	38.74	66.76	4.72	1.98	6.08	0.24

SECTION 6. EXPLANATION OF PROPOSED EXEMPTIONS FROM OTHERWISE APPLICABLE FEDERALLY ENFORCEABLE REQUIREMENTS

Describe and cite the applicable requirements to be exempted. Complete this Section only if the facility is claiming exemptions from or the non-applicability of any federally enforceable requirements.

1. Applicable Requirement:
40 CFR 63 Subpart AAAA – National Emission Standards for Hazardous Air Pollutants – Municipal Solid Waste Landfill (Landfill NESHAP)

2. Brief Description:
The Landfill NESHAP requires that the facilities minimize emissions of hazardous air pollutants. Since the landfill NSPS and State EG programs already contain extensive requirements for monitoring, recordkeeping, and reporting, the NESHAP requires that these activities continue. The only additional requirement is that when the regulations become applicable to a facility, the facility must develop a start-up, shutdown and malfunction (SSM) plan, document that SSM events follow the procedures in the plan, submit semi-annual SSM plan reports, and increase the frequency of the annual NSPS or EG monitoring report to semiannual.

3. Reasons for Proposed Exemption or Justification of Non-applicability:
Per 63.1945(f), existing landfills that are subject to the NSPS or state EG program must comply with the Landfill NESHAP at the time they are required to install a collection and control system by 40 CFR 60.752(b)(2) of Subpart WWW, or their State's EPA-approved EG program. This timeline occurs within 30 months of the data that the facility exceeds NMOC emissions of 50 Mg/year. Since Alpha Ridge Landfill has demonstrated that NMOC emissions will remain below 50 Mg/year for the next five years, this regulation will not be applicable yet to the facility during the term of the next renewal permit. It is therefore requested that this be included in the permit as a future applicable requirement, with an applicability date of 30 months from the date the facility submits a report demonstrating that NMOC emissions are in excess of 50 Mg/year.

SECTION 7. COMPLIANCE SCHEDULE FOR NONCOMPLYING EMISSIONS UNITS

NOT APPLICABLE

1. Emissions Unit #	Anticipated Compliance Date
Applicable Federally Enforceable Requirement being Violated:	

2. Description of Plan to Achieve Compliance:

_____

_____

_____

_____

_____

_____

Certified Progress Reports for sources in noncompliance shall be submitted at least quarterly to the Department.

State-Only Requirements

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STATE-ONLY ENFORCEABLE REQUIREMENTS

Facility Information:

Name of Facility: Alpha Ridge Landfill County: Howard
Premises Number: 0364
Street Address: 2350 Marriottsville Road, Marriottsville, MD 21104
24-hour Emergency Telephone Number for Air Pollution Matters: County Central Communications (410) 313-2929
Type of Equipment (List Significant Units): Municipal Solid Waste Landfill
Landfill Gas Fired Internal Combustion Engine for Electricity Generation
Horizontal Grinder powered by a Diesel Engine
Gasoline Storage Tank and Dispensing Facility

CITATION TO AND DESCRIPTION OF APPLICABLE STATE-ONLY ENFORCEABLE REQUIREMENTS

Registration No.: All Sources

Emissions Unit No.: Facility-wide **General Reference:** COMAR 26.11.06.08 and 26.11.06.09

Briefly describe the requirement and the emissions limit (if applicable):

The Permittee shall not discharge emissions beyond the property line in such a manner that a nuisance or air pollution is created.

Methods used to demonstrate compliance:

None

CITATION TO AND DESCRIPTION OF APPLICABLE STATE-ONLY ENFORCEABLE REQUIREMENTS

Registration No.: _____

Emissions Unit No.: Facility-wide **General Reference:** COMAR 26.11.15.05A

Briefly describe the requirement and the emissions limit (if applicable):

A person may not construct, reconstruct, operate, or cause to be constructed, reconstructed, or operated any new installation or new source that will discharge a toxic air pollutant to the atmosphere without installing and operating T-BACT.

Methods used to demonstrate compliance:

None

CITATION TO AND DESCRIPTION OF APPLICABLE STATE-ONLY ENFORCEABLE REQUIREMENTS

Registration No.: _____

Emissions Unit No.: Facility-wide **General Reference:** COMAR 26.11.15.06A

Briefly describe the requirement and the emissions limit (if applicable):

This regulation prohibits the construction, modification, or operation of any new installation or source without a demonstration that emissions of Toxic Air Pollutants will not unreasonably endanger human health.

Methods used to demonstrate compliance:

None

CITATION TO AND DESCRIPTION OF APPLICABLE STATE-ONLY ENFORCEABLE REQUIREMENTS

Registration No.: _____

Emissions Unit No.: Facility-wide **General Reference:** COMAR 26.11.15

Briefly describe the requirement and the emissions limit (if applicable):

The Permittee shall submit to the Department, by April 1 of each year during the term of the permit, a written certification of the results of an analysis of emissions of toxic air pollutants from the Permittee's facility during the previous calendar year.

Methods used to demonstrate compliance:

A statement that previously submitted compliance demonstrations for emissions of toxic air pollutants remains valid or a revised compliance demonstration in accordance with the requirements included under COMAR 26.11.15 & 16.

Insignificant Activities

III. Checkoff List of Emissions Units and Activities Exempt from the Part 70 Permit Application

Insignificant Activities

Place a check mark beside each type of emissions unit or activity that is located at the facility. Where noted, please indicate the number of that type of emissions unit or activity located at the facility.

(1) No. 2 Fuel-burning equipment using gaseous fuels or no. 1 or no. 2 fuel oil, and having a heat input less than 1,000,000 Btu (1.06 gigajoules) per hour;

(2) No. ___ Fuel-burning equipment using solid fuel and having a heat input of less than 350,000 Btu (0.37 gigajoule) per hour;

(3) No. 1 Stationary internal combustion engines with an output less than 500 brake horsepower (373 kilowatts) of power output **Onan 80 kW Stationary EG** (***Please note that the remaining equipment is portable and identified here for information purposes only*** **– Vermeer HG 4000 445 hp horizontal grinder, McCloskey 516RE 100 hp trommel screener, Powerscreen 130 hp trommel screener, Cummins 80 kW EG, Olympian 75kW EG, Generac 105 kW EG**);

(4) ___ Space heaters utilizing direct heat transfer and used solely for comfort heat;

(5) ___ Water cooling towers and water cooling ponds unless used for evaporative cooling of water from barometric jets or barometric condensers, or used in conjunction with an installation requiring a permit to operate;

(6) No. ___ Unheated VOC dispensing containers or unheated VOC rinsing containers of 60 gallons (227 liters) capacity or less;

(7) ___ Commercial bakery ovens with a rated heat input capacity of less than 2,000,000 Btu per hour;

(8) ___ Kilns used for firing ceramic ware, heated exclusively by natural gas, liquefied petroleum gas, electricity, or any combination of these;

(9) ___ Confection cookers where the products are edible and intended for human consumption;

(10) ___ Die casting machines;

(11) ___ Photographic process equipment used to reproduce an image upon sensitized material through the use of radiant energy;

(12)___ Equipment for drilling, carving, cutting, routing, turning, sawing, planing, spindle sanding, or disc sanding of wood or wood products;

(13)___ Brazing, soldering, or welding equipment, and cutting torches related to manufacturing and construction activities that emit HAP metals and not directly related to plant maintenance, upkeep and repair or maintenance shop activities;

(14)___ Equipment for washing or drying products fabricated from metal or glass, provided that no VOC is used in the process and that no oil or solid fuel is burned;

(15)___ Containers, reservoirs, or tanks used exclusively for electrolytic plating work, or electrolytic polishing, or electrolytic stripping of brass, bronze, cadmium, copper, iron, lead, nickel, tin, zinc, and precious metals;

(16) Containers, reservoirs, or tanks used exclusively for:

(a) ___ Dipping operations for applying coatings of natural or synthetic resins that contain no VOC;

(b) ___ Dipping operations for coating objects with oils, waxes, or greases, and where no VOC is used;

(c) ___ Storage of butane, propane, or liquefied petroleum, or natural gas;

(d) No. _____ Storage of lubricating oils:
(i) constructed on or before July 23, 1984, or
(ii) constructed after July 23, 1984, and having capacities less than 10,568 gallons (40 cubic meters);

(e) No. ___ Storage of lubricating oils, constructed after July 23, 1984, and having individual tank capacities of 10,568 gallons (40 cubic meters) or greater;

(f) No. 3 Unheated storage of VOC with an initial boiling point of 300 °F (149 °C) or greater:
(i) constructed on or before July 23, 1984, or
(ii) constructed after July 23, 1984, and having capacities less than 10,568 gallons (40 cubic meters) (**3 waste oil tanks, 2 – 1,000 gallons and 1 – 300 gallons**);

(g) No. __ Unheated storage of VOC with an initial boiling point of 300 °F (149 >C) or greater, constructed after July 23, 1984, and having individual tank capacities of 10,568 gallons (40 cubic meters) or greater;

(h) No. 5 Storage of Numbers 1, 2, 4, 5, and 6 fuel oil and aviation jet engine fuel:

(i) constructed on or before July 23, 1984, or

(ii) constructed after July 23, 1984, and having capacities less than 10,568 gallons (40 cubic meters); (**1 – 10,000 gallon Diesel AST, 2- 500 gallon Diesel AST, 1-2,000 gallon heating oil AST, 1-1,000 gallon diesel AST[On Ford F-750 Pickup Truck])**

(i) No. ___ Storage of Numbers 1, 2, 4, 5, and 6 fuel oil and aviation jet engine fuel, constructed after July 23, 1984, and having individual tank capacities of 10,568 gallons (40 cubic meters) or greater;

(j) No. ___ Storage of motor vehicle gasoline and having individual tank capacities of 2,000 gallons (7.6 cubic meters) or less;

(k) No. ___ The storage of VOC normally used as solvents, diluents, thinners, inks, colorants, paints, lacquers, enamels, varnishes, liquid resins, or other surface coatings and having individual capacities of 2,000 gallons (7.6 cubic meters) or less;

(17) ___ Gaseous fuel-fired or electrically heated furnaces for heat treating glass or metals, the use of which does not involve molten materials;

(18) Crucible furnaces, pot furnaces, or induction furnaces, with individual capacities of 1,000 pounds (454 kilograms) or less each, in which no sweating or distilling is conducted, or any fluxing is conducted using chloride, fluoride, or ammonium compounds, and from which only the following metals are poured or in which only the following metals are held in a molten state:

(a) ___ Aluminum or any alloy containing over 50 percent aluminum, if no gaseous chloride compounds, chlorine, aluminum chloride, or aluminum fluoride is used;

(b) ___ Magnesium or any alloy containing over 50 percent magnesium;

(c) ___ Lead or any alloy containing over 50 percent lead;

(d) ___ Tin or any alloy containing over 50 percent tin;

(e) ___ Zinc or any alloy containing over 50 percent zinc;

(f) ___ Copper;

(g) ____ Precious metals;

(19) ____ Charbroilers and pit barbecues as defined in COMAR 26.11.18.01 with a total cooking area of 5 square feet (0.46 square meter) or less;

(20) ____ First aid and emergency medical care provided at the facility, including related activities such as sterilization and medicine preparation used in support of a manufacturing or production process;

(21) ___ Certain recreational equipment and activities, such as fireplaces, barbecue pits and cookers, fireworks displays, and kerosene fuel use;

(22) ___ Potable water treatment equipment, not including air stripping equipment;

(23) ___ Firing and testing of military weapons and explosives;

(24) ___ Emissions resulting from the use of explosives for blasting at quarrying operations and from the required disposal of boxes used to ship the explosive;

(25) __ Comfort air conditioning subject to requirements of Title VI of the Clean Air Act;

(26) ___ Grain, metal, or mineral extrusion presses;

(27) ___ Breweries with an annual beer production less than 60,000 barrels;

(28) ___ Natural draft hoods or natural draft ventilators that exhaust air pollutants into the ambient air from manufacturing/industrial or commercial processes;

(29) ___ Laboratory fume hoods and vents;

(30) No. ___ Sheet-fed letter or lithographic printing press(es) with a cylinder width of less than 18 inches;

For the following, attach additional pages as necessary:

(31) Any other emissions unit, not listed in this section, with a potential to emit less than the "de minimus" levels listed in COMAR 26.11.02.10X (list and describe units):

No. 1 Air stripper for groundwater treatment system

No. ___ _____

No. ___ _____

No. ___ _____

No. ___ _____

(32) Any other emissions unit at the facility which is not subject to an applicable requirement of the Clean Air Act (list and describe):

No. 1 Portable Ingersol Rand diesel air compressor, 100 psi

No. ___ _____

No. ___ _____

Emission Calculations

Table 1
Summary of Facility Actual and Potential Criteria and HAP Emissions
2019 Title V Renewal
Alpha Ridge Landfill

Facility-Wide Actual CY2018 Criteria Emissions

Units	Unit IDs	NOx (tons/yr)	CO (tons/yr)	VOC (tons/yr)		PM_{10} (tons/yr)		SO_2 (tons/yr)	HAP (tons/yr)		CO_2 Eq (tons/yr)	
				Point Source	Fugitive Source	Point Source	Fugitive Source		Point Source	Fugitive Source	Point Source	Fugitive Source
Landfill controlled by Flare	EU-01	0.50	1.67	0.00	0.11	0.14	0.13	0.02	0.07	0.42	1,632	4,008
LFG fired Engine	EU-03	3.14	19.71	0.02	-	0.97	-	0.04	0.16	-	4,356	-
Grinder powered by Engine	EU-04	1.33	0.35	0.00	-	0.04	-	0.42	-	-	-	-
4,000 gal Gasoline Tank	EU-05	-	-	0.82	0.01	-	-	-	0.06	0.00	-	-
Total		**4.97**	**21.73**	**0.83**	**0.12**	**1.15**	**0.13**	**0.48**	**0.30**	**0.42**	**5,987**	**4,008**

Facility-Wide Maximum Potential Criterial Emissions

Units	Unit IDs	NOx (tons/yr)	CO (tons/yr)	VOC (tons/yr)		PM_{10} (tons/yr)		SO_2 (tons/yr)	HAP (tons/yr)		CO_2 Eq (tons/yr)	
				Point Source	Fugitive Source	Point Source	Fugitive Source		Point Source	Fugitive Source	Point Source	Fugitive Source
Landfill controlled by Flare	EU-01	7.62	19.05	0.01	-	1.62	1.67	1.58	0.12	-	75,554	-
LFG fired Engine	EU-03	8.51	42.53	2.84	-	2.13	-	0.39	0.02	-	8,096	-
Grinder powered by Engine	EU-04	22.61	5.18	0.60	-	0.66	-	0.01	0.01	-	438.89	-
4,000 gal Gasoline Tank	EU-05	-	-	1.00	0.28	-	-	-	0.07	0.02	-	-
Total		**38.74**	**66.76**	**4.44**	**0.28**	**4.40**	**1.67**	**1.98**	**0.22**	**0.02**	**84,089**	-

Table 2-1
LandGEM Model 3.02 Results
Emission Unit EU-01
Alpha Ridge Landfill

Registration No. 9-0205

Source: Municipal Solid Waste Landfill

The Landfill Gas Emissions Model (LandGEM) Version 3.02 was used to generate all values used in this report. User inputs and LandGEM results are summarized below.

USER INPUTS

Landfill Open Year	1980	
Landfill Closure Year (with 80-year limit)	2056	
Actual Closure Year (without limit)	2122	
Have Model Calculate Closure Year?	No	
Model Parameters		
Methane Generation Rate, k	0.050	*year* $^{-1}$
Potential Methane Generation Capacity, L_0	170	*m* ^{3} */Mg*
NMOC Concentration	18	*ppmv as hexane*
Methane Content	50	*% as volume*

Waste Acceptance Rates

	Input Units	Calculated Units
Year	(Mg/year)	(short tons/year)
2000	8,016	8,818
2001	6,013	6,614
2002	7,523	8,275
2003	6,399	7,039
2004	1,636	1,800
2005	2,657	2,923
2006	3,854	4,239
2007	4,312	4,743
2008	3,272	3,599
2009	295	325
2010	463	509
2011	219	241
2012	545	600
2013	0	0
2014	176	194
2015	1,471	1,618
2016	6,669	7,336
2017	926	1,019
2018	8,368	9,205
2019	10,000	11,000

Table 2-2
Potential LFG Generation/Fugitive Emission Rates
Emission Unit EU-01
Alpha Ridge Landfill

Year	Waste Accepted tons/yr	Waste-In-Place tons	Waste Accepted Mg/yr	Waste-In-Place Mg	Methane Generation Rates m^3/yr	LFG Generation Rates cfm	LFG Collection Rates* cfm	LFG Fugitive Rates cfm
1980	90,004	0	81,822	0	0	0	0	0
1981	90,004	90,004	81,822	81,822	680,100	101	0	101
1982	101,965	180,008	92,695	163,644	1,327,000	197	0	197
1983	109,019	281,973	99,108	256,339	2,033,000	302	0	302
1984	129,963	390,992	118,148	355,447	2,757,000	409	0	409
1985	157,079	520,955	142,799	473,595	3,605,000	535	0	535
1986	176,921	678,033	160,837	616,394	4,616,000	685	0	685
1987	211,093	854,954	191,903	777,231	5,728,000	850	0	850
1988	247,910	1,066,047	225,373	969,134	7,043,000	1,045	0	1,045
1989	286,601	1,313,958	260,546	1,194,507	8,573,000	1,272	0	1,272
1990	229,281	1,600,558	208,437	1,455,053	10,320,000	1,531	0	1,531
1991	177,472	1,829,839	161,338	1,663,490	11,550,000	1,713	0	1,713
1992	190,700	2,007,311	173,364	1,824,828	12,330,000	1,829	0	1,829
1993	192,904	2,198,011	175,367	1,998,192	13,170,000	1,953	0	1,953
1994	177,472	2,390,915	161,338	2,173,559	13,980,000	2,074	0	2,074
1995	168,654	2,568,387	153,322	2,334,897	14,640,000	2,171	0	2,171
1996	139,994	2,737,041	127,267	2,488,219	15,200,000	2,254	0	2,254
1997	38,581	2,877,035	35,074	2,615,486	15,520,000	2,302	0	2,302
1998	28,660	2,915,616	26,055	2,650,560	15,050,000	2,232	0	2,232
1999	8,476	2,944,277	7,705	2,676,615	14,540,000	2,157	960	1,197
2000	8,818	2,952,752	8,016	2,684,320	13,890,000	2,060	917	1,143
2001	6,614	2,961,570	6,013	2,692,336	13,280,000	1,970	877	1,093
2002	8,275	2,968,184	7,523	2,698,349	12,680,000	1,881	837	1,044
2003	7,039	2,976,459	6,399	2,705,872	12,130,000	1,799	801	999
2004	1,800	2,983,498	1,636	2,712,271	11,590,000	1,719	765	954
2005	2,923	2,985,298	2,657	2,713,907	11,040,000	1,637	729	909
2006	4,239	2,988,220	3,854	2,716,564	10,520,000	1,560	694	866
2007	4,743	2,992,460	4,312	2,720,418	10,040,000	1,489	663	826
2008	3,599	2,997,203	3,272	2,724,730	9,585,000	1,422	633	789
2009	325	3,000,802	295	2,728,002	9,145,000	1,356	604	753
2010	509	3,001,127	463	2,728,297	8,702,000	1,291	574	716
2011	241	3,001,636	219	2,728,760	8,281,000	1,228	547	682
2012	600	3,001,877	545	2,728,979	7,879,000	1,169	520	649
2013	0	3,002,476	0	2,729,524	7,499,000	1,112	495	617
2014	194	3,002,476	176	2,729,524	7,133,000	1,058	471	587
2015	1,618	3,002,670	1,471	2,729,700	6,787,000	1,007	448	559
2016	7,336	3,004,288	6,669	2,731,171	6,468,000	959	427	532
2017	1,019	3,011,624	926	2,737,840	6,208,000	921	410	511
2018	9,205	3,012,643	8,368	2,738,766	5,913,000	877	390	487
2019	11,000	3,021,847	10,000	2,747,134	5,694,000	845	376	469
2020	11,000	3,032,847	10,000	2,757,134	5,500,000	816	363	453
2021	11,000	3,043,847	10,000	2,767,134	5,315,000	788	351	438
2022	11,000	3,054,847	10,000	2,777,134	5,139,000	762	339	423
2023	11,000	3,065,847	10,000	2,787,134	4,971,000	737	328	409

Measured NMOC Concentration in LFG: 18.1 ppmv
Average Methane Content in LFG: 45.3%
Assumed Collection Efficiency of LFG System: 44.5%
Selected Decay Rate Constant: 0.05
NMOC Concentration based on Tier II Testing Conducted in CY 2018
* LFGCCS installed in CY 1999

Table 2-3
Potential NMOC and VOC Fugitive Emission Rates
Emission Unit EU-01
Alpha Ridge Landfill

Year	NMOC Generation Rates Mg/yr	NMOC Generation Rates tons /yr	NMOC Surface Fugitive Rates tons/yr	VOC Generation Rates* tons/yr	VOC Surface Fugitive Rates tons/yr
1980	0.0000	0.0000	0.0000	0.0000	0.0000
1981	0.0882	0.0971	0.0971	0.0379	0.0379
1982	0.1722	0.1894	0.1894	0.0739	0.0739
1983	0.2638	0.2901	0.2901	0.1132	0.1132
1984	0.3578	0.3936	0.3936	0.1535	0.1535
1985	0.4678	0.5145	0.5145	0.2007	0.2007
1986	0.5990	0.6589	0.6589	0.2570	0.2570
1987	0.7432	0.8175	0.8175	0.3188	0.3188
1988	0.9139	1.0053	1.0053	0.3921	0.3921
1989	1.1124	1.2237	1.2237	0.4772	0.4772
1990	1.3392	1.4731	1.4731	0.5745	0.5745
1991	1.4987	1.6485	1.6485	0.6429	0.6429
1992	1.5996	1.7595	1.7595	0.6862	0.6862
1993	1.7085	1.8794	1.8794	0.7330	0.7330
1994	1.8144	1.9958	1.9958	0.7784	0.7784
1995	1.8999	2.0899	2.0899	0.8150	0.8150
1996	1.9726	2.1698	2.1698	0.8462	0.8462
1997	2.0136	2.2150	2.2150	0.8638	0.8638
1998	1.9533	2.1486	2.1486	0.8379	0.8379
1999	1.8861	2.0747	1.1515	0.8091	0.4491
2000	1.8024	1.9827	1.1004	0.7732	0.4291
2001	1.7232	1.8955	1.0520	0.7392	0.4103
2002	1.6456	1.8102	1.0046	0.7060	0.3918
2003	1.5735	1.7308	0.9606	0.6750	0.3746
2004	1.5036	1.6540	0.9180	0.6451	0.3580
2005	1.4321	1.5753	0.8743	0.6144	0.3410
2006	1.3651	1.5016	0.8334	0.5856	0.3250
2007	1.3027	1.4329	0.7953	0.5588	0.3102
2008	1.2438	1.3682	0.7593	0.5336	0.2961
2009	1.1866	1.3053	0.7244	0.5091	0.2825
2010	1.1291	1.2420	0.6893	0.4844	0.2688
2011	1.0745	1.1820	0.6560	0.4610	0.2558
2012	1.0224	1.1246	0.6241	0.4386	0.2434
2013	0.9731	1.0704	0.5941	0.4175	0.2317
2014	0.9256	1.0182	0.5651	0.3971	0.2204
2015	0.8807	0.9687	0.5376	0.3778	0.2097
2016	0.8393	0.9232	0.5124	0.3601	0.1998
2017	0.8056	0.8861	0.4918	0.3456	0.1918
2018	0.7673	0.8440	0.4684	0.3292	0.1827
2019	0.7389	0.8128	0.4511	0.3170	0.1759
2020	0.7136	0.7850	0.4357	0.3061	0.1699
2021	0.6896	0.7586	0.4210	0.2958	0.1642
2022	0.6668	0.7334	0.4071	0.2860	0.1588
2023	0.6450	0.7095	0.3938	0.2767	0.1536

Measured NMOC Concentration in LFG:	18.1 ppmv
Average Methane Content in LFG:	45.3%
Assumed Collection Efficiency of LFG System:	44.5%
Selected Decay Rate Constant:	0.05

* LFGCCS installed in CY 1999

Table 2-4
Potential HAP/TAP Emission Rates
Emission Unit EU-01
Alpha Ridge Landfill

HAP/TAP EMISSIONS (tons/yr)		
LFG (cfm)	Generated	Surface Emissions
376	8.39	4.66

Pollutant	UM(p)		FM(p)
	Mg/yr	tons/yr	tons/yr
Total landfill gas	14222.38	15644.6177	8682.7628
Methane	3798.95	4178.8454	2319.2592
Carbon dioxide	10423.43	11465.7723	6363.5036
NMOC	0.7389	0.8128	0.4511
Carbon monoxide	1.8575	2.0433	1.1340
1,1,1-Trichloroethane (methyl chloroform) - HAP	0.0303	0.0334	0.0185
1,1,2,2-Tetrachloroethane - HAP/VOC	0.0875	0.0962	0.0534
1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	0.1125	0.1238	0.0687
1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.0092	0.0101	0.0056
1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.0192	0.0211	0.0117
1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.0096	0.0106	0.0059
2-Propanol (isopropyl alcohol) - VOC	1.4237	1.5660	0.8691
Acetone	0.1926	0.2118	0.1176
Acrylonitrile - HAP/VOC	0.1583	0.1742	0.0967
Benzene - No or Unknown Co-disposal - HAP/VOC	0.0703	0.0773	0.0429
Carbon disulfide - HAP/VOC	0.0209	0.0230	0.0128
Carbon tetrachloride - HAP/VOC	0.0003	0.0003	0.0002
Carbonyl sulfide - HAP/VOC	0.0139	0.0153	0.0085
Chlorobenzene - HAP/VOC	0.0133	0.0147	0.0081
Chloroethane (ethyl chloride) - HAP/VOC	0.0397	0.0437	0.0243
Chloroform - HAP/VOC	0.0017	0.0019	0.0010
Chloromethane - VOC	0.0287	0.0316	0.0175
Dichlorobenzene - (HAP for para isomer/VOC)	0.0146	0.0161	0.0089
Dichloromethane (methylene chloride) - HAP	0.5633	0.6196	0.3439
Dimethyl sulfide (methyl sulfide) - VOC	0.2296	0.2525	0.1401
Ethylbenzene - HAP/VOC	0.2313	0.2544	0.1412
Ethylene dibromide - HAP/VOC	0.0001	0.0001	0.0001
Hexane - HAP/VOC	0.2694	0.2964	0.1645
Hydrogen sulfide	0.5812	0.6393	0.3548
Mercury (total) - HAP	0.0000	0.0000	0.0000
Methyl ethyl ketone - HAP/VOC	0.2425	0.2668	0.1481
Methyl isobutyl ketone - HAP/VOC	0.0901	0.0992	0.0550
Methyl mercaptan - VOC	0.0570	0.0627	0.0348
Perchloroethylene (tetrachloroethylene) - HAP	0.2906	0.3197	0.1774
t-1,2-Dichloroethene - VOC	0.1286	0.1414	0.0785
Toluene - No or Unknown Co-disposal - HAP/VOC	1.7020	1.8722	1.0391
Trichloroethylene (trichloroethene) - HAP/VOC	0.1743	0.1917	0.1064
Vinyl chloride - HAP/VOC	0.2161	0.2377	0.1319
Xylenes - HAP/VOC	0.6034	0.6638	0.3684
Total HAPs Only	5.5659	6.1225	3.3980
Total TAPs Only	7.6260	8.3886	4.6557
Total HAPs/TAPs	7.6260	8.3886	4.6557

Assumed Collection Efficiency of LFG System: 44.5%

UM(p) = Uncontrolled mass emissions of pollutant from LandGEM 3.02 Model Run, CY 2019 inventory report.

FM(p) = Fugitive emission rate from the landfill surface.

TAP denotes compounds that are classified as toxic air pollutants per the Code of Maryland Air Regulations.

HAP denotes compounds that are classified as hazardous air pollutants per AP-42 and CAA Section 112.

Table 2-5
Potential Flare Criteria and HAP Emissions
Emission Unit EU-01
Alpha Ridge Landfill

Flare rated capacity =	800	ft^3/min
Average Methane Content =	45.3%	
Methane Heat Content =	1,000	btu/ft^3
LFG Heat content =	453	btu/ft^3
Annual Operating Minutes =	525,600	Maximum
Annual LFG Flow Rate	420,480,000	ft^3/yr
Annual LFG Flow Rate	11,904,937	m^3/yr
Annual Heat Content	190,477	MM BTU
Reduced Sulfur Content in LFG	46.90	ppmv
Total Sulfur in Annual LFG	558.34	m^3/yr
Total Sulfur in Annual LFG	730.73	kg/yr
2019 LFG Generation Rate	845	ft^3/min
2019 NMOC Emission Rate	0.81	tons/yr

	Emission Factor		**Emissions**	
	lbs/MM BTU	**lb/MMCF of CH4**	**tons/year**	**lbs/day**
NO_X	0.08	-	7.62	41.75
CO	0.20	-	19.05	104.37
PM_{10}	-	17.00	1.62	8.87
VOC	-	-	0.01	0.03
SO2	-	-	1.58	8.63
HAP	-	-	0.12	0.64

VOC emissions are 39% of NMOC emissions per AP-42, Section 2.4, Table 2.4-2.
NMOC Emissions are based on the LandGEM 2019 Inventory (Please see attached Table 2-2)
Reduced sulfur concentration is based on AP-42, Page 2.4-8
Total sulfur in kg/year calculated based on AP-42, Section 2.4, Equation 2.4
Destruction Efficiency of Flare is assumed to be 98%

Table 2-6
Potential Fugitive Dust Emissions
Emission Unit EU-01
Alpha Ridge Landfill

Input Parameters:

Number of loaders=	2	site-specific	
Number of dozers=	0	site-specific	
Number of compactors =	1	site-specific	
Cover Material Placed =	2000	tons	(assume 20% cover soil based on 10,000 tons)
Mean wind speed =	22.17	mph	(Marriottsville, MD)
Material silt content =	6.4	(Mean, Table 13.2.2-1, Page 13.2.2-3)	
Material moisture content =	14	(Mean, Table 13.2.4, Page 13.2.4-2)	
Operating Schedule =	2448	hours	site-specific (6 days/week, 8 hours/day, 6 holidays excepted)

Emissions from operation of bulldozers and compactors (USEPA AP-42, Table 11.9-1, July 1998)

EF = $[5.7\ (s)^{1.2}/(M)^{1.3}](0.75)$	**1.28**	**lbs/hr**	**PM**
EF = $[1.0\ (s)^{1.5}/(M)^{1.4}](0.75)$	**0.30**	**lbs/hr**	**PM_{10}**
EF = $[1.0\ (s)^{1.5}/(M)^{1.4}](0.105)$	**0.04**	**lbs/hr**	**$PM_{2.5}$**

where:

EF = emission factor, lbs/hr

s = material silt content (%)

M = material moisture content (%)

Therefore, total emissions from bulldozers and compactors =

EF * no of dozers & compactors * operating hours

9,425.80	lbs/yr	**4.71**	**tons/yr**	**PM**	**E1**
2,216.59	lbs/yr	**1.11**	**tons/yr**	**PM_{10}**	**E1**
310.32	lbs/yr	**0.16**	**tons/yr**	**$PM_{2.5}$**	**E1**

Emissions from loading/unloading daily cover into dump trucks (USEPA AP-42, Eq. 1, Section 13.2.4, January 1995)

EF = $k\ (0.0032)\ [U/5)^{1.3}\ /\ (M/2)^{1.4}]$	**0.0011**	**lbs/ton**	**PM**
	0.0005	**lbs/ton**	**PM_{10}**
	0.00008	**lbs/ton**	**$PM_{2.5}$**

where:

EF = emission factor, lbs/ton

k = particle size multiplier = 0.74 for PM, 0.35 for PM10, and 0.053 for PM2.5

U = mean wind speed, miles/hr (mph)

M = material moisture content (%)

Therefore, total emissions from loading/unloading daily cover from dump trucks =

EF * tons/yr of soil cover used

2.15	lbs/yr	**0.001**	**tons/yr**	**PM**	**E2**
1.02	lbs/yr	**0.001**	**tons/yr**	**PM_{10}**	**E2**
0.15	lbs/yr	**0.0001**	**tons/yr**	**$PM_{2.5}$**	**E2**

Table 2-6
Potential Fugitive Dust Emissions
Emission Unit EU-01
Alpha Ridge Landfill

Emissions from driving dump trucks on unpaved roads (USEPA AP-42, Eqs. 1a and 2, Section 13.2.2, November 2006

EF = $[k(s/12)^a (W/3)^b][(365-p)/365]$

6.52	**lbs/VMT/truck**	**PM**
1.76	**lbs/VMT/truck**	**PM_{10}**
0.18	**lbs/VMT/truck**	**$PM_{2.5}$**

where:

k = particle size multiplier = 4.9 lb/VMT (PM), 1.5 lb/VMT (PM10) and 0.15 lb/VMT (PM2.5)

s = material silt content (%)

W = Weight of the vehicle (tons) = 25 tons

p = Number of days when precipitation was greater than 0.01 inches = 130 (Figure 13.2.2-1)

a = 0.7 for PM, 0.90 for PM_{10} and 0.9 for PM2.5 (Table 13.2.2-2, Page 13.2.2-5)

b = 0.45 for PM, PM_{10} and PM2.5 (Table 13.2.2-2, Page 13.2.2-5)

VMT = vehicle miles travelled by loaded & unloaded trucks on unpaved roads

VMT = 640.00 VMT/yr

Therefore, total emissions from driving dump trucks on unpaved roads =

EF *VMT

3,680	**lbs/yr**	**1.84**	**tons/yr**	**PM**	**E3**
1,126	**lbs/yr**	**0.56**	**tons/yr**	**PM_{10}**	**E3**
115	**lbs/yr**	**0.06**	**tons/yr**	**$PM_{2.5}$**	**E3**

Landfill operators control fugitive dust from unpaved roads using water sprays.

Assume 90% control efficiency from water spray

Therefore, actual controlled emissions from driving dump trucks on unpaved roads =

uncontrolled emissions * 0.1

0.18	**tons/yr**	**PM**	**E4**
0.06	**tons/yr**	**PM10**	**E4**
0.006	**tons/yr**	**PM2.5**	**E4**

Total uncontrolled annual fugitive emissions from the landfill operations (tons/yr) =

=E1+E2+E3

6.6	**tons/yr**	**PM**
1.7	**tons/yr**	**PM_{10}**
0.2	**tons/yr**	**$PM_{2.5}$**

Total controlled annual fugitive emissions from the landfill operations (tons/yr) =

=E1+E2+E4

4.9	**tons/yr**	**PM**
1.2	**tons/yr**	**PM_{10}**
0.2	**tons/yr**	**$PM_{2.5}$**

Table 3
Potential Criteria, HAP, and GHG Emissions
Emission Unit EU-03
Alpha Ridge Landfill

Input		
Engine Size	1468	bhp
Landfill Gas Heating Value	453.4	Btu/scf
Fuel Consumption	350	scfm
Fuel Consumption	9.52	MMBtu/hr
Operating Schedule	8760	hrs/yr

LFG Heating Value obtained from LFG Gas Analysis

Fuel Consumption based on maximum capacity

Criteria and HAP Pollutant Emissions

Emission Factors		
NO_x	0.60	g/bhp-hr
CO	3.00	g/bhp-hr
VOC	0.20	g/bhp-hr
PM (PM_{10}/$PM_{2.5}$)	0.15	g/bhp-hr

Emissions Factors are based on manufacturer supplied information.

