249 Dunham Drive, Dunmore, PA 18512

Commonwealth
Environmental Systems L.P.

August 22, 2024

Mr. Mark Wejkszner, P.E.
Air Quality Program Manager
PA Department of Environmental Protection
Bureau of Air Quality Northeast Regional Office
2 Public Square
Wilkes-Barre, PA 18701-1915

Re: Commonwealth Environmental Systems, L.P.
Plan Approval Application- Southwest Expansion
Title V Operating Permit No. 54-00054
Foster, Frailey and Reilly Townships, Schuylkill County

Dear Mr. Wejkszner:

On behalf of Commonwealth Environmental Systems L.P., EarthRes Group has electronically submitted an A/Q Plan Approval submission to the PADEP Division of Air Quality.

This submission to the Greenport platform included the applicable application fee and corresponds to a Major Permit Modification to the Solid Waste Division for the same facility's expansion project and was uploaded on 8/22/2024.

Please contact me if you have any questions or require further information.

Sincerely

Dominick L. DeNaples, Jr.
Commonwealth Environmental Systems L.P.

cc: J. Hutwelker, P.E, EarthRes
M. Piepoli, CES Site Manager
A. Magnotta, P.E.

Phone
(570) 343-5782

Fax
(570) 348-3135

Earthres Group, Inc.
toll free 800-264-4553

www.earthres.com

EARTHRES
ENGINEERING FOR SUCCESS℠

HEADQUARTERS / PHILADELPHIA REGION
P. O. Box 468, Pipersville, PA 18947
phone 215-766-1211

APPALACHIAN REGIONAL OFFICE
P. O. Box 794, Morgantown, WV 26505
phone 304-212-6866

August 22, 2024

Mr. Mark Wejkszner, P.E.
Air Quality Program Manager
PA Department of Environmental Protection
Bureau of Air Quality
Northeast Regional Office
2 Public Square
Wilkes-Barre, PA 18701-1915

Re: Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application – Landfill Expansion
Title V Operating Permit No. 54-00054
Foster, Frailey, and Reilly Townships, Schuylkill County
EARTHRES Project No. 011035.080

Dear Mr. Wejkszner:

Enclosed please find a Plan Approval Application for the proposed Landfill Expansion at the Commonwealth Environmental Systems, L.P. Landfill (CES) located at the intersection of Foster, Frailey, and Reilly Townships, Schuylkill County, Pennsylvania. The facility currently operates under Title V Operating Permit (TVOP) No. 54-00054.

This application includes a General Information Form (GIF), Plan Approval Application Processes form, application narrative and regulatory review, emission calculations, U.S. EPA LandGEM model, proof of public notification, and site maps/drawings. An application fee of $5,000.00 is enclosed via electronic submission. A solid waste major modification application is being submitted concurrently with this application.

If you have any questions or concerns, please contact us at 215-766-1211.

Sincerely,
Earthres Group, Inc.

Shae Portner, G.I.T.
Project Manager

Enclosures: As stated

cc: Dominick DeNaples, Jr., Keystone Sanitary Landfill
Michael Piepoli, CES Landfill

VIA ONBASE & ELECTRONIC MAIL

COMMONWEALTH ENVIRONMENTAL SYSTEMS, L.P.
(CES) LANDFILL

99 Commonwealth Road
Hegins, PA 17938

LANDFILL EXPANSION
AIR QUALITY PLAN APPROVAL APPLICATION

Foster, Frailey, and Reilly Townships, Schuylkill County
Title V Operating Permit No. 54-00054

AUGUST 2024

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GENERAL INFORMATION FORM (GIF)

pennsylvania
DEPARTMENT OF ENVIRONMENTAL PROTECTION

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

GENERAL INFORMATION FORM – AUTHORIZATION APPLICATION

Before completing this General Information Form (GIF), read the step-by-step instructions provided in this application package. This form is used by the Department of Environmental Protection (DEP) to inform our programs regarding what other DEP permits or authorizations may be needed for the proposed project or activity. This version of the General Information Form (GIF) must be completed and returned with any program-specific application being submitted to the DEP.

Related ID#s (If Known)				DEP USE ONLY
Client ID#	92580	**APS ID#**		Date Received & General Notes
Site ID#	461340	**Auth ID#**		
Facility ID#	512967			

CLIENT INFORMATION

DEP Client ID#	Client Type / Code	Dun & Bradstreet ID#
92580	Pennsylvania Corporation / PACOR	

Legal Organization Name or Registered Fictitious Name	Employer ID# (EIN)	Is the EIN a SSN?
Commonwealth Environmental Systems, L.P. Landfill	23-2792722	☐ Yes ☒ NO

State of Incorporation or Registration of Fictitious Name	
Pennsylvania	☐ Corporation ☐ LLC ☐ Partnership ☐ LLP ☒ LP ☐ Sole Proprietorship ☐ Association/Organization ☐ Estate/Trust ☐ Other

Individual Last Name	First Name	MI	Suffix

Additional Individual Last Name	First Name	MI	Suffix

Mailing Address Line 1	Mailing Address Line 2
99 Commonwealth Road	

Address Last Line – City	State	ZIP+4	Country
Hegins	PA	17938-0322	USA

Client Contact Last Name	First Name	MI	Suffix
Piepoli	Michael		

Client Contact Title	Phone	Ext	Cell Phone
Site Manager	570-695-3590		

Email Address	FAX
mikep@ceslfco.com	

SITE INFORMATION

DEP Site ID#	Site Name
461340	Commonwealth Environmental Systems, L.P. (CES) Landfill

EPA ID# None **Estimated Number of Employees to be Present at Site** 32

Description of Site
Municipal Solid Waste Landfill

Tax Parcel ID(s): 11-05-0006.000

County Name(s)	Municipality(ies)	City	Boro	Twp	State
Schuylkill	Foster	☐	☐	☒	PA
Schuylkill	Frailey	☐	☐	☒	PA
Schuylkill	Reilly	☐	☐	☒	PA
		☐	☐	☐	

Site Location Line 1	Site Location Line 2
99 Commonwealth Road	

Site Location Last Line – City	State	ZIP+4
Hegins	PA	17938

Detailed Written Directions to Site
From US-209 S turn right onto PA-25 W/W Pine Street. Turn right onto Commonwealth Road. Take a slight left to stay on Commonwealth Road for approximately one (1) mile.

Site Contact Last Name	**First Name**	**MI**	**Suffix**
Piepoli	Michael		

Site Contact Title	**Site Contact Firm**
Site Manager	

Mailing Address Line 1	**Mailing Address Line 2**
99 Commonwealth Road	

Mailing Address Last Line – City	**State**	**ZIP+4**
Hegins	PA	17938-0322

Phone	**Ext**	**FAX**	**Email Address**
570-695-3590			mikep@ceslfco.com

NAICS Codes (Two- & Three-Digit Codes – List All That Apply) **6-Digit Code** (Optional)
562

Client to Site Relationship
OWNOP

FACILITY INFORMATION

Modification of Existing Facility	**Yes**	**No**
1. Will this project modify an existing facility, system, or activity?	☒	☐
2. Will this project involve an addition to an existing facility, system, or activity?	☒	☐

If "Yes", check all relevant facility types and provide DEP facility identification numbers below.

	Facility Type	**DEP Fac ID#**		**Facility Type**	**DEP Fac ID#**
☒	Air Emission Plant	512967	☐	Industrial Minerals Mining Operation	
☐	Beneficial Use (water)		☐	Laboratory Location	
☐	Blasting Operation		☐	Land Recycling Cleanup Location	
☐	Captive Hazardous Waste Operation		☐	Mine Drainage Treatment / Land Recycling Project Location	
☐	Coal Ash Beneficial Use Operation		☐	Municipal Waste Operation	
☐	Coal Mining Operation		☐	Oil & Gas Encroachment Location	
☐	Coal Pillar Location		☐	Oil & Gas Location	
☐	Commercial Hazardous Waste Operation		☐	Oil & Gas Water Poll Control Facility	
☐	Dam Location		☐	Public Water Supply System	
☐	Deep Mine Safety Operation -Anthracite		☐	Radiation Facility	
☐	Deep Mine Safety Operation -Bituminous		☐	Residual Waste Operation	
☐	Deep Mine Safety Operation -Ind Minerals		☐	Storage Tank Location	
☐	Encroachment Location (water, wetland)		☐	Water Pollution Control Facility	
☐	Erosion & Sediment Control Facility		☐	Water Resource	
☐	Explosive Storage Location		☐	Other:	

Latitude/Longitude Point of Origin	**Latitude**			**Longitude**		
	Degrees	**Minutes**	**Seconds**	**Degrees**	**Minutes**	**Seconds**
Plant entrance (general)	40°	40'	12.5021"	-76°	22'	57.3869"

Horizontal Accuracy Measure	Feet	*--or--*	Meters
Horizontal Reference Datum Code	☐ North American Datum of 1927 ☐ North American Datum of 1983 ☒ World Geodetic System of 1984		
Horizontal Collection Method Code	ITPMP		
Reference Point Code	ENTGN		
Altitude	Feet 1,500	*--or--*	Meters
Altitude Datum Name	☐ The National Geodetic Vertical Datum of 1929 ☒ The North American Vertical Datum of 1988 (NAVD88)		
Altitude (Vertical) Location Datum Collection Method Code	TOPO		
Geometric Type Code	POINT		
Data Collection Date	July 2024		
Source Map Scale Number	1 Inch(es) = 2,000 Feet		
--or--	Centimeter(s) = Meters		

PROJECT INFORMATION

Project Name
Landfill Expansion Plan Approval Application

Project Description
Plan Approval Application for the proposed landfill expansion at the existing CES Landfill.

Project Consultant Last Name	First Name	MI	Suffix
Portner	Shae	E.	G.I.T.

Project Consultant Title	Consulting Firm
Project Manager	Earthres Group, Inc.

Mailing Address Line 1	Mailing Address Line 2
P.O. Box 468	

Address Last Line – City	State	ZIP+4
Pipersville	PA	18947

Phone	Ext	FAX	Email Address
215-766-1211	172	215-766-1245	sportner@earthres.com

Time Schedules	Project Milestone (Optional)
N/A	N/A

1. **Is the project located in or within a 0.5-mile radius of an Environmental Justice community as defined by DEP?** *Site is located in an Environmental Justice (EJ) Area for economics. EJ issues were addressed during the EAP review process conducted in 2019.* ☒ Yes ☐ No

To determine if the project is located in or within a 0.5-mile radius of an environmental justice community, please use the online Environmental Justice Areas Viewer.

2. **Have you informed the surrounding community prior to submitting the application to the Department?** ☒ Yes ☐ No

Method of notification: Notification Letters

3. **Have you addressed community concerns that were identified?** ☐ Yes ☐ No ☒ N/A

If no, please briefly describe the community concerns that have been expressed and not addressed.

4. **Is your project funded by state or federal grants?** ☐ Yes ☒ No

Note: If "Yes", specify what aspect of the project is related to the grant and provide the grant source, contact person and grant expiration date.

Aspect of Project Related to Grant
Grant Source: _____
Grant Contact Person: _____
Grant Expiration Date: _____

5. **Is this application for an authorization on Appendix A of the Land Use Policy? (For referenced list, see Appendix A of the Land Use Policy attached to GIF instructions)** ☒ Yes ☐ No

Note: If "No" to Question 5, the application is not subject to the Land Use Policy.
If "Yes" to Question 5, the application is subject to this policy and the Applicant should answer the additional questions in the **Land Use Information** section.

LAND USE INFORMATION

Note: Applicants should submit copies of local land use approvals or other evidence of compliance with local comprehensive plans and zoning ordinances.

1.	**Is there an adopted county or multi-county comprehensive plan?**	☒	Yes	☐	No
2.	**Is there a county stormwater management plan?**	☐	Yes	☒	No
3.	**Is there an adopted municipal or multi-municipal comprehensive plan?**	☒	Yes	☐	No
4.	**Is there an adopted county-wide zoning ordinance, municipal zoning ordinance or joint municipal zoning ordinance?** **Note:** If the Applicant answers "No" to either Questions 1, 3 or 4, the provisions of the PA MPC are not applicable and the Applicant does not need to respond to questions 5 and 6 below. If the Applicant answers "Yes" to questions 1, 3 and 4, the Applicant should respond to questions 5 and 6 below.	☒	Yes	☐	No
5.	**Does the proposed project meet the provisions of the zoning ordinance or does the proposed project have zoning approval?** If zoning approval has been received, attach documentation. *Sanitary landfills are a use permitted by right; therefore, no zoning approval from Foster Township is required. Land development approvals are provided in the solid waste permit modification application that is being submitted concurrently with the plan approval application.*	☒	Yes	☐	No
6.	**Have you attached Municipal and County Land Use Letters for the project?**	☐	Yes	☒	No

COORDINATION INFORMATION

Note: The PA Historical and Museum Commission must be notified of proposed projects in accordance with DEP Technical Guidance Document 012-0700-001 utilizing the Project Review Form.

If the activity will be a mining project (i.e., mining of coal or industrial minerals, coal refuse disposal and/or the operation of a coal or industrial minerals preparation/processing facility), respond to questions 1.0 through 2.5 below.

If the activity will not be a mining project, skip questions 1.0 through 2.5 and begin with question 3.0.

1.0	**Is this a coal mining project?** If "Yes", respond to 1.1-1.6. If "No", skip to Question 2.0.	☐	Yes	☒	No
1.1	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be equal to or greater than 200 tons/day?**	☐	Yes	☐	No
1.2	**Will this coal mining project involve coal preparation/ processing activities in which the total amount of coal prepared/processed will be greater than 50,000 tons/year?**	☐	Yes	☐	No
1.3	**Will this coal mining project involve coal preparation/ processing activities in which thermal coal dryers or pneumatic coal cleaners will be used?**	☐	Yes	☐	No
1.4	**For this coal mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
1.5	**Will this coal mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
1.6	**Will this coal mining project involve underground coal mining to be conducted within 500 feet of an oil or gas well?**	☐	Yes	☐	No
2.0	**Is this a non-coal (industrial minerals) mining project?** If "Yes", respond to 2.1-2.6. If "No", skip to Question 3.0.	☐	Yes	☒	No
2.1	**Will this non-coal (industrial minerals) mining project involve the crushing and screening of non-coal minerals other than sand and gravel?**	☐	Yes	☐	No

2.2	**Will this non-coal (industrial minerals) mining project involve the crushing and/or screening of sand and gravel with the exception of wet sand and gravel operations (screening only) and dry sand and gravel operations with a capacity of less than 150 tons/hour of unconsolidated materials?**	☐	Yes	☐	No
2.3	**Will this non-coal (industrial minerals) mining project involve the construction, operation and/or modification of a portable non-metallic (i.e., non-coal) minerals processing plant under the authority of the General Permit for Portable Non-metallic Mineral Processing Plants (i.e., BAQ-PGPA/GP-3)?**	☐	Yes	☐	No
2.4	**For this non-coal (industrial minerals) mining project, will sewage treatment facilities be constructed and treated waste water discharged to surface waters?**	☐	Yes	☐	No
2.5	**Will this non-coal (industrial minerals) mining project involve the construction of a permanent impoundment meeting one or more of the following criteria: (1) a contributory drainage area exceeding 100 acres; (2) a depth of water measured by the upstream toe of the dam at maximum storage elevation exceeding 15 feet; (3) an impounding capacity at maximum storage elevation exceeding 50 acre-feet?**	☐	Yes	☐	No
3.0	**Will your project, activity, or authorization have anything to do with a well related to oil or gas production, have construction within 200 feet of, affect an oil or gas well, involve the waste from such a well, or string power lines above an oil or gas well?** If "Yes", respond to 3.1-3.3. If "No", skip to Question 4.0.	☐	Yes	☒	No
3.1	**Does the oil- or gas-related project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water (including wetlands)?**	☐	Yes	☐	No
3.2	**Will the oil- or gas-related project involve discharge of industrial wastewater or stormwater to a dry swale, surface water, ground water or an existing sanitary sewer system or storm water system?** If "Yes", discuss in *Project Description*.	☐	Yes	☐	No
3.3	**Will the oil- or gas-related project involve the construction and operation of industrial waste treatment facilities?**	☐	Yes	☐	No
4.0	**Will the project involve a construction activity that results in earth disturbance?** If "Yes", specify the total disturbed acreage.	☒	Yes	☐	No
4.0.1	**Total Disturbed Acreage** TBD				
4.0.2	**Will the project discharge or drain to a special protection water (EV or HQ) or an EV wetland?**	☐	Yes	☒	No
4.0.3	**Will the project involve a construction activity that results in earth disturbance in the area of the earth disturbance that are contaminated at levels exceeding residential or non-residential medium-specific concentrations (MSCs) in 25 Pa. Code Chapter 250 at residential or non-residential construction sites, respectively?**	☐	Yes	☒	No
5.0	**Does the project involve any of the following: water obstruction and/or encroachment, wetland impacts, or floodplain project by the Commonwealth/political subdivision or public utility?** If "Yes", respond to 5.1-5.7. If "No", skip to Question 6.0.	☐	Yes	☒	No
5.1	**Water Obstruction and Encroachment Projects – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a watercourse, floodway or body of water?**	☐	Yes	☐	No
5.2	**Wetland Impacts – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a wetland?**	☐	Yes	☐	No

5.3	**Floodplain Projects by the Commonwealth, a Political Subdivision of the Commonwealth or a Public Utility – Does the project involve any of the following: placement of fill, excavation within or placement of a structure, located in, along, across or projecting into a floodplain?**	☐	Yes	☐	No
5.4	**Is your project an interstate transmission natural gas pipeline?**	☐	Yes	☐	No
5.5	**Does your project consist of linear construction activities which result in earth disturbance in two or more DEP regions AND three or more counties?**	☐	Yes	☐	No
5.6	**Does your project utilize Floodplain Restoration as a best management practice for Post Construction Stormwater Management?**	☐	Yes	☐	No
5.7	**Does your project utilize Class V Gravity / Injection Wells as a best management practice for Post Construction Stormwater Management?**	☐	Yes	☐	No
6.0	**Will the project involve discharge of construction related stormwater to a dry swale, surface water, ground water or separate storm water system?**	☐	Yes	☒	No
6.1	**Will the project involve discharge of industrial waste stormwater or wastewater from an industrial activity or sewage to a dry swale, surface water, ground water or an existing sanitary sewer system or separate storm water system?**	☐	Yes	☒	No
7.0	**Will the project involve the construction and operation of industrial waste treatment facilities?**	☐	Yes	☒	No
8.0	**Will the project involve construction of sewage treatment facilities, sanitary sewers, or sewage pumping stations?** If "Yes", indicate estimated proposed flow (gal/day). Also, discuss the sanitary sewer pipe sizes and the number of pumping stations/treatment facilities/name of downstream sewage facilities in the *Project Description*, where applicable. **8.0.1 Estimated Proposed Flow (gal/day)**	☐	Yes	☒	No
9.0	**Will the project involve the subdivision of land, or the generation of 800 gpd or more of sewage on an existing parcel of land or the generation of an additional 400 gpd of sewage on an already-developed parcel, or the generation of 800 gpd or more of industrial wastewater that would be discharged to an existing sanitary sewer system?**	☐	Yes	☒	No
	9.0.1 Was Act 537 sewage facilities planning submitted and approved by DEP? If "Yes" attach the approval letter.	☐	Yes	☒	No
10.0	**Is this project for the beneficial use of biosolids for land application within Pennsylvania?** If "Yes" indicate how much (i.e. gallons or dry tons per year). **10.0.1 Gallons Per Year (residential septage)** _____ **10.0.2 Dry Tons Per Year (biosolids)**	☐	Yes	☒	No
11.0	**Does the project involve construction, modification or removal of a dam?** If "Yes", identify the dam. **11.0.1 Dam Name**	☐	Yes	☒	No
12.0	**Will the project interfere with the flow from, or otherwise impact, a dam?** If "Yes", identify the dam. **12.0.1 Dam Name**	☐	Yes	☒	No

13.0	**Will the project involve operations (excluding during the construction period) that produce air emissions (i.e., NOX, VOC, etc.)?**	☒	Yes	☐	No
	13.0.1 If "Yes", is the operation subject to the agricultural exemption in 35 P.S. § 4004.1?	☐	Yes	☒	No
	13.0.2 If the answer to 13.0.1 is "No", identify each type of emission followed by the estimated amount of that emission. **Enter all types & amounts of emissions; separate each set with semicolons.** Please refer to the emission calculations in Attachment B.				
14.0	**Does the project include the construction or modification of a drinking water supply to serve 15 or more connections or 25 or more people, at least 60 days out of the year?** If "Yes", check all proposed sub-facilities.	☐	Yes	☒	No
	14.0.1 Number of Persons Served				
	14.0.2 Number of Employee/Guests				
	14.0.3 Number of Connections				
	14.0.4 Sub-Fac: Distribution System	☐	Yes	☐	No
	14.0.5 Sub-Fac: Water Treatment Plant	☐	Yes	☐	No
	14.0.6 Sub-Fac: Source	☐	Yes	☐	No
	14.0.7 Sub-Fac: Pump Station	☐	Yes	☐	No
	14.0.8 Sub Fac: Transmission Main	☐	Yes	☐	No
	14.0.9 Sub-Fac: Storage Facility	☐	Yes	☐	No
15.0	**Will your project include infiltration of storm water or waste water to ground water within one-half mile of a public water supply well, spring or infiltration gallery?**	☐	Yes	☒	No
16.0	**Is your project to be served by an existing public water supply?** If "Yes", indicate name of supplier and attach letter from supplier stating that it will serve the project.	☐	Yes	☒	No
	16.0.1 Supplier's Name				
	16.0.2 Letter of Approval from Supplier is Attached	☐	Yes	☒	No
17.0	**Will this project be served by on-lot drinking water wells?**	☐	Yes	☒	No
18.0	**Will this project involve a new or increased drinking water withdrawal from a river, stream, spring, lake, well or other water bod(ies)?** If "Yes", reference Safe Drinking Water Program.	☐	Yes	☒	No
	18.0.1 Source Name				
19.0	**Will the construction or operation of this project involve treatment, storage, reuse, or disposal of waste?** If "Yes", indicate what type (i.e., hazardous, municipal (including infectious & chemotherapeutic), residual) and the amount to be treated, stored, re-used or disposed.	☐	Yes	☒	No
	19.0.1 Type & Amount				
20.0	**Will your project involve the removal of coal, minerals, contaminated media, or solid waste as part of any earth disturbance activities?**	☐	Yes	☒	No
21.0	**Does your project involve installation of a field constructed underground storage tank?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit.	☐	Yes	☒	No
	21.0.1 Enter all substances & capacity of each; separate each set with semicolons.				