Site Specific Data		
Sulfur	34.24	mg/m^3

Sulfur value of 46.9 ppmv based on AP-42, Page 2.4-8 used to calculate sulfur in mg/m^3

Criteria and HAP PTE

Pollutant	**Emissions**	
	lbs/hr	**tons/yr**
NOx	1.94	8.51
CO	9.71	42.53
VOC	0.65	2.84
PM (PM_{10}/$PM_{2.5}$)	0.49	2.13
SO_2	0.09	0.39
HAP	0.01	0.02

Based on 100% conversion of fuel sulfur to SO^2 and $2S = SO_2$ (Weight)

Green House Gas (GHG) Emissions

Input

Landfill Gas Flowrate to Engine	350	scfm
Landfill Gas HHV	841	Btu/scf
Operating Schedule	8760	hrs/yr

*Obtained from 40 CFR 98 Subpart C

GHG Emissions

Pollutant	**Emissions Factor**	**Emissions**	**GWP**	**Tons CO_2 Eq**
	kg/MMBtu	**tons/yr**	**CO2 eq**	**tons/yr**
Methane	3.20E-03	4.95E-01	21	1.04E+01
Carbon dioxide	52.07	8.06E+03	1	8.06E+03
Nitrous Oxide	6.30E-04	9.75E-02	310	3.02E+01
			Total	**8.10E+03**

Emissions Factors are obtained from 40 CFR 98, Subpart C

Table 4
Protential Criteria, HAP, and GHG Emissions
Emission Unit EU-04
Alpha Ridge Landfill

Input		
Engine Size	755	bhp
Fuel Consumption	24	gal/hr
Heat Input	3.36	MMBtu/hr
Operation Schedule	2,496	hrs/yr

Criteria Pollutant Emissions

Emission Factors		
NO_x	2.40E-02	lb/hp-hr
CO	5.50E-03	lb/hp-hr
VOC	6.42E-04	lb/hp-hr
PM (PM_{10}/$PM_{2.5}$)	7.00E-04	lb/hp-hr
SO_2	1.21E-05	lb/hp-hr

Emissions Factors are based on AP-42, Chapter 3, Table 3.4-1
Sulfur Content of Ultra Low Sulfur Diesel (15ppm) was used to calculate SO_2 Emissions Factor

Criteria PTE		
Pollutant	**Emissions**	
	lbs/hr	**tons/yr**
NO_x	18.12	22.61
CO	4.15	5.18
VOC	0.48	0.60
PM (PM_{10}/$PM_{2.5}$)	0.53	0.66
SO_2	0.01	0.01

Hazardous Air Pollutant (HAP) Emissions

Pollutant	**Emissions Factor**	**Emissions**	
	lb/MMBtu	**lbs/hr**	**tons/yr**
Benzene	7.76E-04	2.61E-03	3.25E-03
Toulene	2.81E-04	9.44E-04	1.18E-03
Xylene	1.93E-04	6.48E-04	8.09E-04
Formaldehyde	7.89E-05	2.65E-04	3.31E-04
Acetaldehyde	2.52E-05	8.47E-05	1.06E-04
Acrolein	7.88E-06	2.65E-05	3.30E-05
Naphthalene	1.30E-04	4.37E-04	5.45E-04
Total		**5.01E-03**	**6.26E-03**

Emissions Factors are based on AP-42, Chapter 3.4, Tables 3.4-3 and 3.4-4

Green House Gas (GHG) Emissions

Pollutant	**Emissions Factor**	**Emissions**	**GWP**	**Tons CO_2 Eq**
	kg/MMBtu	**tons/yr**	**CO2 Eq**	**tons/yr**
Methane	3.20E-03	2.68E-02	2.10E+01	5.64E-01
Carbon dioxide	5.21E+01	4.37E+02	1.00E+00	4.37E+02
Nitrous Oxide	6.30E-04	5.28E-03	3.10E+02	1.64E+00
			Total	**4.39E+02**

Emissions Factors are based on 40 CFR 98, Subpart C

Table 5-1
Potential VOC and HAP Emissions
Emission Unit EU-05
Alpha Ridge Landfill

Inputs		
VOC Emissions from Tank	1,993.64	lbs
VOC Emissions from Dispensing	561.60	lbs
Total VOC Emissions	2,555.24	lbs

2019 Potential Emissions - HAPs				
Hazardous Air Pollutants	**Weight Percent in Vapor-Phase[3]**	**Gasoline Dispensing Emissions lbs/yr**	**Gasoline Dispensing Emissions lbs/hour**	**Gasoline Dispensing Emissions tons/yr**
Benzene	0.60%	15.33	0.001750166	0.007665727
Cumene	0.02%	0.51	5.83389E-05	0.000255524
Ethylbenzene	0.04%	1.02	0.000116678	0.000511048
Hexane (*n* -hexane)	0.50%	12.78	0.001458472	0.006388106
Methyl tert-butyl ether	4.60%	117.54	0.013417939	0.058770571
Toluene	0.70%	17.89	0.00204186	0.008943348
2,2,4-Trimethylpentane	0.70%	17.89	0.00204186	0.008943348
Xylenes	0.20%	5.11	0.000583389	0.002555242
Total	**-**	**188.1**		**0.094**

HAP Component Vapor Weight Percent from USAF IERA Air Emissions Inventory Guidance Document
For Stationary Sources at Air Force Installations, May 1999, Revised December 2003, Table 15-2.

Table 5-2
Potential VOC Emissions from AST
Emission Unit EU-05
Alpha Ridge Landfill

Alpha Ridge Landfill

4,000 gal Horizontal Fixed Roof Tank - Gasoline

Month	Pollutant	Emissions	
		lb/hr	tons
January	VOC	64.90	0.03
February	VOC	71.92	0.04
March	VOC	103.39	0.05
April	VOC	138.51	0.07
May	VOC	204.64	0.10
June	VOC	294.42	0.15
July	VOC	366.64	0.18
August	VOC	316.01	0.16
September	VOC	184.55	0.09
October	VOC	125.55	0.06
November	VOC	83.99	0.04
December	VOC	39.12	0.02
Total	VOC	1,993.64	1.00

Material Information (Per Tank):

Material		Gasoline RVP 15
Throughput	**Number of Turnovers:**	12.0
Nominal Capacity:		4000
	Annual Throughput (gal/yr):	48000
	January Throughput (gal/month):	4000
	February Throughput (gal/month):	4000
	March Throughput (gal/month):	4000
	April Throughput (gal/month):	4000
	May Throughput (gal/month):	4000
	June Throughput (gal/month):	4000
	July Throughput (gal/month):	4000
	August Throughput (gal/month):	4000
	September Throughput (gal/month):	4000
	October Throughput (gal/month):	4000
	November Throughput (gal/month):	4000
	December Throughput (gal/month):	4000

Tank Information:

Tank Length (feet)		18.2
Tank Diameter (feet)		6.2
Number of Turnovers per year per tank		4.20
Type of Tank:		Horizontal Fixed Roof
Deck Characteristics	Tank Construction:	Welded
Location	Nearest City:	Baltimore, MD
Tank Solar absorptance (α):	Table 7.1-6	0.17

Other Information:

Constants	°F to °R conversion:	459.67
mmHg to psia conversion (psia/mmHg):		0.019337
AP-42 Defined Material (from Table 7.1-3, 7.1-5):		
VP Calculation Method:		Linear Interpolation
Vapor Molecular Weight (lb/lb-mole):		60.00
Daily Total Solar Insolation Factor (I), (Btu/(ft² day)):		1284
Ideal Gas Constant, (psia ft³/lb-mole °R):		10.73

Meteorological Data
The daily maximum ambient temperature (TAX), daily minimum ambient temperature (TAN), and daily total solar insolation factor (I) for each month for the specified city were taken from the proposed revisions to AP-42 Chapter 7, Table 7.1-7

Table 5-2
Potential VOC Emissions from AST
Emission Unit EU-05
Alpha Ridge Landfill

City:	Baltimore, MD
Annual Average Atmospheric Pressure (psia):	14.68
Annual Average Wind Speed (mph):	8.7

Month	Daily Maximum Ambient Temperature T_{AX} (°F)	Daily Minimum Ambient Temperature T_{AN} (°F)	Daily Total Solar Insolation Factor I (Btu/ft^{2}d)
Jan.	**40.3**	**23.4**	**666**
Feb.	**43.7**	**25.9**	**919**
Mar.	**54.0**	**34.2**	**1236**
Apr.	**64.2**	**42.4**	**1554**
May	**74.1**	**52.5**	**1775**
June	**83.1**	**61.9**	**1966**
July	**87.3**	**66.7**	**1902**
Aug.	**85.5**	**65.7**	**1680**
Sept.	**78.4**	**58.5**	**1395**
Oct.	**67.3**	**45.9**	**1046**
Nov.	**56.5**	**37.0**	**698**
Dec.	**45.1**	**28.2**	**571**

Calculated Tank Temperature Data

The daily average ambient temperature (T_{AA}) and bulk liquid temperature (T_B) were calculated for each month using equations from AP-42, Chapter 7, dated 11/06. If product is not at ambient temperature, then the bulk temperature is set equal to the user entered temperature information above.

$$T_{AA} = \left(\frac{T_{AX} + T_{AN}}{2}\right)$$

Equation 1-27

$$T_B = T_{AA} + 6\alpha - 1$$

Equation 1-28

where:

T_{AA} =	daily average ambient temperature, °R
T_B =	liquid bulk temperature, °R
T_{AX} =	daily maximum ambient temperature, °R
T_{AN} =	daily minimum ambient temperature, °R
α =	tank paint solar absorptance, dimensionless

Month	Days	Daily Maximum Ambient Temperature T_{AX} °R	Daily Minimum Ambient Temperature T_{AN} °R	Daily Average Ambient Temperature T_{AA} °R	Daily Average Ambient Temperature T_{AA} °F	Liquid Bulk Temperature T_B °R	Liquid Bulk Temperature T_B °F
Jan.	31	499.97	483.07	491.52	31.85	491.54	31.87
Feb.	28	503.37	485.57	494.47	34.80	494.49	34.82
Mar.	31	513.67	493.87	503.77	44.10	503.79	44.12
Apr.	30	523.87	502.07	512.97	53.30	512.99	53.32
May	31	533.77	512.17	522.97	63.30	522.99	63.32
June	30	542.77	521.57	532.17	72.50	532.19	72.52
July	31	546.97	526.37	536.67	77.00	536.69	77.02
Aug.	31	545.17	525.37	535.27	75.60	535.29	75.62
Sept.	30	538.07	518.17	528.12	68.45	528.14	68.47
Oct.	31	526.97	505.57	516.27	56.60	516.29	56.62
Nov.	30	516.17	496.67	506.42	46.75	506.44	46.77
Dec.	31	504.77	487.87	496.32	36.65	496.34	36.67

Table 5-2
Potential VOC Emissions from AST
Emission Unit EU-05
Alpha Ridge Landfill

Total Losses from Fixed Roof Tanks

$L_T = L_S + L_W$ **Equation 1-1**

where:

L_T = total loss, lb
L_S = standing storage losses, lb
L_W = working losses, lb

Total Losses, L_T		
January	64.90	lb/month
February	71.92	lb/month
March	103.39	lb/month
April	138.51	lb/month
May	204.64	lb/month
June	294.42	lb/month
July	366.64	lb/month
August	316.01	lb/month
September	184.55	lb/month
October	125.55	lb/month
November	83.99	lb/month
December	39.12	lb/month
Annual Total	1993.64	lb/yr

Standing Storage Loss

$L_S = E_M V_V W_V K_E K_S$ **Equation 1-2**

where:

L_S = standing storage loss, lb/month
V_V = vapor space volume, ft³
W_V = stock vapor density, lb/ft³
K_E = vapor space expansion factor, dimensionless
K_S = vented vapor saturation factor, dimensionless
E_M = the number of daily events in month, $(month)^{-1}$

Standing Storage Loss, L_S		
January	37.95	lb/month
February	42.73	lb/month
March	67.56	lb/month
April	95.51	lb/month
May	152.78	lb/month
June	233.19	lb/month
July	300.78	lb/month
August	251.93	lb/month
September	131.97	lb/month
October	80.48	lb/month
November	46.86	lb/month
December	8.99	lb/month

Tank Vapor Space Volume

$V_V = \left(\frac{\pi}{4} D_E^{\,2}\right) H_{VO}$ **Equation 1-3***

where:

V_V = vapor space volume, ft³
D_E = effective tank diameter, ft
H_{VO} = vapor space outage, ft

*D_E used instead of D for horizontal fixed roof tanks (7.1-14)

V_V =	274.23	ft³
D_E =	11.98	ft
H_{VO} =	2.43	ft

Vapor Space Outage

$H_{VO} = \frac{H_E}{2}$ **Equation 1-15 ***

* For horizontal tanks (7.1-11; 7.1-14)

where:

H_E = effective height, ft
H_{VO} = vapor space outage, ft

Effective Height

$H_E = \frac{\pi}{4} D$ **Equation 1-14**

where:

D = tank diameter, ft

H_{VO} =	2.43	ft
H_E =	4.87	ft
D =	6	ft

Table 5-2
Potential VOC Emissions from AST
Emission Unit EU-05
Alpha Ridge Landfill

Effective Tank Diameter

$$D_E = \sqrt{\frac{LD}{\frac{\pi}{4}}}$$ **Equation 1-13**

where:

D_E = tank diameter, ft
L = length of the horizontal tank, ft
D = diameter of a vertical cross-section of the horizontal tank, ft

D_E =	11.98	ft
L =	18	ft
D =	6	ft

Vapor Space Expansion Factor

$$K_E = \frac{\Delta T_V}{T_{LA}} + \frac{\Delta P_V - \Delta P_B}{P_A - P_{VA}} > 0$$ **Equation 1-7***

*ΔP_B=0 when roof tank is bolted or riveted

where:

K_E = vapor space expansion factor, dimensionless
ΔT_V = daily vapor temperature range, °R
ΔP_V = daily vapor pressure range, psi
ΔP_B = breather vent pressure setting range, psi
T_{LA} = daily average liquid surface temperature, °R
P_A = atmospheric pressure, psia
P_{VA} = vapor pressure at daily average liquid surface temperature, psia

Vapor Space Expansion Factor, K_E	
January	0.13
February	0.16
March	0.21
April	0.28
May	0.40
June	0.60
July	0.74
August	0.62
September	0.36
October	0.22
November	0.15
December	0.03

Daily Vapor Temperature Range

$$\Delta T_V = 0.72\ \Delta T_A + 0.028\ \alpha\ I$$ **Equation 1-8**

where:

ΔT_V = daily vapor temperature range, °R
ΔT_A = daily ambient temperature range, °R
α = tank paint solar absorptance, dimensionless
I = daily total solar insolation factor, Btu/ft² d

Daily Vapor Temperature Range, ΔT_V (°R)	
January	15.34
February	17.19
March	20.14
April	23.09
May	24.00
June	24.62
July	23.89
August	22.25
September	20.97
October	20.39
November	17.36
December	14.89

Daily Ambient Temperature Range

$$\Delta T_A = T_{AX} - T_{AN}$$ **Equation 1-12**

where:

ΔT_A = daily ambient temperature range, °R
T_{AX} = daily maximum ambient temperature, °R
T_{AN} = daily minimum ambient temperature, °R

Daily Ambient Temperature Range, ΔT_A (°R)	
January	16.90
February	17.80
March	19.80
April	21.80
May	21.60
June	21.20
July	20.60
August	19.80
September	19.90
October	21.40
November	19.50
December	16.90

Table 5-2
Potential VOC Emissions from AST
Emission Unit EU-05
Alpha Ridge Landfill

Daily Vapor Pressure Range

$$\Delta P_V = P_{VX} - P_{VN}$$ **Equation 1-9**

where:

ΔP_V = daily vapor pressure range, psi
P_{VX} = vapor pressure at daily maximum liquid surface temperature, psia
P_{VN} = vapor pressure at daily minimum liquid surface temperature, psia

$$T_{LX} = T_{LA} + 0.25\,\Delta T_V$$
$$T_{LN} = T_{LA} - 0.25\,\Delta T_V$$ **Figure 7.1-17**

where:

T_{LX} = daily maximum liquid surface temperature, °R
T_{LA} = daily average liquid surface temperature, °R
ΔT_V = daily vapor temperature range, °R
T_{LN} = daily minimum liquid surface temperature, °R

	ΔP_V (psi)	P_{VX} (psia)	P_{VN} (psia)
January	1.03	5.2284	4.2023
February	1.20	5.7092	4.5070
March	1.41	6.9884	5.5799
April	1.68	8.3863	6.7021
May	2.01	10.1063	8.0982
June	2.21	11.8427	9.6341
July	2.18	12.6847	10.5025
August	2.01	12.2603	10.2490
September	1.76	10.7656	9.0020
October	1.26	8.5400	7.2842
November	0.92	6.9711	6.0550
December	0.00	5.2732	5.2732

True Vapor Pressure

Based on permit data.

	P_{VA} (psia)
January	4.7154
February	5.1081
March	6.2692
April	7.5233
May	9.0753
June	10.7140
July	11.5267
August	11.2141
September	9.2016
October	7.8867
November	6.4993
December	5.2732

Vented Vapor Saturation Factor

$$K_S = \frac{1}{1+0.053 P_{VA} H_{VO}}$$ **Equation 1-20**

where:

K_S = vented vapor saturation factor, dimensionless
P_{VA} = vapor pressure at daily average liquid surface temperature, psia
H_{VO} = vapor space outage, ft
0.053 = constant, $(psia\text{-}ft)^{-1}$

Vented Vapor Saturation Factor, K_S	
January	0.62
February	0.60
March	0.55
April	0.51
May	0.46
June	0.42
July	0.40
August	0.41
September	0.46
October	0.50
November	0.54
December	0.60

Table 5-2
Potential VOC Emissions from AST
Emission Unit EU-05
Alpha Ridge Landfill

Stock Vapor Density

$W_V = \frac{M_V P_{VA}}{RT_{LA}}$ **Equation 1-21**

where:

W_V = vapor density, lb/ft³
M_V = vapor molecular weight, lb/lb-mole
R = the ideal gas constant, 10.731 psia ft³/lb-mole °R
P_{VA} = vapor pressure at daily average liquid surface temperature, psia
T_{LA} = daily average liquid surface temperature, °R

Stock Vapor Density, W_V (lb/ft^3)	
January	0.053541
February	0.057615
March	0.069351
April	0.081669
May	0.096585
June	0.112010
July	0.119519
August	0.116645
September	0.097072
October	0.085180
November	0.071623
December	0.059312

Daily Average Liquid Surface Temperature

$T_{LA} = 0.44T_{AA} + 0.56T_B + 0.0079\ \alpha\ I$ **Equation 1-26**

where:

T_{LA} = daily average liquid surface temperature, °R
T_{AA} = daily average ambient temperature, °R
T_B = liquid bulk temperature, °R
α = tank paint solar absorptance, dimensionless
I = daily total solar insolation factor, Btu/ft² d

Daily Average Liquid Surface Temperature, T_{LA} (°R)	
January	492.43
February	495.72
March	505.44
April	515.07
May	525.37
June	534.82
July	539.24
August	537.54
September	530.00
October	517.69
November	507.37
December	497.10

Daily Average Ambient Temperature

$T_{AA} = \left(\frac{T_{AX} + T_{AN}}{2}\right)$ **Equation 1-27**

where:

T_{AA} = daily average ambient temperature, °R
T_{AX} = daily maximum ambient temperature, °R
T_{AN} = daily minimum ambient temperature, °R

Daily Average Ambient Temperature, T_{AA} (°R)	
January	491.52
February	494.47
March	503.77
April	512.97
May	522.97
June	532.17
July	536.67
August	535.27
September	528.12
October	516.27
November	506.42
December	496.32

Liquid Bulk Temperature

$T_B = T_{AA} + 6\alpha - 1$ **Equation 1-28**

where:

T_B = liquid bulk temperature, °R
T_{AA} = daily average ambient temperature, °R
α = tank paint solar absorptance, dimensionless

Liquid Bulk Temperature, T_B (°R)	
January	491.54
February	494.49
March	503.79
April	512.99
May	522.99
June	532.19
July	536.69
August	535.29
September	528.14
October	516.29
November	506.44
December	496.34

Table 5-2
Potential VOC Emissions from AST
Emission Unit EU-05
Alpha Ridge Landfill

Working Loss

$L_W = 0.0010\ M_V\ P_{VA}\ Q\ K_N\ K_P$ **Equation 1-29**

where:

L_W = working loss, lb
M_V = vapor molecular weight, lb/lb-mole
P_{VA} = vapor pressure at daily average liquid surface temperature, psia
Q = annual net throughput (tank capacity [bbl] times annual turnover rate), bbl
K_N = working loss turnover (saturation) factor, dimensionless*
*turnovers >36 = (180 + N)/6N where N = # of turnovers/yr, dimensionless (7.1-18)
*turnovers ≤36 = 1 (7.1-18)
K_P = working loss product factor for fixed roof tanks, dimensionless**
**1 for volatile organic liquids, 0.75 for crude oils (7.1-19)
N = number of turnovers per year, dimensionless

$N = \frac{5.614Q}{V_{LX}}$ **Equation 1-30**

$V_{LX} = \frac{\pi}{4} D^2 H_{LX}$ **Equation 1-31**

where:

V_{LX} = tank maximum liquid volume, ft³
D = diameter, ft
H_{LX} = maximum liquid height, ft*
*Length for horizontal tank

Working Loss, L_W (lb)	
January	26.95
February	29.19
March	35.82
April	42.99
May	51.86
June	61.22
July	65.87
August	64.08
September	52.58
October	45.07
November	37.14
December	30.13

Q =	1142.88	bbl/yr
N =	12	
V_{LX} =	548	ft³
D =	6.2	ft
H_{LX} =	18	ft

Table 5-3
Potential VOC Emissions
Emission Unit EU-05
Alpha Ridge Landfill

Emission Factors			
Gasoline Dispensing			
VOC Emission Factor[1] =	+ 11.0 lb/1000 gal (displacement factor for vehicle refueling)		
(includes Stage I)	+ 0.7 lb/1000 gal (spillage factor) =	11.7	lb/1,000 gal

Potential Emissions - VOCs							
Tank	**Vapor Recovery**	**Tank Capacity gallons**	**Fuel**	**Throughput gallons**	**Emission Factor lbs/1,000 gallons**	**VOC Emissions lbs/yr**	**VOC Emissions tons/yr**
AST-1	Stage I	4,000	Gasoline	48,000	11.70	561.60	0.28
Total	**---**	**4,000**	**---**	**48,000**	**---**	**561.60**	**0.28**

Emission Factors from AP-42, Section 5.2, January 1995, Table 5.2-7.
Emission calculation methodology from AP-42, Section 5.2, January 1995.

Tier 2 Report

Tier 2 NMOC Testing Report
Alpha Ridge Landfill

Howard County Department of Public Works
Alpha Ridge Landfill
2350 Marriottsville Road
Marriottsville, Maryland 21104

SCS ENGINEERS

02212027.10 | July 20, 2018

11260 Roger Bacon Drive
Suite 300
Reston, VA 20190
703-471-6150

Table of Contents

Tables

Appendices

1 INTRODUCTION

The Alpha Ridge Landfill (landfill) is subject to Maryland state regulations approved in accordance with the Emission Guidelines and Compliance Times for Municipal Solid Waste (MSW) Landfills (EG) of 40 CFR 60 Subpart Cc (see also COMAR 26.11.19.20). The landfill currently operates under Part 70/Title V Permit (TVOP) No. 24-027-00364. In accordance with 40 CFR 60 and Condition IV.1.2 of the landfill TVOP, the landfill uses a site-specific non-methane organic compound (NMOC) concentration to determine its NMOC emission rate. Retesting of the site-specific NMOC concentration using Tier 2 procedures, published in 40 CFR §60.754, is required at least every 5 years.

The landfill last conducted Tier 2 testing on July 15 and 16, 2013. Therefore, retesting of the NMOC was required before July 16, 2018. SCS Engineers (SCS) conducted Tier 2 testing at the landfill on June 14, 2018. The test results and a determination of the NMOC emission rates for the current year and subsequent 5 year period are included herein.

2 FIELD METHODOLOGY

SCS conducted Tier 2 testing on June 14, 2018 in accordance with the test protocol approved by the Maryland Department of the Environment (MDE) on May 4, 2018. A copy of the approved testing protocol is included in Appendix A.

Sampling was conducted using EPA Method 25C, which involves collecting 2 samples per hectare of landfill area that have contained waste for at least 2 years from temporary sampling probes. According to §60.754, the samples can be collected from an active gas removal system in lieu of sampling probes, provided the sampling from the header is as representative as sampling using surface probes. The landfill currently operates a comprehensive landfill gas (LFG) collection and control system (GCCS) that collects gas from all areas that have retained waste for at least 2 years, and which is regularly monitored and adjusted to optimize LFG collection. Therefore, collecting Tier 2 samples from the GCCS will provide representative samples.

A total of three sequential samples were collected from a sampling port located on the main inlet header prior to (i.e., upstream of) the blowers, condensate removal equipment, flare, and engine generator set. A fourth sequential sample was collected as a backup sample. Samples were collected from the main header by vacuum into evacuated 6-liter stainless steel Summa-type canisters, at a maximum filling rate of 500 milliliters (mL) per minute. The sampling train consisted of sample tubing, a shut-off valve, a flow control valve, a manometer for monitoring pressure during filling, a rotameter for measuring filling rate, and a 3-way valve to direct the sample to either the sampling canister or to field instrumentation.

Prior to filling each sampling canister, LFG quality was measured and recorded using a LandTec GEM 5000 infrared gas analyzer. The purpose of these measurements was to purge the sampling equipment and to verify that there are no leaks in the sampling train. Additionally, the GEM was used to check that oxygen concentrations in the LFG were less than 5 percent (per EPA Method 25C) prior to sampling. Field notes from the sampling are included in Appendix B.

3 LABORATORY ANALYSIS RESULTS

Following sampling, the samples were shipped to AtmAA Laboratories in Calabasas, California for analysis using EPA Method 25C for NMOC. In accordance with the quality control (QC) measures of Method 25C, the samples were also analyzed using EPA Method 3C to determine the nitrogen and oxygen concentrations of the samples and verify that either the nitrogen content was below 20 percent by volume or the oxygen content was below 5 percent by volume for each sample. All samples analyzed had both a nitrogen content below 20 percent by volume and an oxygen content below 5 percent by volume, and therefore were acceptable samples.

Table 1 presents a summary of the analytical results. A copy of the analytical results from AtmAA are included in Appendix C. The NMOC results were presented in units of parts per million by volume (ppmv) as methane. To convert the concentrations to ppmv as hexane, the results were divided by a factor of six. Based on the laboratory results, the average NMOC concentration at the landfill was determined to be 18.1 ppmv as hexane.

Table 1. Summary of Analytical Results

Lab Sample ID	Field Sample ID	Summa Canister ID	Nitrogen Content (% v/v)	Oxygen Content (% v/v)	Total NMOCs as Methane (ppmv)	Total NMOCs as Hexane (ppmv)
11668-9	001	387	17.0	2.06	111	18.6
11668-10	002	145	16.7	1.92	104	17.3
11668-11	003	116	16.7	1.90	111	18.4
Average Site-Specific NMOC Concentration					109	**18.1**

4 ESTIMATE OF NMOC EMISSIONS

Current and projected NMOC emission rates were determined using the EPA Landfill Gas Emissions Model (LandGEM) and the calculated site-specific NMOC concentration. The LandGEM uses a first-order decay equation to project the annual emission of NMOCs from a landfill based on the total quantity of waste buried in the landfill at the beginning of the year and the following modeling coefficients:

- Quantity of waste disposed on an annual basis (megagrams, Mg; tons)
- Methane generation potential, Lo (cubic meters methane per Mg waste, m^3/Mg)
- Methane generation rate constant, k (yr^{-1})
- Methane concentration as generated (assumed to be 50 percent)

The following summarizes the modeling coefficients and assumptions used for the model:

- **Waste Filling Rates** – The historical filling rates are based on facility records. Future disposal rates are estimated at 10,000 tons per year for 2018 and for the subsequent 5 years after 2018, which is based on recent historical disposal rates and a conservative safety factor.

- **Methane Decay Rate Constant (k)** – A decay rate constant of 0.05 yr^{-1} was used in the model, as specified by 40 CFR §60.754(a)(1).

- **Methane Generation Rate Potential (L0)** – A methane generation potential of 170 m^3/Mg was used in the model, as specified by 40 CFR §60.754(a)(1).

Using the site-specific NMOC concentration determined from the Tier 2 sampling, the current NMOC emission rate is estimated to be 0.8 megagrams (Mg) per year. Based on the estimated future filling rates, NMOC emission rates are projected to decrease to 0.6 Mg per year by 2023. A summary of the NMOC emission rates is included in Table 2 below. The NMOC emission rate model is included in **Appendix D**.

Table 2. Summary of Projected NMOC Emission Rates

Year	Projected NMOC Emission Rate (Mg/yr)
2018	0.8
2019	0.7
2020	0.7
2021	0.7
2022	0.7
2023	0.6

5 SUMMARY

Using the site-specific NMOC emission rate determined from the June 2018 testing and the NMOC emission rate model, the annual NMOC emission rate is below 50 Mg for 2018. Additionally, NMOC emission rates are projected to remain below 50 Mg per year for the next 5 years following 2018. As such, the Alpha Ridge Landfill is not subject to the GCCS installation and operational requirements of 40 CFR §60.752(b)(2). In accordance with 40 CFR §60.754(a)(3)(iii), the landfill will continue to submit periodic estimations of the NMOC emission rate and will retest the site-specific NMOC concentration within 5 years after the June 2018 testing date. The next Tier 2 testing is required to be conducted by June 14, 2023.

Appendix A – Approved Sampling Protocol

Environmental Consultants

11260 Roger Bacon Drive
Suite 300
Reston, VA 20190-5282

703 471-6150
FAX 703 471-6676
www.scsengineers.com

SCS ENGINEERS

April 30, 2018
File No. 02212027.10

Mr. David Ermer
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Blvd, Suite 715
Baltimore, Maryland 21230

Subject: NSPS Tier 2 NMOC Retesting
Alpha Ridge Landfill – Howard County Maryland

Dear Mr. Ermer:

On behalf of Howard County (County), SCS Engineers (SCS) submits this protocol for conducting retesting of the non-methane organic compound (NMOC) site-specific concentration at the Alpha Ridge Landfill (landfill).

The landfill, which operates under Title V Operating Permit (TVOP) No. 24-027-00364, is subject to the New Source Performance Standards (NSPS) for Municipal Solid Waste (MSW) Landfills of 40 CFR Part 60 Subpart WWW. The current NMOC emission rate of the landfill is below 50 megagrams (Mg) per year. Per Subpart WWW, the landfill uses a site-specific NMOC concentration to determine its NMOC emission rate, and retests the NMOC concentration at least every 5 years in accordance with §60.754(a)(3) and Condition IV.1.2 of the TVOP. The most-recent Tier 2 testing was conducted on July 15 and 16, 2013. Therefore, retesting of the NMOC concentration is required before July 16, 2018.

Field Sampling Procedures

Tier 2 sampling will be conducted using EPA Method 25C, which involves collecting 2 samples per hectare of landfill area (which have contained waste for at least 2 years) from temporary sampling probes. According to Subpart WWW, the samples can be collected from an active gas removal system in lieu of sampling probes, provided the sampling from the header is as representative as sampling using surface probes. The landfill currently operates a comprehensive landfill gas (LFG) collection and control system (GCCS) that collects gas from all areas that have retained waste for at least 2 years, and which is regularly monitored and adjusted to optimize LFG collection. Therefore, collecting Tier 2 samples from the GCCS will provide representative samples. Drawings of the landfill showing the GCCS coverage are attached.

Tier 2 samples will be collected from a sampling port located prior to (i.e., upstream of) the flare, blowers, and condensate removal equipment, such that the samples collected will be representative of gas from the landfill mass. A total of three sequential samples will be collected for laboratory analysis. A fourth sample will be collected as a backup sample and will be analyzed only if a primary sample is damaged or compromised during shipping or laboratory

procedures. Samples will be drawn from the main header by vacuum into 6-liter stainless steel Summa-type canisters, at a filling rate of 500 milliliters (mL) per minute or less. The sampling train will include sample tubing, a flow control valve, a manometer for monitoring pressure during filling, a rotameter for measuring filling rate, and a 3-way valve to direct the sample to either the sampling canister or to field instrumentation.

Prior to filling each sampling canister, LFG quality will be measured and recorded using a LandTec GEM 5000 infrared gas analyzer. The purpose of these measurements is to purge the sampling equipment and to verify that there are no leaks in the sampling train. Additionally, the GEM will be used to check that oxygen concentrations in the LFG are less than 5 percent (per EPA Method 25C).

Laboratory Analysis

Following collection, the sample canisters will be shipped by overnight courier to AtmAA laboratories, located in Calabasas, CA, for analysis. In accordance with Subpart WWW, the sample canisters will be analyzed according to Method 25C for NMOCs. Per Method 25C, the laboratory will also analyze the samples using EPA Method 3C to verify that either the nitrogen content is less than 20 percent or the oxygen content is less than 5 percent.

NMOC Calculation and Reporting

The laboratory will report the NMOC concentrations in parts per million by volume (ppmv) as methane. We will divide this by a factor of six to convert the concentrations to ppmv as hexane. The site-specific NMOC concentration will be calculated as the average concentrations of all three samples and will be used to determine the annual NMOC emission rate for the current year and the next 5 years. The report and test results will be submitted to MDE.

Closing

We appreciate your prompt review and response. If you have any questions or need more information, please contact us at (703) 471-6150 or Ms. Niti Blackwell of Howard County at (410) 313-6418.

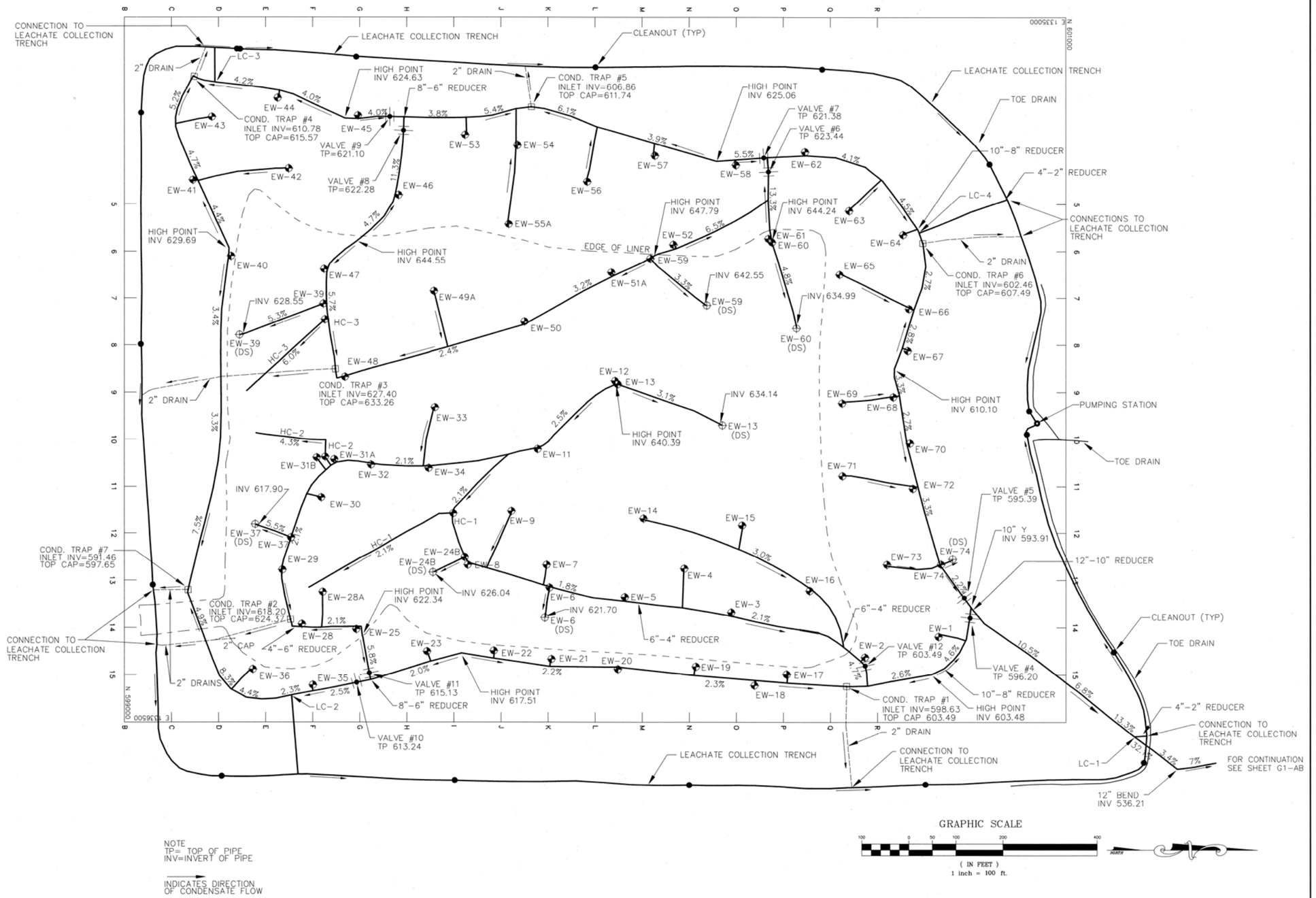
Sincerely,

Jacob Shepherd, E.I.T.
Project Professional
SCS ENGINEERS

Deji Fawole
Project Manager
SCS ENGINEERS

CC: Ms. Niti Blackwell, P.E. – Howard County Department of Public Works

Attachments



NOTE
TP= TOP OF PIPE
INV=INVERT OF PIPE

→ INDICATES DIRECTION OF CONDENSATE FLOW

GRAPHIC SCALE

100 0 50 100 200 400

(IN FEET)
1 inch = 100 ft.

NORTH

DESIGNED BY:	DATE
DRAWN BY:	DATE
CHECKED BY:	DATE
APPROVED BY:	DATE

REVISIONS

DATE	BY	DESCRIPTION
12-21-00	TWH	NOTE FOR CLARIFICATION OF ELEVATIONS.
1-12-01	TWH	INDICATORS FOR DIRECTION OF CONDENSATE FLOW.