22.0	**Does your project involve installation of an aboveground storage tank greater than 21,000 gallons capacity at an existing facility?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **22.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐	Yes	☒	No
23.0	**Does your project involve installation of a tank greater than 1,100 gallons which will contain a highly hazardous substance as defined in DEP's Regulated Substances List, 2570-BK-DEP2724?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **23.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐	Yes	☒	No
24.0	**Does your project involve installation of a storage tank at a new facility with a total AST capacity greater than 21,000 gallons?** If "Yes", list each Substance & its Capacity. **Note:** Applicant may need a Storage Tank Site Specific Installation Permit. **24.0.1 Enter all substances & capacity of each; separate each set with semicolons.**	☐	Yes	☒	No
	NOTE: If the project includes the installation of a regulated storage tank system, including diesel emergency generator systems, the project may require the use of a Department Certified Tank Handler. For a full list of regulated storage tanks and substances, please go to www.dep.pa.gov search term storage tanks				
25.0	**Will the intended activity involve the use of a radiation source?**	☐	Yes	☒	No

CERTIFICATION

I certify that I have the authority to submit this application on behalf of the applicant named herein and that the information provided in this application is true and correct to the best of my knowledge and information.

For applicants supplying an EIN number: I am applying for a permit or authorization from the Pennsylvania Department of Environmental Protection (DEP). As part of this application, I will provide DEP with an accurate EIN number for the applicant entity. By filing this application with DEP, I hereby authorize DEP to confirm the accuracy of the EIN number provided with the Pennsylvania Department of Revenue. As applicant, I further consent to the Department of Revenue discussing the same with DEP prior to issuance of the Commonwealth permit or authorization.

Type or Print Name Michael Piepoli

Signature

Site Manager
Title

8-22-24
Date

PLAN APPROVAL APPLICATION FORM FOR PROCESSES

2700-PM-AQ0007 Rev. 7/2004

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Submit in Triplicate

PROCESSES

Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device

This application must be submitted with the General Information Form (GIF).

Before completing this form, read the instructions provided for the form.

Section A - Facility Name, Checklist And Certification

Organization Name or Registered Fictitious Name/Facility Name: *Commonwealth Environmental Systems, L.P. Landfill*

DEP Client ID# (if known): *92580*

Type of Review required and Fees:

- ☐ Source which is not subject to NSPS, NESHAPs, MACT, NSR and PSD: ..... $_____
- ☒ Source requiring approval under NSPS or NESHAPS or both: *$5,000.00**
- ☐ Source requiring approval under NSR regulations: ..... $_____
- ☐ Source requiring the establishment of a MACT limitation: ..... $_____
- ☐ Source requiring approval under PSD: ..... $_____

**Based on the PADEP Air Quality Fee Schedule (Rev 02/2021). Above fee includes the Subchapter B base fee ($2,500.00) and NSPS/NESHAP/MACT Standard fee ($2,500.00).*

Applicant's Checklist

Check the following list to make sure that all the required documents are included.

- ☒ **General Information Form (GIF)**
- ☒ **Processes Plan Approval Application**
- ☒ **Compliance Review Form** or provide reference of most recently submitted compliance review form for facilities submitting on a periodic basis: _____
- ☒ **Copy and Proof of County and Municipal Notifications**
- ☒ **Permit Fees**
- ☒ **Addendum A:** Source Applicable Requirements (only applicable to existing Title V facility)

Certification of Truth, Accuracy and Completeness by a Responsible Official

I, ***Michael Piepoli***, certify under penalty of law in 18 Pa. C. S. A. §4904, and 35 P.S. §4009(b) (2) that based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete.

(Signature): _____ Date: 8-22-24

Name (Print): *Michael Piepoli* Title: *Site Manager*

OFFICIAL USE ONLY

Application No. _____ Unit ID _____ Site ID _____

DEP Client ID #: _____ APS. ID _____ AUTH. ID _____

Date Received _____ Date Assigned _____ Reviewed By _____

Date of 1st Technical Deficiency _____ Date of 2nd Technical Deficiency _____

Comments: _____

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Submit in Triplicate

PROCESSES

Application for Plan Approval to Construct, Modify or Reactivate an Air Contamination Source and/or Install an Air Cleaning Device

This application must be submitted with the General Information Form (GIF).

Before completing this form, read the instructions provided for the form.

Section A - Facility Name, Checklist And Certification

Organization Name or Registered Fictitious Name/Facility Name: *Commonwealth Environmental Systems, L.P. Landfill*

DEP Client ID# (if known): *92580*

Type of Review required and Fees:

- ☐ Source which is not subject to NSPS, NESHAPs, MACT, NSR and PSD: ..... $_____
- ☒ Source requiring approval under NSPS or NESHAPS or both: *$5,000.00**
- ☐ Source requiring approval under NSR regulations: ..... $_____
- ☐ Source requiring the establishment of a MACT limitation: ..... $_____
- ☐ Source requiring approval under PSD: ..... $_____

**Based on the PADEP Air Quality Fee Schedule (Rev 02/2021). Above fee includes the Subchapter B base fee ($2,500.00) and NSPS/NESHAP/MACT Standard fee ($2,500.00).*

Applicant's Checklist

Check the following list to make sure that all the required documents are included.

- ☒ **General Information Form (GIF)**
- ☒ **Processes Plan Approval Application**
- ☒ **Compliance Review Form** or provide reference of most recently submitted compliance review form for facilities submitting on a periodic basis: _____
- ☒ **Copy and Proof of County and Municipal Notifications**
- ☒ **Permit Fees**
- ☒ **Addendum A:** Source Applicable Requirements (only applicable to existing Title V facility)

Certification of Truth, Accuracy and Completeness by a Responsible Official

I, ***Michael Piepoli***, certify under penalty of law in 18 Pa. C. S. A. §4904, and 35 P.S. §4009(b) (2) that based on information and belief formed after reasonable inquiry, the statements and information in this application are true, accurate and complete.

(Signature): _____ Date: _____

Name (Print): *Michael Piepoli* Title: *Site Manager*

OFFICIAL USE ONLY

Application No. _____ Unit ID _____ Site ID _____

DEP Client ID #: _____ APS. ID _____ AUTH. ID _____

Date Received _____ Date Assigned _____ Reviewed By _____

Date of 1st Technical Deficiency _____ Date of 2nd Technical Deficiency _____

Comments: _____

Section B - Processes Information

1. Source Information

Source Description (give type, use, raw materials, product, etc). Attach additional sheets as necessary.

Expansion of the existing, permitted landfill. See Attachment A for details.

Manufacturer	Model No.	Number of Sources
NA	*NA*	*One (1) – Landfill Expansion*
Source Designation	Maximum Capacity	Rated Capacity
Existing Landfill, including Expansion	*4,750 ton/day, Max for any day*	*NA*

Type of Material Processed
Municipal Solid Waste Disposal

Maximum Operating Schedule *(Landfill Gas Collection and Control System)*

Hours/Day	Days/Week	Days/Year	Hours/Year
24	*7*	*365*	*8,760*

Operational restrictions existing or requested, if any (e.g., bottlenecks or voluntary restrictions to limit PTE)

Capacity (specify units)

Per Hour	Per Day	Per Week	Per Year
NA	*4,750 ton/day, average*	*NA*	*NA*

Operating Schedule *(Waste Acceptance)*

Hours/Day	Days/Week	Days/Year	Hours/Year
8 hours/day (Mon.- Fri.)	*5*	*254 (Accounts for Holidays)*	*2,080*

Seasonal variations (Months) From *NA* to *NA*

If variations exist, describe them
NA

2. Fuel – *N/A*

Type	Quantity Hourly	Annually	Sulfur	% Ash (Weight)	BTU Content
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Oil Number _____	GPH @ 60°F	X 10^3 Gal	% by wt		Btu/Gal. & Lbs./Gal. @ 60 °F
Natural Gas	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Gas (other) _____	SCFH	X 10^6 SCF	grain/100 SCF		Btu/SCF
Coal _____	TPH	Tons	% by wt		Btu/lb
Other * _____					
_____					
_____					

*Note: Describe and furnish information separately for other fuels in Addendum B.

Section B - Processes Information (Continued)

3. Burner – *N/A*

Manufacturer	Type and Model No.	Number of Burners
Description:		
Rated Capacity	Maximum Capacity	

4. Process Storage Vessels – *N/A*

A. For Liquids:

Name of material stored		
Tank I.D. No.	Manufacturer	Date Installed
Maximum Pressure	Capacity (gallons/Meter^3)	
Type of relief device (pressure set vent/conservation vent/emergency vent/open vent)		
Relief valve/vent set pressure (psig)	Vapor press. of liquid at storage temp. (psia/kPa)	
Type of Roof: Describe:		
Total Throughput Per Year	Number of fills per day (fill/day): Filling Rate (gal./min.): Duration of fill hr./fill):	

B. For Solids – *N/A*

Type: ☐ Silo ☐ Storage Bin ☐Other, Describe	Name of Material Stored	
Silo/Storage Bin I.D. No.	Manufacturer	Date Installed
State whether the material will be stored in loose or bags in silos	Capacity (Tons)	
Turn over per year in tons	Turn over per day in tons	
Describe fugitive dust control system for loading and handling operations		
Describe material handling system		

5. Request for Confidentiality

Do you request any information on this application to be treated as "Confidential"? ☐ Yes ☒ No
If yes, include justification for confidentiality. Place such information on separate pages marked **"confidential"**.

Section B - Processes Information (Continued)

6. Miscellaneous Information

Attach flow diagram of process giving all (gaseous, liquid and solid) flow rates. Also, list all raw materials charged to process equipment, and the amounts charged (tons/hour, etc.) at rated capacity (give maximum, minimum and average charges describing fully expected variations in production rates). Indicate (on diagram) all points where contaminants are controlled (location of water sprays, collection hoods, or other pickup points, etc.). Describe collection hoods location, design, airflow and capture efficiency. Describe any restriction requested and how it will be monitored.

N/A – Plan Approval is for the expansion of the existing, permitted landfill. See Attachment A for details.

Describe fully the facilities provided to monitor and to record process operating conditions, which may affect the emission of air contaminants. Show that they are reasonable and adequate.

Monitoring and recordkeeping will be conducted in accordance with 40 CFR 63 Subpart AAAA.

Describe each proposed modification to an existing source.

See Attachment A.

Identify and describe all fugitive emission points, all relief and emergency valves and any by-pass stacks.

Sources of fugitive emissions include NMOC and VOC from Municipal Solid Waste degradation, and dust from the landfill construction and roadway operations.

All of the existing LFG Flares are equipped with automatic block valves that will close upon any of the following conditions to prevent venting of gas to the atmosphere: (1) high temperature shutdown; (2) low temperature shutdown; and (3) loss of flame shutdown.

Describe how emissions will be minimized especially during start up, shut down, process upsets and/or disruptions.

The facility will continue to comply with the Startup, Shutdown and Malfunction (SSM) requirements contained in 40 CFR Part 63 Subpart AAAA. Emissions will be minimized through use of best available technology (flares, landfill capping, road wetting) and by employing good air pollution control practices.

Anticipated Milestones:

i. Expected commencement date of construction/reconstruction/installation: *Pending PADEP Approval*
ii. Expected completion date of construction/reconstruction/installation: *Not Available*
iii. Anticipated date of start-up: *Pending PADEP Approval*

Section C - Air Cleaning Device

1. Precontrol Emissions*

Pollutant	Maximum Emission Rate				Calculation/ Estimation Method
	Specify Units	Pounds/Hour	Hours/Year	Tons/Year	
PM	*Landfill will not operate without gas collection and control system; therefore, pre-control emission estimates are not shown.*				
PM_{10}					
SO_x					
CO					
NO_x					
VOC					
Others: (e.g., HAPs)					

* These emissions must be calculated based on the requested operating schedule and/or process rate, e.g., operating schedule for maximum limits or restricted hours of operation and/or restricted throughput. Describe how the emission values were determined. Attach calculations.

2. Gas Cooling – *N/A*

Water quenching ☐ Yes ☐ No Water injection rate _____ GPM

Radiation and convection cooling ☐ Yes ☐ No	Air dilution ☐ Yes ☐ No If yes, _____CFM
Forced Draft ☐ Yes ☐ No	Water cooled duct work ☐ Yes ☐ No
Other	
Inlet Volume _____ACFM @ _____°F _____% Moisture	Outlet Volume _____ACFM @ _____°F _____% Moisture

Describe the system in detail.

Section C - Air Cleaning Device (Continued)

12. Flares – ***N/A; No new flares are proposed as part of this project. See Attachment A.***

Equipment Specifications

Manufacturer	Type ☐ Elevated flare ☐ Ground flare ☐ Other _____ Describe	Model No.
Design Volume (SCFM)	Dimensions of stack (ft.) Diameter _____ Height _____	
Residence time (sec.) and outlet temperature (°F)	Turn down ratio	Burner details

Describe the flare design (air/steam-assisted or nonassisted), essential auxiliaries including pilot flame monitor of proposed flare with a sketch.

Describe the operation of the flare's ignition system.

Describe the provisions to introduce auxiliary fuel to the flare.

Operation Parameters

Detailed composition of the waste gas	Heat content	Exit velocity
Maximum and average gas flow burned (ACFM)	Operating temperature (°F)	

Describe the warning/alarm system that protects against operation when unit is not meeting design requirements.

Emissions Data

Pollutant	Inlet	Outlet	Removal Efficiency (%)

Section C - Air Cleaning Device (Continued)

14. Costs – *N/A; No new air cleaning devices are proposed as part of the Landfill Expansion.*

Indicate cost associated with air cleaning device and its operating cost (attach documentation if necessary)

N/A – No new air cleaning devices are proposed as part of the Landfill Expansion.

Device	Direct Cost	Indirect Cost	Total Cost	Annual Operating Cost

15. Miscellaneous

Describe in detail the removal, handling and disposal of dust, effluent, etc. from the air cleaning device including proposed methods of controlling fugitive emissions.

N/A – No new air cleaning devices proposed as part of the Landfill Expansion.

Attach manufacturer's performance guarantees and/or warranties for each of the major components of the control system (or complete system).

N/A – No new control system components are proposed as part of the Landfill Expansion.

Attach the maintenance schedule for the control equipment and any part of the process equipment that if in disrepair would increase air contaminant emissions.

N/A – No new control system or process equipment is proposed as part of the Landfill Expansion.

Section D - Additional Information

Will the construction, modification, etc. of the sources covered by this application increase emissions from other sources at the facility? If so, describe and quantify.

Yes. Emissions from the existing, permitted landfill will increase due to the increase in landfill gas (LFG) generation from the additional quantity of waste that can be accommodated by the Landfill Expansion.

See Attachment A and Attachment B for more detail.

If this project is subject to any one of the following, attach a demonstration to show compliance with applicable standards.

a. Prevention of Significant Deterioration permit (PSD), 40 CFR 52? ☐ YES ☒ NO

b. New Source Review (NSR), 25 Pa. Code Chapter 127, Subchapter E? ☐ YES ☒ NO

c. New Source Performance Standards (NSPS), 40 CFR Part 60? ☐ YES ☒ NO
(If Yes, which subpart) *See below note**

d. National Emissions Standards for Hazardous Air Pollutants (NESHAP), 40 CFR Part 61? (If Yes, which subpart) ☐ YES ☒ NO

e. Maximum Achievable Control Technology (MACT) 40 CFR Part 63? ☒ YES ☐ NO
(If Yes, which part) *Subpart AAAA*

**Previously, CES was compliant with NSPS 40 CFR 62 Subpart OOO. It is understood that CES's adherence to 40 CFR 63 (NESHAP AAAA) will be in lieu of performing similar provisions outlined in the NSPS 40 CFR 62 Subpart OOO and the landfill cannot return to the provisions outlined in NSPS OOO.*

Attach a demonstration showing that the emissions from any new sources will be the minimum attainable through the use of best available technology (BAT).

See Attachment A for a BAT demonstration.

Provide emission increases and decreases in allowable (or potential) and actual emissions within the last five (5) years for applicable PSD pollutant(s) if the facility is an existing major facility (PSD purposes).

The current landfill is not an existing major facility and the expansion will not cause the existing landfill to become a major source for PSD purposes.

Section D - Additional Information (Continued)

Indicate emission increases and decreases in tons per year (tpy), for volatile organic compounds (VOCs) and nitrogen oxides (NOx) for NSR applicability since January 1, 1991 or other applicable dates (see other applicable dates in instructions). The emissions increases include all emissions including stack, fugitive, material transfer, other emission generating activities, quantifiable emissions from exempted source(s), etc.

Existing landfill is not a major source with respect to NSR pollutants. The expansion will not result in the existing landfill becoming a major source for NSR pollutants. See Attachment B for Emission Calculations.

Permit number (if applicable)	Date issued	Indicate ***Yes*** or ***No*** if emission increases and decreases were used previously for netting	Source I. D. or Name	**VOCs**		**NOx**	
				Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)	Emission increases in potential to emit (tpy)	Creditable emission decreases in actual emissions (tpy)

If the source is subject to 25 Pa. Code Chapter 127, Subchapter E, New Source Review requirements,

a. Identify Emission Reduction Credits (ERCs) for emission offsets or demonstrate ability to obtain suitable ERCs for emission offsets. *NA*

b. Provide a demonstration that the lowest achievable emission rate (LAER) control techniques will be employed (if applicable). *NA*

c. Provide an analysis of alternate sites, sizes, production processes and environmental control techniques demonstrating that the benefits of the proposed source outweigh the environmental and social costs (if applicable). *NA*

Attach calculations and any additional information necessary to thoroughly evaluate compliance with all the applicable requirements of Article III and applicable requirements of the Clean Air Act adopted thereunder The Department may request additional information to evaluate the application such as a standby plan, a plan for air pollution emergencies, air quality modeling, etc.

See Attachment B – Emission Calculations.

Section E - Compliance Demonstration

Note: Complete this section if source is not a Title V facility. Title V facilities must complete Addendum A.

Method of Compliance Type: Check all that apply and complete all appropriate sections below

☐ Monitoring ☐ Testing ☐ Reporting

☐ Recordkeeping ☐ Work Practice Standard *See Addendum A.*

Monitoring:

a. Monitoring device type (Parameter, CEM, etc):

b. Monitoring device location:

c. Describe all parameters being monitored along with the frequency and duration of monitoring each parameter:

Testing:

a. Reference Test Method: Citation

b. Reference Test Method: Description

Recordkeeping:

Describe what parameters will be recorded and the recording frequency:

Reporting:

a. Describe what is to be reported and frequency of reporting:

b. Reporting start date: _____

Work Practice Standard:

Describe each:

Section F - Flue and Air Contaminant Emission

1. Estimated Atmospheric Emissions* ***See Attachment B for additional details.***

Emissions are based on the projected annual LFG generation amount and include the existing landfill and the expansion. Hourly emission rates (lb/hr) are not presented because the LandGEM model does not calculate hourly emissions.

Pollutant	Maximum emission rate			Calculation/ Estimation Method
	specify units	lbs/hr	tons/yr.	
NO_x	---	---	*33.99*	*Manufacturer's Data*
CO	---	---	*169.99*	*Manufacturer's Data*
PM / PM_{10} / $PM_{2.5}$	---	---	*14.46*	*U.S. EPA AP-42*
SO_x	---	---	*166.96*	*Site specific U.S. EPA AP-42*
NMOC	---	---	*29.22*	*U.S. EPA AP-42*
VOC	---	---	*11.40*	*U.S. EPA AP-42*
Total HAPs	---	---	*13.37*	*U.S. EPA AP-42*
Biogenic CO_2	---	---	*180,710*	*U.S. EPA AP-42*
CH_4	---	---	*4,567*	*U.S. EPA AP-42*
Total Non-Biogenic CO_2e	---	---	*114,168*	*U.S. EPA AP-42*

* These emissions must be calculated based on the requested operating schedule and/or process rate e.g., operating schedule for maximum limits or restricted hours of operation and /or restricted throughput. Describe how the emission values were determined. Attach calculations. *See Attachment B.*

2. Stack and Exhauster – *N/A; No change to existing stacks and exhausts, i.e. existing flares. No new flares.*

Stack Designation/Number

List Source(s) or source ID exhausted to this stack:	% of flow exhausted to stack:

Stack height above grade (ft.) Grade elevation (ft.)	Stack diameter (ft) or Outlet duct area (sq. ft.)	f. Weather Cap ☐ YES ☐ NO

Distance of discharge to nearest property line (ft.). Locate on topographic map.

Does stack height meet Good Engineering Practice (GEP)?

If modeling (estimating) of ambient air quality impacts is needed, attach a site plan with buildings and their dimensions and other obstructions.

Location of stack** Latitude/Longitude Point of Origin	Latitude			Longitude		
	Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

Stack exhaust
Volume _____ ACFM Temperature _____ °F Moisture _____ %

Indicate on an attached sheet the location of sampling ports with respect to exhaust fan, breeching, etc. Give all necessary dimensions.

Exhauster (attach fan curves) _____ in. of water _____ HP @ _____RPM.

** If the data and collection method codes differ from those provided on the General Information Form-Authorization Application, provide the additional detail required by that form on a separate form.

Section G - Attachments

Number and list all attachments submitted with this application below:

General Information Form (GIF)

Plan Approval Processes Application Form

Addendum A	*Source Applicable Requirements*
Attachment A	*Application Narrative and Regulatory Review*
Attachment B	*Emission Calculations*
Attachment C	*LandGEM Model*
Attachment D	*Supplemental Compliance Review Form*
Attachment E	*Proof of Municipal/County Notifications*
Figure 1	*Site Location Map*

ADDENDUM A

SOURCE APPLICABLE REQUIREMENTS

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

Addendum A: Source Applicable Requirements

Describe and cite all applicable requirements pertaining to this source.
Note: A Method of Compliance Worksheet (Addendum 1) must be completed for each requirement listed.