ENGINEERING TECHNOLOGIES ASSOCIATES, INC.
ENGINEERS * PLANNERS * SURVEYORS
3458 ELLICOTT CENTER DRIVE SUITE 101
ELLICOTT CITY, MARYLAND 21043
BALTO. (410)461-9920 FAX (410)750-8565

H. E. SARGENT, INC.
CONTRACTORS • STILLWATER, NE.

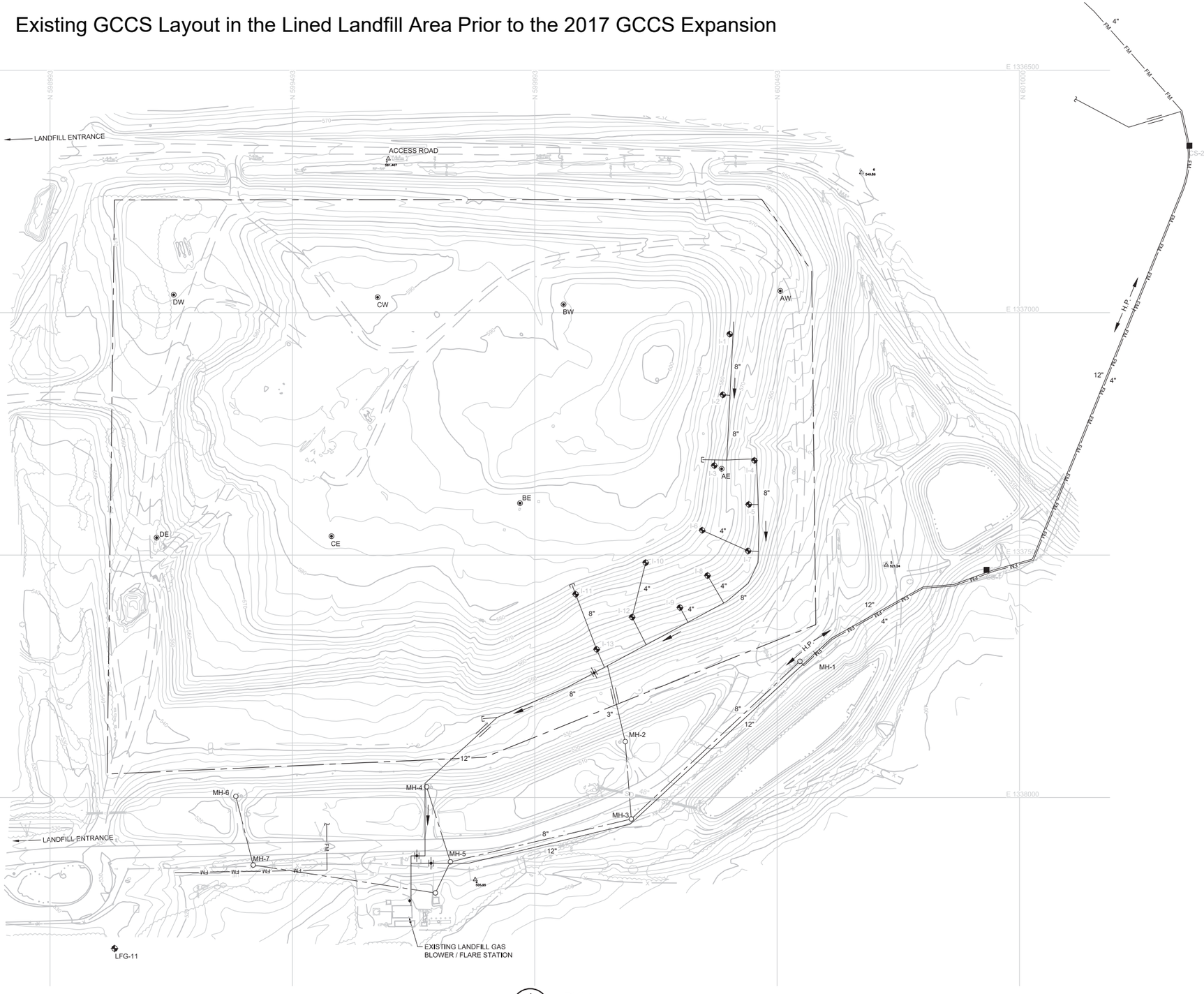
AS-BUILT LANDFILL GAS

ALPHA RIDGE LANDFILL CELL CLOSURE

HOWARD COUNTY MARYLAND

SCALE : 1"=100'	CONTRACT NO.: 98301.10	DATE : 1-11-2000	SHEET : G2-AB

Existing GCCS Layout in the Lined Landfill Area Prior to the 2017 GCCS Expansion



LEGEND

- APPROXIMATE CELL BOUNDARY
- EXISTING GRADE CONTOUR (FEET-MSL)
- EXISTING SPOT ELEVATION
- EXISTING BUILDING / STRUCTURE
- EXISTING LANDFILL GAS WELL
- EXISTING CONDENSATE SUMP
- EXISTING LANDFILL GAS HEADER
- EXISTING LANDFILL GAS LATERAL
- EXISTING CONDENSATE FLOW DIRECTION
- LANDFILL GAS TRANSMISSION PIPE HIGH POINT
- EXISTING PIPE ROAD CROSSING
- EXISTING ISOLATION VALVE
- EXISTING LEACHATE DRAIN LINE
- EXISTING LEACHATE FORCEMAIN
- EXISTING MANHOLE
- EXISTING SURVEY POINT LOCATION AND ELEVATION
- EXISTING TREE / TREELINE
- EXISTING FENCE
- EXISTING PAVED ROAD / UNPAVED DRIVE
- EXISTING GUARDRAIL
- EXISTING WATER LINE
- LEACHATE RECIRCULATION WELL

NOTES:

1. EXISTING CONDITIONS FROM AERIAL SURVEY USING PHOTOGRAMMETRIC METHODS ENTITLED "TOPOGRAPHIC MAP, ALPHA RIDGE LANDFILL, HOWARD COUNTY, MARYLAND" BY QUANTUM SPATIAL ; AERIAL PHOTOGRAPHY DATED 5 JANUARY 2016 EXCEPT AS FOLLOWS. EXISTING LANDFILL GAS SYSTEM DIGITIZED FROM A PDF OF AN FROM AS-BUILT SURVEY ENTITLED "LINED CELL LFG SYSTEM LAYOUT, ALPHA RIDGE LANDFILL UNLINED CELL CLOSURE" BY SCS ENGINEERS DATED 30 OCTOBER 1997.
2. GRID BASED ON MARYLAND STATE PLANE COORDINATES SYSTEM NAD 1983; VERTICAL DATUM BASED ON NAVD 1988.
3. REFER TO DRAWING NO. 6 FOR ADJACENT UNLINED CELL EXISTING CONDITIONS AND PROPOSED SITE DEVELOPMENT PLAN.

0 100' 200'
SCALE IN FEET

1/2 PLAN
EXISTING CONDITIONS
SCALE: 1" = 100'

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

Howard County
Department of Public Works
3430 Courthouse Drive
Ellicott City, Maryland 21043

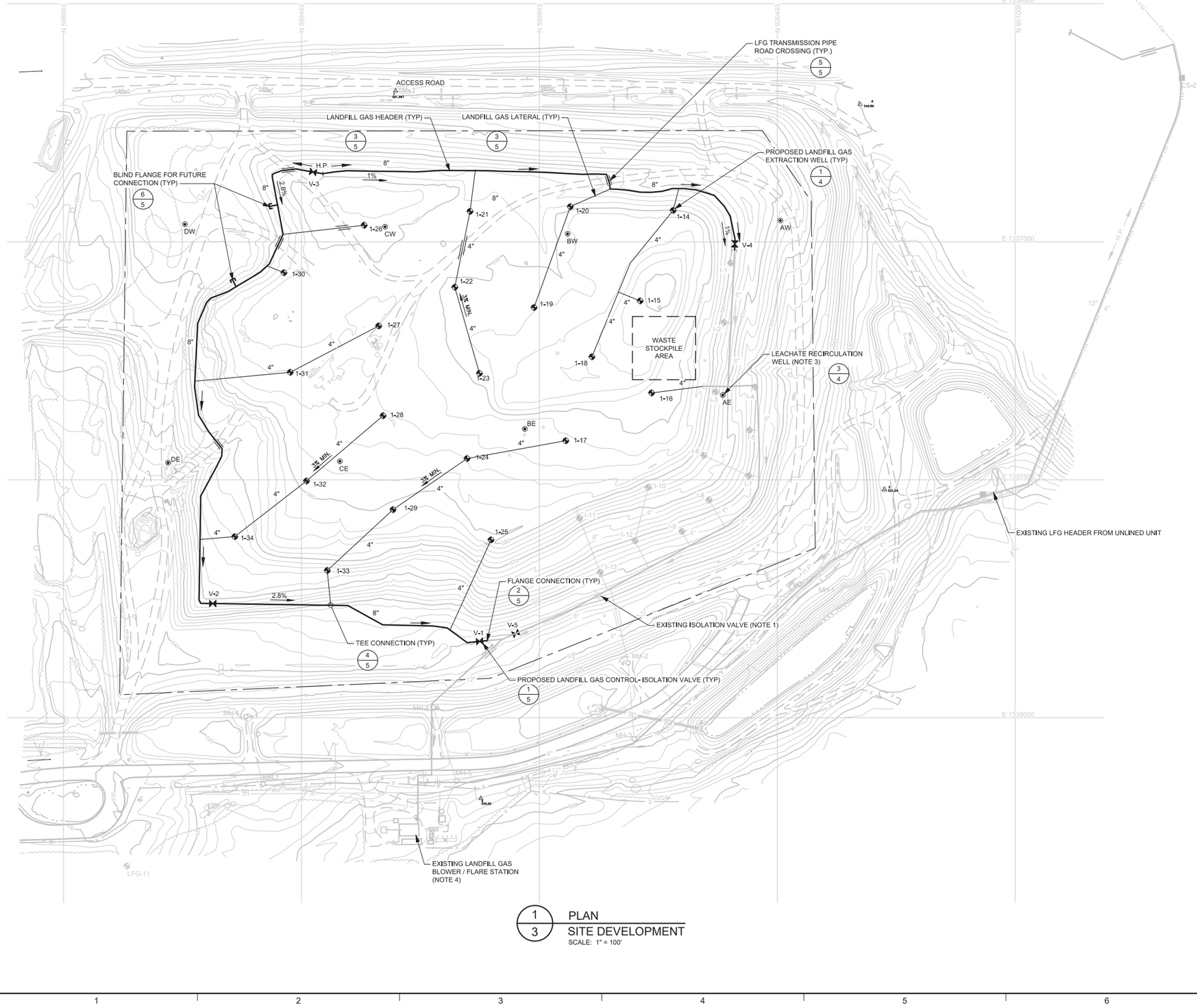
TITLE: EXISTING CONDITIONS PLAN

PROJECT: CELL 1 LANDFILL GAS COLLECTION SYSTEM EXPANSION

SITE: ALPHA RIDGE LANDFILL
MARRIOTTSVILLE, HOWARD COUNTY, MARYLAND

DESIGN BY:	AMS	DATE:	SEPTEMBER 2016
DRAWN BY:	CPG	PROJECT NO.:	ME1073
CHECKED BY:	AMS	FILE:	1073-002
REVIEWED BY:	JWFM	DRAWING NO.:	
APPROVED BY:	JWFM		2 OF 9

Design Layout for Additional Wells in the Lined Landfill Area - 2017 GCCS Expansion



1 / 3 PLAN
SITE DEVELOPMENT
SCALE: 1" = 100'

N

LEGEND

- APPROXIMATE CELL BOUNDARY
- EXISTING GRADE CONTOUR (FEET-MSL)
- EXISTING SPOT ELEVATION
- EXISTING BUILDING / STRUCTURE
- EXISTING / PROPOSED LANDFILL GAS WELL
- EXISTING CONDENSATE SUMP
- EXISTING / PROPOSED LANDFILL GAS HEADER
- EXISTING / PROPOSED LANDFILL GAS LATERAL
- EXISTING / PROPOSED CONDENSATE FLOW DIRECTION
- LANDFILL GAS TRANSMISSION PIPE HIGH POINT
- PROPOSED PIPE ROAD CROSSING
- EXISTING / PROPOSED ISOLATION VALVE
- EXISTING LEACHATE DRAIN LINE
- EXISTING LEACHATE FORCEMAIN
- EXISTING MANHOLE
- EXISTING SURVEY POINT LOCATION AND ELEVATION
- EXISTING TREE / TREELINE
- EXISTING FENCE
- EXISTING PAVED ROAD / UNPAVED DRIVE
- EXISTING GUARDRAIL
- EXISTING WATER LINE
- LEACHATE RECIRCULATION WELL (NOTE 3)

NOTES:

1. EXISTING VALVE TO BE ABANDONED IN PLACE IN THE OPEN POSITION.
2. HEADER PIPE TO BE BURIED AS SHOWN IN DETAIL 3 ON DRAWING 5. HEADER PIPE TO BE ENCASED IN CORRUGATED METAL PIPE AT ALL ROAD CROSSINGS.
3. LEACHATE RECIRCULATION WELLS TO BE ABANDONED IN PLACE. REFER TO DRAWING NO. 4 FOR ABANDONMENT PLAN.
4. PVC PIPING AT BLOWER / FLARE STATION TO BE REPLACED OR SEALED AT LOCATIONS WHERE JOINTS HAVE BEEN NOTED TO BE LEAKING.
5. LANDFILL GRADES SETTLE OVER TIME. CONTRACTOR SHALL LAYOUT PROPOSED PIPING IN THE FIELD PRIOR TO INSTALLATION TO DEMONSTRATE MINIMUM SLOPES CAN BE ACHIEVED. THE FINAL LOCATION OF PIPING MAY BE CHANGED TO MAINTAIN MINIMUM REQUIRED SLOPE.
6. REFER TO DRAWING NO. 6 FOR ADJACENT UNLINED CELL EXISTING CONDITIONS AND PROPOSED SITE DEVELOPMENT PLAN.

0 100' 200'
SCALE IN FEET

REV	DATE	DESCRIPTION	DRN	APP

Geosyntec consultants
10220 OLD COLUMBIA ROAD, SUITE A
COLUMBIA, MARYLAND 21046 USA
PHONE: 410.381.4333

Howard County
Department of Public Works
3430 Courthouse Drive
Ellicott City, Maryland 21043

TITLE: SITE DEVELOPMENT PLAN

PROJECT: CELL 1 LANDFILL GAS COLLECTION SYSTEM EXPANSION

SITE: ALPHA RIDGE LANDFILL
MARRIOTTSVILLE, HOWARD COUNTY, MARYLAND

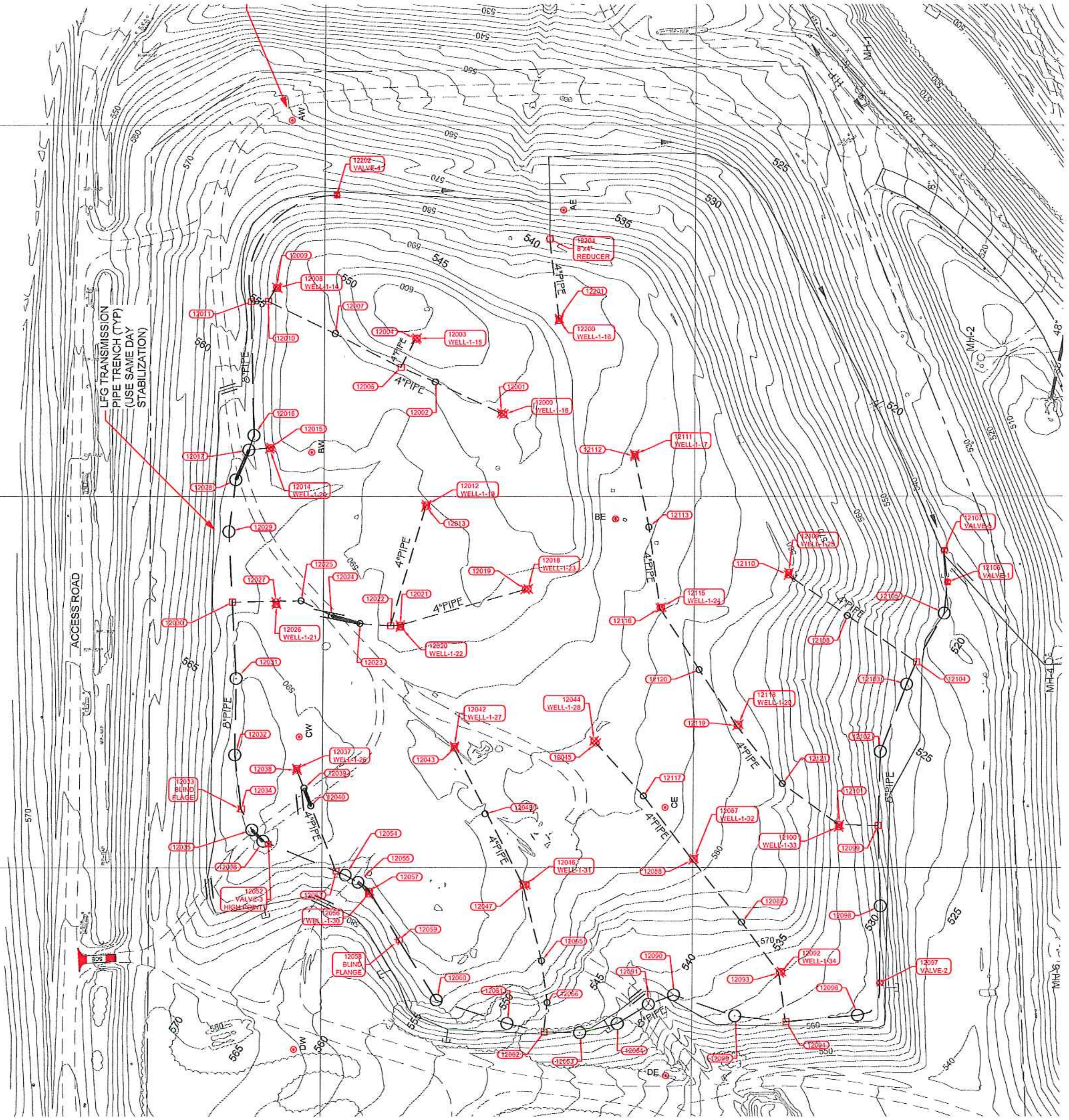
THIS DRAWING MAY NOT BE ISSUED FOR PROJECT TENDER OR CONSTRUCTION, UNLESS SEALED.

SIGNATURE

DATE

DESIGN BY:	AMS	DATE:	SEPTEMBER 2016
DRAWN BY:	CPG	PROJECT NO.:	ME1073
CHECKED BY:	AMS	FILE:	1073-003
REVIEWED BY:	JWFM	DRAWING NO.:	
APPROVED BY:	JWFM		3 OF 9

%COLUMBIA-01\DATA\CAD\1073-ALPHA RIDGE\1073-003\1073-003.DWG 16 September 2016



LEGEND

Symbol	Description
○	4" PIPE
⊙	8" PIPE
⊗ (filled)	VALVE
⊠	WELL POINT
□	TEE CONNECTION
⊗	RISER
▨	ROAD CROSSING
〉	BLIND FLANGE

GAS WELL ASBUILT SURVEY

CELL 1 LANDFILL GAS COLLECTION SYSTEM EXPANSION
ALPHA RIDGE LANDFILL
GAS WELLS 1-14 TO 1-34
MARRIOTSVILLE, MARYLAND

AULtec, Inc.
7895 Cessna Avenue, Suite D
Gaithersburg, Maryland 20879
Tel. 301-947-6695 Fax 301-947-6911
E-mail: mail@aultecinc.com
Engineers Surveyors Planners GIS Consultants GPS Consultants

SHEET 1 OF 2

DATE: August 24, 2017 - SCALE: 1"=80'

DESIGN BY: AM

Shepherd, Jacob

From: David Ermer -MDE- <david.ermer@maryland.gov>
Sent: Friday, May 4, 2018 7:20 AM
To: Shepherd, Jacob
Cc: Blackwell, Niti; Fawole, Deji
Subject: Re: Alpha Ridge Landfill - Protocol for Tier 2 NMOC Testing

All: Test protocol is approved. Please let me know when the testing is scheduled.

Thank you, David Ermer

On Mon, Apr 30, 2018 at 10:51 AM, Shepherd, Jacob <JShepherd@scsengineers.com> wrote:

> David-
>
> Good morning. Alpha Ridge Landfill is preparing to conduct NMOC retesting in accordance with NSPS Subpart WWW. Attached is a protocol for this testing for your review and approval. Please let us know if you have any questions or comments. Thank you,
>
> Jacob Shepherd, EIT
>
> SCS ENGINEERS
>
> 11260 Roger Bacon Dr. #300
>
> Reston, VA 20190
>
> (571) 353-2025
>
> www.scsengineers.com

--
David Ermer,
david.ermer@maryland.gov
Air and Radiation Administration
Maryland Department of the Environment
1800 Washington Blvd., Ste. 715
Baltimore, MD 21230
Office: 410-537-4126 Fax: 410-537-3202

Appendix B – Field Notes

PROJECT/CLIENT	PROJECT LOCATION	DATE	WEATHER	PERSONNEL	
Alpha Ridge Tier 2	Alpha Ridge LF	June 14, 2018	Clear - 71°F	Jacob Shepherd - SCS	Page 1 of 1

SUMMA CANNISTER ID	387	145	116	144		
SAMPLE NO.	001	002	003	004		
TOTAL CANISTER VACUUM (in. Hg)	-22.4	-22.3	-22.5	-22.4		
CANISTER VOLUME (L)	6.0	6.0	6.0	6.0		
CANISTER VACUUM/VOL (in. Hg/L)	3.7	3.7	3.7	3.7		
AMBIENT TEMPERATURE	71°F	71°F	72°F	73°F		
BAROMETRIC PRESSURE	29.94"	29.94"	29.94"	29.94"		
TIME: BEGIN PURGE	N/A	N/A	N/A	N/A		
PURGE RATE (ml/min)	N/A	N/A	N/A	N/A		
TIME: END PURGE	N/A	N/A	N/A	N/A		
PURGE VOLUME (L)	N/A	N/A	N/A	N/A		
GEM 500: % METHANE	49.1	48.9	48.8	48.9	48.8	
GEM 500: % CO2	32.7	33.0	33.2	33.2	33.2	
GEM 500: % O2	2.0	1.9	1.8	1.8	1.8	
GEM 500: % NITROGEN (calc)	16.1	16.3	16.3	16.0	16.2	
CANISTER VAC: INITIAL	-22.4	-22.3	-22.5	-22.4		
CANISTER VAC: FINAL	-8.0	-8.0	-8.0	-8.5		
TIME: BEGIN FILL	9:20	9:37	9:52	10:03		
SAMPLE FILL RATE (ml/min)	400	400	400	400		
TIME: END FILL	9:28	9:46	10:00	10:10		
SAMPLE VOLUME (L)	3.2	3.6	3.2	2.8		
SAMPLE TEMPERATURE	63°F	63°F	63°F	63°F		

LEAK CHECK - #387

START: 9:00 -22.4

STOP: 9:05 -22.4

Appendix C – Analytical Results

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250

LABORATORY ANALYSIS REPORT

environmental consultants
laboratory services
atmaa.com

Total Gaseous Non-Methane Organics (TGNMO), Nitrogen, and Oxygen
Analysis in SUMMA Canister Samples

Report Date: June 21, 2018
Client: SCS Engineers
Site: Alpha Ridge Landfill Tier 2
Date Received: June 15, 2018
Date Analyzed: June 15, 2018

ANALYSIS DESCRIPTION

Total gaseous non-methane organics in SUMMA canisters was measured by flame ionization detection/ total combustion analysis (FID/TCA), EPA Method 25C. Nitrogen and oxygen were measured by thermal conductivity detection/ gas chromatography (TCD/GC), EPA Method 3C.

AtmAA Lab No.	Sample ID	Oxygen (%,v)	Nitrogen (%,v)	TGNMO (ppmvC)	TGNMO (ppmvC6)
11668-9	001	2.12	17.4	111	18.6
11668-10	002	1.94	16.9	104	17.3
11668-11	003	1.95	17.1	111	18.4

TGNMO is total gaseous non-methane organics measured as ppmvC and ppmvC6.
The reported oxygen concentration includes any argon present in the sample, calibration is based on a standard atmosphere containing 20.95% oxygen and 0.93% argon.

Note: Site barometric pressures and site temperatures which were recorded on the submitted chain of custody, were used in the concentration calculations.

Michael S Porter
Senior Analyst

AtmAA Inc.
23917 Craftsman Rd., Calabasas, CA 91302 • (818) 223-3277 • FAX (818) 223-8250
environmental consultants
laboratory services
atmaa.com

LABORATORY ANALYSIS REPORT

Permanent Gases Analysis in SUMMA Canister Samples

Report Date: June 21, 2018
Client: SCS Engineers
Project Name: Alhpa Ridge Landfill Tier 2
Project Location: Marriotsville Landfill
Project No.: 02212027.10

Date Received: June 15, 2018
Date Analyzed: June 15, 2018

ANALYSIS DESCRIPTION

Permanent gases are measured by thermal conductivity detection/gas chromatography (TCD/GC), EPA 3C.

AtmAA Lab No.:	11668-9	11668-10	11668-11
Sample ID:	001	002	003
Canister:	387	145	116

Components	(Concentration in %v)		
Methane	49.2	48.9	49.2
Carbon Dioxide	31.9	32.0	32.4
Nitrogen	17.0	16.7	16.7
Oxygen	2.06	1.92	1.90

Actual analysis results are reported on a "wet" basis.

Michael S Porter
Senior Analyst

QUALITY ASSURANCE SUMMARY
(Repeat Analyses)

Project Name: Alhpa Ridge Landfill Tier 2
Date Received: June 15, 2018
Date Analyzed: June 15, 2018

Components	Sample ID	Repeat Analysis Run #1	Repeat Analysis Run #2	Mean Conc.	% Diff. From Mean
		(Concentration in %v)			
Methane	001	49.2	49.2	49.2	0.0
	003	49.2	49.2	49.2	0.0
Carbon Dioxide	001	31.8	31.9	31.9	0.16
	003	32.3	32.4	32.4	0.15
Nitrogen	001	16.9	17.1	17.0	0.59
	002	16.6	16.7	16.7	0.30
	003	16.6	16.7	16.7	0.30
Oxygen	001	2.07	2.05	2.06	0.49
	002	1.91	1.92	1.92	0.26
	003	1.90	1.90	1.90	0.0

Three SUMMA canister samples, laboratory numbers 11668-(9 - 11), were analyzed for permanent gases. Agreement between repeat analyses is a measure of precision and is shown in the column "% Difference from Mean". The average % difference from mean for 10 repeat measurements from 3 SUMMA canister samples is 0.23%.

CHAIN OF CUSTODY RECORD

Client/Project Name	Alpha Ridge LF Tier 2
Project Location	Alpha Ridge LF, Marriottsville, MD
Project No.	02212027.10
Field Logbook No.	-
Sampler: (Signature)	Jacob Shepherd Jacob Shepherd
Chain of Custody Tape No.	-

Sample No./ Identification	Type of Sample	AtmAA Lab Number	Sampling Date	Sampling Time	EPA Method 3C Fixed Gases	EPA Method 25C (NMOCs - Tier 2)	Special Remarks
001 (Can #		1116-8-9	6/14/2018	9:28	X	✓	
002 (Can #145)		-10	6/14/2018	9:46	X	X	
003 (Can # 116)		-11	6/14/2018	10:00	X	✓	
004 (Can # 144)		-12	6/14/2018	10:10	X	X	Analyze only if another sample is bad or has O_2 > 5%. Notify PM below before analyzing.

Relinquished by: (Signature)	Jacob Shepherd Jacob Shepherd	**Date**	6/14/2018	**Time**	15:00
Relinquished by: (Signature)		**Date**		**Time**	
Relinquished by: (Signature)		**Date**		**Time**	

Received by: (Signature)		**Date**		**Time**	
Received by: (Signature)		**Date**		**Time**	
Received for Laboratory by: (Signature)		**Date**	6/15/18	**Time**	10:00

Company Info:

Company: SCS Engineers
Street Address 11260 Roger Bacon Dr. Ste. 300
City/State/Zip: Reston, VA 20190
Telephone No.: 703-471-6150
Fax No.: -

Send Report to:

Company: SCS Engineers
Street Address 11260 Roger Bacon Dr. #300
City/State/Zip: Reston, VA 20190
Project Manager: Jacob Shepherd
Email Address: JSHEPHERD@SCSENGINEERS.COM

Analytical Laboratory

AtmAA Inc.
23917 Craftsman Rd.
Calabasas, CA 91302
TEL: (818) 223-3277
FAX: (818) 223-8250

Date: June 21, 2018

AtmAA, Inc.

Laboratory Analysis Data Package

Client:	SCS Engineers
Project:	Alpha Ridge Landfill Tier 2
Project No,:	02212027.10
Date Received:	June 15, 2018
Date Analyzed:	June 15, 2018
Lab No.:	11668-(9 - 11)
	TGNMO by M25C analysis and calculation

Presheet

CLIENT : SCS

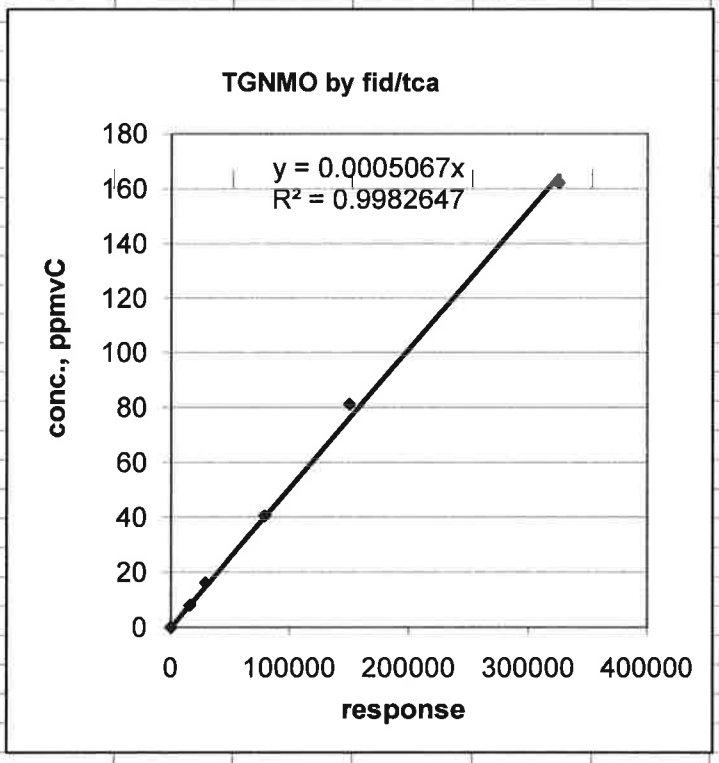
DATE: 6/15/18

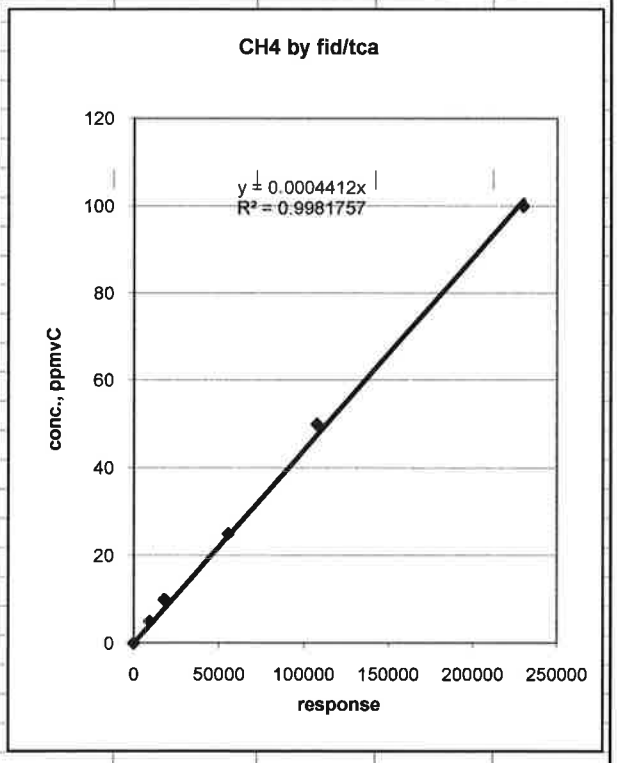
LAB #	SAMPLE ID	CAN/TANK	Trap	P1	P2
			P1	P2	P3
11668-9		~~118~~ 387	175	555	821
-10		145	176	553	820
-11		116	176	554	821
-12		144	176	544	821

P atm = _____

Samples Pressurized with: He

3/26/18		n2 bkg			2921	2921				
Tca2	chart				avg bkg	b1	b2			
ALM033827				20x		10x		4x		2x
co	222975	101	9783	5.05	18492	10.1	54062	25.25	105405	50.5
ch4	229945	100	9401	5	18063	10	55471	25	107793	50
co2	929598	394	50108	19.7	86524	39.4	234585	98.5	449472	197
tgnmo	328221	162.3	19050	8.115	32280	16.23	82101	40.575	153282	81.15
c2	152658	8039	6791	401.95	13748	803.9	38582	2009.75	73494	4019.5
FF18628		low prax		2x						
co										
ch4		4.01		2.01						
co2										
tgnmo		3.00		1.50						
c2		4.00		2.00						
tgnmo	0	ch4								
0	0	0	0							
16129	8.115	9401	5							
29359	16.23	18063	10							
79180	40.575	55471	25							
150361	81.15	107793	50							
325300	162.3	229945	100							





Client	SCS Engineers
Site	Alpha Ridge Landfill Tier 2
Project #:	02212027.10
Report Date	June 21, 2018
Date Received	June 15, 2018
Date Analyzed	June 15, 2018

29.87

	Lab #	ID	Can #	P1	P2	Pvac	Pb	(°F) LFG Temp	(°C) LFG Temp	Vapor Pressure
1	11668-9	001	387	380	821	0.2	29.94	71.00	21.6667	19.42448
2	11668-10	002	145	377	820	0.2	29.94	71.00	21.6667	19.42448
3	11668-11	003	116	378	821	0.2	29.94	72.00	22.2222	20.09454

D:\REPORT98\SCS_ENG\11668-9-11 25c

Client:	SCS Engineers			3.80	10151	2671					
Site	Alpha Ridge Landfill Tier 2			11668-9	3.68	9830					
Project #:	02212027.10			11668-10	3.64	9724					
Report Date	June 21, 2018			11668-11	3.71	9911					
Date Received	June 15, 2018										
Date Analyzed	June 15, 2018										
rf from 03/26/2018 3 pt calibration											
	0.0005067										
N_2 BKG	3471		% Diff from								
			3 point calib								
initial std	*326900*	*0.000502*	*0.97*								
end std	*321030*	*0.000511*	*0.87*								
							TGNMO				
Lab #	ID#	Can #	P1	P2	Dil	area	**conc**	MD	RMD(%)		
11668-9	001	387	380	821	4	28662	**38.2**	0.367		0.519	(STDEV)
					4	29024	**38.9**	0.367			
					4						
						(mean)	38.5	0.367	0.952		
11668-10	002	145	377	820	4	27756	**36.5**	0.533		0.754	(STDEV)
					4	27230	**35.5**	0.533			
					4						
						(mean)	36	0.533	1.480		
11668-11	003	116	378	821	4	29071	**38.8**	0.646		0.913	(STDEV)
					4	28434	**37.5**	0.646			
					4						
						(mean)	38.2	0.646	1.690		

				N_2	rf		
				63719	0.001202	**0.001192**	
Alpha Ridge Landfill Tier 2				64788	0.001182		
N_2							
						N_2	N_2
Lab #	ID#	Can #	P_1	P_2		area	conc
11668-9	001	387	380	821		6616	17.439
			380	821		6682	
11668-10	002	145	377	820		6293	16.910
			377	820		6304	
11668-11	003	116	378	821		6467	17.093
			378	821		6487	

				O_2	rf		
				16937	0.001293	**0.001275**	
Alpha Ridge Landfill Tier 2				17410	0.001258		
O_2							
						O_2	O_2
Lab #	ID #	Can #	P_1	P_2		area	conc
11668-9	001	387	380	821		762	2.118
			380	821		756	
11668-10	002	145	377	820		672	1.943
			377	820		674	
11668-11	003	116	378	821		695	1.953
			378	821		696	

Lab#	ID#	Can #	Tank Pressure after sampling P_t	Tank Temperature after pressurization T_{tf}	Tank Pressure after pressurization P_{tf}	*Tank Temperature after sampling* T_t	*Tank Pressure after evacuation* P_{ti}	*Tank Temperature before sampling* T_{ti}	*Vapor Pressure of water* P_w
11668-9	001	387	380	298	821	298	0.2	298	19.424
11668-10	002	145	377	298	820	298	0.2	298	19.424
11668-11	003	116	378	298	821	298	0.2	298	20.095

Barometric Pressure P_b	Water Correction B_w	Number of analysis r	Measured N_2 Fraction C_{N2}	Measured NMOC conc C_{tm}	**Calculated NMOC conc** C_t	Lab#	ID#	TGNMO conc w/o formula
760.476	0.025542526	2	0.174387694	38.2	**111.4673875**	11668-9	001	83.25513
				38.9				
				0.0				
760.476	0.025542526	2	0.169097435	36.5	**103.9222437**	11668-10	002	78.3351
				35.5				
				0.0				
760.476	0.026423629	2	0.170930385	38.8	**110.5160237**	11668-11	003	82.94446
				37.5				
				0.0				

Duplicate Analyses Results
(Without Method 25C formula)

Site	Alpha Ridge Landfill Tier 2		
Report Date	June 21, 2018		
Date Analyzed	June 15, 2018		
Date Received	June 15, 2018		
AtmAA Lab #	Sample ID#	**Measured conc (ppm)**	
11668-9	001	**82.5**	Run #1
		84.0	Run #2
		---	Run #3
11668-10	002	**79.5**	Run #1
		77.2	Run #2
		---	Run #3
11668-11	003	**84.3**	Run #1
		81.5	Run #2
		---	Run #3

Oxidation and Reduction Catalysts Efficiency Report

June 15, 2018
Catalyst Efficiencies for
TCA 2

alm033827	std conc (ppmv)	Cr in Ni in response	Cr in Ni out response	(oxidation) Chromium (% efficiency)	instrument resp factor	(reduction) Nickel (% efficiency)
CO	101	210146	0	**100**	0.000481	**93.2**
CH4	100	223187	0	**100**	0.000448	**100**
CO2	394	896764	0	**100**	0.000439	**102.0**
TGNMO	162.3	326900	0	**100**	0.000496	**90.2**

Oxidation and Reduction Catalysts Efficiency Report

Instrument	Date	Oxidation Catalyst Efficiency (Converting TGNMO to CO_2) (%)	Reduction Catalyst Efficiency (Converting CO_2 to CH_4) (%)
TCA 2	June 15, 2018	100.0	90.24591

TGNMO is total gaseous non- methane organics.