Citation Number	Citation Limitation	Limitation Used
All conditions from Title V Permit No. 54-00054, issued August 18, 2020 and subsequently amended November 2, 2021, remain unchanged unless noted.		

ATTACHMENT A

APPLICATION NARRATIVE AND REGULATORY REVIEW

ATTACHMENT A
APPLICATION NARRATIVE AND REGULATORY REVIEW

Introduction

Commonwealth Environmental Systems, L.P. (CES) owns and operates a municipal solid waste (MSW) landfill facility located in Hegins, Pennsylvania. A facility site location map is provided as Figure 1. The facility is proposing to construct a landfill expansion and increase the landfill capacity. The expansion will increase the current permitted landfill waste capacity by approximately 40,741,714 tons (based on a 53,558,188 CY net volume expansion, assuming a conversion factor of 0.7607 tons/CY). Please refer to the associated solid waste permit modification application for more details on solid waste acceptance, etc.

This Application for Plan Approval is being submitted for the proposed landfill expansion. All calculations and emission estimates are representative of the increase in emissions as a result of the proposed landfill expansion. The following sections include available information regarding the generation of LFG, LFG collection and control, air contaminant emissions, and regulatory requirements related to the proposed landfill expansion.

Landfill Gas (LFG) Generation

LFG consisting primarily of methane and carbon dioxide, and small amounts of non-methane organic compounds (NMOC), is generated from the anaerobic decomposition of deposited MSW. The LFG generation cycle begins within one (1) year after the MSW is placed in the landfill and continues as long as conditions are suitable or the organics are completely consumed. The duration of the LFG generation cycle is a function of the quantity of MSW deposited in the landfill and the rate of decomposition. The rate that MSW decomposes is controlled by individual landfill conditions (e.g., waste composition, moisture conditions, landfill design/management, and anaerobic state).

The existing landfill gas (LFG) collection and control system for the landfill includes three (3) enclosed flares, two (2) with a rated capacity of 4,500 standard cubic feet per minute (SCFM), one (1) with a rated capacity of 6,000 SCFM, and portable candlestick flare with a rated capacity of 340 SCFM for a combined control capacity of 15,340 SCFM.

Based on the newest available version of the United States Environmental Protection Agency's (U.S. EPA) Landfill Gas Emissions Model (LandGEM), the existing flares can adequately control the modeled maximum gas generation rate of 10,181 SCFM for the existing landfill. With the addition of the landfill expansion, the maximum modeled gas generation rate is projected at 17,369 SCFM in the year 2061. LFG flow rates are projected to exceed the landfill's current control capacity of 15,340 SCFM in the year 2040 (15,345 SCFM). The projected maximum for the following ten (10) years is projected at 13,639 in year 2034.

The modeled LFG generation rates for the existing landfill and the landfill including the proposed expansion are included under Attachment C of this submission.

LFG Collection and Control

The enclosed flares at the facility are the primary control devices for the destruction of landfill gas generated at the facility. The open flare is used in certain circumstances as an additional control device. Although CES currently has the ability to control all landfill gas generated at the facility, it does sell gas to an unrelated, third-party end-user. The Source ID for each flare assigned by PADEP in the landfill's existing Title V Air Quality Operating Permit No. 54-00054 are:

- 4,500 SCFM enclosed stationary flare (Source ID CD01 – Flare 1)
- 4,500 SCFM enclosed stationary flare (Source ID CD03A – Flare 2)
- 6,000 SCFM enclosed stationary flare (Source ID CD05 – Flare 3)
- 340 SCFM open portable flare (Source ID CD02 – Candlestick Flare (Utility Flare))

While an additional flare is not proposed as part of this expansion application, an additional flare will be permitted in the future to control the additional LFG volume associated with the landfill expansion. This additional flare will be permitted when actual LFG flows begin to approach the current control capacity.

Emissions Inventory

A summary of the potential and actual emissions (Calendar Year 2023) of regulated pollutants from the existing landfill, including the proposed expansion, is provided in Attachment B. Potential emissions from the flares and uncollected, fugitive emissions from the landfill surface are provided. The potential emissions are based on the onsite combustion in flares and fugitive emissions from the maximum LFG generation as predicted by the LFG model for the existing landfill after the proposed expansion has been completed. The attached emission calculations provided under Attachment B show potential emissions in more detail.

The control of LFG by the flares results in the emission of the products of combustion, including carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), particulate matter (PM), and biogenic carbon dioxide (CO_2). Regulated pollutants that may be contained in fugitive emissions of LFG from the landfill surface include non-methane organic compounds (NMOCs), volatile organic compounds (VOCs), greenhouse gases (including methane (CH_4) and biogenic CO_2), and various hazardous air pollutants (HAPs).

Formaldehyde is a byproduct of LFG combustion in internal combustion engines. Formaldehyde is not a byproduct of LFG combustion in candlestick or enclosed flares. CES only operates a candlestick and enclosed flares at the existing landfill and will continue to operate at the proposed landfill expansion. Therefore, formaldehyde will not be emitted from the combustion of LFG by the facility.

The potential emissions from the existing landfill, including the proposed expansion, have been estimated based primarily on available U.S. EPA AP-42 Section 2.4 (Rev. 11/98) emissions factors and calculation procedures. Additional assumptions used for the emission calculations are also presented in Attachment B.

Fugitive dust emissions from the construction of the landfill expansion, daily operations of the existing landfill, including the proposed expansion, and paved and unpaved roadways were estimated and included with the Solid Waste Major Modification Application for the Expansion. See Form G(A) in Solid Waste Application for the major modification that was submitted to PADEP concurrently with this application for details on the fugitive dust emissions. Since the landfill is not one of the regulated stationary source categories for which fugitive emissions must be included for major source determination, per 25 Pa. Code §121.1, fugitive dust emissions are not included in this application.

Air Quality Regulatory Review and BAT Analysis

The following section is a summary of the regulatory review conducted as part of the Air Quality Plan Approval Application process. The results are also presented in Table 1 – Regulatory Review Summary Table. The purpose of this summary is to provide an overview of federal and state regulations and the applicability of these regulations to the landfill after the expansion has been implemented.

Major Source Applicability: Title V Operating Permit

The facility currently operates as a major (Title V) source under Title V Operating Permit No. 54-00054.

NNSR and PSD Analysis

Non-Attainment New Source Review (NNSR)

The Non-Attainment New Source Review (NNSR) program applies to a new major source or a major modification at a major source in a non-attainment area, based on emission levels. The landfill is classified as a minor source of emissions for NNSR purposes. The landfill is located in the ozone transport region for VOC and NOx emissions. Major source thresholds for NNSR applicability are 50 tons per year (tpy) of VOC and 100 tpy of NOx. Future potential emissions of NOx and VOC from the proposed landfill expansion are less than the major source levels under the NNSR program. Therefore, NNSR does not apply to the landfill expansion.

Prevention of Significant Deterioration (PSD)

The Prevention of Significant Deterioration (PSD) requirements apply to a new major source or a major modification at a major source in an attainment area, based on emission levels. The landfill is a classified as a minor source of emissions for PSD purposes. Sources that have a potential to emit at least 250 tpy of a regulated pollutant or at least 100 tpy of a regulated

pollutant if the source falls within a listed source category are subject to PSD. Landfills are not one of the listed source categories; therefore, the 250 tpy major source threshold applies to this project.

Future potential emissions of any regulated PSD pollutant from the proposed landfill expansion are less than the major source levels under the PSD program. Therefore, PSD does not apply to the landfill expansion.

Federal New Source Performance Standards (NSPS)

Previously, CES was compliant with NSPS 40 CFR 60 Subpart WWW – Standards of Performance for Municipal Solid Waste Landfills and subsequently 40 CFR 62 Subpart OOO – Federal Plan Requirements for Municipal Solid Waste Landfills That Commenced Construction On or Before July 17, 2014 and Have Not Been Modified or Reconstructed Since July 17, 2014.

It is understood that CES's adherence to 40 CFR 63 (NESHAP AAAA) will be in lieu of performing similar provisions outlined in the NSPS 40 CFR 62 Subpart OOO and the landfill cannot return to the provisions outlined in NSPS OOO. Please refer to the NESHAP AAAA regulatory review below.

Federal National Emission Standards for Hazardous Air Pollutants (NESHAP)

The existing landfill, including the proposed expansion, will continue to be subject to the requirements contained in 40 CFR Part 63, Subpart AAAA – National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills. The landfill is subject to this subpart because it has a design capacity of 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 Mg per year of NMOC based on the annual LFG and VOC forecast completed for the site (See 40 CFR Part 63.1935(a)(3)).

Requirements under the NESHAP Subpart AAAA include compliance with NSPS Subpart WWW and Startup, Shutdown, and Malfunction (SSM) Plan requirements under 40 CFR Part 63.6. The facility will continue to comply with NESHAP Subpart AAAA requirements.

Reasonably Available Control Technology (RACT) – Additional RACT Requirements for Major Sources of NOx and VOCs (RACT III)

The Pennsylvania Environmental Quality Board promulgated the final RACT II regulation on November 12, 2022. This rule expands on the Reasonably Available Control Technology (RACT) regulations, including the establishment of numerical emission limits and presumptive RACT/RACT II requirements. It is codified under 25 Pa. Code 129.96 through 129.100. RACT is defined as the "lowest emission limitation that a particular source is capable of meeting by the application of control technology that is reasonably available considering technological and economic feasibility."

Pursuant to 129 Pa. Code §129.96, RACT III requirements only apply to facilities that meet either the definition of a "major NOx emitting facility" or a "major VOC emitting facility". CES is neither a major NOx emitting facility nor a major VOC emitting facility as those terms are defined in 25 Pa. Code §121.1, and is therefore not subject to the RACT III requirements.

Actual emissions are forecasted to decrease with the startup later this year and operation of a third-party renewable natural gas (RNG) facility which will take the majority of the LFG generated by the landfill.

Although CES holds a Title V Operating Permit and is a Title V facility as defined in 25 Pa. Code §121.1, its potential to emit NOx and VOCs is, and has been at all relevant times, less than the applicable "major" source thresholds set forth in the respective definitions; i.e., 100 tons per year of NOx, and 50 tons per year of VOC. Although all major NOx and VOC emitting facilities are defined as Title V facilities, the converse is not true.

EPA Mandatory Greenhouse Gas (GHG) Reporting Rule

The U.S. EPA published the final Mandatory Greenhouse Gas (GHG) Reporting Rule on October 30, 2009 in the Federal Register. The rule became effective on December 29, 2009. The annual reports are due by March 31st for the previous Reporting Year.

Rule applicability is based on source category and GHG emissions. Municipal solid waste landfills that generate methane (CH_4) in amounts equivalent to 25,000 metric tons (mt) of carbon dioxide (CO_2) equivalents (e) or more per year ($mtCO_2e/yr$) are subject to Subpart HH of the GHG Reporting Rule per 40 CFR Part 98.2(a)(1). Since the CH_4 generation rate is greater than 25,000 $mtCO_2e/yr$, CES is subject to the GHG Reporting Rule. Rule requirements require facility's to develop/maintain a GHG Monitoring Plan and submit an annual GHG Report using EPA's electronic Greenhouse Gas Reporting Tool (e-GGRT) software. The facility will continue to prepare and submit annual GHG Reports if actual emissions exceed 25,000 mtCO2e/yr.

Pennsylvania State Requirements

The existing landfill, including the proposed landfill expansion, will continue to be subject to standards and requirements under the PADEP's Rules and Regulations. This permit application has been submitted in order to comply with the plan approval requirements of 25 Pa. Code Chapter 127 of the State's rules. Applicability of the PSD and NNSR requirements of Chapter 127, Subchapters D and E, respectively, were discussed above.

The existing landfill and proposed expansion are subject to Best Available Technology (BAT) as referenced in 25 Pa. Code §127(a)(5). BAT is discussed in more detail below.

25 Pa. Code Chapter 123 specifies emission standards for contaminants and the following Subsections will continue to potentially apply to the existing landfill after the proposed expansion has been implemented:

- §123.21(b), limits SO_2 to 500 ppmv dry basis,
- §123.31, limits malodors,
- §123.41, limits visible emissions, and
- §123.1(c), limits fugitive emissions.

The estimated potential emissions for the existing landfill, including the proposed expansion, of PM and SO_2 are provided in the attached calculations. The potential emissions of PM and SO_2 are below the regulatory limits for each of these pollutants. Therefore, the existing landfill, after implementation of the proposed expansion, will continue to be in compliance with the limits specified by the above-cited rules.

The collected LFG from the existing landfill and proposed expansion will continue to be combusted to control malodorous air contaminants and NMOC in accordance with the requirements of 25 Pa. Code §123.31(a)(1). This can be accomplished by using the existing flares, although it is the Landfill's intention to continue to sell LFG to the third-party RNG plant thereby reducing emissions from the landfill. While an additional flare is not proposed as part of this expansion application, an additional flare will be permitted in the future to control the additional LFG volume associated with the landfill expansion. This additional flare will be permitted when actual LFG flows begin to approach the current control capacity; however, it is assumed that the RNG facility will continue to accept most of the generated LFG. The permitting and installation of an additional flare will be to strictly maintain 100% backup control capacity.

The existing landfill, including the proposed expansion, will continue to be operated in a manner to limit opacity emissions from the landfill's combustion sources to less than 20% for periods aggregating more than 3 minutes in any 1 hour, and less than 60% at any time.

25 Pa. Code §123.1(c) requires the person responsible for sources of fugitive emissions specified under the rule to take all reasonable actions to prevent particulate matter from becoming airborne.

The existing landfill, including the proposed expansion will continue to be operated in accordance with work practices that are currently used at the existing landfill to control fugitive particulate matter emissions.

Best Available Technology

The existing flares must meet the PADEP's "Special Requirements for Enclosed Flares" under the PADEP's document *Best Available Technology and Other Permitting Criteria for Municipal Solid Waste Landfills (June 5, 2009).* Because landfill gas generated by the facility is sold to

third-parties, the candlestick (open) flare is subject to the requirements of the PADEP's "Open Flare Policy for Beneficial Use of Landfill Gas" that pertain to open flares operated to support the beneficial use of landfill gas, including sale to any third parties.

The existing landfill and the proposed expansion will meet the Landfill Fugitive Emission Control Criteria of the BAT as set forth in Section C, Condition #023 of the Title V Operating Permit. Those conditions establish requirements for fugitive dust control measures. Other landfill fugitive emissions, including CH_4, NMOCs, VOCs, and HAPs, will continue to be collected and controlled by the facility's existing GCCS, including the wellfield, piping, flares, and/or third-parties.

No new flares are proposed as part of this project. While an additional flare is not proposed as part of this expansion application, an additional flare will be permitted in the future to control the additional LFG volume associated with the landfill expansion. This additional flare will be permitted when actual LFG flows begin to approach the current control capacity; however, it is assumed that the RNG facility will continue to accept most of the generated LFG. The permitting and installation of an additional flare will be to strictly maintain 100% backup control capacity. Future permitted flares will meet PADEP's BAT requirements at the time of permitting and installation.

Regulatory Review Summary Table

Regulatory Standard	Subject to Standard (Yes/No)	Comment
Title V	Yes	The facility currently operates as a major (Title V) source under Title V Operating Permit No. 54-00054.
NNSR	No	Projected Potential Emissions from the proposed expansion will be below the NNSR major source levels.
PSD	No	Projected Potential Emissions from the proposed expansion will be below the PSD major source levels.
NSPS	No	It is understood that CES's adherence to 40 CFR 63 (NESHAP AAAA) will be in lieu of performing similar provisions outlined in the NSPS 40 CFR 62 Subpart OOO and the landfill cannot return to the provisions outlined in NSPS OOO. Please refer to the NESHAP AAAA regulatory review below.
NESHAP	Yes	Facility is subject to 40 CFR Part 63 Subpart AAAA.
PADEP RACT III	No	Facility is neither a major NOx emitting facility nor a major VOC emitting facility.
EPA Mandatory GHG Reporting Rule	Yes	Facility is currently subject to annual GHG reporting requirements under the EPA Mandatory GHG Reporting Rule. The facility will continue to be subject after the proposed expansion has been implemented.
BAT	Yes	The existing landfill, including the proposed expansion, will continue to meet BAT for landfills, including requirements for enclosed flares, open flares, and landfill fugitives.
PA State Requirements	Yes	The existing landfill, including the proposed expansion, will continue to meet PA requirements under 25 Pa. Code Chapter 123 for PM, SO_2, malodors, fugitive emissions, and visible emissions.

ATTACHMENT B

EMISSION CALCULATIONS

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
Landfill Expansion Emissions Increases/Summary

Parameter	Expansion Emissions Increase [(1), (2), (3)]
LFG Generation (SCFM)	**7,188**
NOx	**33.99**
CO	**169.99**
PM	**14.46**
PM-10	**14.46**
PM-2.5	**14.46**
SOx	**166.96**
NMOC	**29.22**
VOC	**11.40**
Total HAPs	**13.37**
H_2S	**9.86**
Total Biogenic CO_2e	**180,710**
CH_4	**4,567**
Total Non-Biogenic CO_2e	**114,168**

Notes:

(1) Based on modeled current peak and expansion LFG generation rates.

(2) Current peak and expansion LFG generation rates compared to generate baseline levels (see LandGEM Model) for NNSR and PSD analysis.

(3) The above emission estimates assume no LFG is sent offsite to third-parties. It is assumed that the renewable natural gas (RNG) facility will continue to accept most of the generated LFG by the landfill; therefore, actual emissions are anticipated to be less.

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
Landfill Emissions - Current Peak LFG Flow/TPD

Emissions Type	Maximum Predicted Generation (SCFM)	Potential to Emit (tpy) for Current Landfill at Collection Efficiency of 90% [1]												
		NOx	CO	PM	PM-10	PM-2.5	SOx	NMOC	VOC	Total HAPs	H_2S [2]	Biogenic CO_2	CH_4	Total Non-Biogenic CO_2e [3]
Flared	9,163	48.18	240.81	20.45	20.45	20.45	236.61	6.31	2.45	11.78	--	243,962	987	24,682
Fugitive [4]	1,018	--	--	NA	NA	NA	--	35.03	13.66	7.22	13.97	12,026	5,482	137,050
Total [5]	**10,181**	**48.18**	**240.81**	**20.45**	**20.45**	**20.45**	**236.61**	**41.34**	**16.11**	**19.00**	**13.97**	**255,988**	**6,469**	**161,732**

Notes:

(1) Potential to Emit (PTE) Emissions calculated at tonnage of 4,750 TPD, LFG generation rate of 10,181 CFM. Includes existing landfill only.

(2) H_2S is a non-HAP, non-criteria pollutant subject to a New Source Performance Standard (NSPS) and emissions are included because they are greater than 0.5 tpy.

(3) Only CH_4 emissions are included in the total non-biogenic values. Total non-biogenic GHG emissions expressed in units of CO_2 equivalents (CO_2e), using the following global warming potential (GWP): 1 ton CH_4 = 25 tons CO_2e.

(4) Fugitive emissions are associated with the landfill and are based on the maximum LFG generation rate predicted by the LandGEM model.

(5) The above emission estimates assume no LFG is sent offsite to third-parties. It is assumed that the renewable natural gas (RNG) facility will continue to accept most of the generated LFG by the landfill; therefore, actual emissions are anticipated to be less.

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
Landfill Emissions - Expansion Peak Flow/TPD

Emissions Type	Maximum Predicted Generation (SCFM)	Potential to Emit (tpy) for Landfill Expansion at Collection Efficiency of 90% [1]												
		NOx	CO	PM	PM-10	PM-2.5	SOx	NMOC	VOC	Total HAPs	H_2S [2]	Biogenic CO_2	CH_4	Total Non-Biogenic CO_2e [3]
Flared	15,632.1	82.17	410.80	34.91	34.91	34.91	403.57	10.77	4.20	20.06	--	416,183	1,684	42,100
Fugitive [4]	1,736.9	--	--	NA	NA	NA	--	59.76	23.31	12.31	23.83	20,515	9,352	233,800
Total [5]	**17,369**	**82.17**	**410.80**	**34.91**	**34.91**	**34.91**	**403.57**	**70.53**	**27.51**	**32.37**	**23.83**	**436,698**	**11,036**	**275,900**

Notes:

(1) Potential to Emit (PTE) Emissions calculated at tonnage of 4,750 TPD, LFG generation rate of 17,369 CFM, and a conservative site-specific sulfur concentration. Includes existing landfill and expansion.

(2) H_2S is a non-HAP, non-criteria pollutant subject to a New Source Performance Standard (NSPS) and emissions are included because they are greater than 0.5 tpy.

(3) Only CH_4 emissions are included in the total non-biogenic values. Total non-biogenic GHG emissions expressed in units of CO_2 equivalents (CO_2e), using the following global warming potential (GWP): 1 ton CH_4 = 25 tons CO_2e.

(4) Fugitive emissions are associated with the landfill and are based on the maximum LFG generation rate predicted by the LandGEM model.

(5) The above emission estimates assume no LFG is sent offsite to third-parties. It is assumed that the renewable natural gas (RNG) facility will continue to accept most of the generated LFG by the landfill; therefore, actual emissions are anticipated to be less.