Date: June 15, 2018

AtmAA, Inc.

Laboratory Analysis Data Package

Client: SCS Engineers
Site: Alpha Ridge Landfill
Project No.: 02212027.10
SampleLocation: Marriotsville, MD.

CANISTER ANALYSIS
CHROMATOGRAMS:
M25C

Data File G:\HPCHEM\4\DATA\T061518\SIG10001.D
Sample Name: n2

```
================================================================================
Acq. Operator   :
Acq. Instrument : TCA #2                          Location : Vial 1
Injection Date  : 6/15/2018 7:57:20 AM
                                                  Inj Volume : Manually
Acq. Method     : C:\HPCHEM\4\METHODS\TCA2S.M
Last changed    : 9/22/2016 10:55:32 AM by msp
Analysis Method : G:\HPCHEM\METHOD\TCA2L.M
Last changed    : 6/19/2018 5:36:23 PM
                  (modified after loading)
Method Info     : TCA2
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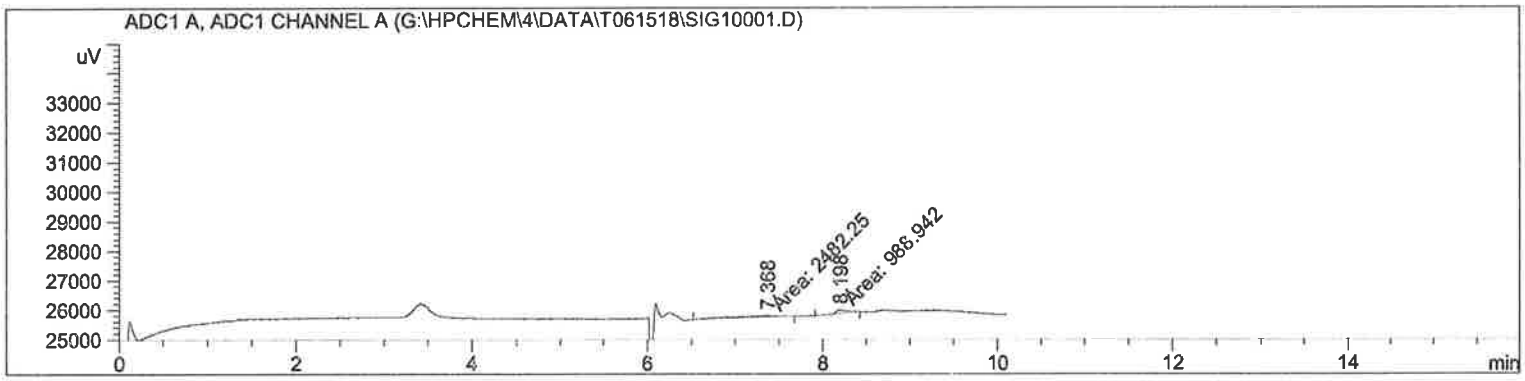



```
================================================================================
                          Area Percent Report
================================================================================

Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: ADC1 A, ADC1 CHANNEL A

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]    [uV*s]      [uV]       %
----|-------|----|-------|----------|----------|--------|
   1   7.368 MM    0.7322 2482.25171   56.50145 71.51003
   2   8.198 MM    0.1353  988.94189  121.83970 28.48997

Totals :                  3471.19360  178.34114

================================================================================
                          *** End of Report ***
```

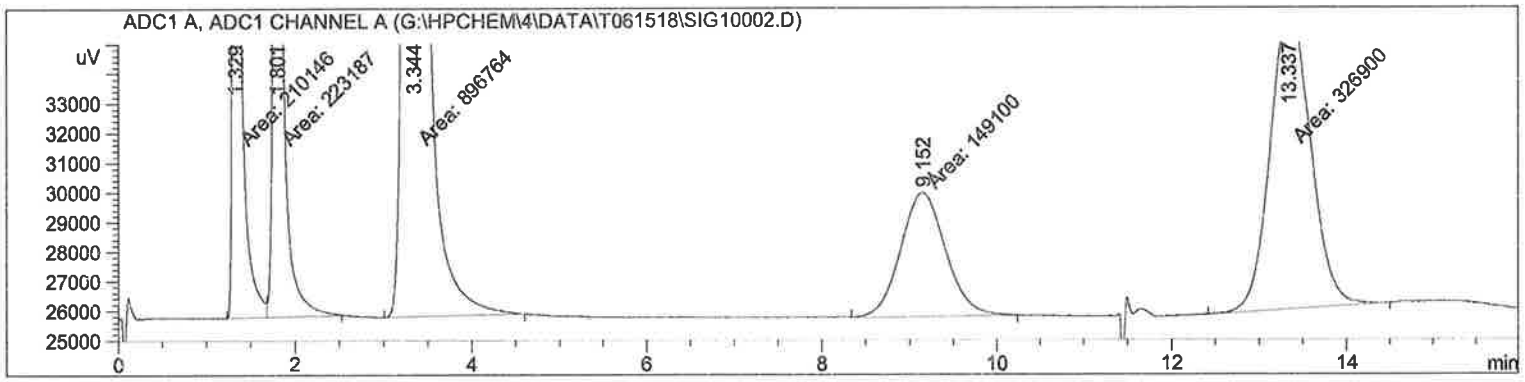
TGNMO 3471

Data File G:\HPCHEM\4\DATA\T061518\SIG10002.D
Sample Name: std

Begin Std

==========

Acq. Operator :
Acq. Instrument : TCA #2 Location : Vial 1
Injection Date : 6/15/2018 8:09:45 AM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 5/5/2017 8:03:03 PM by K2M
Analysis Method : G:\HPCHEM\METHOD\TCA2L.M
Last changed : 6/19/2018 6:06:47 PM
(modified after loading)
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %	
1	1.329	MF	0.0891	2.10146e5	3.93057e4	11.63536	co
2	1.801	FM	0.1073	2.23187e5	3.46756e4	12.35744	chy
3	3.344	MM	0.2262	8.96764e5	6.60667e4	49.65200	Cor
4	9.152	MM	0.5939	1.49100e5	4184.06543	8.25539	cr
5	13.337	MM	0.5335	3.26900e5	1.02125e4	18.09982	TONMO

Totals : 1.80610e6 1.54445e5

==========

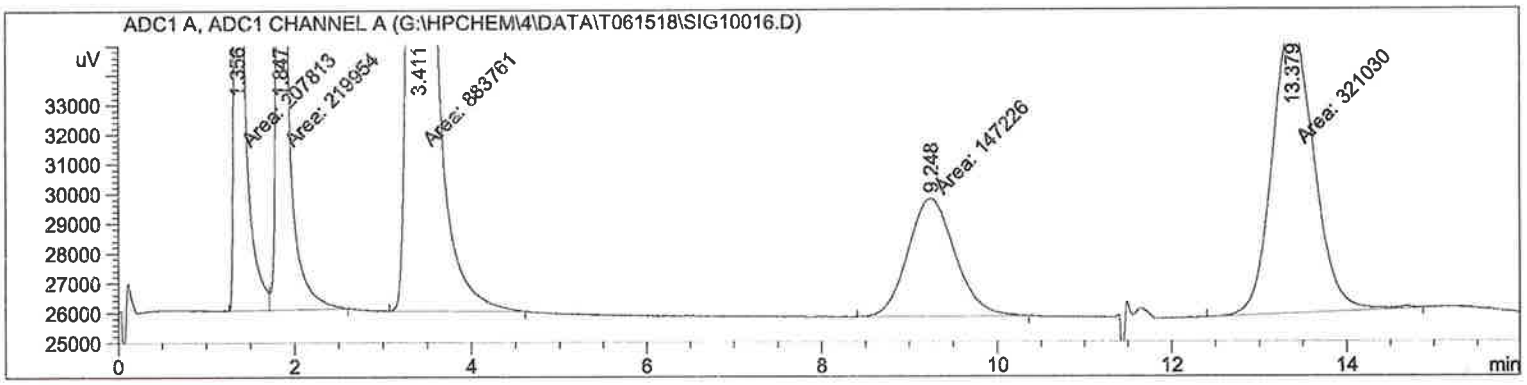
*** End of Report ***

Data File G:\HPCHEM\4\DATA\T061518\SIG10016.D
Sample Name: std

2nd Std

==========

Acq. Operator :
Acq. Instrument : TCA #2 Location : Vial 1
Injection Date : 6/15/2018 1:12:40 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 5/5/2017 8:03:03 PM by K2M
Analysis Method : G:\HPCHEM\METHOD\TCA2L.M
Last changed : 6/19/2018 6:06:47 PM
(modified after loading)
Method Info : TCA2



==========

Area Percent Report

==========

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

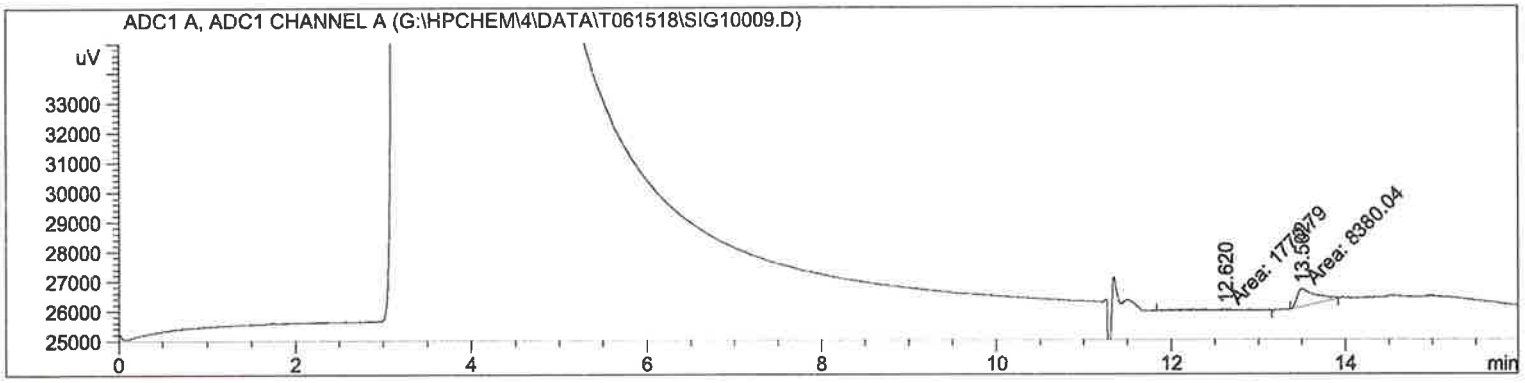
Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %	
1	1.356	MF	0.0982	2.07813e5	3.52620e4	11.67629	Co
2	1.847	FM	0.1217	2.19954e5	3.01217e4	12.35848	Chy
3	3.411	MM	0.2381	8.83761e5	6.18738e4	49.65552	Cor
4	9.248	MM	0.6198	1.47226e5	3958.92432	8.27215	Cz
5	13.379	MM	0.5466	3.21030e5	9789.38086	18.03757	TGNNO
Totals :				1.77978e6	1.41006e5		

==========

*** End of Report ***

Data File G:\HPCHEM\4\DATA\T061518\SIG10009.D
Sample Name: 3.80% co2bkg

```
================================================================================
Acq. Operator   :
Acq. Instrument : TCA #2                          Location : Vial 1
Injection Date  : 6/15/2018 10:42:59 AM
                                                  Inj Volume : Manually
Acq. Method     : C:\HPCHEM\4\METHODS\TCA2L.M
Last changed    : 5/5/2017 8:03:03 PM by K2M
Analysis Method : G:\HPCHEM\METHOD\TCA2L.M
Last changed    : 6/19/2018 6:06:47 PM
                  (modified after loading)
Method Info     : TCA2
```




```
================================================================================
                          Area Percent Report
================================================================================

Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: ADC1 A, ADC1 CHANNEL A

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]    [uV*s]      [uV]       %
----|-------|----|-------|----------|----------|--------|
   1  12.620 MM    0.5430 1770.79224   54.34729 17.44480
   2  13.502 MM    0.2352 8380.04199  593.84802 82.55520

Totals :                  1.01508e4   648.19531

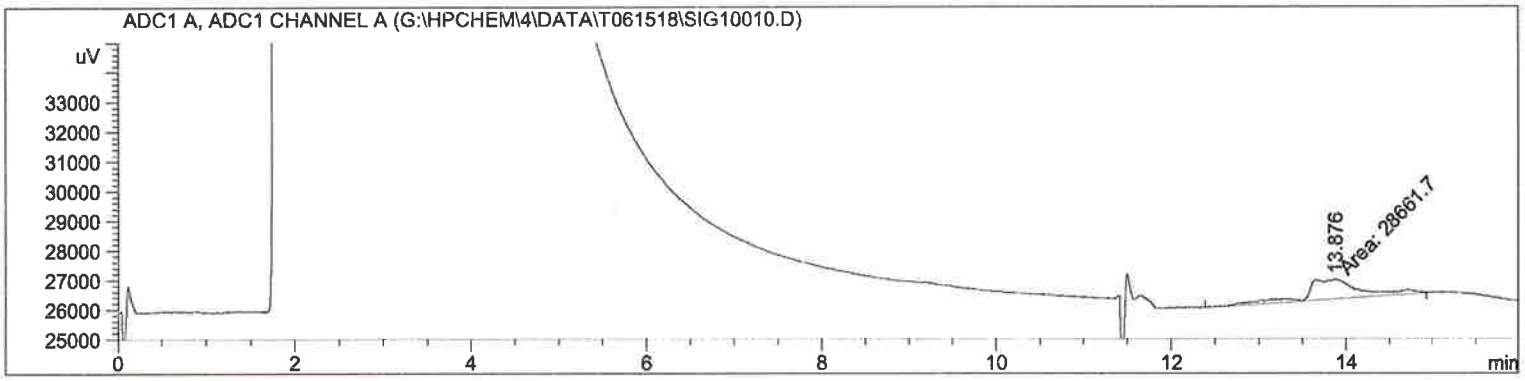
================================================================================
                          *** End of Report ***
```

TGMW 10151

Data File G:\HPCHEM\4\DATA\T061518\SIG10010.D
Sample Name: 11668-9

R.

```
==========================================================================
Acq. Operator   :
Acq. Instrument : TCA #2                          Location : Vial 1
Injection Date  : 6/15/2018 11:04:14 AM
                                                  Inj Volume : Manually
Acq. Method     : C:\HPCHEM\4\METHODS\TCA2L.M
Last changed    : 5/5/2017 8:03:03 PM by K2M
Analysis Method : G:\HPCHEM\METHOD\TCA2L.M
Last changed    : 6/19/2018 6:06:47 PM
                  (modified after loading)
Method Info     : TCA2
```




```
==========================================================================
                        Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: ADC1 A, ADC1 CHANNEL A

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]    [uV*s]      [uV]       %
----|-------|----|-------|----------|----------|--------|
   1  13.876 MM    0.7149 2.86617e4   668.19116 1.000e2

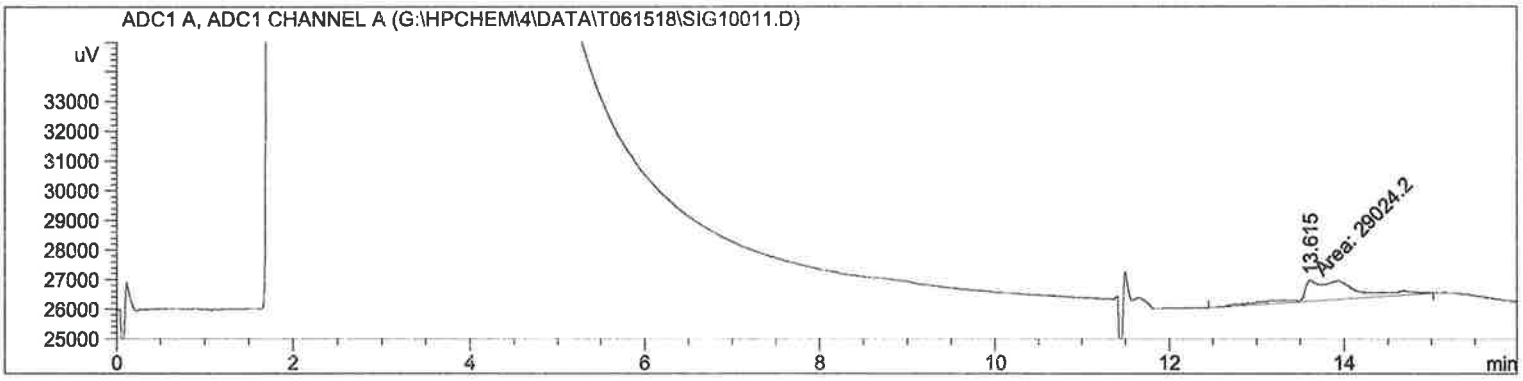
Totals :                  2.86617e4   668.19116

==========================================================================
                        *** End of Report ***
```

Data File G:\HPCHEM\4\DATA\T061518\SIG10011.D
Sample Name: 11668-9

R2

```
==========================================================================
Acq. Operator    :
Acq. Instrument  : TCA #2                          Location : Vial 1
Injection Date   : 6/15/2018 11:23:54 AM
                                                   Inj Volume : Manually
Acq. Method      : C:\HPCHEM\4\METHODS\TCA2L.M
Last changed     : 5/5/2017 8:03:03 PM by K2M
Analysis Method  : G:\HPCHEM\METHOD\TCA2L.M
Last changed     : 6/19/2018 6:06:47 PM
                   (modified after loading)
Method Info      : TCA2
```




```
==========================================================================
                          Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: ADC1 A, ADC1 CHANNEL A

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]    [uV*s]      [uV]       %
----|-------|----|-------|----------|----------|--------|
   1  13.615 MM    0.6764 2.90242e4   715.21552 1.000e2

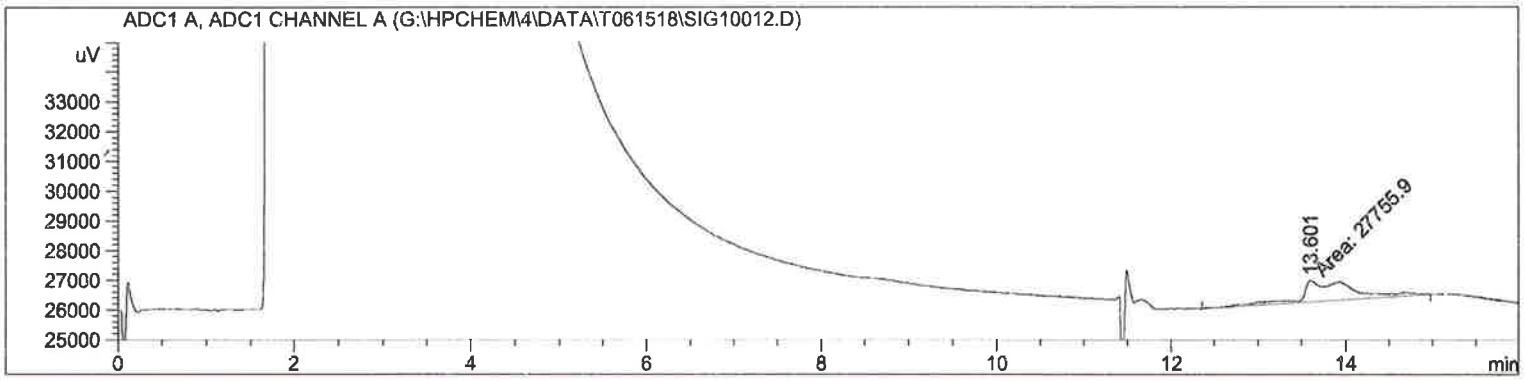
Totals :                  2.90242e4   715.21552

==========================================================================
                          *** End of Report ***
```

Data File G:\HPCHEM\4\DATA\T061518\SIG10012.D
Sample Name: 11668-10

12

```
==========================================================================
Acq. Operator    :
Acq. Instrument  : TCA #2                          Location : Vial 1
Injection Date   : 6/15/2018 11:43:30 AM
                                                   Inj Volume : Manually
Acq. Method      : C:\HPCHEM\4\METHODS\TCA2L.M
Last changed     : 5/5/2017 8:03:03 PM by K2M
Analysis Method  : G:\HPCHEM\METHOD\TCA2L.M
Last changed     : 6/19/2018 6:06:47 PM
                   (modified after loading)
Method Info      : TCA2
```




```
==========================================================================
                        Area Percent Report
==========================================================================

Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: ADC1 A, ADC1 CHANNEL A

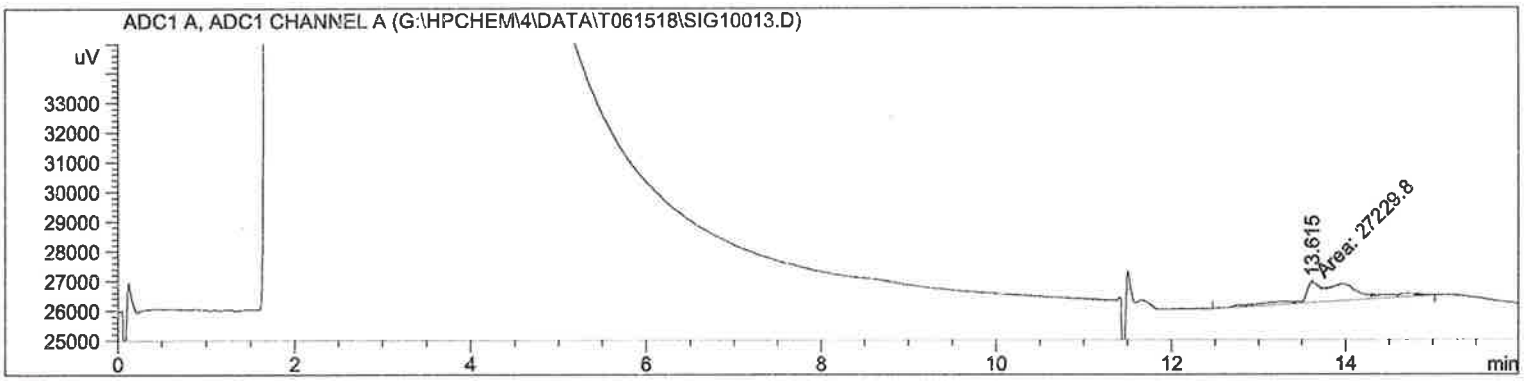
Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]    [uV*s]      [uV]       %
----|-------|----|-------|----------|----------|--------|
   1  13.601 MM    0.6499 2.77559e4   711.80408 1.000e2

Totals :                  2.77559e4   711.80408

==========================================================================
                        *** End of Report ***
```

Data File G:\HPCHEM\4\DATA\T061518\SIG10013.D
Sample Name: 11668-10

```
================================================================================
Acq. Operator    :
Acq. Instrument  : TCA #2                          Location : Vial 1
Injection Date   : 6/15/2018 12:02:44 PM
                                                   Inj Volume : Manually
Acq. Method      : C:\HPCHEM\4\METHODS\TCA2L.M
Last changed     : 5/5/2017 8:03:03 PM by K2M
Analysis Method  : G:\HPCHEM\METHOD\TCA2L.M
Last changed     : 6/19/2018 6:06:47 PM
                   (modified after loading)
Method Info      : TCA2
```




```
================================================================================
                          Area Percent Report
================================================================================

Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: ADC1 A, ADC1 CHANNEL A

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [uV*s]      [uV]        %
----|-------|----|-------|----------|----------|--------|
   1  13.615 MM    0.6493 2.72298e4   698.94257 1.000e2

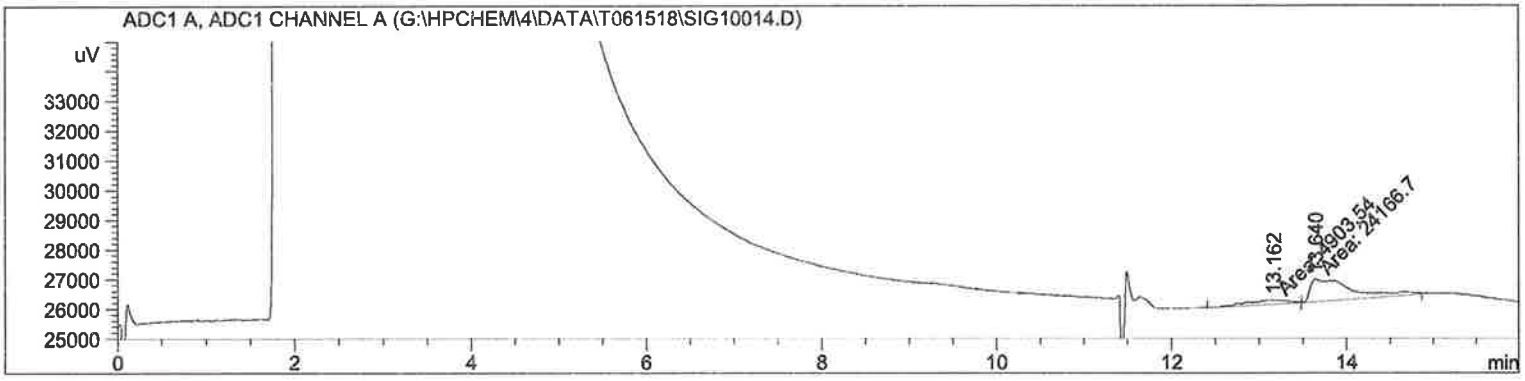
Totals :                  2.72298e4   698.94257

================================================================================
                          *** End of Report ***
```

Data File G:\HPCHEM\4\DATA\T061518\SIG10014.D
Sample Name: 11668-10

R.

```
================================================================================
Acq. Operator    :
Acq. Instrument  : TCA #2                          Location : Vial 1
Injection Date   : 6/15/2018 12:33:42 PM
                                                   Inj Volume : Manually
Acq. Method      : C:\HPCHEM\4\METHODS\TCA2L.M
Last changed     : 5/5/2017 8:03:03 PM by K2M
Analysis Method  : G:\HPCHEM\METHOD\TCA2L.M
Last changed     : 6/19/2018 6:06:47 PM
                   (modified after loading)
Method Info      : TCA2
```




```
================================================================================
                          Area Percent Report
================================================================================

Sorted By             :      Signal
Multiplier:                   :      1.0000
Dilution:                     :      1.0000
Use Multiplier & Dilution Factor with ISTDs


Signal 1: ADC1 A, ADC1 CHANNEL A

Peak RetTime Type  Width     Area      Height     Area
  #   [min]        [min]   [uV*s]      [uV]        %
----|-------|----|-------|----------|----------|--------|
   1  13.162 MM    0.5581 4903.54346  146.44788 16.86789
   2  13.640 MM    0.5270 2.41667e4   764.31512 83.13211

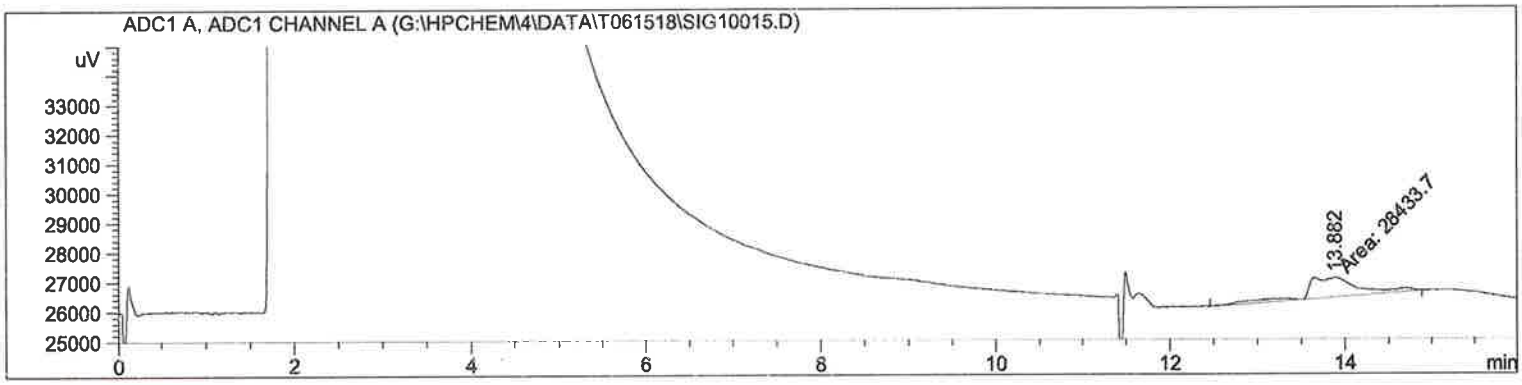
Totals :                  2.90703e4   910.76300

================================================================================
                          *** End of Report ***
```

Data File G:\HPCHEM\4\DATA\T061518\SIG10015.D
Sample Name: 11668-10

R2

Acq. Operator :
Acq. Instrument : TCA #2 Location : Vial 1
Injection Date : 6/15/2018 12:53:21 PM
Inj Volume : Manually
Acq. Method : C:\HPCHEM\4\METHODS\TCA2L.M
Last changed : 5/5/2017 8:03:03 PM by K2M
Analysis Method : G:\HPCHEM\METHOD\TCA2L.M
Last changed : 6/19/2018 6:06:47 PM
(modified after loading)
Method Info : TCA2



Area Percent Report

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

Signal 1: ADC1 A, ADC1 CHANNEL A

Peak #	RetTime [min]	Type	Width [min]	Area [uV*s]	Height [uV]	Area %
1	13.882	MM	0.7135	2.84337e4	664.15717	1.000e2

Totals : 2.84337e4 664.15717

*** End of Report ***

Data File G:\HPCHEM\4\DATA\T061218\SIG10001.D
Sample Name: cat eff

5th

Acq. Operator :
Acq. Instrument : TCA #2
Injection Date : 6/12/2018 6:46:26 AM

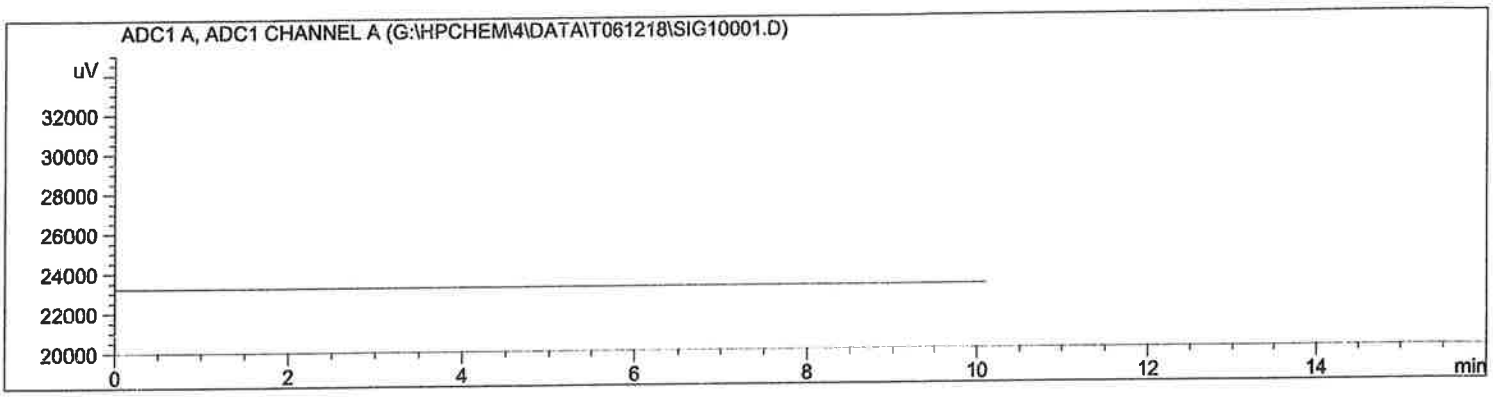
Location : Vial 1

Inj Volume : Manually

Catalyst check

Cr in Nicat

Acq. Method : C:\HPCHEM\4\METHODS\TCA2S.M
Last changed : 9/22/2016 10:55:32 AM by msp
Analysis Method : G:\HPCHEM\METHOD\TCA2L.M
Last changed : 6/19/2018 5:31:55 PM
(modified after loading)
Method Info : TCA2



Area Percent Report

Sorted By : Signal
Multiplier: : 1.0000
Dilution: : 1.0000
Use Multiplier & Dilution Factor with ISTDs

No peaks found

*** End of Report ***

Appendix D – NMOC Emission Rate Model

Appendix D - Projected NMOC Generation Rates
Alpha Ridge Landfill

Year	Disposal Rate (tons/yr)	Refuse In-Place (tons)	Disposal Rate (Mg/yr)	Refuse In-Place (Mg)	NMOC Generation Rates (tons/yr)	NMOC Generation Rates (Mg/yr)
1980	90,004	0	81,650	0	0.0	0.0
1981	90,004	90,004	81,650	81,650	0.1	0.1
1982	101,964	180,007	92,500	163,300	0.2	0.2
1983	109,019	281,971	98,900	255,800	0.3	0.3
1984	129,963	390,990	117,900	354,700	0.4	0.4
1985	157,079	520,952	142,500	472,600	0.5	0.5
1986	176,921	678,032	160,500	615,100	0.7	0.6
1987	211,093	854,953	191,500	775,600	0.8	0.7
1988	247,910	1,066,045	224,900	967,100	1.0	0.9
1989	286,601	1,313,955	260,000	1,192,000	1.2	1.1
1990	229,281	1,600,556	208,000	1,452,000	1.5	1.3
1991	177,472	1,829,837	161,000	1,660,000	1.7	1.5
1992	190,700	2,007,309	173,000	1,821,000	1.8	1.6
1993	192,904	2,198,009	175,000	1,994,000	1.9	1.7
1994	177,472	2,390,913	161,000	2,169,000	2.0	1.8
1995	168,654	2,568,385	153,000	2,330,000	2.1	1.9
1996	139,994	2,737,039	127,000	2,483,000	2.2	2.0
1997	38,581	2,877,032	35,000	2,610,000	2.2	2.0
1998	28,660	2,915,613	26,000	2,645,000	2.2	2.0
1999	8,476	2,944,273	7,689	2,671,000	2.1	1.9
2000	8,818	2,952,749	8,000	2,678,689	2.0	1.8
2001	6,614	2,961,568	6,000	2,686,689	1.9	1.7
2002	8,275	2,968,182	7,507	2,692,689	1.8	1.6
2003	7,039	2,976,457	6,386	2,700,196	1.7	1.6
2004	1,800	2,983,496	1,633	2,706,581	1.7	1.5
2005	2,923	2,985,296	2,652	2,708,214	1.6	1.4
2006	4,239	2,988,219	3,846	2,710,866	1.5	1.4
2007	4,743	2,992,458	4,303	2,714,712	1.4	1.3
2008	3,599	2,997,201	3,265	2,719,014	1.4	1.2
2009	324	3,000,800	294	2,722,279	1.3	1.2
2010	509	3,001,124	462	2,722,573	1.2	1.1
2011	241	3,001,633	219	2,723,035	1.2	1.1
2012	600	3,001,874	544	2,723,254	1.1	1.0
2013	0	3,002,474	0	2,723,798	1.1	1.0
2014	194	3,002,474	176	2,723,798	1.0	0.9
2015	1,619	3,002,668	1,469	2,723,974	1.0	0.9
2016	7,336	3,004,287	6,655	2,725,443	0.9	0.8
2017	1,019	3,011,623	924	2,732,098	0.9	0.8
2018	10,000	3,012,642	9,072	2,733,022	0.8	0.8
2019	10,000	3,022,642	9,072	2,742,094	0.8	0.7
2020	10,000	3,032,642	9,072	2,751,166	0.8	0.7
2021	10,000	3,042,642	9,072	2,760,238	0.8	0.7
2022	10,000	3,052,642	9,072	2,769,310	0.7	0.7
2023	10,000	3,062,642	9,072	2,778,382	0.7	0.6

Note: Tons were converted to megagrams (Mg) using a conversion factor of 0.9072 Mg/ton.

Methane Content of LFG Adjusted to:	50%	
Selected Decay Rate Constant (k):	0.050	
Selected Ultimate Methane Recovery Rate (Lo):	170	m^3/Mg =
NMOC Concentration in LFG:	18.1	ppmv as Hexane

2018 Emissions Certification Report

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
9801 Broken Land Parkway ■ Columbia, Maryland 21046 ■ 410-313-6444

Mark DeLuca, P.E., Deputy Director
Chief, Bureau of Environmental Services
mdeluca@howardcountymd.gov

FAX 410-313-6490
TDD 410-313-2323

March 25, 2019

Mr. Laramie Daniel
Compliance Program
Maryland Department of the Environment
Air and Radiation Management Administration
1800 Washington Blvd., Suite 715
Baltimore, MD 21230

Subject: Emissions Certification Report
Alpha Ridge Landfill, Howard County, MD
Facility Number 24-027-00364

Dear Mr. Daniel:

Attached please find a copy of the Annual Emissions Certification for the Alpha Ridge Landfill for calendar year 2018. In accordance with Section VI of our operating permit, we certify the results of our analysis of emissions of toxic air pollutants from the Alpha Ridge Landfill during calendar year 2018. The analysis of emissions of toxic air pollutants demonstrates compliance with COMAR 26.11.15.

If you have any questions regarding this report, please contact Niti Blackwell at 410-313-6418.

Sincerely,

Mark DeLuca, P.E.
Chief, Bureau of Environmental Services

Enclosures

Cc: Wayne Souder, ARL File
File

MARYLAND DEPARTMENT OF THE ENVIRONMENT
1800 Washington Boulevard, Suite 715 • Baltimore Maryland 21230-1720
410-537-3000 • 1-800-633-6101 • http://www.mde.state.md.us
Air and Radiation Management Administration
Air Quality Compliance Program
410-537-3220

FORM 1:

GENERAL FACILITY INFORMATION
EMISSIONS CERTIFICATION REPORT

Calendar Year: 2018

A. FACILITY IDENTIFICATION Facility Name Alpha Ridge Landfill	**Do Not Write in This Space** Date Received Regional
Address 2350 Marriottsville Road	Date Received State
City Marriottsville County Howard Zip Code 21104	AIRS Code
B. Briefly describe the major function of the facility	FINDS Code
Municipal Solid Waste Landfill	SIC Code
	Facility Number:
	TEMPO ID:

C. SEASONAL PRODUCTION (%, if applicable)

Winter *(Dec.-Feb.)*	Spring *(Mar – May)*	Summer *(Jun – Aug)*	Fall *(Sept – Nov)*
_____	_____	_____	_____

Reviewed by:

Name Date

D. Explain any increases or decreases in emissions from the previous calendar year for each registration at this facility.

The County continued operation of a reciprocating internal combustion engine which utilizes landfill gas (diverted from the flare) and produces electricity.

E. CONTROL DEVICE INFORMATION (for NOx and VOC sources only)

Control Device	Capture Efficiency	Removal Efficiency
Landfill Gas Collection System	44.5%	
Enclosed Ground Flare		98%
Engine		97.2%

I am familiar with the facility and the installations and sources for which this report is submitted. I have personally examined the information in this report, which consists of 36 pages (including attachments), and certify that the information is correct to the best of my knowledge.

Mark DeLuca, P.E.	Chief, Bureau of Environmental Services	3/25/19
Name (Print/Type)	Title	Date
		410-313-4414
Signature		Telephone

1/09/08

FORM 2:

CRITERIA AIR POLLUTANTS
EMISSIONS CERTIFICATION REPORT

Calendar Year: 2018

Facility Name: Alpha Ridge Landfill

Facility ID: 24-027-00364

Pollutant: CO

Equipment Description/ Registration No.	SCC Number	Fuel		Actual Emissions		Operating Schedule (Actual)				TOSD	Operating Schedule			Emissions Methods
				Tons/yr	Lbs/day	Hrs/dy	Dys/wk	Wk/yr	Days/yr	Lbs/dy	Hrs/dy	Start	End	
Flare		LFG	S	1.7	35.6				94					C1/C3
13-9-0193			F											
Engine		LFG	S	19.7	160.4				246					C1/C3
9-0364			F											
Grinder		Diesel	S	0.4	13.2	7								C1/C3
9-0369			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
Total				21.8										

S - Stack Emissions F - Fugitive Emissions Daily emissions (lbs/day) are lbs/operating day of the source

TOSD: Typical Ozone Season Day means a typical day of that period of the year during which conditions for photochemical conditions are most favorable, which is generally during sustained periods of direct sunlight and warm temperatures (April-September). This section needs to be completed only for VOC and NOx sources.

Fuel: Include emissions for each fuel used. If more than one fuel is used, calculate and list emissions separately for each fuel.

Emission Estimation Method

A1-U.S. EPA Reference Method
A2-Other Particulate Sampling Train
A3-Liquid Absorption Technique
A4-Solid Absorption Technique
A5-Freezing Out Technique
A9-Other, Specify

C1-User calculated based on source test or other measurement
C2-User calculated based on material balance using engineering knowledge of the process
C3-User calculated based on AP-42
C4-User calculated by best guess/engineering Judgment

C5-User calculated based on a State or local agency emission factor
C6-New construction, not operational
C7-Source closed, operation ceased
C8-Computer calculated based on standard

FORM 2:

CRITERIA AIR POLLUTANTS
EMISSIONS CERTIFICATION REPORT

Calendar Year: 2018

Facility Name: Alpha Ridge Landfill

Facility ID: 24-027-00364

Pollutant: NOx

Equipment Description/ Registration No.	SCC Number	Fuel		Actual Emissions		Operating Schedule (Actual)				TOSD	Operating Schedule			Emissions Methods
				Tons/yr	Lbs/day	Hrs/dy	Dys/wk	Wk/yr	Days/yr	Lbs/dy	Hrs/dy	Start	End	
Flare		LFG	S	0.5	10.7				94	10.7	24			C1/C3
13-9-0193			F											
Engine		LFG	S	3.1	25.6				246	25.6	24			C1/C3
9-0364			F											
Grinder		Diesel	S	1.3	49.7	7				49.7	7			C1/C3
9-0369			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
Total				4.9										

S - Stack Emissions F - Fugitive Emissions Daily emissions (lbs/day) are lbs/operating day of the source

TOSD: Typical Ozone Season Day means a typical day of that period of the year during which conditions for photochemical conditions are most favorable, which is generally during sustained periods of direct sunlight and warm temperatures (April-September). This section needs to be completed only for VOC and NOx sources.

Fuel: Include emissions for each fuel used. If more than one fuel is used, calculate and list emissions separately for each fuel.

Emission Estimation Method

A1-U.S. EPA Reference Method
A2-Other Particulate Sampling Train
A3-Liquid Absorption Technique
A4-Solid Absorption Technique
A5-Freezing Out Technique
A9-Other, Specify

C1-User calculated based on source test or other measurement
C2-User calculated based on material balance using engineering knowledge of the process
C3-User calculated based on AP-42
C4-User calculated by best guess/engineering Judgment

C5-User calculated based on a State or local agency emission factor
C6-New construction, not operational
C7-Source closed, operation ceased
C8-Computer calculated based on standard

FORM 2:

CRITERIA AIR POLLUTANTS
EMISSIONS CERTIFICATION REPORT

Calendar Year: 2018

Facility Name: Alpha Ridge Landfill Facility ID: 24-027-00364 Pollutant: SOx

Equipment Description/ Registration No.	SCC Number	Fuel		Actual Emissions		Operating Schedule (Actual)				TOSD	Operating Schedule			Emissions Methods
				Tons/yr	Lbs/day	Hrs/dy	Dys/wk	Wk/yr	Days/yr	Lbs/dy	Hrs/dy	Start	End	
Flare		LFG	S	0.0	0.4				94					C1/C3
13-9-0193			F											
Engine		LFG	S	0.0	0.3				246					C1/C3
9-0364			F											
Grinder		Diesel	S	0.4	15.7	7								C1/C3
9-0369			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
Total				0.4										

S - Stack Emissions F - Fugitive Emissions Daily emissions (lbs/day) are lbs/operating day of the source

TOSD: Typical Ozone Season Day means a typical day of that period of the year during which conditions for photochemical conditions are most favorable, which is generally during sustained periods of direct sunlight and warm temperatures (April-September). This section needs to be completed only for VOC and NOx sources.

Fuel: Include emissions for each fuel used. If more than one fuel is used, calculate and list emissions separately for each fuel.

Emission Estimation Method

A1-U.S. EPA Reference Method
A2-Other Particulate Sampling Train
A3-Liquid Absorption Technique
A4-Solid Absorption Technique
A5-Freezing Out Technique
A9-Other, Specify

C1-User calculated based on source test or other measurement
C2-User calculated based on material balance using engineering knowledge of the process
C3-User calculated based on AP-42
C4-User calculated by best guess/engineering Judgment

C5-User calculated based on a State or local agency emission factor
C6-New construction, not operational
C7-Source closed, operation ceased
C8-Computer calculated based on standard

FORM 2:

CRITERIA AIR POLLUTANTS
EMISSIONS CERTIFICATION REPORT

Calendar Year: 2018

Facility Name: Alpha Ridge Landfill

Facility ID: 24-027-00364

Pollutant: VOCs

Equipment Description/ Registration No.	SCC Number	Fuel		Actual Emissions		Operating Schedule (Actual)				TOSD	Operating Schedule			Emissions Methods
				Tons/yr	Lbs/day	Hrs/dy	Dys/wk	Wk/yr	Days/yr	Lbs/dy	Hrs/dy	Start	End	
Flare		LFG	S	0.0	0.0				94	0.0	24			C1/C3
13-9-0193			F											
Landfill			S						365		24			
9-0205			F	0.1	0.6					0.6				C1/C3
Engine		LFG	S	0.0	0.1				246	0.1	24			C1/C3
9-0364			F											
Grinder		Diesel	S	0.0	0.0	7				0.0	7			C1/C3
9-0369			F											
AST & Dispensing Facility		Gasolin	S						365		24			
9-0379		e	F	0.8	4.5					4.5				C1/C3
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
			S											
			F											
Total				0.9										

S - Stack Emissions F - Fugitive Emissions Daily emissions (lbs/day) are lbs/operating day of the source

TOSD: Typical Ozone Season Day means a typical day of that period of the year during which conditions for photochemical conditions are most favorable, which is generally during sustained periods of direct sunlight and warm temperatures (April-September). This section needs to be completed only for VOC and NOx sources.

Fuel: Include emissions for each fuel used. If more than one fuel is used, calculate and list emissions separately for each fuel.

Emission Estimation Method

A1-U.S. EPA Reference Method
A2-Other Particulate Sampling Train
A3-Liquid Absorption Technique
A4-Solid Absorption Technique
A5-Freezing Out Technique
A9-Other, Specify

C1-User calculated based on source test or other measurement
C2-User calculated based on material balance using engineering knowledge of the process
C3-User calculated based on AP-42
C4-User calculated by best guess/engineering Judgment

C5-User calculated based on a State or local agency emission factor
C6-New construction, not operational
C7-Source closed, operation ceased
C8-Computer calculated based on standard

FORM 3: PM

EMISSIONS CERTIFICATION REPORT

Particulate Matter

Calendar Year: 2018

Facility Name: Alpha Ridge Landfill

Facility ID: 24-027-00365

Pollutant: PM

Equipment Description/ Registration No.	SCC Number	Fuel		PM – Filterable		PM 10 –Filterable		PM 2.5 – Filterable		PM Condensable		Operation	Emissions Methods
				Tons/yr	Lbs/day	Tons/yr	Lbs/day	Tons/yr	Lbs/day	Tons/yr	Lbs/day	Days/yr	
Flare		LFG	S	0.0	0.8	0.0	0.8	0.0	0.8	0.1	2.3		C1/C3
13-9-0193			F									94	
Landfill			S										
9-0205			F			0.1	0.5					365	C1/C3
Engine		LFG	S	0.2	2.0	0.2	2.0	0.2	2.0	1.0	7.9		C1/C3
9-0364			F									246	
Grinder		Diesel	S	0.0	1.6	0.0	0.9						C1/C3
9-0369			F										
			S										
			F										
			S										
			F										
			S										
			F										
			S										
			F										
			S										
			F										
			S										
			F										
Total				0.2		0.3		0.2		1.1			

S - Stack Emissions F - Fugitive Emissions Daily emissions (lbs/day) are lbs/operating day of the source

Fuel: Include emissions for each fuel used. If more than one fuel is used, calculate and list emissions separately for each fuel.

Emission Estimation Method

A1-U.S. EPA Reference Method
A2-Other Particulate Sampling Train
A3-Liquid Absorption Technique
A4-Solid Absorption Technique
A5-Freezing Out Technique
A9-Other, Specify

C1-User calculated based on source test or other measurement
C2-User calculated based on material balance using engineering knowledge of the process
C3-User calculated based on AP-42
C4-User calculated by best guess/engineering Judgment

C5-User calculated based on a State or local agency emission factor
C6-New construction, not operational
C7-Source closed, operation ceased
C8-Computer calculated based on standard

2/21/08

FORM 4:

TOXIC AIR POLLUTANTS

Calendar Year: 2018

EMISSIONS CERTIFICATION REPORT

Facility Name: Alpha Ridge Landfill **Facility ID**: 24-027-00364 **Pollutant**: Acrylonitrile

Equipment Description/ Registration Number[1]	Actual Emissions			Control Device**	% Efficiency
	Tons/yr	Lbs/day	Lbs/hr		
Flare 13-9-0193	0.00	0.01	0.00	O	98
Landfill 9-0205	0.06	0.34	0.01		
Engine 9-0364	0.00	0.01	0.00	O	97.2
TOTALS	0.06				

[1]Emissions must be broken down by equipment registration number (ex. 9-0076, 9-0077)

FORM 4:

TOXIC AIR POLLUTANTS

Calendar Year: 2018

EMISSIONS CERTIFICATION REPORT

Facility Name: Alpha Ridge Landfill **Facility ID**: 24-027-00364 **Pollutant**: Chlorine

Equipment Description/ Registration Number[1]	Actual Emissions			Control Device**	% Efficiency
	Tons/yr	Lbs/day	Lbs/hr		
Landfill 9-0205	0.27	1.48	0.06		
TOTALS	0.27				

[1]Emissions must be broken down by equipment registration number (ex. 9-0076, 9-0077)

FORM 4:

TOXIC AIR POLLUTANTS

Calendar Year: 2018

EMISSIONS CERTIFICATION REPORT

Facility Name: Alpha Ridge Landfill **Facility ID**: 24-027-00364 **Pollutant**: Formaldehyde

Equipment Description/ Registration Number[1]	Actual Emissions			Control Device**	% Efficiency
	Tons/yr	Lbs/day	Lbs/hr		
Engine 9-0364	2.78	22.64	0.94	O	97.2
TOTALS	2.78				

[1]Emissions must be broken down by equipment registration number (ex. 9-0076, 9-0077)

1/09/08

FORM 4:

TOXIC AIR POLLUTANTS

Calendar Year: 2018

EMISSIONS CERTIFICATION REPORT

Facility Name: Alpha Ridge Landfill **Facility ID**: 24-027-00364 **Pollutant**: Hexachloro-1,3-butadiene

Equipment Description/ Registration Number[1]	Actual Emissions			Control Device**	% Efficiency
	Tons/yr	Lbs/day	Lbs/hr		
Flare 13-9-0193	0.00	0.02	0.00	O	98
Landfill 9-0205	0.00	0.03	0.00		
Engine 9-0364	0.00	0.00	0.0	O	97.2
TOTALS	0.00				

[1]Emissions must be broken down by equipment registration number (ex. 9-0076, 9-0077)

FORM 4:

TOXIC AIR POLLUTANTS

Calendar Year: 2018

EMISSIONS CERTIFICATION REPORT

Facility Name: Alpha Ridge Landfill **Facility ID**: 24-027-00364 **Pollutant**: Hydrochloric Acid

Equipment Description/ Registration Number[1]	Actual Emissions			Control Device**	% Efficiency
	Tons/yr	Lbs/day	Lbs/hr		
Flare 13-9-0193	0.06	1.22	0.05	O	98
Engine 9-0364	0.16	1.28	0.05	O	97.2
TOTALS	0.22				

[1]Emissions must be broken down by equipment registration number (ex. 9-0076, 9-0077)

FORM 5:

BILLABLE TOXIC AIR POLLUTANTS EMISSIONS CERTIFICATION REPORT

Calendar Year: 2018

Facility Name: Alpha Ridge Landfill Facility ID#: 24-027-00364

Chemical Name	CAS Number		Actual Emissions				Estimation Method
			Tons/year	Lbs/day	Lbs/hr		
carbon disulfide	75-15-0	S	0.00	0.00	0.00		C1
		F	0.00	0.01	0.00		C1
carbonyl sulfide	463-58-1	S	0.00	0.00	0.00		C1
		F	0.01	0.06	0.02		C1
chlorine	7782-50-5	S	N/A	N/A	N/A		C3
		F	0.27	1.48	0.06		C3
cyanide compounds	57-12-5	S	N/A	N/A	N/A		N/A
		F	N/A	N/A	N/A		N/A
hydrochloric acid	7647-01-0	S	0.22	2.51	0.10		C3
		F	N/A	N/A	N/A		N/A
hydrogen fluoride	7664-39-3	S	N/A	N/A	N/A		N/A
		F	N/A	N/A	N/A		N/A
methyl chloroform	71-55-6	S	0.00	0.00	0.00		C1
		F	0.00	0.01	0.00		C1
methylene chloride	75-09-2	S	0.00	0.00	0.00		C1
		F	0.00	0.01	0.00		C1
perchloroethylene	127-18-4	S	0.00	0.00	0.00		C1
		F	0.00	0.02	0.00		C1
phosphine	7803-51-2	S	N/A	N/A	N/A		N/A
		F	N/A	N/A	N/A		N/A
titanium tetrachloride	7550-45-0	S	N/A	N/A	N/A		N/A
		F	N/A	N/A	N/A		N/A
TOTALS			0.50				

S-Stack Emissions F-Fugitive Emissions Daily emissions (lbs/day) are lbs/operating day of the source

Emission Estimation Method

A1-U.S. EPA Reference Method
A2-Other Particulate Sampling Train
A3-Liquid Absorption Technique
A4-Solid Absorption Technique
A5-Freezing Out Technique
A9-Other, Specify

C1-User calculated based on source test or other measurement
C2-User calculated based on material balance using engineering knowledge of the process
C3-User calculated based on AP-42
C4-User calculated by best guess/engineering judgment
C5-User calculated based on a State or local agency factor
C6-New construction, not operational
C7-Source closed, operation ceased
C8-Computer calculated based on standards

This form to include only the eleven chemicals identified.

PLEASE NOTE: Be sure to attach all data and calculations necessary to support the emissions figures shown above.

FORM 6: Greenhouse Gases

GREENHOUSE GAS AIR POLLUTANTS

Calendar Year: 2018

EMISSIONS CERTIFICATION REPORT

Facility Name: Alpha Ridge Landfill **Facility ID:** 24-027-00364 **Pollutant:** Carbon Dioxide (CO2)

Equipment Description/ Registration Number[1]	Actual Emissions		
	Tons/yr	Lbs/day	Lbs/hr
Flare 13-9-0193	1,632	34,798	1,450
Landfill 9-0205	4,008	21,959	915
Engine 9-0364	3,856	31,378	1,307
TOTALS	9,496		

This form must be used to report Greenhouse gas emissions:

- carbon dioxide (CO2)
- methane (CH4)
- nitrous oxide (N2O)
- hydrofluorocarbons (HFCs)
- perfluorocarbons (PFCs)
- sulfur hexafluoride (SF6)

* Use a separate form for each pollutant.

* Please attach all calculations.

[1]Emissions must be broken down by equipment registration number (ex. 9-0076, 9-0077)

FORM 6: Greenhouse Gases

GREENHOUSE GAS AIR POLLUTANTS

Calendar Year: 2018

EMISSIONS CERTIFICATION REPORT

Facility Name: Alpha Ridge Landfill **Facility ID**: 24-027-00364 **Pollutant**: Methane (CH4)

Equipment Description/ Registration Number[1]	Actual Emissions		
	Tons/yr	Lbs/day	Lbs/hr
Flare 13-9-0193	6	128	5
Landfill 9-0205	1,457	7,985	333
Engine 9-0364	23	188	8
TOTALS	1,486		

[1]Emissions must be broken down by equipment registration number (ex. 9-0076, 9-0077)

This form must be used to report Greenhouse gas emissions:

- carbon dioxide (CO2)
- methane (CH4)
- nitrous oxide (N2O)
- hydrofluorocarbons (HFCs)
- perfluorocarbons (PFCs)
- sulfur hexafluoride (SF6)

* Use a separate form for each pollutant.

* Please attach all calculations.

FORM 6: Greenhouse Gases

GREENHOUSE GAS AIR POLLUTANTS

Calendar Year: 2018

EMISSIONS CERTIFICATION REPORT

Facility Name: Alpha Ridge Landfill **Facility ID**: 24-027-00364 **Pollutant**: Nitrous Oxide (N2O)

Equipment Description/ Registration Number[1]	Actual Emissions		
	Tons/yr	Lbs/day	Lbs/hr
Engine 9-0364	0.04	0.36	0.02
TOTALS	0.04		

This form must be used to report Greenhouse gas emissions:

- carbon dioxide (CO2)
- methane (CH4)
- nitrous oxide (N2O)
- hydrofluorocarbons (HFCs)
- perfluorocarbons (PFCs)
- sulfur hexafluoride (SF6)

* Use a separate form for each pollutant.

* Please attach all calculations.

[1]Emissions must be broken down by equipment registration number (ex. 9-0076, 9-0077)

2018 Flare and Landfill Emissions Calculations
Alpha Ridge Landfill

Calculated by: NB
Checked by: JED

Table 1: Site Specific LFG Data

Month	LFG Flow to Flare (cfm)	Methane Content (percent)
January	307	40.8%
February	285	43.3%
March	232	44.3%
April	236	48.6%
May	220	47.7%
June	215	48.8%
July	315	46.7%
August	275	43.8%
September	249	46.9%
October	290	44.6%
November	324	45.8%
December	325	42.8%
Average	273	45.3%

Methane flow (cfm) = (273 * 45.3) = 123.7 cfm CH_4

Notes:
1. LFG Flow and methane content taken from Howard County records.
2. The County operates an enclosed ground flare manufactured by John Zink and an engine manufactured by Jenbacher.

The following parameters and values are utilized in these computations:

1.	Site specific methane content =	45.3%
2.	Site specific LFG flow rate to flare =	273 cfm
3.	Site specific methane flow rate to flare =	123.7 cfm
4.	Normalized LFG flow rate =	247.3 cfm [@50% methane]
5.	Methane generation rate =	244.5 cfm [see Table 2]
6.	LFG generation rate (@ 50% CH_4) =	489 cfm [see Table 2]
7.	VOC generation rate =	0.2 tons [see Note 1]
8.	Flare control efficiency =	98.0% [Manufacturer's expected emission]
9.	NO_x emission factor =	0.06 lb/MMBTU
10.	CO emission factor =	0.20 lb/MMBTU
11.	Flare down time =	6509 hours [Howard County records]
12.	Flare operating days =	94 days [Howard County records]
13.	CO_2 generation rate =	244.5 cfm [see Table 2]

Note 1: It is assumed that VOC emissions are 39% of NMOC emissions (see Table 2), per AP-42, Section 2.4.

2018 Flare and Landfill Emissions Calculations
Alpha Ridge Landfill

Calculated by: NB
Checked by: JED

Step 1. Calculate Average Site Specific LFG Heat (BTU) Content

Using the standard heating value for LFG of 500 BTU/ft^3 (at 50% methane content), the site specific LFG heating value is:

= (site specific methane content/50% methane) * (500 BTU/ft^3)

= **453.4 BTU/ft^3** LFG

where:

methane content = 45.3%

Step 2. Compute the Site Specific NO_x Emissions

The emission of NO_x is estimated using the manufacturer's expected emission rate of 0.06 lb NO_x per MMBTU.

Using the site specific LFG heat content the NO_x emissions are:

= (0.06 lb/MMBTU) * (site specific LFG heat content, BTU/ft^3) * (1 MMBTU/10^6 BTU) * (site specific LFG flow rate, cfm) * [(525,600 min/year) - (# hrs flare down * 60 min/hr)] * (1 ton/2,000 lb)

= **0.5 tons NO_x** total flare emissions

= **10.7 lbs/day NO_x** total flare emissions

where:

site specific LFG heat content =	453.4 BTU/ft^3 LFG
site specific LFG flow rate =	273 cfm
# hours flare down =	6509 hours
Flare operating days =	94 days

Step 3. Compute the Site Specific CO Emissions

The emission of CO is estimated using the manufacturer's expected emission rate of 0.20 lb CO per MMBTU.

Using the site specific LFG heat content the CO emissions are:

= (0.20 lb/MMBTU) * (site specific LFG heat content, BTU/ft^3) * (1 MMBTU/10^6 BTU) * (site specific LFG flow rate, cfm) * [(525,600 min/year) - (# hrs flare down * 60 min/hr)] * (1 ton/2,000 lb)

= **1.7 tons CO total flare emissions**

= **35.6 lbs/day CO total flare emissions**

where:

site specific LFG heat content =	453.4 BTU/ft^3 LFG
site specific LFG flow rate =	273 cfm
# hours flare down =	6509 hours
Flare operating days =	94 days

2018 Flare and Landfill Emissions Calculations
Alpha Ridge Landfill

Calculated by: NB
Checked by: JED

Step 4. PM Emissions

The PM emissions from burning LFG in flares are less than 2.5 micron (AP-42). So, emission factor for PM_{total}, PM_{10}, and $PM_{2.5}$ is the same resulting in the same calculation for each of the PM categories. PM here would mean PM_{total}, PM_{10} or $PM_{2.5}$.

The emission of PM is estimated using the EPA's AP-42 emission factor (Table 2.4-5) of 17 lb PM/10^6 dscf methane. Divide lb/10^6 dscf by 16,700 to obtain lb/hr/dscfm.
The condensable PM is 75% and filterable PM is 25% (AP-42 Table 1.4-2, Natural Gas Combustion).
So, condenable PM emission factor is calculated as 12.75 lb PM/10^6 dscf methane and filterable PM emission factor is calculated as 4.25 lb PM/10^6 lb PM/dscf methane.

Using the site specific average methane flow rate, the condensable PM emissions are:

=[(12.75 lb PM)/(16,700)] * (site specific methane flow rate, cfm) * (1 ton/2,000 lb) * (8,760 hr/year - # hrs flare down)

=	**0.1 tons condensable PM flare emissions**
=	**2.3 lbs/day condensable PM flare emissions**

where:

site specific methane flow rate =	123.7 cfm
# hours flare down =	6509 hours
Flare operating days =	94 days

Using the site specific average methane flow rate, the filterable PM emissions are:

=[(4.25 lb PM)/(16,700)] * (site specific methane flow rate, cfm) * (1 ton/2,000 lb) * (8,760 hr/year - # hrs flare down)

=	**0.0 tons filterable PM flare emissions**
=	**0.8 lbs/day filterable PM flare emissions**

where:

site specific methane flow rate =	123.7 cfm
# hours flare down =	6509 hours
Flare operating days =	94 days

2018 Flare and Landfill Emissions Calculations
Alpha Ridge Landfill

Calculated by: NB
Checked by: JED

Step 5. SO_x Emissions

The emission of sulfur oxides (SO_x) is estimated using the normalized LFG flow rate to the flare and the site specific concentration of 6.39 ppmv of total reduced sulfur compounds.

First, calculate the volume flow rate of sulfur to the flare using AP-42 equation 2.4(3):

= (normalized LFG flow rate) * [(6.39 ppmv)/(1,000,000)] * (1 m^3/35.31 ft^3) * [525,600 min/year - (# hrs flare down * 60 min/hr)]

= 6.0 m^3 sulfur/yr

where:
LFG flow rate is converted from cfm to cubic meters per year
normalized LFG flow rate = 247.3 cfm
hours flare down = 6509 hours

Next, calculate the mass flow rate of sulfur to the flare using AP-42 equation 2.4(4):

=[(sulfur volume flow) * (32 g/mol)] / [(8.205 x 10^{-5}) * (1000 g/kg) * (298 K)]

= 7.9 kg sulfur/yr

where:
32 g/mol is the molecular weight of sulfur
8.205 x 10^{-5} is the ideal gas conversion factor
298 K is the assumed temperature of the LFG (equivalent to 25o C)
sulfur volume flow = 6.0 m^3 sulfur/yr

Finally, calculate the SO_x flare emissions using AP-42 equation 2.4(7):

= (sulfur mass flow to the flare, kg) * (2.0) * (2.2 lb/kg) * (1 ton/2,000 lb)

= **0.0 tons SO_x** total flare emissions
= **0.4 lbs/day SO_x** total flare emissions

where:
2.0 is the ratio of the molecular weight of SO_2 to that of sulfur
sulfur mass flow = 7.9 kg sulfur/yr
Flare operating days = 94 days

2018 Flare and Landfill Emissions Calculations
Alpha Ridge Landfill

Calculated by: NB
Checked by: JED

Step 6. VOC Emissions

The emission of VOCs from the flare and from the landfill (as a fugitive emission) is estimated using the LFG normalized collection efficiency and the landfill's VOC generation rate (see attached Table 2 with LFG Modeling Results).

First, calculate the normalized collection efficiency of the LFG collection system using the methane flow to the flare and engine and the methane generation rate:

= (site specific methane flow, cfy) / (methane generation, cfy) * 100

= **44.5% normalized collection efficiency**

where:

methane generation =	128,509,200	cfy
site specific methane flow to flare =	16,699,227	cfy
site specific methane flow to engine =	40,430,000	cfy
site specific methane flow =	57,129,227	cfy

Next, calculate the uncombusted flare emissions of VOCs (to the nearest 0.1 ton):

= (VOC generation rate, tons) * (normalized collection efficiency) * (1 - flare control efficiency)*(flare operating days/365 days/year)

= **0.0 tons VOC total flare emissions**
= **0.0 lbs/day VOC total flare emissions**

where:

VOC generation rate =	0.2	tons
normalized collection efficiency =	44.5%	
flare control efficiency =	98.0%	
flare operating days =	94	days

Next, calculate the uncollected landfill emission of VOCs (fugitive emissions):

= (VOC generation rate, tons) * (1 - normalized collection efficiency)

= **0.1 tons VOC fugitive landfill emissions**
= **0.6 lbs/day VOC fugitive landfill emissions**

where:

VOC generation rate (tons) =	0.2	tons
normalized collection efficiency =	44.5%	

2018 Flare and Landfill Emissions Calculations
Alpha Ridge Landfill

Calculated by: NB
Checked by: JED

Step 7. Toxic Air Pollutant (TAP) and Hazardous Air Pollutant (HAP) Emissions

The emission of TAPs and HAPs from the flare and from the landfill (as a fugitive emission) is estimated using the LFG collection efficiency, the LFG generation rate, and the concentration of the TAPs and HAPs, which are taken from the EPA's AP-42.

The attached Table 3 presents a summary of the emissions for the TAPs and HAPs. The following is a sample collection for the emission of TAP Toluene - the emission of the other TAPs and HAPs was completed in a similar manner.

First, calculate the toluene volumetric flow rate using AP-42 equation 2.4(3):

* The site specific concentration based on the most recent landfill gas testing for toluene is 1.17 ppm

= (LFG generation rate) * (1.17 ppm) / (1,000,000) * (1 m^3 / 35.3 ft^3) * (525,600 min/yr)

= 8.5 m^3 toluene/yr

where:
LFG generation rate is converted from cfm to cubic meters per year
LFG generation rate = 489 cfm

Next, calculate the mass flow of toluene generated using AP-42 equation 2.4(4):
= [(toluene volume flow) * (92.13 g/mol)] / [(8.205 x 10^{-5}) * (1000 g/kg * 298 K)]

= 32.1 kg toluene/yr

where:
92.13 g/mol is the molecular weight of toluene
8.205 x 10^{-5} is the ideal gas conversion factor
298 k is the assumed temperature of the LFG (equivalent to 25° C)
toluene volume flow = 8.5 m^3/yr

Next, calculate the uncombusted flare emission of toluene:

= (toluene mass generation rate, kg) * (normalized collection efficiency) * (1- flare control effiiciency) * (1 ton / 908 kg)* (flare operating days/365 days/year)

= **0.0 tons toluene flare emissions**

where:
toluene mass generation = 32.1 kg
normalized collection efficiency = 44.5%
flare control efficiency = 98.0%
flare operating days = 94 days

Finally, calculate the uncollected landfill emission of toluene (fugutive emissions):

= (toluene mass generation rate, kg) * (1- normalized collection effiiciency) * (1 ton / 908 kg)

= **0.0 tons toluene fugitive landfill emissions**

where:
toluene mass generation = 32.1 kg
normalized collection efficiency = 44.5%

2018 Flare and Landfill Emissions Calculations
Alpha Ridge Landfill

Calculated by: NB
Checked by: JED