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
NNSR & PSD Anaylsis

Parameter	PTE at Current Site Conditions		Expansion PTE Max Flow [1], [2]	Expansion Emissions Increase [3]	PSD [7]					NNSR				
	Current Max Flow [1]	2023 Actuals			Major Source Level	Current Major Source? [4]	Is Expansion Major? [5]	Significant Emissions Increase Level [6]	Potential Increase Allowed [6]	Major Source Level	Current Major Source? [4]	Is Expansion Major? [5]	Significant Emissions Increase Level [6]	Potential Increase Allowed [6]
LFG Generation (SCFM)	10,181.25	7,624.24	**17,369**	**7,188**	--	--	--	--	--	--	--	--	--	--
NOx	48.18	19.45	**82.17**	**33.99**	250	NO	NO	40	250	100	NO	NO	40	100
CO	240.81	97.26	**410.80**	**169.99**	250	NO	NO	100	250	--	--	--	--	--
PM	20.45	8.26	**34.91**	**14.46**	250	NO	NO	25	250	--	--	--	--	--
PM-10	20.45	8.26	**34.91**	**14.46**	250	NO	NO	15	250	--	--	--	--	--
PM-2.5	20.45	8.26	**34.91**	**14.46**	250	NO	NO	10	250	--	--	--	--	--
SOx	236.61	222.40	**403.57**	**166.96**	250	NO	NO	40	250	--	--	--	--	--
NMOC	41.31	89.79	**70.53**	**29.22**	--	--	--	--	--	--	--	--	--	--
VOC	16.11	35.02	**27.51**	**11.40**	--	--	--	--	--	50	NO	NO	40	50

Notes:
(1) Based on modeled current peak and expansion LFG generation rates.
(2) Before any limits on LFG combusted in onsite flares.
(3) Current peak and expansion LFG generation rates compared to generate conservative baseline levels (see LandGEM Model) for NNSR and PSD analysis.
(4) Based on if current peak LFG at 4,750 TPD triggers applicable Major Source Level.
(5) Based on if landfill expansion emissions increase triggers levels over applicable Potential Increase Allowed.
(6) Based on if current peak flow/TPD triggers applicable Major Source Level. If current peak flow/TPD is at Major Source Level, use applicable Significant Emissions Increase Level. Otherwise, use Potential Increase Allowed.
(7) Greenhouse gas (GHG) emissions not included in above anaylsis since GHG emissions alone do not trigger PSD, per EPA.

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
Fugitive VOC Emissions

Landfill fugitive NMOC/VOC emission factor based on the AP-42 default NMOC concentration of 595 ppmv as hexane.

Concentration of NMOC, C_{NMOC} =	595	ppm_v	
Landfill Gas (LFG) Fugitive Throughput (10% of total LFG Generated = 10% x 17,369 SCFM	1,736.9	SCFM	10% of total LFG flow model
Landfill Gas (LFG) Fugitive Throughput (10% of total LFG Generated) =			
1,736.9 SCF/min x 60 min/hr x 8,760 hr/yr x 1 MMSCF/1E06 SCF =	912.91	MMSCF/yr	

Using Equations 3, 4, and 10 from AP-42 Section 2.4:

$UM_{NMOC} = C_{NMOC}$ x LFG Throughput (MMSCF/yr) x 1E6 SCF/1 MMSCF x MW_{NMOC} (g/gmol) x 1 atm / [(8.205 x10^{-5} m^3-atm/gmol-K)(453.6 g/lb)(273 + T K)] x m^3/35.315 CF

where Molecular weight of NMOC, MW_{NMOC} =	86.18	g/gmol	
Temperature of LFG, T =	25	°C	
UM_{NMOC} =	119,515.52	lb/yr	
	59.76	tons/yr	

39% of NMOCs are VOC, per AP-42 Section 2.4.

Concentration of VOCs, C_{VOC} =	232.05	ppm_v	
where UM_{VOC} = 39% x UM_{NMOC}			

Fugitive VOCs =	**23.31**	**tons/yr**

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
Fugitive H_2S Emissions

Landfill fugitive H_2S emission factor based on a site-specific H_2S concentration of 600 ppm_v. [1]

Concentration of H_2S, C_{H2S} =	600	ppm_v
Landfill Gas (LFG) Fugitive Throughput (10% of total LFG Generated = 10% x 17,369 SCFM	1,736.9	SCFM [2]
Landfill Gas (LFG) Fugitive Throughput (10% of total LFG Generated) = 1,737 SCF/min x 60 min/hr x 8,760 hr/yr x 1 MMSCF/1E06 SCF =	912.91	MMSCF/yr

Using Equations 3 and 4 from AP-42 Section 2.4:
Assume

$UM_{H2S} = C_{H2S}$ x LFG Throughput (MMSCF/yr) x 1E6 SCF/1 MMSCF x MW_{H2S} (g/gmol) x 1 atm / [(8.205 x10^{-5} m^3-atm/gmol-K)(453.6 g/lb)(273 + T K)] x m^3/35.315 CF

where	Molecular weight of H_2S, MW_{H2S} =	34.08	g/gmol
	Temperature of LFG, T =	25	°C
	UM_{H2S} =	47,659.74	lb/yr
		23.83	tons/yr

Fugitive H_2S =	**23.83**	**tons/yr**

Notes:

(1) Site-specific H_2S concentration based on highest allowable concentration. Landfill gas (LFG) treatment is currently utilized to bring treated H_2S concentrations <600 PPM.
(2) 90% of the total LFG generated is captured and routed to a control device, the remaining 10% is released as fugitive emissions.

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
Fugitive GHG (CO_2 and CH_4) Emissions

Landfill Gas (LFG) Fugitive Throughput (10% of total LFG Generated = 10% x 17,369 SCFM	1,736.9	SCFM
Landfill Gas (LFG) Fugitive Throughput (10% of total LFG Generated) = 1,736.9 SCF/min x 60 min/hr x 8,760 hr/yr x 1 MMSCF/1E06 SCF =	912.91	MMSCF/yr
50% of LFG is methane (CH_4)	456.46	MMSCF/yr
40% of LFG is CO_2	365.16	MMSCF/yr

Using Equations 3, 4, and 10 from AP-42 Section 2.4:

UM_{CH4} = CH_4 Throughput (MMSCF/yr) x 1E6 SCF/1 MMSCF x MW_{CH4} (g/gmol) x 1 atm / [(8.205 x10^{-5} m^3-atm/gmol-K)(453.6 g/lb)(273 + T K)] x m^3/35.315 CF

UM_{CO2} = CO_2 Throughput (MMSCF/yr) x 1E6 SCF/1 MMSCF x MW_{CO2} (g/gmol) x 1 atm / [(8.205 x10^{-5} m^3-atm/gmol-K)(453.6 g/lb)(273 + T K)] x m^3/35.315 CF

where	Molecular weight of CH_4, MW_{CH4} =	16.05	g/gmol	
	Molecular weight of CO_2, MW_{CO2} =	44.01	g/gmol	
	Temperature of LFG, T =	25	°C	
	UM_{CH4} =	18,704,696	lb/yr	
		9,352	tons/yr	
	UM_{CO2} =	41,030,562	lb/yr	(Biogenic CO_2)
		20,515	tons/yr	(Biogenic CO_2)

GHG emissions can be converted to carbon dioxide equivalents (CO_2e) using the following Global Warming Potentials (GWP): CO_2 = 1 and CH_4 = 25.

Total Fugitive Non-Biogenic CO_2e	**233,800**	**tons/yr**

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
Fugitive HAP Emissions

Fugitive Throughput = 912.91 MMSCF/yr [1]

CAS No.	Hazardous Air Pollutant (HAP) [2]	MW (g/mol) [3]	C_P (ppmv) [3]	Fugitive HAP Emissions (tons/yr) [4]
71-55-6	1,1,1-Trichloroethane (Methyl chloroform)	133.41	0.48	0.075
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1.11	0.217
75-34-3	1,1-Dichloroethane	98.97	2.35	0.271
75-35-4	1,1-Dichloroethene (Vinylidine chloride)	96.94	0.20	0.023
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	98.96	0.41	0.047
78-87-5	1,2-Dichloropropane (Propylene dichloride)	112.99	0.18	0.024
107-13-1	Acrylonitrile	53.06	6.33	0.391
71-43-2	Benzene	78	1.91	0.174
75-15-0	Carbon disulfide	76.13	0.58	0.051
56-23-5	Carbon tetrachloride	153.84	0.004	0.001
463-58-1	Carbonyl sulfide (Carbon oxysulfide)	60.07	0.49	0.034
108-90-7	Chlorobenzene	112.56	0.25	0.033
75-00-3	Chloroethane (Ethyl chloride)	64.52	1.25	0.094
67-66-3	Chloroform	119.39	0.03	0.004
75-09-2	Dichloromethane (Methylene chloride)	84.94	14.3	1.415
100-41-4	Ethylbenzene	106.16	4.61	0.570
110-54-3	Hexane	86.18	6.57	0.660
7439-97-6	Mercury (total)	200.61	2.92E-04	0.000
108-10-1	Methyl isobutyl ketone	100.16	7.09	0.827
127-18-4	Perchloroethylene (Tetrachloroethylene)	165.83	3.73	0.721
108-88-3	Toluene	92.13	39.3	4.218
79-01-6	Trichloroethylene	131.4	2.82	0.432
75-01-4	Vinyl Chloride	62.5	7.34	0.534
1330-20-7	Xylenes	106.16	12.1	1.496
	Total Fugitive HAPs			**12.31**

Notes:
(1) 90% of the total LFG generated is captured and routed to a control device, the remaining 10% is released as fugitive emissions.
(2) No HCl emissions are found in the fugitive LFG emissions. HCl emissions are only expected to result from the combustion of LFG in the control devices (i.e., flares), in which the Cl- compounds are converted to HCl during the combustion reaction.
(3) Molecular weights and concentrations obtained from AP-42 Tables 2.4-1 and 2.4-2 (Rev 11/98).
(4) Emissions calculated using equations 3 and 4 from AP-42 Section 2.4 (Rev 11/98).

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
Flared Emissions [1]

Maximum Predicted LFG Generation:	**17,369**	**SCFM**
Maximum LFG Flow to Flares:	**15,632.1**	**SCFM**
Methane content:	**50**	**%**
LFG Heating value:	**500**	**BTU/SCF**

Pollutant	Emission Factor			Potential to Emit - Maximum Flow	
	(lb/MMDSCF CH_4)	(lb/MMSCF)	(lb/MMBTU)	(lb/hr)	(tons/yr)
NOx [2]	--	20	--	18.76	82.17
CO [2]	--	100	--	93.79	410.80
PM [3]	17	8.5	--	7.97	34.91
PM-10	17	8.5	--	7.97	34.91
PM-2.5	17	8.5	--	7.97	34.91
SOx [4]	--	98.24	--	92.14	403.57
NMOC [5]	--	2.62	--	2.46	10.77
VOC [6]	--	1.02	--	0.96	4.20
HCl [7]	--	4.61	--	4.32	18.92
Total HAPs [8]	--	4.88	--	4.58	20.06
Biogenic CO_2 [9]	--	101,308	--	95,019	416,183
CH_4 [9]	--	410	--	384.55	1,684
Total Non-Biogenic CO_2e [10]	--	--	--	9,614	42,100

Notes:

(1) Facility-wide max LFG generation estimated to be 17,369 CFM at 4,750 TPD. 90% of this amount will be collected and combusted.

(2) NOx and CO emission factors are based on manufacturer's data for the enclosed flares operated at the landfill. Use a typical heating value of 500 BTU/SCF. Worst-case flare emission factor used to be conservative.

(3) PM emission factor obtained from U.S. EPA AP-42 Section 2.4 Table 2.4-5 (Rev 11/98) for an enclosed flare. The same emission factor may be used to estimate emissions of PM, PM-10, and PM-2.5 per footnote b to Table 2.4-5. Use 50% methane (CH_4) in LFG.

(4) Emission factor for SOx calculated using a site-specific sulfur compound concentration of 600 ppmv (based on highest allowable concentration; LFG treatment is currently utilized to bring treated H_2S concentrations <600 PPM), and then increased by a 50% safety factor to accommodate any potential future increase in H_2S concentration) and Equations (3), (4), and (7) from AP-42 Section 2.4.