Step 8. Calculate the Site-Specific Methane Emissions

The emission of CH4 from the flare and from the landfill (as a fugitive emission) is estimated using the LFG collection efficiency and the landfill's methane generation rate (see attached Table 2 with LFG Modeling Results).

Calculate the mass flow of methane generated using AP-42 equation 2.4(4):

= [(methane generation rate) * (1 m^3 / 35.3 ft^3) * (525,600 min/yr) * (16 g/mol)] / [(8.205 x 10^{-5}) * (1000 g/kg * 298 K)]

= 2,382,235.3 kg methane/yr

where:
16 g/mol is the molecular weight of methane
8.205 x 10^{-5} is the ideal gas conversion factor
298 k is the assumed temperature of the LFG (equivalent to 25° C)
Methane generation rate is converted from cfm to cubic meters per year
Methane generation rate = 245 cfm

Next, calculate the uncombusted flare emissions of methane (to the nearest 0.1 ton):

= (mass flow of methane, kg/yr) * (1 ton / 908 kg) * (normalized collection efficiency) * (1 - flare control efficiency)* (flare operating days/365 days/year)

= **6.0 tons methane total flare emissions**
= **127.8 lbs/day methane total flare emissions**
= **5.3 lbs/hr methane total flare emissions**

where:
Mass flow of methane is converted from kg/yr to tons/yr
Mass flow of methane = 2,382,235.3 kg methane/yr
normalized collection efficiency = 44.5%
flare control efficiency = 98.0%
flare operating days = 94 days

Next, calculate the uncollected landfill emission of methane (fugitive emissions):

= (mass flow of methane, kg/yr) * (1 ton / 908 kg) * (1 - normalized collection efficiency)

= **1,457.3 tons methane fugitive landfill emissions**
= **7,985.1 lbs/day methane fugitive landfill emissions**
= **332.7 lbs/hr methane fugitive landfill emissions**

where:
Mass flow of methane is converted from kg/yr to tons/yr
Mass flow of methane = 2,382,235.3 kg methane/yr
normalized collection efficiency = 44.5%

2018 Flare and Landfill Emissions Calculations
Alpha Ridge Landfill

Calculated by: NB
Checked by: JED

Step 9. Calculate the Site-Specific CO_2 Emissions

The emission of CO_2 from the flare and from the landfill (as a fugitive emission) is estimated using the LFG collection efficiency and the landfill's CO_2 generation rate (see attached Table 2 with LFG Modeling Results).

Calculate the mass flow of CO_2 generated using AP-42 equation 2.4(4):

= [(CO_2 generation rate) * (1 m^3 / 35.3 ft^3) * (525,600 min/yr) * (44 g/mol)] / [(8.205 x 10^{-5}) * (1000 g/kg * 298 K)]

= 6,551,147.0 kg CO_2/yr

where:
44 g/mol is the molecular weight of CO_2
8.205 x 10^{-5} is the ideal gas conversion factor
298 k is the assumed temperature of the LFG (equivalent to 25° C)
CO_2 generation rate is converted from cfm to cubic meters per year
CO_2 generation rate = 245 cfm

Next, calculate the flare emissions of CO_2 (to the nearest 0.1 ton), which is the sum of the collected CO_2 and the combusted flare emissions of methane converted to CO_2:

= [(mass flow of CO_2, kg/yr) * (1 ton / 908 kg) * (normalized collection efficiency)
+ (mass flow of methane, kg/yr) * (1 ton / 908 kg) * (normalized collection efficiency) * (flare control efficiency) * (2.75)] *
(flare operating days/365 days/year)

= **1,631.5 tons CO_2** total flare emissions
= **34,798.3 lbs/day CO_2** total flare emissions
= **1,449.9 lbs/hr CO_2** total flare emissions

where:
Mass flow of CO_2 is converted from kg/yr to tons/yr
2.75 is the ratio of the molecular weight of CO_2 to that of methane

Mass flow of CO_2 =	6,551,147.0 kg CO_2/yr
Mass flow of methane =	2,382,235.3 kg methane/yr
normalized collection efficiency =	44.5%
flare control efficiency =	98.0%
flare operating days =	94 days

Next, calculate the uncollected landfill emission of CO_2 (fugitive emissions):

= (mass flow of methane, kg/yr) * (1 ton / 908 kg) * (1 - normalized collection efficiency)

= **4,007.5 tons CO_2** fugitive landfill emissions
= **21,958.9 lbs/day CO_2** fugitive landfill emissions
= **915.0 lbs/hr CO_2** fugitive landfill emissions

where:
Mass flow of CO_2 is converted from kg/yr to tons/yr

Mass flow of CO_2 =	6,551,147.0 kg CO_2/yr
normalized collection efficiency =	44.5%

Table 2: Generation Rates
Alpha Ridge Landfill, Facility ID# 24-027-00364

User Inputs[1]:

Methane Generation Rate, k =	0.040	$year^{-1}$
Potential Methane Generation Capacity, L_o =	100	m^3/Mg
NMOC Concentration =	110.0	*ppmv as hexane*
Methane Content =	50	*% by volume*

Year	Waste Accepted		Waste-In-Place		Total landfill gas	Methane	Carbon dioxide	NMOC	VOC
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*	*(av ft^3/min)*	*(av ft^3/min)*	*(av ft^3/min)*	*(short tons/year)*	*(short tons/year)*
1980	81,822	90,004	0	0	0	0	0	0.00	0.00
1981	81,822	90,004	81,822	90,004	43	22	22	0.05	0.02
1982	92,695	101,964	163,644	180,008	85	42	42	0.09	0.04
1983	99,108	109,019	256,338	281,972	130	65	65	0.14	0.05
1984	118,148	129,963	355,446	390,991	178	89	89	0.19	0.07
1985	142,799	157,079	473,595	520,954	233	116	116	0.25	0.10
1986	160,837	176,921	616,394	678,033	299	150	150	0.32	0.12
1987	191,903	211,093	777,231	854,954	372	186	186	0.40	0.15
1988	225,373	247,910	969,134	1,066,047	459	230	230	0.49	0.19
1989	260,546	286,601	1,194,506	1,313,957	560	280	280	0.59	0.23
1990	208,437	229,281	1,455,053	1,600,558	676	338	338	0.72	0.28
1991	161,338	177,472	1,663,490	1,829,839	759	380	380	0.81	0.31
1992	173,364	190,700	1,824,828	2,007,311	815	407	407	0.87	0.34
1993	175,367	192,904	1,998,192	2,198,011	874	437	437	0.93	0.36
1994	161,338	177,472	2,173,559	2,390,915	933	466	466	0.99	0.39
1995	153,322	168,654	2,334,897	2,568,387	981	491	491	1.04	0.41
1996	127,267	139,994	2,488,219	2,737,041	1,024	512	512	1.09	0.42
1997	35,074	38,581	2,615,486	2,877,035	1,051	525	525	1.12	0.44
1998	26,055	28,660	2,650,560	2,915,616	1,028	514	514	1.09	0.43
1999	7,705	8,476	2,676,615	2,944,276	1,001	501	501	1.06	0.41
2000	8,016	8,818	2,684,320	2,952,752	966	483	483	1.03	0.40
2001	6,013	6,614	2,692,336	2,961,570	933	466	466	0.99	0.39
2002	7,523	8,275	2,698,349	2,968,184	899	450	450	0.96	0.37
2003	6,399	7,039	2,705,872	2,976,459	868	434	434	0.92	0.36
2004	1,636	1,800	2,712,271	2,983,498	837	419	419	0.89	0.35
2005	2,657	2,923	2,713,907	2,985,298	805	403	403	0.86	0.33
2006	3,854	4,239	2,716,565	2,988,221	775	388	388	0.82	0.32
2007	4,312	4,743	2,720,418	2,992,460	747	373	373	0.79	0.31
2008	3,272	3,599	2,724,730	2,997,203	720	360	360	0.76	0.30
2009	295	324	2,728,002	3,000,802	693	347	347	0.74	0.29
2010	463	509	2,728,296	3,001,126	666	333	333	0.71	0.28
2011	219	241	2,728,759	3,001,635	640	320	320	0.68	0.27
2012	545	600	2,728,978	3,001,876	615	308	308	0.65	0.25
2013	0	0	2,729,524	3,002,476	592	296	296	0.63	0.25
2014	176	194	2,729,524	3,002,476	568	284	284	0.60	0.24
2015	1,471	1,619	2,729,700	3,002,670	546	273	273	0.58	0.23
2016	6,669	7,336	2,731,171	3,004,288	526	263	263	0.56	0.22
2017	926	1,019	2,737,841	3,011,625	508	254	254	0.54	0.21
2018	8,368	9,205	2,738,767	3,012,644	489	244	244	0.52	0.20
2019	0	0	2,747,136	3,021,849	474	237	237	0.50	0.20
2020	0	0	2,747,136	3,021,849	456	228	228	0.48	0.19
2021	0	0	2,747,136	3,021,849	438	219	219	0.46	0.18
2022	0	0	2,747,136	3,021,849	421	210	210	0.45	0.17
2023	0	0	2,747,136	3,021,849	404	202	202	0.43	0.17
2024	0	0	2,747,136	3,021,849	388	194	194	0.41	0.16
2025	0	0	2,747,136	3,021,849	373	187	187	0.40	0.15
2026	0	0	2,747,136	3,021,849	358	179	179	0.38	0.15
2027	0	0	2,747,136	3,021,849	344	172	172	0.37	0.14
2028	0	0	2,747,136	3,021,849	331	165	165	0.35	0.14
2029	0	0	2,747,136	3,021,849	318	159	159	0.34	0.13
2030	0	0	2,747,136	3,021,849	305	153	153	0.32	0.13
2031	0	0	2,747,136	3,021,849	293	147	147	0.31	0.12
2032	0	0	2,747,136	3,021,849	282	141	141	0.30	0.12
2033	0	0	2,747,136	3,021,849	271	135	135	0.29	0.11
2034	0	0	2,747,136	3,021,849	260	130	130	0.28	0.11
2035	0	0	2,747,136	3,021,849	250	125	125	0.27	0.10
2036	0	0	2,747,136	3,021,849	240	120	120	0.26	0.10
2037	0	0	2,747,136	3,021,849	231	115	115	0.25	0.10
2038	0	0	2,747,136	3,021,849	222	111	111	0.24	0.09
2039	0	0	2,747,136	3,021,849	213	107	107	0.23	0.09
2040	0	0	2,747,136	3,021,849	205	102	102	0.22	0.08
2041	0	0	2,747,136	3,021,849	197	98	98	0.21	0.08
2042	0	0	2,747,136	3,021,849	189	94	94	0.20	0.08
2043	0	0	2,747,136	3,021,849	182	91	91	0.19	0.08
2044	0	0	2,747,136	3,021,849	174	87	87	0.19	0.07
2045	0	0	2,747,136	3,021,849	168	84	84	0.18	0.07
2046	0	0	2,747,136	3,021,849	161	81	81	0.17	0.07
2047	0	0	2,747,136	3,021,849	155	77	77	0.16	0.06
2048	0	0	2,747,136	3,021,849	149	74	74	0.16	0.06
2049	0	0	2,747,136	3,021,849	143	71	71	0.15	0.06
2050	0	0	2,747,136	3,021,849	137	69	69	0.15	0.06

Table 2: Generation Rates
Alplha Ridge Landfill, Facility ID# 24-027-00364

User Inputs[1]:

Methane Generation Rate, k =	0.040	$year^{-1}$
Potential Methane Generation Capacity, L_o =	100	m^3/Mg
NMOC Concentration =	110.0	*ppmv as hexane*
Methane Content =	50	*% by volume*

Year	Waste Accepted		Waste-In-Place		Total landfill gas	Methane	Carbon dioxide	NMOC	VOC
	(Mg/year)	*(short tons/year)*	*(Mg)*	*(short tons)*	*(av ft^3/min)*	*(av ft^3/min)*	*(av ft^3/min)*	*(short tons/year)*	*(short tons/year)*
2051	0	0	2,747,136	3,021,849	132	66	66	0.14	0.05
2052	0	0	2,747,136	3,021,849	127	63	63	0.13	0.05
2053	0	0	2,747,136	3,021,849	122	61	61	0.13	0.05
2054	0	0	2,747,136	3,021,849	117	58	58	0.12	0.05
2055	0	0	2,747,136	3,021,849	112	56	56	0.12	0.05
2056	0	0	2,747,136	3,021,849	108	54	54	0.11	0.04
2057	0	0	2,747,136	3,021,849	104	52	52	0.11	0.04
2058	0	0	2,747,136	3,021,849	100	50	50	0.11	0.04
2059	0	0	2,747,136	3,021,849	96	48	48	0.10	0.04
2060	0	0	2,747,136	3,021,849	92	46	46	0.10	0.04
2061	0	0	2,747,136	3,021,849	88	44	44	0.09	0.04
2062	0	0	2,747,136	3,021,849	85	42	42	0.09	0.04
2063	0	0	2,747,136	3,021,849	82	41	41	0.09	0.03
2064	0	0	2,747,136	3,021,849	78	39	39	0.08	0.03
2065	0	0	2,747,136	3,021,849	75	38	38	0.08	0.03
2066	0	0	2,747,136	3,021,849	72	36	36	0.08	0.03
2067	0	0	2,747,136	3,021,849	70	35	35	0.07	0.03
2068	0	0	2,747,136	3,021,849	67	33	33	0.07	0.03
2069	0	0	2,747,136	3,021,849	64	32	32	0.07	0.03
2070	0	0	2,747,136	3,021,849	62	31	31	0.07	0.03
2071	0	0	2,747,136	3,021,849	59	30	30	0.06	0.02
2072	0	0	2,747,136	3,021,849	57	28	28	0.06	0.02
2073	0	0	2,747,136	3,021,849	55	27	27	0.06	0.02
2074	0	0	2,747,136	3,021,849	53	26	26	0.06	0.02
2075	0	0	2,747,136	3,021,849	50	25	25	0.05	0.02
2076	0	0	2,747,136	3,021,849	49	24	24	0.05	0.02
2077	0	0	2,747,136	3,021,849	47	23	23	0.05	0.02
2078	0	0	2,747,136	3,021,849	45	22	22	0.05	0.02
2079	0	0	2,747,136	3,021,849	43	22	22	0.05	0.02
2080	0	0	2,747,136	3,021,849	41	21	21	0.04	0.02
2081	0	0	2,747,136	3,021,849	40	20	20	0.04	0.02
2082	0	0	2,747,136	3,021,849	38	19	19	0.04	0.02
2083	0	0	2,747,136	3,021,849	37	18	18	0.04	0.02
2084	0	0	2,747,136	3,021,849	35	18	18	0.04	0.01
2085	0	0	2,747,136	3,021,849	34	17	17	0.04	0.01
2086	0	0	2,747,136	3,021,849	33	16	16	0.03	0.01
2087	0	0	2,747,136	3,021,849	31	16	16	0.03	0.01
2088	0	0	2,747,136	3,021,849	30	15	15	0.03	0.01
2089	0	0	2,747,136	3,021,849	29	14	14	0.03	0.01
2090	0	0	2,747,136	3,021,849	28	14	14	0.03	0.01
2091	0	0	2,747,136	3,021,849	27	13	13	0.03	0.01
2092	0	0	2,747,136	3,021,849	26	13	13	0.03	0.01
2093	0	0	2,747,136	3,021,849	25	12	12	0.03	0.01
2094	0	0	2,747,136	3,021,849	24	12	12	0.03	0.01
2095	0	0	2,747,136	3,021,849	23	11	11	0.02	0.01
2096	0	0	2,747,136	3,021,849	22	11	11	0.02	0.01
2097	0	0	2,747,136	3,021,849	21	10	10	0.02	0.01
2098	0	0	2,747,136	3,021,849	20	10	10	0.02	0.01
2099	0	0	2,747,136	3,021,849	19	10	10	0.02	0.01
2100	0	0	2,747,136	3,021,849	19	9	9	0.02	0.01
2101	0	0	2,747,136	3,021,849	18	9	9	0.02	0.01
2102	0	0	2,747,136	3,021,849	17	9	9	0.02	0.01
2103	0	0	2,747,136	3,021,849	16	8	8	0.02	0.01
2104	0	0	2,747,136	3,021,849	16	8	8	0.02	0.01
2105	0	0	2,747,136	3,021,849	15	8	8	0.02	0.01
2106	0	0	2,747,136	3,021,849	15	7	7	0.02	0.01
2107	0	0	2,747,136	3,021,849	14	7	7	0.01	0.01
2108	0	0	2,747,136	3,021,849	13	7	7	0.01	0.01
2109	0	0	2,747,136	3,021,849	13	6	6	0.01	0.01
2110	0	0	2,747,136	3,021,849	12	6	6	0.01	0.01
2111	0	0	2,747,136	3,021,849	12	6	6	0.01	0.00
2112	0	0	2,747,136	3,021,849	11	6	6	0.01	0.00
2113	0	0	2,747,136	3,021,849	11	6	6	0.01	0.00
2114	0	0	2,747,136	3,021,849	11	5	5	0.01	0.00
2115	0	0	2,747,136	3,021,849	10	5	5	0.01	0.00
2116	0	0	2,747,136	3,021,849	10	5	5	0.01	0.00
2117	0	0	2,747,136	3,021,849	9	5	5	0.01	0.00
2118	0	0	2,747,136	3,021,849	9	5	5	0.01	0.00
2119	0	0	2,747,136	3,021,849	9	4	4	0.01	0.00
2120	0	0	2,747,136	3,021,849	8	4	4	0.01	0.00

Notes:
1) Generation rates are estimated using LANDGEM v. 3.02 by USEPA. Generation rates are based on the user inputs and waste acceptance rates provided.

Table 3: Pollutant Table
Alpha Ridge Landfill, Facility ID# 24-027-00364

User Inputs:

LFG Generation flowrate (cfm) from LANDGEM =	489	
Normalized LFG flowrate (cfm) collected, measured at flare =	247.3	(@ 50% methane)
Flare Destruction Efficiency =	98.0%	
Normalized LFG Collection Efficiency =	44.5%	
Flare Operating Days =	94	
Flare Operating Hours =	2250	

Gas / Pollutant	Concentration	Molecular Weight	Source	AP-42	Volumetric Flow Rate	Mass Flow	Flare Emissions			Fugitive Emissions		
	(ppmv)	*(g/gmol)*		Pollutant	*(cubic meters/year)*	*(kilograms/year)*	*(short tons/year)*	*(lbs/day)*	*(lbs/hour)*	*(short tons/year)*	*(lbs/day)*	*(lbs/hour)*
1,1,1-Trichloroethane (methyl chloroform) - HAP	0.10	133.41	Site Specific[1]	yes	0.73	3.97	0.0000	0.0002	0.0000	0.0024	0.0133	0.0006
1,1,2,2-Tetrachloroethane - HAP/VOC	0.10	167.85	Site Specific[1]	yes	0.73	5.00	0.0000	0.0003	0.0000	0.0031	0.0167	0.0007
1,1-Dichloroethane (ethylidene dichloride) - HAP/VOC	0.10	98.97	Site Specific[1]	yes	0.73	2.95	0.0000	0.0002	0.0000	0.0018	0.0099	0.0004
1,1-Dichloroethene (vinylidene chloride) - HAP/VOC	0.10	96.94	Site Specific[1]	yes	0.73	2.89	0.0000	0.0002	0.0000	0.0018	0.0097	0.0004
1,2-Dichloroethane (ethylene dichloride) - HAP/VOC	0.10	98.96	Site Specific[1]	yes	0.73	2.95	0.0000	0.0002	0.0000	0.0018	0.0099	0.0004
1,2-Dichloropropane (propylene dichloride) - HAP/VOC	0.10	112.99	Site Specific[1]	yes	0.73	3.36	0.0000	0.0002	0.0000	0.0021	0.0113	0.0005
2-Propanol (isopropyl alcohol) - VOC	0.31	60.11	Site Specific[1]	yes	2.26	5.55	0.0000	0.0003	0.0000	0.0034	0.0186	0.0008
Acetone	0.20	58.08	Site Specific[1]	yes	1.46	3.46	0.0000	0.0002	0.0000	0.0021	0.0116	0.0005
Acrylonitrile - HAP/VOC	6.33	53.06	AP-42	yes	46.09	100.02	0.0003	0.0054	0.0002	0.0611	0.3350	0.0140
Benzene - No or Unknown Co-disposal - HAP/VOC	0.29	78.11	Site Specific[1]	yes	2.11	6.75	0.0000	0.0004	0.0000	0.0041	0.0226	0.0009
Bromodichloromethane - VOC	0.10	163.83	Site Specific[1]	yes	0.73	4.88	0.0000	0.0003	0.0000	0.0030	0.0163	0.0007
Butane - VOC	5.58	58.12	Site Specific[1]	yes	40.63	96.57	0.0002	0.0052	0.0002	0.0590	0.3234	0.0135
Carbon disulfide - HAP/VOC	0.10	76.13	Site Specific[2]	yes	0.73	2.27	0.0000	0.0001	0.0000	0.0014	0.0076	0.0003
Carbon monoxide	141.00	28.01	AP-42	yes	1026.62	1176.05	0.0030	0.0632	0.0026	0.7188	3.9389	0.1641
Carbon tetrachloride - HAP/VOC	0.10	153.84	Site Specific[1]	yes	0.73	4.58	0.0000	0.0002	0.0000	0.0028	0.0153	0.0006
Carbonyl sulfide - HAP/VOC	0.98	60.07	Site Specific[2]	yes	7.14	17.53	0.0000	0.0009	0.0000	0.0107	0.0587	0.0024
Chlorobenzene - HAP/VOC	0.22	112.56	Site Specific[1]	yes	1.60	7.37	0.0000	0.0004	0.0000	0.0045	0.0247	0.0010
Chlorodifluoromethane	1.30	86.47	AP-42	yes	9.47	33.47	0.0001	0.0018	0.0001	0.0205	0.1121	0.0047
Chloroethane (ethyl chloride) - HAP/VOC	0.31	64.52	Site Specific[1]	yes	2.26	5.96	0.0000	0.0003	0.0000	0.0036	0.0199	0.0008
Chloroform - HAP/VOC	0.10	119.39	Site Specific[1]	yes	0.73	3.56	0.0000	0.0002	0.0000	0.0022	0.0119	0.0005
Chloromethane - VOC	0.37	50.49	Site Specific[1]	yes	2.69	5.56	0.0000	0.0003	0.0000	0.0034	0.0186	0.0008
Dichlorobenzene - (HAP for para isomer/VOC)	0.21	147.00	AP-42	yes	1.53	9.19	0.0000	0.0005	0.0000	0.0056	0.0308	0.0013
Dichlorodifluoromethane	0.10	120.91	Site Specific[1]	yes	0.73	3.60	0.0000	0.0002	0.0000	0.0022	0.0121	0.0005
Dichlorofluoromethane - VOC	2.62	102.92	AP-42	yes	19.08	80.30	0.0002	0.0043	0.0002	0.0491	0.2689	0.0112
Dichloromethane (methylene chloride) - HAP	0.10	84.94	Site Specific[1]	yes	0.73	2.53	0.0000	0.0001	0.0000	0.0015	0.0085	0.0004
Dimethyl sulfide (methyl sulfide) - VOC	0.10	62.13	Site Specific[2]	yes	0.73	1.85	0.0000	0.0001	0.0000	0.0011	0.0062	0.0003
Ethane	889.00	30.07	AP-42	yes	6472.79	7960.31	0.0201	0.4275	0.0179	4.8656	26.6609	1.1109
Ethanol - VOC	0.20	46.08	Site Specific[1]	yes	1.46	2.74	0.0000	0.0001	0.0000	0.0017	0.0092	0.0004
Ethyl mercaptan (ethanethiol) - VOC	0.10	62.13	Site Specific[2]	yes	0.73	1.85	0.0000	0.0001	0.0000	0.0011	0.0062	0.0003
Ethylbenzene - HAP/VOC	2.15	106.16	Site Specific[1]	yes	15.65	67.97	0.0002	0.0037	0.0002	0.0415	0.2276	0.0095
Ethylene dibromide - HAP/VOC	0.00	187.88	AP-42	yes	0.01	0.06	0.0000	0.0000	0.0000	0.0000	0.0002	0.0000
Fluorotrichloromethane - VOC	0.10	137.38	Site Specific[1]	yes	0.73	4.09	0.0000	0.0002	0.0000	0.0025	0.0137	0.0006
Hexane - HAP/VOC	2.18	86.18	Site Specific[1]	yes	15.87	55.94	0.0001	0.0030	0.0001	0.0342	0.1874	0.0078
Hydrogen sulfide	5.11	34.08	Site Specific[2]	yes	37.21	51.86	0.0001	0.0028	0.0001	0.0317	0.1737	0.0072
Mercury (total) - HAP	0.00	200.61	AP-42	yes	0.00	0.02	0.0000	0.0000	0.0000	0.0000	0.0001	0.0000
Methyl ethyl ketone - HAP/VOC	0.20	72.11	Site Specific[1]	yes	1.46	4.29	0.0000	0.0002	0.0000	0.0026	0.0144	0.0006
Methyl isobutyl ketone - HAP/VOC	1.87	100.16	AP-42	yes	13.62	55.77	0.0001	0.0030	0.0001	0.0341	0.1868	0.0078
Methyl mercaptan - VOC	0.10	48.11	Site Specific[2]	yes	0.73	1.43	0.0000	0.0001	0.0000	0.0009	0.0048	0.0002
Pentane - VOC	1.10	72.15	Site Specific[1]	yes	8.01	23.63	0.0001	0.0013	0.0001	0.0144	0.0792	0.0033
Perchloroethylene (tetrachloroethylene) - HAP	0.10	165.83	Site Specific[1]	yes	0.73	4.94	0.0000	0.0003	0.0000	0.0030	0.0165	0.0007
Propane - VOC	11.66	44.09	Site Specific[1]	yes	84.90	153.09	0.0004	0.0082	0.0003	0.0936	0.5127	0.0214
t-1,2-Dichloroethene - VOC	2.84	96.94	AP-42	yes	20.68	81.98	0.0002	0.0044	0.0002	0.0501	0.2746	0.0114
Toluene - No or Unknown Co-disposal - HAP/VOC	1.17	92.13	Site Specific[1]	yes	8.52	32.10	0.0001	0.0017	0.0001	0.0196	0.1075	0.0045
Trichloroethylene (trichloroethene) - HAP/VOC	0.10	131.40	Site Specific[1]	yes	0.73	3.91	0.0000	0.0002	0.0000	0.0024	0.0131	0.0005
Vinyl chloride - HAP/VOC	0.69	62.50	Site Specific[1]	yes	5.02	12.84	0.0000	0.0007	0.0000	0.0078	0.0430	0.0018
Xylenes - HAP/VOC	5.42	106.16	Site Specific[1]	yes	39.46	171.34	0.0004	0.0092	0.0004	0.1047	0.5739	0.0239
Chlorine	42.00	35.45	AP-42	yes	305.80	443.36	N/A[5]	N/A[5]	N/A[5]	0.2710	1.4849	0.0619
Hydrochloric acid	42.00	36.46	AP-42	yes	305.80	456.00	0.0576	1.2245	0.0512	N/A[5]	N/A[5]	N/A[5]
Benzyl chloride	0.10	126.58	Site Specific[1]	no	0.73	3.77	0.0005	0.0101	0.0004	0.0023	0.0126	0.0005

Table 3: Pollutant Table
Alpha Ridge Landfill, Facility ID# 24-027-00364

User Inputs:

LFG Generation flowrate (cfm) from LANDGEM =	489	
Normalized LFG flowrate (cfm) collected, measured at flare =	247.3	(@ 50% methane)
Flare Destruction Efficiency =	98.0%	
Normalized LFG Collection Efficiency =	44.5%	
Flare Operating Days =	94	
Flare Operating Hours =	2250	

Gas / Pollutant	Concentration (ppmv)	Molecular Weight (g/gmol)	Source	AP-42 Pollutant	Volumetric Flow Rate (cubic meters/year)	Mass Flow (kilograms/year)	Flare Emissions			Fugitive Emissions		
							(short tons/year)	(lbs/day)	(lbs/hour)	(short tons/year)	(lbs/day)	(lbs/hour)
Bromoform	0.10	252.73	Site Specific[1]	no	0.73	7.53	0.0009	0.0202	0.0008	0.0046	0.0252	0.0011
cis-1,3-Dichloropropene	0.10	110.97	Site Specific[1]	no	0.73	3.30	0.0004	0.0089	0.0004	0.0020	0.0111	0.0005
Cumene	0.56	120.19	Site Specific[1]	no	4.08	20.04	0.0025	0.0538	0.0022	0.0123	0.0671	0.0028
1,4-Dichlorobenzene	0.15	147.00	Site Specific[1]	no	1.09	6.57	0.0008	0.0176	0.0007	0.0040	0.0220	0.0009
Hexachloro-1,3-butadiene	0.10	260.76	Site Specific[1]	no	0.73	7.76	0.0010	0.0209	0.0009	0.0047	0.0260	0.0011
Methyl tert-butyl ether	0.20	88.15	Site Specific[1]	no	1.46	5.25	0.0007	0.0141	0.0006	0.0032	0.0176	0.0007
Naphthalene	0.10	128.17	Site Specific[1]	no	0.73	3.82	0.0005	0.0102	0.0004	0.0023	0.0128	0.0005
Styrene	0.57	104.15	Site Specific[1]	no	4.15	17.68	0.0022	0.0475	0.0020	0.0108	0.0592	0.0025
1,2,4-Trichlorobenzene	0.10	181.45	Site Specific[1]	no	0.73	5.40	0.0007	0.0145	0.0006	0.0033	0.0181	0.0008
1,1,2-Trichloroethane	0.10	133.40	Site Specific[1]	no	0.73	3.97	0.0005	0.0107	0.0004	0.0024	0.0133	0.0006
2,2,4-trimethylpentane/2,2-dimethylhexane	0.28	114.23	Site Specific[1]	no	2.04	9.52	0.0012	0.0256	0.0011	0.0058	0.0319	0.0013
trans-1,3-Dichloropropene	0.10	110.97	Site Specific[1]	no	0.73	3.30	0.0004	0.0089	0.0004	0.0020	0.0111	0.0005

Notes:

1) Site specific concentration from Analytical Solution, Inc. laboratory data dated 10/29/10. If laboratory analysis reported concentration as less than a specific value, the concentration was assumed to be equal to that specific value.
2) Site specific concentration from Analytical Solution, Inc. laboratory data dated 11/14/18. If laboratory analysis reported concentration as less than a specific value, the concentration was assumed to be equal to that specific value.
3) Plant Level Thresholds taken from Attachment 1 Toxic Air Pollutants provided by MDE.
4) There are only fugutive emissions of Chlorine. Chlorine is converted to Hydrochloric Acid by the flare therefore there are only flare emissions of Hydrochloric Acid.
5) N/A indicates that a plant level threshold was not available for this parameter in Attachment 1 Toxic Air Pollutants provided by MDE.
6) The destruction efficiency of mercury is 0%.

Calculated by: NB
Checked by: JED

2018 Engine Emissions Calculations
Alpha Ridge Landfill

Notes:
1. Table 4 gives engine operation, flow, and engine power output.
2. Normalized landfill gas (LFG) flow is the equivalent LFG flow at 50% methane (CH4) content.
3. scf, scfm, yr, hr, m3, CO2, M, MM, min, gal, and tpy are standard cubic feet, standard cubic feet per minute, year, hour, cubic meter, carbon dioxide, thousand, million, minute, gallons, and tons per year respectively.
4. AP 42 2.4 draft version - October 2008 was used in these calculations. Default concentrations for LFG constituents for landfills with waste in place prior to 1992 were used.
5. NOx, CO and VOC engine emissions were calculated based on the emission factors from the stack test performed in September 2018. Emission factors reported as less than a value were assumed to be equal to that specific value.

The following parameters and values are utilized in emissions computations:

1. Site Specific CH_4 content	45.3%	[Table 4]
2. Site Specific CO_2 content	33.1%	[Table 4]
5. Site Specific LFG flow to JEN engine	89.17	MM scf/yr [Table 4, Site Data]
6. CH_4 flow to JEN engine	40.43	MM scf/yr [Calculated]
7. Normalized LFG flow to JEN engine	80.86	MM scf/yr [Calculated]
8. JEN engine system operation	5,952,163	BHP-hr/yr [Table 4]
	5899	hr/yr [Table 4]
9. NO_X emission factor for JEN engine	0.48	g/BHP-hr [most recent stack test - May 2017]
10. CO emission factor for JEN engine	3.01	g/BHP-hr [most recent stack test - May 2017]
11. VOC emission factor for JEN engine	0.002	g/BHP-hr [most recent stack test - May 2017]
12. CH_4 destruction efficiency of JEN engine	97.2%	[AP 42 Typical Control Efficiency]

Step 1. Calculate Average Site Specific LFG Heat Content

Using the standard heat content of 1,000 Btu/scf for Methane, the site-specific LFG heat content is:

= (Site Specific Methane Content) * (Heat Content of Methane)
= (45.34/100)*1,000 Btu/scf
= **453.4** **Btu/scf of LFG**

where:

Site Specific Methane Content	45.34%	
Heat content of Methane	1,000	Btu/scf of Methane

Step 2. Compute the Site Specific NO_X Emissions

NO_X emissions are calculated using the stack test emission factor of 0.48 g/BHP-hr:

= NO_x Emission Factor * Power Used
= 0.48 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g) * (1 ton/2,000 lb)
= **3.14 tons/yr NO_x total engine emissions**
= 0.48 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g) / (246 days/yr)
= **25.57 lbs/day NO_x total engine emissions**

where:

JEN Emission Factor for NO_X	0.48	g/BHP-hr
JEN Engine System Operation	5,952,163	BHP-hr/yr
JEN Engine Operating Days	246	Days/yr

Calculated by: NB
Checked by: JED

Step 3. Compute the Site Specific CO Emissions

CO emissions are calculated using the stack test emission factor of 3.01 g/BHP-hr:

= CO Emission Factor * Power Used
= 3.01 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g) * (1 ton/2,000 lb)
= **19.71 tons/yr CO total engine emissions**
= 3.01 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g) / (246 days/yr)
= **160.36 lbs/day CO** total engine emissions

where:

JEN Emission Factor for CO	3.01	g/BHP-hr
JEN Engine System Operation	5,952,163	BHP-hr/yr
JEN Engine Operating Days	246	Days/yr

Step 4. Calculate Site Specific PM Emissions

The PM emissions from burning LFG in engines are less than 2.5 micron (AP-42). So, emission factor for PM_{total}, PM_{10}, and $PM_{2.5}$ is the same resulting in the same calculations for each of the PM category. PM here would mean PM_{total}, PM_{10}, or $PM_{2.5}$.

The AP-42 PM emission factor per Table 2.4-5 is 48 lb/MM dscf CH4. The condensable PM is 75% and filterable PM is 25% (AP-42 Table 1.4-2, natural gas combustion in boilers). So, condensable PM emission factor is calculated as 36 lb/MM dscf CH4 and filterable PM emission factor is calculated as 12 lb/MM dscf CH4.

Condensable PM emissions = [(Site Specific CH_4 Flow to Engine) * (Condensable PM Emission Factor)]
/ (Engine Operation)
= [(40.43 MM scf/yr of CH_4) * (36.00 lb/MM scf CH_4)] * (1 ton/2,000 lb)
= **0.73 tons/yr Condensable PM total engine emissions**
= [(40.43 MM scf/yr of CH_4) * (36.00 lb/MM scf CH_4)] / (246 days/yr)
= **5.92 lbs/day Condensable total engine emissions**

where:

Site Specific CH4 flow to JEN	40.43	MM scf/yr
Condensable PM emission factor	36.00	lb/MM scf CH4
Filterable PM emission factor	12.00	lb/MM scf CH4
JEN Engine Operating Days	246	Days/yr

Similarly filterable PM emissions were calculated and these are reported below.

Filterable PM emissions = [(Site Specific CH_4 Flow to Engine) * (Filterable PM Emission Factor)]
/ (Engine Operation)
= [(40.43 MM scf/yr of CH_4) * (12.00 lb/MM scf CH_4)] * (1 ton/2,000 lb)
= **0.24 tons/yr Filterable PM total engine emissions**
= [(40.43 MM scf/yr of CH_4) * (12.00 lb/MM scf CH_4)] / (246 days/yr)
= **1.97 lbs/day Filterable PM total engine emissions**

Total PM emissions are the sum total of condensable and filterable PM emissions, as calculated below.
Total PM emissions = (Condensable PM emissions) + (Filterable PM emissions)
= **0.97 tons/yr Total PM total engine emissions**
= **7.90 lbs/day Total PM total engine emissions**

Calculated by: NB
Checked by: JED

Step 5. Calculate Site Specific SO_X Emissions.

The AP-42 factors for SO_X emissions from burning LFG assume that total reduced sulfur (TRS) is converted to SO_2. Each lb of TRS results in two pounds of SO_2. Using the TRS concentration of 6.39 ppmv from the most recent landfill gas testing (AnSol 11/14/18), the emission factor for SO_X is first calculated using equations 3 and 4 (AP-42, Section 2.4).

SO_X emission factor = (1 MM scf of LFG) * (6.39 ppmv) / (35.31 ft^3/m^3) * (32 g/gmol) /
[(8.205×10^{-5} m^3-atm/gmol/K) * (298 K)] * (2.2 lb/1,000 g) * (2 lb SO_2/lb TRS)
= 1.04 lb/MM scf of LFG

where:

TRS concentration in LFG	6.39	ppmv [Landfill gas testing - Ansol 11/16/17]

32 g/gmol is the molecular weight of sulfur
8.205×10^{-5} is universal gas constant (m^3-atm/gmol/K)
298 K is the standard temperature of LFG (25 °C)

SO_X emission is calculated:
=[(Normalized LFG flow to Engine) * (SO_x Emission Factor)]
= [(80.86 MM scf/yr of LFG) * (1.04 lb/MM scf LFG)] * (1 ton/2,000 lbs)
= **0.04 tons/yr SO_x total engine emissions**
= [(80.86 MM scf/yr of LFG) * (1.04 lb/MM scf LFG)] / (246 days/yr)
= **0.34 lbs/day SO_x total engine emissions**

where:

Normalized LFG flow to JEN engine	80.86	MM scf/yr
SO_X emission factor	1.04	lb/MM scf LFG
JEN Engine Operating Days	246	Days/yr

Step 6. Calculate Site Specific VOC Emissions

VOC emissions are calculated using the stack test emission factor of 0.002 g/BHP- hr:

= VOC Emission Factor * Power Used
= 0.002 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g) * (1 ton/2,000 lb)
= **0.02 tons/yr VOC total engine emissions**
= 0.002 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g) / (246 days/yr)
= **0.13 lbs/day VOC total engine emissions**

where:

JEN Emission Factor for VOC	0.002	g/BHP-hr
JEN Engine System Operation	5,952,163	BHP-hr/yr
JEN Engine Operating Days	246	Days/yr

Calculated by: NB
Checked by: JED

Step 7. Calculate TAP emissions

For pollutants that were not included in the most recent landfill gas testing, AP-42 default values were used. Attached Table 5 gives TAP emissions from the engine.

The following is a sample calculation for the mercury emissions from the engine. The engine emissions calculations of other TAPs were completed in the similar manner.

Mercury emissions from burning LFG in the JEN engine are calculated using the AP-42 default value of mercury concentration. As mercury is a metal, its destruction efficiency is assumed to be zero. First, the mercury inflow to the engine is calculated:

= (Normalized LFG flow to JEN engine) * (Mercury Concentration in LFG) * (Mercury molecular mass)
/ [(universal gas constant) * (gas temperature)]
= (80.86 MM scf/yr) * [(0.000292 ppmv) / (35.31 ft3/m3)] * (200.61 g/gmol)
/ [(8.205E-05 m3-atm/gmol/K) * (1,000 g/kg) x (298 K)] * (2.2 lb/kg)
= 0.0121 lb/yr

where:

Normalized LFG flow to JEN engine	80.86	MM scf/yr
Mercury Concentration in LFG	0.000292	ppmv [AP-42]

200.61 g/gmol is the molecular weight of mercury

8.205×10^{-5} is universal gas constant (m^3-atm/gmol/K)

298 K is the standard temperature of LFG (25 °C)

Then, from equation 5 (AP-42, Section 2.4) mercury emissions are calculated as below.
= [(mercury inflow to JEN engine) * (1 - mercury destruction efficiency of engine)]
= (0.0121 lb/yr) * (1 - 0.00)
= **0.0121 lb/yr Mercury total engine emissions**
= [(0.0121 lb/yr) * (1 - 0.00)]*(1 ton/2,000 lb)
= **6.04E-06 tons/yr Mercury total engine emissions**
= (0.0121 lb/yr) * (1 - 0.00) / (246 days/yr)
= **4.91E-05 lb/day Mercury total engine emissions**
= (0.0121 lb/yr) * (1 - 0.00) / 5,899 hr/yr)
= **2.05E-06 lb/hr Mercury total engine emissions**

where:

Mercury inflow to JEN engine	0.0121	lb/yr
Mercury destruction efficiency of	0.00%	
JEN Engine Operating Days	246	days/yr
JEN Engine Operating Hours	5,899	hr/yr

Calculated by: NB
Checked by: JED

Step 8. Calculate greenhouse gas emissions

Step 8a. Carbon dioxide (CO_2)

The CO_2 emissions from burning LFG in engines are calculated using site-specific CH_4 and CO_2 contents of LFG, the assumption that any CH_4 is burnt, and that 1 mole of CH_4 produces 1 mole of CO_2.

CO_2 emissions volume = (Site Specific LFG flow to engine) * [(Site Specific CO_2 content of LFG)
+ (Site Specific CH_4 content of LFG*CH_4 Destruction Efficiency)]
= (89.17 MM scf/yr) * [(33.1%) + (45.3%*97.2%)]
= 68.77 MM scf/yr

where:

Site Specific LFG flow to JEN	89.17	MM scf/yr
Site Specific CO_2 content of LFG	33.1%	
Site Specific CH_4 content of LFG	45.3%	
CH_4 destruction efficiency	97.2%	

Mass of CO_2 emissions = (CO_2 emissions volume) * (CO_2 molecular mass) / [(universal gas constant) * (gas temperature)]
= (68.77 MM scf/yr) * ((1E+06 scf/MM scf) / (35.31 ft^3/m^3)) * (44.01 g/mol)
/ [(8.205x10-05 m3-atm/gmol-K) * (298 K) * (1,000 g/kg)]) * (2.2 lb/kg)
= **7,712,344 lb/yr CO_2** total engine emissions

= (68.77 MM scf/yr) * ((1E+06 scf/MM scf) / (35.31 ft^3/m^3)) * (44.01 g/mol)
/ [(8.205x10-05 m3-atm/gmol-K) * (298 K) * (1,000 g/kg)]) * (2.2 lb/kg) * (1 ton/2,000 lb)
= **3,856 tons/yr CO_2** total engine emissions

= (68.77 MM scf/yr) * ((1E+06 scf/MM scf) / (35.31 ft^3/m^3)) * (44.01 g/mol)
/ [(8.205x10-05 m3-atm/gmol-K) * (298 K) * (1,000 g/kg)]) * (2.2 lb/kg) / (246 days/yr)
= **31,378 lb/day CO_2** total engine emissions

= (68.77 MM scf/yr) * ((1E+06 scf/MM scf) / (35.31 ft^3/m^3)) * (44.01 g/mol)
/ [(8.205x10-05 m3-atm/gmol-K) * (298 K) * (1,000 g/kg)]) * (2.2 lb/kg) / (5,899 hours/yr)
= **1,307 lb/hr CO_2** total engine emissions

where:

CO_2 emissions volume	68.77	MM scf/yr
JEN Engine Operating Days	246	days/yr
JEN Engine Operating Hours	5,899	hr/yr

44.01 g/gmol is the molecular weight of CO_2

$8.205x10^{-5}$ is universal gas constant (m^3-atm/gmol/K)

298 K is the standard temperature of LFG (25 °C)

Calculated by: NB
Checked by: JED

Step 8b. Methane (CH_4)

The LFG contains CH4. Uncombusted CH_4 is emitted from the engine. AP-42 factors are used for the estimation of CH_4 emissions. Calculations for CH_4 stack emissions are given below.

The CH_4 emissions from burning LFG in engines are calculated using site-specific CH_4 content of LFG and the AP-42 factor CH_4 destruction efficiency of 97.2% (assumed equal to destruction efficiency of NMOC species).

CH_4 emissions volume = (Site Specific LFG flow to engine) * (Site Specific methane content of LFG)
* (CH_4 destruction efficiency)
= (89.17 MM scf/yr) * (45.3%) * (1 - 97.2 %)
= 1.13 MM scf/yr

where:

Site Specific LFG flow to JEN	89.17	MM scf/yr
CH_4 destruction efficiency	97.2%	
Site Specific CH_4 content of LFG	45.3%	

Mass of CH_4 emissions = (CH_4 emissions volume) * (CH_4 molecular mass) / [(universal gas constant) * (gas temperature)]
= (1.13 MM scf/yr) * ((1E+06 scf/MM scf) / (35.31 ft^3/m^3)) * (16.044 g/mol)
/ [(8.205x10-05 m3-atm/gmol-K) * (298 K) * (1,000 g/kg)]) * (2.2 lb/kg)
= **46,283 lb/yr CH_4** total engine emissions

= (1.13 MM scf/yr) * ((1E+06 scf/MM scf) / (35.31 ft^3/m^3)) * (16.044 g/mol)
/ [(8.205x10-05 m3-atm/gmol-K) * (298 K) * (1,000 g/kg)]) * (2.2 lb/kg) * (1 ton/2,000 lb)
= **23 tons/yr CH_4** total engine emissions

= (1.13 MM scf/yr) * ((1E+06 scf/MM scf) / (35.31 ft^3/m^3)) * (16.044 g/mol)
/ [(8.205x10-05 m3-atm/gmol-K) * (298 K) * (1,000 g/kg)]) * (2.2 lb/kg) / (246 days/yr)
= **188 lb/day CH_4** total engine emissions

= (1.13 MM scf/yr) * ((1E+06 scf/MM scf) / (35.31 ft^3/m^3)) * (16.044 g/mol)
/ [(8.205x10-05 m3-atm/gmol-K) * (298 K) * (1,000 g/kg)]) * (2.2 lb/kg) / (5,899 hours/yr)
= **8 lb/hr CH_4** total engine emissions

where:

CH_4 emissions volume	1.13	MM scf/yr
JEN Engine Operating Days	246	days/yr
JEN Engine Operating Hours	5,899	hr/yr

16.04 g/gmol is the molecular weight of CH_4

$8.205x10^{-5}$ is universal gas constant (m^3-atm/gmol/K)

298 K is the standard temperature of LFG (25 °C)

Calculated by: NB
Checked by: JED

Step 8c. Nitrous oxide (N_2O)

Burning of LFG produces N_2O. Therefore,the engine causes N_2O emissions. The AP-42 factors are used for the estimation of N_2O engine emissions. Calculations for N_2O engine emissions are given below.

An AP-42 factor for LFG combustion is not available. We used the AP-42 factor for natural gas combusted in boilers for our calculations. The AP-42 factor for N_2O emissions (Table 1.4-2) from natural gas combustion is $2.2x10^{-3}$ lb/MM Btu (assuming 1,000 Btu/scf heat content of natural gas).

N_2O emissions = (Site Specific LFG flow to engine) * (Site Specific heat content of LFG) * (N_2O emission factor)
=(89.17 MM scf/yr) * (453.4 Btu/scf) * (0.0022 lb/MM Btu)
= **88.9** **lb/yr N_2O** total engine emissions
=(89.17 MM scf/yr) * (453.4 Btu/scf) * (0.0022 lb/MM Btu) * (1 ton/2,000 lb)
= **0.04** **ton/yr N_2O** total engine emissions
=(89.17 MM scf/yr) * (453.4 Btu/scf) * (0.0022 lb/MM Btu) / (246 days/yr)
= **0.36** **lb/day N_2O** total engine emissions
=(89.17 MM scf/yr) * (453.4 Btu/scf) * (0.0022 lb/MM Btu) / (5,899 hours/yr)
= **0.02** **lb/hr N_2O** total engine emissions

where:

Site Specific LFG flow to JEN	89.17	MM scf/yr
N_2O emission factor	0.0022	lb/MM Btu
Site Specific heat content of LFG	453.4	Btu/scf
JEN Engine Operating Days	246	days/yr
JEN Engine Operating Hours	5,899	hr/yr

Step 8d. Calculate hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) **emissions.**
The HFCs, PFCs, and SF_6 emissions from LFG combusted in engines are not quantified due to the absence of AP-42 factors.

Step 9. Formaldehyde (CH_2O) Emissions

CH_2O emissions are calculated using the stack test emission factor of 0.284 g/BHP-hr (converted from 0.76 lb/hr):

= CH_2O Emission Factor in lb/hr* 453.6 g/lb * (1/calculated generator brake horsepower)
=0.76 lb/hr *453.6 g/lb* (1/1215.5 BHP)
= 0.284 g/BHP-hr

= CH_2O Emission Factor * Power Used
= 0.284 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g)
= **5,565.27** **lb/yr CH_2O** total engine emissions
= 0.284 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g) * (1 ton/2,000 lb)
= **2.78** **ton/yr CH_2O** total engine emissions
= 0.284 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g) / (246 days/yr)
= **22.64** **lb/day CH_2O** total engine emissions
= 0.284 g/BHP-hr * 5,952,163 BHP-hr/yr * (2.2 lb/1000 g) / (5,899 hours/yr)
= **0.94** **lb/hr CH_2O** total engine emissions

where:

JEN Emission Factor for CH_2O	0.43	g/BHP-hr
JEN Engine System Operation	5,952,163	BHP-hr/yr
JEN Engine Operating Days	246	Days/yr
JEN Engine Operating Hours	5,899	hours/yr

Table 4. Operational Schedule of Jenbacher engine for the year 2018
JEN Engine Operation

	Hours	Days	kWH Produced	BHP-hr Used	MMscf LFG *	Methane	Carbon Dioxide
2018 Annual total	5899	246	4,438,600	5,952,163	89.17	45.3%	33.1%

note: 1 kW = 1.341 HP
* calculated from Performance Test Report, dated 7-19-12 (9,109 btu/kWH)

Calculated by: NB
Checked by: JED

Table 5. Jenbacher Engine Emissions of Toxic Air Pollutants for the year 2018

Normalized LFG flow to JEN engine = 80.86 MM scf/yr

JEN Engine Operating Days 246 days/yr

JEN Engine Operating Hours 5,899 hr/yr

Pollutant	Molecular Weight (g/gmol)	Concentration (ppmv)	Pollutant inflow (lb/yr)	Destruction Efficiency	Toxic Air Pollutants Emissions (lb/day)	(lb/hr)	(tpy)
1,1,1-Trichloroethane (methyl chloroform) [2] - HAP	133.41	0.10	2.7	97.2%	0.0003	0.0000	0.0000
1,1,2,2-Tetrachloroethane [2] - HAP/VOC	167.85	0.10	3.5	97.2%	0.0004	0.0000	0.0000
1,1-Dichloroethane (ethylidene dichloride) [2] - HAP/VOC	98.97	0.10	2.0	97.2%	0.0002	0.0000	0.0000
1,1-Dichloroethene (vinylidene chloride) [2] - HAP/VOC	96.94	0.10	2.0	97.2%	0.0002	0.0000	0.0000
1,2-Dichloroethane (ethylene dichloride) [2] - HAP/VOC	98.96	0.10	2.0	97.2%	0.0002	0.0000	0.0000
1,2-Dichloropropane (propylene dichloride) [2] - HAP/VOC	112.99	0.10	2.3	97.2%	0.0003	0.0000	0.0000
2-Propanol (isopropyl alcohol) [2] - VOC	60.11	0.31	3.8	97.2%	0.0004	0.0000	0.0001
Acetone [2]	58.08	0.20	2.4	97.2%	0.0003	0.0000	0.0000
Acrylonitrile [1] - HAP/VOC	53.06	6.33	69.2	97.2%	0.0079	0.0003	0.0010
Benzene [2] - No or Unknown Co-disposal - HAP/VOC	78.11	0.29	4.7	97.2%	0.0005	0.0000	0.0001
Bromodichloromethane [2] - VOC	163.83	0.10	3.4	97.2%	0.0004	0.0000	0.0000
Butane [2] - VOC	58.12	5.58	66.8	97.2%	0.0076	0.0003	0.0009
Carbon disulfide [3] - HAP/VOC	76.13	0.10	1.6	97.2%	0.0002	0.0000	0.0000
Carbon monoxide [1]	28.01	141.00	813.8	97.2%	0.0927	0.0039	0.0114
Carbon tetrachloride [2] - HAP/VOC	153.84	0.10	3.2	97.2%	0.0004	0.0000	0.0000
Carbonyl sulfide [3] - HAP/VOC	60.07	0.98	12.1	97.2%	0.0014	0.0001	0.0002
Chlorobenzene [2] - HAP/VOC	112.56	0.22	5.1	97.2%	0.0006	0.0000	0.0001
Chlorodifluoromethane [1]	86.47	1.30	23.2	97.2%	0.0026	0.0001	0.0003
Chloroethane (ethyl chloride) [2] - HAP/VOC	64.52	0.31	4.1	97.2%	0.0005	0.0000	0.0001
Chloroform [2] - HAP/VOC	119.39	0.10	2.5	97.2%	0.0003	0.0000	0.0000
Chloromethane [2] - VOC	50.49	0.37	3.8	97.2%	0.0004	0.0000	0.0001
Dichlorobenzene [1] - (HAP for para isomer/VOC)	147.00	0.21	6.4	97.2%	0.0007	0.0000	0.0001
Dichlorodifluoromethane [2]	120.91	0.10	2.5	97.2%	0.0003	0.0000	0.0000
Dichlorofluoromethane [1] - VOC	102.92	2.62	55.6	97.2%	0.0063	0.0003	0.0008
Dichloromethane (methylene chloride) [2] - HAP	84.94	0.10	1.8	97.2%	0.0002	0.0000	0.0000
Dimethyl sulfide (methyl sulfide) [3] - VOC	62.13	0.10	1.3	97.2%	0.0001	0.0000	0.0000
Ethane [1]	30.07	889.00	5508.2	97.2%	0.6275	0.0261	0.0771
Ethanol [2] - VOC	46.08	0.20	1.9	97.2%	0.0002	0.0000	0.0000
Ethyl mercaptan (ethanethiol) [3] - VOC	62.13	0.10	1.3	97.2%	0.0001	0.0000	0.0000
Ethylbenzene [2] - HAP/VOC	106.16	2.15	47.0	97.2%	0.0054	0.0002	0.0007
Ethylene dibromide [1] - HAP/VOC	187.88	0.00	0.0	97.2%	0.0000	0.0000	0.0000
Fluorotrichloromethane [2] - VOC	137.38	0.10	2.8	97.2%	0.0003	0.0000	0.0000
Hexane [2] - HAP/VOC	86.18	2.18	38.7	97.2%	0.0044	0.0002	0.0005
Hydrogen sulfide [3]	34.08	5.11	35.9	97.2%	0.0041	0.0002	0.0005
Mercury (total) [1] - HAP	200.61	0.00	0.0121	0.0%	0.0000	0.0000	0.0000
Methyl ethyl ketone [2] - HAP/VOC	72.11	0.20	3.0	97.2%	0.0003	0.0000	0.0000
Methyl isobutyl ketone [1] - HAP/VOC	100.16	1.87	38.6	97.2%	0.0044	0.0002	0.0005
Methyl mercaptan [3] - VOC	48.11	0.10	1.0	97.2%	0.0001	0.0000	0.0000
Pentane [2] - VOC	72.15	1.10	16.4	97.2%	0.0019	0.0001	0.0002

Calculated by: NB
Checked by: JED

Perchloroethylene (tetrachloroethylene) [2] - HAP	165.83	0.10	3.4	97.2%	0.0004	0.0000	0.0000
Propane [2] - VOC	44.09	11.66	105.9	97.2%	0.0121	0.0005	0.0015
t-1,2-Dichloroethene [1] - VOC	96.94	2.84	56.7	97.2%	0.0065	0.0003	0.0008
Toluene [2] - No or Unknown Co-disposal - HAP/VOC	92.13	1.17	22.2	97.2%	0.0025	0.0001	0.0003
Trichloroethylene (trichloroethene) [2] - HAP/VOC	131.40	0.10	2.7	97.2%	0.0003	0.0000	0.0000
Vinyl chloride [2] - HAP/VOC	62.50	0.69	8.9	97.2%	0.0010	0.0000	0.0001
Xylenes [2] - HAP/VOC	106.16	5.42	118.6	97.2%	0.0135	0.0006	0.0017
Chlorine [1]	35.45	42.00	306.8	n/a	n/a	n/a	n/a
Hydrochloric acid [1]	36.46	42.00	315.5	0.0%	1.2837	0.0535	0.1578
Benzyl chloride [2]	126.58	0.10	2.6	97.2%	0.0003	0.0000	0.0000
Bromoform [2]	252.73	0.10	5.2	97.2%	0.0006	0.0000	0.0001
cis-1,3-Dichloropropene [2]	110.97	0.10	2.3	97.2%	0.0003	0.0000	0.0000
Cumene [2]	120.19	0.56	13.9	97.2%	0.0016	0.0001	0.0002
1,4-Dichlorobenzene [2]	147.00	0.15	4.5	97.2%	0.0005	0.0000	0.0001
Hexachloro-1,3-butadiene [2]	260.76	0.10	5.4	97.2%	0.0006	0.0000	0.0001
Methyl tert-butyl ether [2]	88.15	0.20	3.6	97.2%	0.0004	0.0000	0.0001
Naphthalene [2]	128.17	0.10	2.6	97.2%	0.0003	0.0000	0.0000
Styrene [2]	104.15	0.57	12.2	97.2%	0.0014	0.0001	0.0002
1,2,4-Trichlorobenzene [2]	181.45	0.10	3.7	97.2%	0.0004	0.0000	0.0001
1,1,2-Trichloroethane [2]	133.40	0.10	2.7	97.2%	0.0003	0.0000	0.0000
2,2,4-trimethylpentane/2,2-dimethylhexane [2]	114.23	0.28	6.6	97.2%	0.0008	0.0000	0.0001
trans-1,3-Dichloropropene [2]	110.97	0.10	2.3	97.2%	0.0003	0.0000	0.0000

[1] Laboratory data was not available, therefore AP-42 default values were assumed.

[2] Analytical Solution, Inc. laboratory data dated 10/29/10. If laboratory analysis reported concentration as less than a specific value, the concentration was assumed to be equal to that specific value.

[3] Analytical Solution, Inc. laboratory data dated 11/14/18. If laboratory analysis reported concentration as less than a specific value, the concentration was assumed to be equal to that specific value.

Note: n/a means not applicable

Calculated by: NB
Checked by: JED

Alpha Ridge Landfill

PM10 from Landfill Operations

The amount of PM10 emission is calculated using the emission factors in Table 13.2.3-1 of the EPA's AP-42.

Using the material silt and moisture content the PM10 emission from operating loaders is: [Table 11.9-1]

$= [(1.0 * (\text{silt content, \%})^{1.5} * 0.75) / (\text{moisture content, \%})^{1.4}] * (\text{operation hours per year}) * (1 \text{ ton} / 2{,}000 \text{ lb})$

= **0.1 tons PM10 from Loader operations**

where:

material silt content, % =	9.2%	[AP-42, Table 13.2.4-1]
material moisture content, % =	14.0%	[AP-42, Table 13.2.4-1]
operation hours per year =	767.0	[Based on Howard County records]
number of loaders =	2	

The amount of PM10 emission is calculated using the emission factors in Table 13.2.3-1 of the EPA's AP-42.

Using the material silt and moisture content the PM10 emission from operating excavators is: [Table 11.9-1]

$= [(1.0 * (\text{silt content, \%})^{1.5} * 0.75) / (\text{moisture content, \%})^{1.4}] * (\text{operation hours per year}) * (1 \text{ ton} / 2{,}000 \text{ lb})$

= **0.0 tons PM10 from Compactor operations**

where:

material silt content, % =	9.2%	[AP-42, Table 13.2.4-1]
material moisture content, % =	14.0%	[AP-42, Table 13.2.4-1]
operation hours per year =	17	[Based on Howard County records]
number of compactors =	1	

= **0.1 Total tons PM10 from landfill operations**

Notes:
1) The material silt content and moisture content is for clay/dirt mix from AP-42, Table 13.2.4-1.
2) PM10 calculations for operations at active face of landfill.

Calculated by NB
Checked by JED

Large Diesel Engines - Emissions Calculations

Equipment:	Vermeer HG6000		
Engine:	CAT -C18 Diesel Tier IV		
Horsepower:	755	hp	
Fuel:	Low Sulfur Diesel		
Default Fuel consumption:	39.1	gal/hr at full load	
Calendar Year:	2018		
Any days > 8 hrs w/ grind?	No		
Operating Hours:	462.0	hrs	
Ending meter reading	2840.0	hrs	
Beginning meter	2378.0	hrs	
Daily Maximum Use	7.0	hrs	
Fuel Consumed	7320.5	gals	
Fuel Consumed per hour	15.8	gals/hr	
Energy Used this year			
based on fuel consumed =	1024.87	MMbtu	standard conversion for diesel: 1 gal = 0.14MMbtu
based on hours and default fuel consumption =	2528.99	MMbtu	
Energy used (from above)	828.15	MMbtu	

Stack Emissions (based on AP42 table 3.4-1)
Formula for lbs/day must be altered if Daily Maximum Use ≠ 7.0

Particulate Matter	0.0	tons/yr	
	1.6	lbs/day	
	3.8	lbs/day	based on 7.0 hrs at full load consumption rate
Sulfur Oxides	0.4	tons/yr	
	15.7	lbs/day	
	38.7	lbs/day	based on 7.0 hrs at full load consumption rate
Nitrogen Oxides	1.3	tons/yr	
	49.7	lbs/day	
	122.6	lbs/day	based on 7.0 hrs at full load consumption rate
Carbon Monoxide	0.4	tons/yr	
	13.2	lbs/day	
	32.6	lbs/day	based on 7.0 hrs at full load consumption rate
VOC	0.0	tons/yr	
	0.0	lbs/day	
	0.0	lbs/day	based on 7.0 hrs at full load consumption rate
PM-10	0.0	tons/yr	
	0.9	lbs/day	
	2.2	lbs/day	based on 7.0 hrs at full load consumption rate

Calculated by NB
Checked by JED

Alpha Ridge Landfill
4,000 gal Gasoline AST & Dispensing Facility
Emissions Calculations

VOC Emissions from Tank - Part A	1,632.13 lbs
VOC Emissions from Dispensing - Part B	25.93 lbs
Total VOC Emissions	1,658.06 lbs

2018 Actual Emissions - HAPs				
Hazardous Air Pollutants	Weight Percent in Vapor-Phase[1]	Gasoline Dispensing Actual Emissions lbs/yr	Gasoline Dispensing Actual Emissions lbs/hour	Gasoline Dispensing Actual Emissions tons/yr
Benzene	0.60%	9.95	0.001	0.005
Cumene	0.02%	0.33	0.000	0.000
Ethylbenzene	0.04%	0.66	0.000	0.000
Hexane (*n* -hexane)	0.50%	8.29	0.001	0.004
Methyl tert-butyl ether	4.60%	76.27	0.009	0.038
Toluene	0.70%	11.61	0.001	0.006
2,2,4-Trimethylpentane	0.70%	11.61	0.001	0.006
Xylenes	0.20%	3.32	0.000	0.002
Total	-	122.0	0.014	0.061

1. HAP Component Vapor Weight Percent from USAF IERA Air Emissions Inventory Guidance Document For Stationary Sources at Air Force Installations, May 1999, Revised December 2003, Table 15-2.

Calculated by NB
Checked by JED

Part A - VOC Emissions from Tank

Month	Pollutant	Emissions	
		lb/hr	tons
January	VOC	52.30	0.03
February	VOC	58.96	0.03
March	VOC	81.13	0.04
April	VOC	95.51	0.05
May	VOC	173.71	0.09
June	VOC	262.43	0.13
July	VOC	300.78	0.15
August	VOC	278.14	0.14
September	VOC	152.70	0.08
October	VOC	105.08	0.05
November	VOC	46.86	0.02
December	VOC	24.54	0.01
Total	VOC	1,632.13	0.82

Material Information (Per Tank):

Material		Gasoline RVP 15
Throughput	Number of Turnovers:	4.2
	Nominal Capacity:	4000
	Annual Throughput (gal/yr):	16853
	January Throughput (gal/month):	2129
	February Throughput (gal/month):	2223
	March Throughput (gal/month):	1515
	April Throughput (gal/month):	0
	May Throughput (gal/month):	1614
	June Throughput (gal/month):	1910
	July Throughput (gal/month):	0
	August Throughput (gal/month):	1636
	September Throughput (gal/month):	1577
	October Throughput (gal/month):	2184
	November Throughput (gal/month):	0
	December Throughput (gal/month):	2065

Tank Information:

Tank Length (feet)		18.2
Tank Diameter (feet)		6.2
Number of Turnovers per year per tank		4.20
Type of Tank:		Horizontal Fixed Roof
Deck Characteristics	Tank Construction:	Welded
Location	Nearest City:	Baltimore, MD
Tank Solar absorptance (α):	Table 7.1-6	0.17

Other Information:

Constants	°F to °R conversion:	459.67
mmHg to psia conversion (psia/mmHg):		0.019337
AP-42 Defined Material (from Table 7.1-3, 7.1-5):		
VP Calculation Method:		Linear Interpolation
Vapor Molecular Weight (lb/lb-mole):		60.00
Daily Total Solar Insolation Factor (I), (Btu/(ft² day)):		1284
Ideal Gas Constant, (psia ft³/lb-mole °R):		10.73

Meteorological Data

The daily maximum ambient temperature (TAX), daily minimum ambient temperature (TAN), and daily total solar insolation factor (I) for each month for the specified city were taken from the proposed revisions to AP-42 Chapter 7, Table 7.1-7

City:	Baltimore, MD
Annual Average Atmospheric Pressure (psia):	14.68
Annual Average Wind Speed (mph):	8.7

Month	Daily Maximum Ambient Temperature T_{AX} (°F)	Daily Minimum Ambient Temperature T_{AN} (°F)	Daily Total Solar Insolation Factor I (Btu/ft²d)
Jan.	40.3	23.4	666
Feb.	43.7	25.9	919
Mar.	54.0	34.2	1236
Apr.	64.2	42.4	1554
May	74.1	52.5	1775
June	83.1	61.9	1966
July	87.3	66.7	1902
Aug.	85.5	65.7	1680
Sept.	78.4	58.5	1395
Oct.	67.3	45.9	1046
Nov.	56.5	37.0	698
Dec.	45.1	28.2	571

Calculated by NB
Checked by JED

Part B - VOC Emissions from Dispensing

Emission Factors			
Gasoline Dispensing			
VOC Emission Factor[1] =	+ 1.1 lb/1000 gal (displacement factor for vehicle refueling)		
(includes Stage I&II)	+ 0.7 lb/1000 gal (spillage factor) =	1.8	lb/1,000 gal

2018 Actual Emissions - VOCs							
Tank	Vapor Recovery	Tank Capacity gallons	Fuel	Throughput gallons	Emission Factor lbs/1,000 gallons	VOC Emissions lbs/yr	VOC Emissions tons/yr
AST-1	Stage I & II	4,000	Gasoline	14,404	1.80	25.93	0.01
Total	---	4,000	---	14,404	---	25.93	0.01

1. Emission Factors from AP-42, Section 5.2, January 1995, Table 5.2-7.
2. Emission calculation methodology from AP-42, Section 5.2, January 1995.

2018 Annual Compliance Certification Report

HOWARD COUNTY DEPARTMENT OF PUBLIC WORKS
9801 Broken Land Parkway ■ Columbia, Maryland 21046 ■ 410-313-6444

Mark DeLuca, P.E., Deputy Director
Chief, Bureau of Environmental Services
mdeluca@howardcountymd.gov

FAX 410-313-6490
TDD 410-313-2323

March 25, 2019

CERTIFIED MAIL
Mr. Laramie Daniel
Compliance Program
Maryland Department of the Environment
Air and Radiation Management Administration
1800 Washington Blvd., Suite 715
Baltimore, MD 21230

Subject: Compliance Certification Report
Alpha Ridge Landfill, Howard County, MD
Facility Number 24-027-00364

Dear Mr. Daniel:

Enclosed please find two copies of the Compliance Certification Report for the Alpha Ridge Landfill for calendar year 2018. This Report includes the Certification of Plant-Wide Conditions (ARMA) and the Annual Compliance Certification, Form A (EPA).

If you have any questions regarding this report, please contact Niti Blackwell at 410-313-6418.

Sincerely,

Mark DeLuca, P.E.
Chief, Bureau of Environmental Services

Enclosures

Cc: Wayne Souder, ARL File
File

EPA United States Environmental Protection Agency

OMB No. 2060-0336,
Approval Expires 05/31/2019

Federal Operating Permit Program (40 CFR Part 71)
CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS (CTAC)

This form must be completed, signed by the "Responsible Official" designated for the facility or emission unit, and sent with each submission of documents (i.e., application forms, updates to applications, reports, or any information required by a part 71 permit).

A. Responsible Official

Name: (Last) DeLuca (First) Mark (MI) A

Title Chief, Bureau of Environmental Services

Street or P.O. Box 6751 Columbia Gateway Drive, Suite 514

City Columbia State Maryland ZIP 21046

Telephone (410) 313-4414 Ext. _____ Facsimile (410) 313-6490

B. Certification of Truth, Accuracy and Completeness (to be signed by the responsible official)

I certify under penalty of law, based on information and belief formed after reasonable inquiry, the statements and information contained in these documents are true, accurate and complete.

Name (signed) _____

Name (typed) Mark DeLuca, P.E. Date: 03/25/2019

EPA United States Environmental Protection Agency

OMB No. 2060-0336,
Approval Expires 05/31/2019

Federal Operating Permit Program (40 CFR Part 71)
ANNUAL COMPLIANCE CERTIFICATION (A-COMP)

A. GENERAL INFORMATION

Permit No. 24-027-00364

Reporting Period: Beg. 01/01/2018 End. 12/31/2018

Source / Company Name Alpha Ridge Landfill

Mailing Address: Street or P.O. Box 2350 Marriottsville Road

City Marriottsville State Maryland ZIP 21104 - _____

Contact person Mark DeLuca Title Chief, Bureau of Environmental Services

Telephone (410) 313-4414 Ext. _____

Continued on next page

B. COMPLIANCE STATUS

Describe the compliance status of each permit term for the reporting period. Copy this page as many times as necessary to cover all permit terms and conditions.

Emission Unit ID(s):

1.0 Emissions Unit Number(s) – EU-01
MDE Registration No. 9-0205

EU01- MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm.

Permit Term (Describe requirements and cross-reference)

1.1 Applicable Standards/Limits:
Alpha Ridge Landfill is subject to the testing, record keeping, and reporting requirements indicated below.

1.2 Testing Requirements:
"If the resulting NMOC mass emission rate is less than 50 megagrams per year, the owner or operator shall submit a periodic estimate of the emission rate report as provided in §60.757(b)(1) and retest the site-specific NMOC concentration every 5 years using the methods specified in this section."
[COMAR 26.11.19.20D3(a)]

1.3 Monitoring Requirements:
The Permittee shall monitor the following information:

(a) *Operating hours for the flaring system.*

(b) *The operating temperature for the flaring system.*

(c) *The total landfill gas flow rate as part of the annual emission certification.* ***[Reference: MDE Reg. No. 9-0205]***

1.4 Record Keeping Requirements:
The Permittee shall keep all the records required under this permit for at least five years and shall make such records available to the Department upon request. ***[Reference: COMAR 26.11.03.06C]***

1.5 Reporting Requirements:
If the Permittee increases the maximum design capacity of the Alpha Ridge Landfill after November 1, 1997, the Permittee shall amend and resubmit the design capacity report within 90 days of the issuance of an air quality Permit to Construct or a permit from the MDE Land Management Administration that authorizes the increase or any other change that increases the maximum design capacity of the landfill. ***[Reference: COMAR 26.11.19.20D(2)]***

The Permittee shall estimate the annual NMOC emission rate calculated using the formula and procedures as described in 40 CFR §60.754(a). The Permittee shall prepare and submit an updated NMOC emission rate report by November 1 of each year. A less frequent emission rate report may be submitted upon approval by the Department in accordance with COMAR 26.11.19.20D(6).
[Reference: COMAR 26.11.19.20D(3)(a) & COMAR 26.11.19.20D(6)]

The Permittee may, upon approval by the Department, submit a combined report to satisfy the NMOC reporting requirements and the annual Emissions Certification requirements. Such report shall be submitted by April 1 of each year for the previous calendar year. ***[Reference: COMAR 26.11.19.20D(7)]***

Compliance Methods for the Above (Description and Citation):

1.2 Testing Requirement: Tier 2 retest was conducted on June 14, 2018. The next test will be scheduled on or before June 2023.

1.3 Monitoring Requirements:

(a) Operating time of the flare is recorded by the Yokogawa data acquisition system.

(b) Operating temperature of the flare is recorded by the Yokogawa data acquisition system.

(c) The total landfill gas flow rate is calculated for the annual emission certification.

1.4 Record Keeping Requirement: Records are maintained on-site.

1.5 Reporting Requirement: Combined report for calendar year 2018 submitted to the Department by April 1, 2018.

Status (Check one): ___ Intermittent Compliance X Continuous Compliance

Emission Unit ID(s):

1A.0 Emissions Unit Number(s) – EU-01
MDE Registration No. 9-0205

EU01- MSW Landfill with an active landfill gas collection and control system with a flare rated at 800 scfm.

Permit Term (Describe requirements and cross-reference)

1A.1 Applicable Standards/Limits:

A. Control of Visible Emissions

COMAR 26.11.06.02C(2) – Visible Emission Standards.
"In Areas III and IV a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers."

COMAR 26.11.06.02A(2) – General Exceptions.
The visible emissions standards in §C of this regulation do not apply to emissions during start-up and process modifications or adjustments, or occasional cleaning of control equipment, if:
(a) The visible emissions are not greater than 40 percent opacity; and
(b) The visible emissions do not occur for more than 6 consecutive minutes in any 60-minute period."

B. Control of Particulate Matter

Particulate Matter from Confined Sources

[COMAR 26.11.06.03B(2)(a)] *– "A person may not cause or permit to be discharged into the outdoor atmosphere from any other installation, particulate matter in excess of 0.03 gr/SCFD (68.7 mg/dscm)."*

C. Operational Standards

The Permittee shall operate and maintain the flare system in accordance with the manufacturer's recommendations. ***[Reference: MDE PTC No. 13-9-0193]***

1A.2 Testing Requirements:

A. Control of Visible Emissions

The Permittee shall follow the Monitoring procedures in Section 1A.3.A.

B. Control of Particulate Matter

The Permittee shall follow the Monitoring procedures in Section 1A.3.B.

C. Operational Standards

The Permittee shall follow the Monitoring procedures in Section 1A.3.C.

1A.3 Monitoring Requirements:

A. Control of Visible Emissions

The Permittee shall properly operate and maintain the flare in a manner to minimize visible emissions. ***[Reference: COMAR 26.11.03.06C]***

B. Control of Particulate Matter

The Permittee shall perform preventive maintenance on the flare once per month or as recommended by the equipment manufacturer. ***[Reference: COMAR 26.11.03.06C]***

C. Operational Standards

The Permittee shall continuously monitor the landfill gas flow rate and the flare combustion temperature. ***[Reference: COMAR 26.11.03.06C]***

The Permittee shall conduct regular monitoring at least once a week of the blower and flare system to ensure proper operation of the landfill gas extraction system. ***[Reference: COMAR 26.11.03.06C]***.

1A.4 Record Keeping Requirements:

A. Control of Visible Emissions

The Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. ***[Reference: COMAR 26.11.03.06C]***

B. Control of Particulate Matter

The Permittee shall maintain a log of the maintenance performed on the flare and make the logs available to the Department upon request. ***[Reference: COMAR 26.11.03.06C]***

C. Operational Standards

*The Permittee shall maintain records of the landfill gas flow rate and flare combustion temperature results of the weekly monitoring of the blower and flare system****[Reference: COMAR 26.11.03.06C].***

1A.5 Reporting Requirements:

A. Control of Visible Emissions
The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

B. Control of Particulate Matter
The Permittee shall make records available to the Department upon request. ***[Reference: COMAR 26.11.03.06C]***

C. Operational Standards
The Permittee shall make records available to the Department upon request. ***[Reference: COMAR 26.11.03.06C]***

Compliance Methods for the Above (Description and Citation):

1A.3 Monitoring Requirements:

A. Flare is operated and maintained to minimize visible emissions.

B. Preventive maintenance is performed on the flare system at regularly scheduled intervals, i.e. daily, weekly, monthly, bi-monthly, quarterly, semi-annual and annual.

C. Landfill gas flow rate and flare combustion temperature are recorded by the Yokogawa data acquisition system. Alarms and shut-downs ensure operating parameters are within manufacturer's design specification during all operation.

1A.4 Record Keeping Requirements:

A. Records are maintained on-site.

B. Maintenance log for flare is maintained on-site.

C. Operational records are maintained on-site.

1A.5 Reporting Requirements:

A. No incidents of visible emissions in calendar year 2018.

B. Records available upon request.

C. Records available upon request.

Status (Check one): ___ Intermittent Compliance X Continuous Compliance

Emission Unit ID(s):

1B.0 Emissions Unit Number(s) – EU-01
MDE Registration No. 9-0205

EU01- MSW Landfill with an active landfill gas collection and control system with a flare

rated at 800 scfm.

Permit Term (Describe requirements and cross-reference)

1B.1 Applicable Standards/Limits:

Subpart AAAA – National Emission Standard for Hazardous Air Pollutants: Municipal Solid Waste Landfills.

Applicability

"You are subject to this subpart if you own or operate a MSW landfill that has accepted since November 8, 1987 or has additional capacity for waste disposition and meets any one of the three criteria in paragraphs (a)(1) through (3) of this section: (3) Your MSW landfill is an area source landfill that has a design capacity equal to or greater than 2.5 million megagrams (Mg) and 2.5 million cubic meters (m3) and has estimated uncontrolled emissions equal to or greater than 50 megagrams per year (Mg/yr) NMOC as calculated according to §60.754(a) of the MSW landfills new source performance standards in 40 CFR part 60, subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan that applies to your landfill." ***[Reference: 40 CFR §63.1935(a)(3)]***

"If your landfill is an existing affected source and is an area source meeting the criteria in §63.1935(a)(3), you must comply with the requirements in §§63.1955(b) and 63.1960 through 63.1980 by the date your landfill is required to install a collection and control system by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or EPA approved and effective State or tribal plan that applies to your landfill or by January 16, 2004, whichever occurs later." ***[Reference: 40 CFR §63.1945(f)]***

Standards

"If you are required by 40 CFR 60.752(b)(2) of subpart WWW, the Federal plan, or an EPA approved and effective State or tribal plan to install a collection and control system, you must comply with the requirements in §§63.1960 through 63.1985 and with the general provisions of this part specified in table 1 of this subpart." ***[Reference: 40 CFR §63.1955(b)]***

General and Continuing Compliance Requirements

"Compliance is determined in the same way it is determined for 40 CFR Part 60, subpart WWW, including performance testing, monitoring of the collection system, continuous parameter monitoring, and other credible evidence. In addition, 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. If a deviation occurs, you have failed to meet the control device operating conditions described in this subpart and have deviated from the requirements of this subpart. Finally, you must develop and implement a written SSM plan according to the provisions in 40 CFR 63.6(e)(3). A copy of the SSM plan must be maintained on site. Failure to write, implement, or maintain a copy of the SSM plan is a deviation from the requirements of this subpart." ***[Reference: 40 CFR §63.1960]***

1B.2 Testing Requirements:

See General and Continuing Compliance Requirements

1B.3 Monitoring Requirements:

See General and Continuing Compliance Requirements

1B.4 Record Keeping Requirements:
"Keep records and reports as specified in 40 CFR Part 60, Subpart WWW, or in the Federal plan, EPA approved State plan or tribal plan that implements 40 CFR Part 60, Subpart Cc, whichever applies to your landfill, with one exception: You must submit the annual report described in 40 CFR 60.757(f) every 6 months." ***[Reference: 40 CFR §63.1980(a)]***

"You must also keep records and reports as specified in the general provisions of 40 CFR Part 60 and this part as shown in Table 1 of this subpart. Applicable records in the general provisions include items such as SSM plans and the SSM plan reports." ***[Reference: 40 CFR §63.1980(b)]***

1B.5 Reporting Requirements:

See General and Continuing Compliance Requirements

Compliance Methods for the Above (Description and Citation):

This emission unit is not applicable since NMOC emissions are calculated to be less than 55 tons per year.

Status (Check one): ___ Intermittent Compliance X Continuous Compliance

Emission Unit ID(s):

2.0 Emissions Unit Number(s) – EU-02
MDE Registration No. 9-0205

Roadways and Operations supporting the landfill started on 1980.

Permit Term (Describe requirements and cross-reference)

2.1 Applicable Standards/Limits:

Control of Particulate Matter – [COMAR 26.11.06.03D]
The Permittee shall not cause or permit any materials to be handled, transported, or stored, or a building, its appurtenances, or a road to be used, constructed, altered, repaired, or demolished without taking reasonable precautions to prevent particulate matter from becoming airborne.

2.2 Testing Requirements:

Control of Particulate Matter
The Permittee shall follow the Monitoring procedures in Section 2.3.

2.3 Monitoring Requirements:

Control of Particulate Matter
The Permittee shall prepare and update, as needed a best management practices plan that describes the procedures and methods that will be used to take reasonable precautions.

The Permittee shall perform an inspection at minimum once a month to verify that best management practices are being implemented and that the precautions are sufficient to control particulate matter emissions.

[Reference: COMAR 26.11.03.06]

2.4 Record Keeping Requirements:

Control of Particulate Matter
The Permittee shall maintain the plan and records of the dates and results of inspections for at least five (5) years and make them available to the Department upon request. ***[Reference: COMAR 26.11.03.06C]****.*

2.5 Reporting Requirements:

Control of Particulate Matter
The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, "Report of Excess Emissions and Deviations."

Compliance Methods for the Above (Description and Citation):

2.3 Monitoring Requirements:

A best management practices plan for control of particulate matter has been prepared and is updated as needed. Monthly inspections are performed.

2.4 Record Keeping Requirements:

Records are maintained on-site.

2.5 Reporting Requirements:

No incidents of visible emissions in calendar year 2018.

Status (Check one): ___ Intermittent Compliance X Continuous Compliance

Emission Unit ID(s):

3.0 Emissions Unit Number(s) – EU-03
MDE Registration No. 9-0364

One (1) 1,059 kW LFG fired reciprocating internal combustion engine (GE Jenbacher) to generate electricity, manufactured on April 28, 2011 and installed in June 2012.

Permit Term (Describe requirements and cross-reference)

3.1 Applicable Standards/Limits:

A. Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). – [40 CFR 60, Subpart JJJJ]
All applicable terms, provisions, emissions standards, testing, monitoring, record keeping, and reporting requirements included in federal New Source Performance Standards (NSPS) promulgated under 40 CFR 60, Subparts A and Subpart JJJJ for Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE), Section

60.4233, including the following:

Section e: "Owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 75 KW (100 HP) (except gasoline and rich burn engines that use LPG) must comply with the emission standards in Table 1 to this subpart for their stationary SI ICE. For owners and operators of stationary SI ICE with a maximum engine power greater than or equal to 100 HP (except gasoline and rich burn engines that use LPG) manufactured prior to January 1, 2011, that were certified to the certification emission standards in 40 CFR part 1048 applicable to engines that are not severe duty engines, if such stationary SI ICE was certified to a carbon monoxide (CO) standard above the standard in Table 1 to this subpart, then the owners and operators may meet the CO certification (not field testing) standard for which the engine was certified."

A summary of the EPA emission standards for this engine is shown in Table 1 of this preamble."

Excerpt from Table 1 to Subpart JJJJ of Part 60 "NOx, CO, and VOC Emission Standards for Stationary Non-Emergency SI Engines ≥ 100 HP (except gasoline and rich burn LPG), stationary SI landfill/digester gas engines, and stationary emergency engines > 25 HP.

		Emission standards (g/HP-hr)			
Engine type & fuel	Maximum Engine Power	Manufacture Date	NO_x	CO	VOC
Landfill/Digester Gas (except lean burn	500≥ 130 < 1,350) HP≥ 500	Dec 14, 2010	2.0	5.0	1.0

The Permittee shall meet the emission limits shown in Table 1, 40 CFR 60 Subpart JJJJ, over the entire life of the engine.

B. <u>National Emissions Standards for Hazardous Air Pollutants (NESHAP)</u>. – [40 CFR 63, Subpart ZZZZ]

§ 63.6585 Am I subject to this subpart?
"You are subject to this subpart if you own or operate a stationary RICE at a major or area source of HAP emissions, except if the stationary RICE is being tested at a stationary RICE test cell/stand.
(a) …. (c) An area source of HAP emissions is a source that is not a major source."

§ 63.6590 What parts of my plant does this subpart cover?
This subpart applies to each affected source.

Section c: Stationary RICE subject to Regulations under 40 CFR Part 60.
*"An affected source that meets any of the criteria in paragraphs (c)(1) through (7) of this section must meet the requirements of this part by meeting the requirements of 40 CFR part 60 subpart IIII, for compression ignition engines or **40 CFR part 60 subpart JJJJ, for spark ignition engines**. No further requirements apply for such engines under this part.*
(1) A new or reconstructed stationary RICE located at an area source;"

All reports and notifications required under 40 CFR 60 or 63, Subpart JJJJ, and ZZZZ, respectively shall be submitted to the Compliance Program of the Department's Air and Radiation Management Administration.

C. Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment. – [COMAR 26.11.09.05E]

"(1) Definitions. For the purpose of this section:

(a) "Idle" means the condition during which the engine is not performing the useful network that enables the piece of equipment to accomplish its designated purpose.

(b) "Internal combustion engine" (hereafter "engine") means all engines except those used for propulsion of ships or vehicles licensed to operate upon the public highway within the State, or engines employed solely for agricultural and recreational purposes unless they are an integral part of a stationary installation.

(2) Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

(3) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

(4) Exceptions:

(a) Section E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(b) Section E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(i) Engines that are idled continuously when not in service: 30 minutes;

(ii) All other engines: 15 minutes.

(c) Section E(2) and (3) does not apply while maintenance, repair, or testing is being performed by qualified mechanics."

3.2 Testing Requirements:

A. Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). – [40 CFR 60, Subpart JJJJ]

In accordance with 40 CFR § 60.4243(b), "the Permittee must conduct subsequent performance testing every 8,760 hours or 3 years, whichever comes first, thereafter to demonstrate compliance."

B. National Emissions Standards for Hazardous Air Pollutants (NESHAP). – [40 CFR 63, Subpart ZZZZ]

See NSPS requirements.

C. Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment. –

[COMAR 26.11.09.05B]
See Monitoring requirements in Section 3.3.C.

3.3 Monitoring Requirements:

A. *Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). – [40 CFR 60, Subpart JJJJ]*

(1) On an annual basis, the Permittee shall monitor the engine exhaust gas NOx and CO using hand-held instrumentation. ***[Reference: COMAR 26.11.03.06C]***

(2) The Permittee shall monitor the following parameters for the engine/generator set:

(a) total electrical output from the engine; and

(b) the total hours of operation and reason for operations the engine. ***[Reference: COMAR 26.11.03.06C]***

(3) The Permittee shall install a non-resettable hour meter.

(4) In accordance with the manufacturer's specifications and recommendations, the Permittee shall operate the engine/generator at all times to ensure compliance with the emission limits in Table 1 to Subpart JJJJ of Part 60. The Permittee shall use an air-to-fuel ratio (AFR) controller in a manner that ensures proper operation of the engine and control device in order to minimize emissions at all times.

B. *National Emissions Standards for Hazardous Air Pollutants (NESHAP). – [40 CFR 63, Subpart ZZZZ]*
See NSPS requirements.

C. *Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment. – [COMAR 26.11.09.05B]*
The Permittee shall monitor, and properly operate and maintain, the engines in such a manner to minimize visible emissions. ***[Reference: COMAR 26.11.03.06C]***

3.4 Record Keeping Requirements:

Note**: All records must be maintained for a period of 5 years.* ***[Reference: COMAR 26.11.03.06C(5)(g)]

A. *Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). – [40 CFR 60, Subpart JJJJ]*
In accordance with 40 CFR §60.4245 (a), the owners or operators of stationary SI ICE must keep records of the information in paragraphs (a) through (d) of this section.

(a) All notifications submitted to comply with this subpart and all documentation supporting any notification.

(b) Maintenance conducted on the engine.

(c) If the stationary SI internal combustion engine is a certified engine, documentation from the manufacturer that the engine is certified to meet the emission standards and information as required in 40 CFR parts 90 and 1048.

(d) If the stationary SI internal combustion engine is not a certified engine or is a certified engine operating in a non-certified manner and subject to § 60.4243(a)(2), documentation that the engine meets the emission standards.

The Permittee shall also keep a record of the hours of operation that are recorded through the non-resettable hour meter as well as documentation of the type of operation (e.g., emergency, testing, emergency demand response).

B. *National Emissions Standards for Hazardous Air Pollutants (NESHAP). – [40 CFR 63, Subpart ZZZZ]*
See NSPS requirements.

C. *Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment. – [COMAR 26.11.09.05B]*
The Permittee shall maintain records of any event showing visible emissions originating from the engines and the actions taken to correct such events. ***[Reference: COMAR 26.11.03.06C]***

3.5 Reporting Requirements:

A. *Standard of Performance for Stationary Spark Ignition Internal Combustion Engines (SI ICE). – [40 CFR 60, Subpart JJJJ]*
The Permittee must comply with applicable federal requirements. In accordance with 40 CFR §60.4245(d), "owners and operators of stationary SI ICE that are subject to performance testing must submit a copy of each performance test as conducted in § 60.4244 within 60 days after the test has been completed." A report including all the analytical data gathered by the Permittee and/or emission testing company must be provided to ARMA.

B. *National Emissions Standards for Hazardous Air Pollutants (NESHAP). – [40 CFR 63, Subpart ZZZZ]*
See NSPS requirements.

C. *Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment. – [COMAR 26.11.09.05B]*
The Permittee report incidents of visible emissions and the corrective actions taken in accordance with the Permit Condition 4, Section III, "Report of Excess Emissions and Deviations." ***[Reference: COMAR 26.11.01.07]*** *and* ***[COMAR 26.11.03.06C(7)]***

Compliance Methods for the Above (Description and Citation):

3.2 Testing Requirements:

A. Subpart JJJJ compliance emissions test performed on September 21, 2018.

3.3 Monitoring Requirements:

A.
(1) The engine exhaust is measured for NOx and CO concentrations at least once per year using an ECOM meter.
(2) The total electrical output and the operating hours of the engine are monitored by the DIA.NE engine management system.
(3) The engine is equipped with an hour meter which the County is unable to reset.
(4) The engine is equipped with a Leanox controller, a combustion control system patented by GE

which continually uses AFR to control NOx emissions.

C. The engine is operated and maintained to minimize visible emissions.

3.4 Record Keeping Requirements:

A. Records of the information in paragraphs (a) through (d) are maintained on-site.
C. No incidents of visible emissions in calendar year 2018. Records are maintained on-site.

3.5 Reporting Requirements:

A. Subpart JJJJ compliance emissions test report submitted on November 7, 2018.
C. No incidents of visible emissions in calendar year 2018.

Status (Check one): ___ Intermittent Compliance X Continuous Compliance

Emission Unit ID(s):

4.0 Emissions Unit Number(s) – EU-04
MDE Registration No. 9-0369

One (1) horizontal grinder, powered by a 755 bhp diesel-fired internal combustion engine, installed on November 2012.

Permit Term (Describe requirements and cross-reference)

4.1 Applicable Standards/Limits:

A. Control of Visible Emissions

(1) Control of Visible Emission for grinding process
[COMAR 26.11.06.02C(2)]
"In Areas III and IV, a person may not cause or permit the discharge of emissions from any installation or building, other than water in an uncombined form, which is visible to human observers."

Exception – [COMAR 26.11.06.02A(2)]
"The visible emissions standards in C of this regulation do not apply to emissions during start-up and process modification or adjustments, or occasional cleaning of control equipment, if: (a) The visible emissions are not greater than 40 percent opacity; and (b) The visible emissions do not occur for more than 6 consecutive minutes in any 60 minute period."

FOR ENGINE ONLY

(2) Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment
[COMAR 26.11.09.05E]
(1) "Emissions During Idle Mode. A person may not cause or permit the discharge of emissions from any engine, operating at idle, greater than 10 percent opacity.

(2) Emissions During Operating Mode. A person may not cause or permit the discharge of emissions from any engine, operating at other than idle conditions, greater than 40 percent opacity.

(3) Exceptions.

(a) Section E(2) does not apply for a period of 2 consecutive minutes after a period of idling of 15 consecutive minutes for the purpose of clearing the exhaust system.

(b) Section E(2) does not apply to emissions resulting directly from cold engine start-up and warm-up for the following maximum periods:

(i) Engines that are idled continuously when not in service: 30 minutes;
(ii) All other engines: 15 minutes.

(c) Section E(2) and (3) does not apply while maintenance, repair, or testing is being performed by qualified mechanics."

FOR ENGINE ONLY

B. Control of Sulfur Oxides from Fuel Burning Equipment
[COMAR 26.11.09.07A(2)]
"A person may not burn, sell, or make available for sale any fuel with a sulfur content by weight in excess of or which otherwise exceeds the following limitations:

(b) Distillate fuel oils, 0.3 percent;"

C. Operational Limit
(a) *The engine, which powers the horizontal grinder, shall operate no more than 2,496 hours for any 12-month rolling period.*
[MDE Permit No. 027-00364-9-0369]

(b) *The engine shall be a nonroad engine, as defined in 40 CFR §1068.30, unless the Permittee complies with the stationary engine requirements of 40 CFR 60, Subpart III or Subpart JJJJ and 40 CFR 63, Subpart ZZZZ, as applicable, for the engine.*

4.2 Testing Requirements:

A. Control of Visible Emissions
(1) ***Control of Visible Emissions for grinding process***
See monitoring requirements.

FOR ENGINE ONLY
(2) ***Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment***
See monitoring requirements.

B. Control of Sulfur Oxides from Fuel Burning Equipment
See monitoring requirements.

C. Operational Limit
See monitoring requirements.

4.3 Monitoring Requirements:

A. Control of Visible Emissions

(1) ***Control of Visible Emissions for grinding process***
The Permittee shall properly operate and maintain the horizontal grinder in a manner to minimize visible emissions. ***[Reference: COMAR 26.11.03.06C]***

FOR ENGINE ONLY

(2) ***Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment***
The Permittee shall properly operate and maintain engine in a manner to minimize visible emissions. ***[Reference: COMAR 26.11.03.06C]***

B. ***Control of Sulfur Oxides from Fuel Burning Equipment***
The Permittee shall obtain a certification from the fuel supplier indicating that the fuel oil complies with the limitation on sulfur content of the fuel oil. ***[Reference: COMAR 26.11.03.06C]***

C. ***Operational Limit***
The Permittee shall monitor the operating hours for the engine that drives the horizontal grinder. ***[Reference: PTC-00364-9-0369]***

4.4 Record Keeping Requirements:

A. ***Control of Visible Emissions***

(1) ***Control of Visible Emissions for grinding process***
See reporting requirements.

FOR ENGINE ONLY

(2) ***Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment***
The Permittee shall retain records of preventive maintenance on site for at least five years and make these records available to the Department upon request. ***[Reference: COMAR 26.11.03.06C]***

B. ***Control of Sulfur Oxides from Fuel Burning Equipment***
The Permittee shall retain annual fuel supplier certifications stating that the fuel oil is in compliance with this regulation must be maintained for at least 5 years. ***[Reference: COMAR 26.11.09.07C]***

C. ***Operational Limit***
The Permittee shall maintain records of the operating hours for the engine that drives the horizontal grinder. ***[Reference: COMAR 26.11.03.06C]***

4.5 Reporting Requirements:

A. ***Control of Visible Emissions***

(1) ***Control of Visible Emissions for grinding process***
The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

FOR ENGINE ONLY

(2) ***Visible Emissions Limits for Stationary Internal Combustion Engine Powered Equipment***
The Permittee shall report incidents of visible emissions in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviation

B. ***Control of Sulfur Oxides from Fuel Burning Equipment***
The Permittee shall report the amount of fuel oil combusted as part of the annual emission

certification.

C. Operational Limit

The Permittee shall report the engine operating hours as part of the annual emission certification.

Compliance Methods for the Above (Description and Citation):

4.3 Monitoring Requirements:

A.(1) The horizontal grinder is operated with material containing greater than 30% moisture content to minimize visible emissions from grinding process. Unscheduled maintenance log documents operational issues for service.
A.(2) The engine for the horizontal grinder is operated and maintained to minimize visible emissions.
B. Fuel supplier certification regarding sulfur content has been obtained.
C. The operating hours for the engine that drives the horizontal grinder are recorded through Fuelmaster, the fuel use system.

4.4 Record Keeping Requirements:

A.(2) Preventive maintenance records are maintained on-site.
B. Fuel supplier certification is valid for all fuel delivered under contract to Howard County.
C. Records are maintained on-site.

4.5 Reporting Requirements:

A.(1) No incidents of visible emissions in calendar year 2018.
A.(2) No incidents of visible emissions in calendar year 2018.
B. The amount of diesel consumed by the engine is reported as part of the annual emission certification.
C. The engine operating hours are reported as part of the annual emission certification.

Status (Check one): ___ Intermittent Compliance X Continuous Compliance

Emission Unit ID(s):

5.0 Emissions Unit Number(s) – EU-05
MDE Registration No. 9-0379

One (1) 4,000 gallon above ground gasoline storage tank and a gasoline dispensing facility, installed on May 2015.

Permit Term (Describe requirements and cross-reference)

5.1 Applicable Standards/Limits:

Control of VOCs

[COMAR 26.11.13.04C] – Small Storage Tanks.

*(1) "**Applicability**. This section applies to a person who owns or operates:*

(a) A gasoline storage tank that has a tank capacity greater than 2,000 gallons but less than 40,000 gallons; or
(b) A gasoline tank truck used to transfer gasoline into a storage tank that is listed in Sec. C(1)(a) of this regulation.

(2) ***Stage I Vapor Recovery****. An owner or operator of a gasoline tank truck or an owner or operator of a stationary storage tank subject to this regulation may not cause or permit gasoline to be loaded into a stationary tank unless the loading system is equipped with a vapor balance line that is properly installed, maintained and used."*

[COMAR 26.11.13.04D] – General Standards*.*

"A person may not cause or permit a gasoline or VOC having a TVP of 1.5 psia (10.3 kilonewtons/square meter) or greater to be loaded into any truck, railroad tank car, or other contrivance unless the:

(1) Loading connections on the vapor lines are equipped with fittings that have no leaks and that automatically and immediately close upon disconnection to prevent release of gasoline or VOC from these fittings; and

(2) Equipment is maintained and operated in a manner to prevent avoidable liquid leaks during loading and unloading operations."

5.2 Testing Requirements:

Control of VOCs
See monitoring requirements.

5.3 Monitoring Requirements:

Control of VOCs
The Permittee shall monitor the fuel drop to verify that the Stage 1 vapor balance system is used at least once a month. In addition, at least once a month during a delivery, the Permittee shall monitor a fuel drop for liquid spills and check the hose fittings and connections for leaks and proper operation. ***[Reference: COMAR 26.11.03.06C]***

5.4 Record Keeping Requirements:

Control of VOCs
Control of VOC Emissions: The Permittee shall maintain a record of the monthly inspection results, gasoline loading and unloading operations for liquid leaks and spills, and that the loading connections are leak tight and automatically close. ***[Reference: COMAR 26.11.03.06C]***

NOTE: All records must be maintained for a period of 5 years. ***[Reference: COMAR 26.11.03.06.C (5)(g)]***

5.5 Reporting Requirements:

Control of VOCs
The Permittee shall report incidents of release of volatile organic compounds in accordance with Permit Condition 4, Section III, Plant Wide Condition, "Report of Excess Emissions and Deviations.

Compliance Methods for the Above (Description and Citation):

5.3 Monitoring Requirements: The facility does not receive a fuel drop every month, however, each fuel drop that was made to the facility during the calendar year was monitored.

5.4 Record Keeping Requirements: Records are maintained on-site.

5.5 Reporting Requirements: No reportable incidents of release of volatile organic compounds.

Status (Check one): ___ Intermittent Compliance X Continuous Compliance

C. DEVIATIONS FROM PERMIT TERMS AND CONDITIONS

Report all deviations from permit terms (whether reported previously or not) that occurred during the permit term. Cross-reference deviations already reported in the six-month report. Indicate whether each deviation is a "possible exception to compliance." Start and end period of each deviation should be in mo/day/yr, hr:min format (24-hour clock). Also, specify the date when the written deviation report was submitted (If written report required, but not submitted, leave the date field blank).

Permit Term for Which There was a Deviation:

Emission Units (unit IDs):

Deviation Start _____/_____/__________ ____:____ End:_____/_____/__________ _____:____

Date Written Report Submitted ____/____/________

Permit Term for Which There was a Deviation:

Emission Units (unit IDs):

Deviation Start _____/_____/__________ ____:____ End:_____/_____/__________ _____:____

Date Written Report Submitted ____/____/________

Permit Term for Which There was a Deviation:

Emission Units (unit IDs):

Deviation Start _____/_____/__________ ____:____ End:_____/_____/__________ _____:____

Date Written Report Submitted ____/____/________

Permit Term for Which There was a Deviation:

Emission Units (unit IDs):

Deviation Start _____/_____/__________ ____:____ End:_____/_____/__________ _____:____

Date Written Report Submitted ____/____/________

Alpha Ridge Landfill
Permit No. 24-027-00364

Certification of Plant-Wide Conditions (Section III of Part 70 Operating Permit)

Indicate compliance with the following requirements of Section III of your Part 70 Operating Permit in the space provided below:

1. **Particulate Matter from Construction and Demolition**

   Field conditions are assessed and water is applied on unpaved roads and other surfaces as needed to prevent particulate matter from becoming airborne.

2. **Open Burning**

   The County did no open burning during the reporting period.

3. **Air Pollution Episode**

   N/A

4. **Report of Excess Emissions and Deviations**
   (All deviations from permit requirements should be clearly identified in semi-annual monitoring reports.)

   There were no excess emissions during the reporting period. Deviations have been reported in the semi-annual report.

5. **Accidental Release Provisions**

   N/A

6. **General Testing Requirements**

   Tier 2 retest was conducted on June 14, 2018. This is within the last five years.

   Subpart JJJJ compliance emissions test was conducted on September 21, 2018. This is within the last 8,760 operating hours.

7. **Emissions Test Methods**

   Tier 2 retest was performed in accordance with the U.S. Environmental Protection Agency's Method 25C and was approved through correspondence with the Maryland Department of the Environment.

Subpart JJJJ compliance emissions test was performed in accordance with 40 CFR 60 Appendix A test procedures and was approved through correspondence with the Maryland Department of the Environment.

8. Emission Certification Report

a. Calendar year 2018 report submitted by April 1, 2019.
b. The information submitted is accurate.
c. Records are maintained on-site, as required.

9. Compliance Certification Report

Calendar year 2018 compliance certification report was submitted to MDE and EPA by April 1, 2019. All required sections were addressed.

10. Certification by Responsible Official

A responsible official has certified forms, reports and compliance certifications.

11. Sampling and Emissions Testing Record Keeping

Records are maintained on-site.

12. General Record Keeping

Preventive maintenance is performed on the flare system at regularly scheduled intervals, i.e. daily, weekly, monthly, bi-monthly, quarterly, semi-annual and annual. Preventive maintenance records are maintained on-site.

13. General Conformity

N/A

14. Asbestos Provisions

No asbestos identified.

15. Ozone Depleting Regulations

The County contracts with a Contractor compliant to this section for refrigerant removal, recovery and recycling.

16. Acid Rain Permit

N/A

MDE Budget Reconciliation Form

MARYLAND DEPARTMENT OF THE ENVIRONMENT

1800 Washington Boulevard • Suite 720 • Baltimore, Maryland 21230-1720
410-537-3000 • 800-633-6101 • http://www.mde.maryland.gov

Air and Radiation Administration • Air Quality Permits Program

Budget Reconciliation and Financing Act of 2003
(Commonly referred as Maryland House Bill 935)

On July 1, 2003, House Bill 935, Chapter 203 amended § 1-203 of the Environment Article, Annotated Code of Maryland, as follows:

Section 1-203(b).
(1) A license or permit is considered renewed for purposes of this subsection if the license or permit is issued by a unit of State government to a person for the period immediately following a period for which the person previously possessed the same or a substantially similar license.
(2) Before any license or permit may be renewed under this article, **the issuing authority shall verify through the office of the Comptroller (emphasis added)** that the applicant has paid all undisputed taxes and the unemployment insurance contributions payable to the Comptroller or the Secretary of Labor, Licensing, and Regulation or that the applicant has provided for payment in a manner satisfactory to the unit responsible for collection.

In order for the Maryland Department of the Environment (MDE) to verify this compliance, we would need you to provide the following information before we can process or issue your renewal license, permit, or certification:

Current MDE License/Permit No.: 24-027-00364

Name of Licensee or Permit Holder: Howard County DPW Bureau of Environmental Services

Address: 9801 Broken Land Parkway, Columbia, MD 21046

Contact Name: Mark DeLuca **Title:** Chief, Bureau of Environmental Services

Contact Telephone Number: 410-313-6444

Privacy Act Notice: This Notice is provided pursuant to the Federal Privacy Act of 1974, 5 U.S.C. § 552a. Disclosure of your Social Security or Federal Tax Identification on this form is mandatory pursuant to the provisions of § 1-203 (2003) of Environment Article, Annotated Code of Maryland, which requires MDE to verify that an applicant for a permit or license has paid all undisputed taxes and unemployment insurance. Social Security and Federal Tax Identification Nos. will not be used for any purposes other than those described in this Notice.

Federal Employer Identification Number (FEIN): 52-6000965

Certification: I certify that the above information is true and correct to the best of my knowledge.

Signature

Date 4/30/19

Complete and return this form to Sena Harlley at the above address. If you have any questions, please contact Ms. Harlley at (410) 537-3251.

Backup Documentation

Backup Calculations
Paved and Unpaved Road Particulate Emission Factor Calculation
Previous Emission Unit EU-02
Alpha Ridge Landfill

Calculation of PM_{10} Paved Road Emission Factors

$E_{in/out} = k\ (sL)^{0.91} * (W_{in/out})^{1.02}$

$E_{in/out}$ = particulate emission factor for inbound and outbound vehicles (lb/vehicle mile traveled "VMT")
k = base emission factor for particle size range and units of interest (lb/VMT)
sL = road surface silt loading (g/m^2)
$W_{in/out}$ = average weight of the inbound and outbound vehicles (tons)

			Source
k =	0.0022	lb/VMT	AP-42, Table 13.2.1-1
sL =	7.4	g/m^2	AP-42, Table 13.2.1-3 Municipal Solid Waste Landfills
W_{in} =	5.03	tons	See Calculation of Mean Vehicle Weight (Page 3)
W_{out} =	4.08	tons	See Calculation of Mean Vehicle Weight (Page 3)

$E_{in} = (0.0022\ lb/VMT) * (7.4\ g/m^2)^{0.91} * (5.03\ tons)^{1.02}$

E_{in} =	0.07	lb/VMT

$E_{out} = (0.0022\ lb/VMT) * (7.4\ g/m^2)^{0.91} * (4.08\ tons)^{1.02}$

E_{out} =	0.06	lb/VMT

Calculation of PM_{10} Unpaved Road Emission Factors

$E_{in/out} = [(k) * (s/12)^a * (W_{in/out}/3)^b]$

$E_{in/out}$ = size-specific inbound and outbound vehicle emission factor (lb/VMT)
k = empirical constant (lb/VMT)
s = surface silt content (%)
a = empirical constant
$W_{in/out}$ = mean inbound and outbound vehicle weight (tons)
b = empirical constant

			Source
k =	1.50	lb/VMT	AP-42 Table 13.2.2-2 for PM-10
s =	6.40	%	AP-42 Table 13.2.2-1 for Municipal Solid Waste Landfills
a =	0.90		AP-42 Table 13.2.2-2 for PM-10
W_{in} =	25.00	tons	See Calculation of Mean Vehicle Weight (Page 3)
W_{out} =	16.00	tons	See Calculation of Mean Vehicle Weight (Page 3)
b =	0.45		AP-42 Table 13.2.2-2 for PM-10

$E_{in} = [(1.5\ lb/VMT) * (6.4\%/12)^{0.9} * (25\ tons/3)^{0.45}] =$

E_{in} =	2.21	lb/VMT

$E_{out} = [(1.5\ lb/VMT) * (6.4\%/12)^{0.9} * (16\ tons/3)^{0.45}] =$

E_{out} =	1.81	lb/VMT

Backup Calculations
Calculation of Mean Vehicle Weight (Paved Roads)
Previous Emission Unit EU-02
Alpha Ridge Landfill

Vehicle Type	Trucks/yr	% Type Vehicle	Loaded Vehicle Weight In (tons)	Unloaded Vehicle Weight Out (tons)	One Way Distance (miles)	Distance Travelled (miles)
Transfer - Pickups	56,073	84.01%	4	3	0.8	44,859
Transfer - Garbage Trucks *	2,034	3.05%	16	25	0.8	1,627
Compost - Pickups	6,235	9.34%	4	3	1	6,235
Compost - Recycling Trucks	579	0.87%	25	16	1	579
Landfill - Garbage Trucks	1,531	2.29%	25	16	1.15	1,761
Convenience Center - Pickups	293	0.44%	4	3	0.33	97
Totals	**66,745**	**100%**				**55,157**

Mean Inbound Vehicle Weight "W_{in}" (tons) = Loaded Vehicle Weights(tons) * %Type Vehicle = **5.03** **tons**

Mean Outbound Vehicle Weight "W_{out}" (tons) = Unloaded Vehicle Weight (tons) * % Type Vehicle = **4.08** **tons**

* Transfer station trucks come in empty and leave full.

Backup Calculations
Calculation of Mean Vehicle Weight (Unpaved Roads)
Previous Emission Unit EU-02
Alpha Ridge Landfill

Vehicle Type	Trucks/yr	% Type Vehicle	Loaded Vehicle Weight In (tons)	Unloaded Vehicle Weight Out (tons)	One Way Distance (miles)	Distance Travelled (miles)
Compost - Recycling Trucks	579	27.44%	25	16	0.15	87
Landfill - Garbage Trucks	1,531	72.56%	25	16	0.15	230
Totals	**2,110**	**100%**				**317**

Mean Inbound Vehicle Weight "W_{in}" (tons) = Loaded Vehicle Weights(tons) * %Type Vehicle = **25.00** **tons**

Mean Outbound Vehicle Weight "W_{out}" (tons) = Unloaded Vehicle Weight (tons) * % Type Vehicle = **16.00** **tons**

Backup Calculations
Paved and Unpaved Roads Particulate Emissions Calculations
Previous Emission Unit EU-02
Alpha Ridge Landfill

Calculation of PM_{10} Paved Road Emissions

$PM_{10(in/out)}$ (lb/yr) = ($E_{in/out}$) * (miles travelled per year)

$PM_{10(in)}$ = (0.0706 lb/VMT) * (55,157 miles/yr)

$PM_{10(in)}$ =	3,896	lbs/yr

$PM_{10(out)}$ = (0.0571 lb/VMT) * (55,157 miles/yr)

$PM_{10(out)}$ =	3,148	lbs/yr

Calculation of PM_{10} Unpaved Road Emissions

$PM_{10(in/out)}$ (lb/yr) = ($E_{in/out}$) *(miles travelled on Unpaved Road)

$PM_{10(in)}$ = (1.42 lb/VMT) * (317 miles travelled on unpaved road/yr)

$PM_{10(in)}$ =	700	lbs/yr

$PM_{10(out)}$ = (1.19 lb/VMT) * (317 miles travelled on unpaved road)

$PM_{10(out)}$ =	573	lbs/yr

Calculation of Impact from Natural mitigation (Paved and Unpaved)
Based on figures 13.2.1-2 and 13.2.2-1, there are a mean of 130 days per year in Howard County that have 0.01" . precipitation or more. Formula (2) from 13.2.2-6 states that precipitation creates natural mitigation for unpaved roads.

E_{ext} (unpaved) = E*[(365-D)/365] equation (2), Page 13.2.2-7
E_{ext} (unpaved) = E*0.644
Eext (in/out) (unpaved Emission factor extrapolated for natural mitigation
E(in/out) = Emission factor for unpaved roads
D = 130 mean days with 0.01 inches precipitation

Similarly,

E_{ext} (paved) = E*[1-(P/4N)] equation (2), Page 13.2.1-5
E_{ext} (paved) = E*0.911
Eext (in/out) (unpaved Emission factor extrapolated for natural mitigation
E(in/out) = Emission factor for paved roads
P = 130 mean days with 0.01 inches precipitation
N = 365 number of wet days with 0.01 inches precipitation

In Summary

Fugitive Emissions from Paved and Unpaved Road Emissions

Paved Roads (lbs/yr)	$PM_{10(in)}$ = 0.911 * 3896 = 3,548.94	$PM_{10(out)}$ = 0.911 * 3148 2,867.86	PM_{total} = 6,416.80
Unpaved Roads (lbs/yr)	$PM_{10(in)}$ = 0.644 * 700 450.84	$PM_{10(out)}$ = 0.644 * 573 368.81	PM_{total} = 819.64
		Total (lbs/yr)	7,236.44
		Total (tons/yr)	**3.62**