(5) Emission factors for NMOC calculated using a default concentration of 595 ppmv and Equations (3), (4) and (10) from AP-42 Section 2.4 to be conservative.

(6) Emission factor for VOC calculated using 39% of NMOC are VOC, per AP-42 Section 2.4 to be conservative.

(7) Emission factors for HCl calculated using Equations (3), (4), (9), and (10) from AP-42 Section 2.4. Emission factor increased by a 20% safety factor to account for fluctuations in the concentration of chlorinated compounds in the LFG.

(8) Emission factors for landfill HAPs calculated using Equations (3), (4), and (5) from AP-42 Section 2.4. Total HAPs include HCl. Emission factor increased by a 20% safety factor to account for fluctuations in the concentration of chlorinated compounds in the LFG.

(9) Emission factors for CO_2 and CH_4 calculated using AP-42 Section 2.4 Equations (3), (4), and (5). No other Greenhouse Gas (GHG) emissions are expected from combustion of landfill gas in the flare, per AP-42 Section 2.4.

(10) GHG emissions converted to carbon dioxide equivalents (CO_2e) using the following Global Warming Potentials (GWP): CO_2 = 1 and CH_4 = 25.

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
HAPs and HCl Emission Factors for Flares

LFG Throughput [(1)] = 17,369 SCFM
LFG Throughput to flares = 15,632.1 SCFM
26,559 m^3/hr
50% of the LFG is methane (CH_4), then Q_{CH4} = 13,280 m^3/hr

CAS No.	HAZARDOUS AIR POLLUTANT (HAP)	MW	C_P (ppmv) [(2)]	AP-42 Control Efficiency (%)	Q_P (m^3/hr)	UM_P (kg/hr)	CM_P (kg/hr)	CM_P (lb/hr)	EF (lb/MMSCF) [(3)]
71-55-6	1,1,1-Trichloroethane (Methyl chloroform)	133.41	0.48	98.0	0.01	0.07	0.00	0.00	0.003
79-34-5	1,1,2,2-Tetrachloroethane	167.85	1.11	98.0	0.03	0.20	0.00	0.01	0.010
75-34-3	1,1-Dichloroethane	98.97	2.35	98.0	0.06	0.25	0.01	0.01	0.012
75-35-4	1,1-Dichloroethene (Vinylidine chloride)	96.94	0.20	98.0	0.01	0.02	0.00	0.00	0.001
107-06-2	1,2-Dichloroethane (Ethylene dichloride)	98.96	0.41	98.0	0.01	0.04	0.00	0.00	0.002
78-87-5	1,2-Dichloropropane (Propylene dichloride)	112.99	0.18	98.0	0.00	0.02	0.00	0.00	0.001
107-13-1	Acrylonitrile	53.06	6.33	99.7	0.17	0.36	0.00	0.00	0.003
71-43-2	Benzene	78	1.91	99.7	0.05	0.16	0.00	0.00	0.001
75-15-0	Carbon disulfide	76.13	0.58	99.7	0.02	0.05	0.00	0.00	0.000
56-23-5	Carbon tetrachloride	153.84	0.004	98.0	0.00	0.00	0.00	0.00	0.000
463-58-1	Carbonyl sulfide (Carbon oxysulfide)	60.07	0.49	99.7	0.01	0.03	0.00	0.00	0.000
108-90-7	Chlorobenzene	112.56	0.25	98.0	0.01	0.03	0.00	0.00	0.001
75-00-3	Chloroethane (Ethyl chloride)	64.52	1.25	98.0	0.03	0.09	0.00	0.00	0.004
67-66-3	Chloroform	119.39	0.03	98.0	0.00	0.00	0.00	0.00	0.000
75-09-2	Dichloromethane (Methylene chloride)	84.94	14.3	98.0	0.38	1.32	0.03	0.06	0.062
100-41-4	Ethylbenzene	106.16	4.61	99.7	0.12	0.53	0.00	0.00	0.004
110-54-3	Hexane	86.18	6.57	99.7	0.17	0.62	0.00	0.00	0.004
7439-97-6	Mercury (total)	200.61	2.92E-04	0.0	0.00	0.00	0.00	0.00	0.000
108-10-1	Methyl isobutyl ketone	100.16	7.09	99.7	0.19	0.77	0.00	0.01	0.005
127-18-4	Perchloroethylene (Tetrachloroethylene)	165.83	3.73	98.0	0.10	0.67	0.01	0.03	0.032
108-88-3	Toluene	92.13	39.3	99.7	1.04	3.93	0.01	0.03	0.028
79-01-6	Trichloroethylene	131.4	2.82	98.0	0.07	0.40	0.01	0.02	0.019
75-01-4	Vinyl Chloride	62.5	7.34	98.0	0.19	0.50	0.01	0.02	0.023
1330-20-7	Xylenes	106.16	12.1	99.7	0.32	1.40	0.00	0.01	0.010

Total HAP Emission Factor (excluding HCl), lb/MMSCF	**0.23**

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
HCl Emission Factor Calculation for Flares

LFG Throughput [1] =	17,369	SCFM
LFG Throughput to flares =	15,632.1	SCFM
	26,559	m^3/hr
50% of the LFG is methane (CH_4), then Q_{CH4} =	13,280	m^3/hr

Concentration of total Chloride Compounds (AP-42 Eqn (9))

Total concentration of chloride-containing HAPs, C_{Cl} [4] =	42.0	ppmv

Estimated Emission Rate of HCl (AP-42 Eqn (3) [5]

Concentration of Methane, C_{CH4} =	0.50	Use multiplication factor of 2 (50% methane) instead of 1.82 (55% methane)
$Q_{Cl} = 1/C_{CH4} \times Q_{CH4} \times C_{Cl} / 1x10^6$, in m^3/hr =	1.116	m^3/hr

Uncontrolled Mass Emissions of HCl (AP-42 Eqn (4))

$UM_{Cl} = Q_{Cl} \times [(MW_{Cl} \times 1 \text{ atm})/(8.205 \times 10^{-5} \text{ m3-atm/gmol-K})(1000 \text{ g/kg})(273 + T \text{ K})]$

where	Molecular weight of Cl, MW_{Cl} =	35.5	g/gmol
	Temperature of LFG, T =	25	°C
	UM_{Cl} =	1.620	kg/hr

Controlled Mass Emissions of HCl (AP-42 Eqn (10))

$CM_{HCl} = UM_{Cl} \times 1.03 \times (\eta cnt/100)$ =

Collection efficiency already accounted for in adjusted throughput above.

1.03 = Ratio of molecular weight of HCl to molecular weight of Cl^-

ηcnt = control efficiency of the LFG control flares =	98	% destruction efficiency for NMOCs
CM_{HCl} =	1.635	kg/hr
	3.605	lbs/hr

HCl emission factor:	**3.84**	**lb/MMSCF**

Total HAP Emission Factor (including HCl), lb/MMSCF [6]	**4.07**

Notes:

(1) Facility-wide max LFG generation estimated by LandGEM to be 17,369 SCFM. Assume 90% of this amount will be collected and combusted.
(2) Concentrations published in AP-42 Section 2.4 Table 2.4-1 (Rev 11/98).
(3) HAP emission factors calculated using Equations (3), (4), and (5) from AP-42 Section 2.4 Table 2.4-1 (Rev 11/98).
(4) Used the default value of 42.0 ppmv from AP-42 Section 2.4 since it is more conservative than site-specific data.
(5) HCl emission factor calculated using Equations (3), (4), (9) and (10) from AP-42 Section 2.4 Table 2.4-1 (Rev 11/98).
(6) Total HAPs include HAPs plus HCl.

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
NMOC and VOC Emission Factors for Flares

LFG Throughput (Assume 90% of this amount will be collected and combusted) =	17,369	SCFM
	29,510	m^3/hr
50% of the LFG is methane (CH_4), then Q_{CH4} =	14,755	m^3/hr
Concentration of NMOC, C_{NMOC} =	595	ppm_v
39% of NMOCs are VOC, per AP-42 Section 2.4.		
Concentration of VOCs, C_{VOC} =	232	ppm_v
C_{CH4} =	0.50	
Using Equation 3 from AP-42 Section 2.4:		
$Q_{NMOC} = Q_{CH4} \times C_{NMOC}/(C_{CH4} \times 1x10^6)$, in m^3/hr =	17.558	m^3/hr
$Q_{VOC} = Q_{CH4} \times C_{VOC}/(C_{CH4} \times 1x10^6)$, in m^3/hr =	6.846	m^3/hr

Uncontrolled Mass Emissions of NMOC (AP-42 Eqn (4))

$UM_{NMOC} = Q_{NMOC} \times [(MW_{NMOC} \times 1 \text{ atm})/(8.205 \times 10^{-5} \text{ m}^3\text{-atm/gmol-K})(1000 \text{ g/kg})(273 + T \text{ K})]$

where Molecular weight of NMOC, MW_{NMOC} =	86.18	g/gmol
Temperature of LFG, T =	25	°C
UM_{NMOC} =	61.885	kg/hr

Controlled Mass Emissions of NMOC (AP-42 Eqn (10))

$CM_{NMOC} = UM_{NMOC} \times$ ŋcol/100 x (1 - ŋcnt/100) =

ŋcol = NMOC collection efficiency =	90	% collection efficiency of the GCCS
ŋcnt = NMOC control efficiency of a flare =	98	% destruction efficiency for NMOCs
CM_{NMOC} =	1.114	kg/hr
CM_{NMOC} =	2.456	lb/hr
Maximum LFG throughput to the flare =	15,632.1	SCFM
NMOC Emission Factor:	**2.62**	**lbs/MMSCF**

Uncontrolled Mass Emissions of VOC (AP-42 Eqn (4))

$UM_{VOC} = Q_{VOC} \times [(MW_{VOC} \times 1 \text{ atm})/(8.205 \times 10^{-5} \text{ m3-atm/gmol-K})(1{,}000 \text{ g/kg})(273 + T \text{ K})]$

where Molecular weight of VOC, MW_{VOC} =	86.18	g/gmol
Temperature of LFG, T =	25	°C
UM_{VOC} =	24.130	kg/hr

Controlled Mass Emissions of VOC (AP-42 Eqn (10))

$CM_{VOC} = UM_{VOC} \times$ ŋcol/100 x (1 - ŋcnt/100) =

ŋcol = VOC collection efficiency =	90	% collection efficiency of the GCCS
ŋcnt = VOC control efficiency of a flare =	98	% destruction efficiency
CM_{VOC} =	0.434	kg/hr
CM_{VOC} =	0.957	lb/hr
Maximum LFG throughput to the flare =	15,632	SCFM
VOC Emission Factor:	**1.02**	**lbs/MMSCF**

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
SOx Emission Factor for Flares using Site-Specific Sulfur Concentration

SOx Emission Factor calculated using US EPA AP-42 Section 2.4 Equations (3), (4), and (7) (Rev 11/98).

Equation (3) **Estimate emission rate of Pollutant, P**

Let P = S (sulfur)

$Q_S = 1/C_{CH4} * Q_{CH4} * C_S/(1x10^6)$

Where Q_S = Emission rate of Pollutant, S, in m^3/hr

C_{CH4} = Methane Content of Landfill Gas (LFG) (0.50 or 50%) [1] = 1/Multiplication Factor [2]

2 = Multiplication Factor (50% Methane, 1/0.50 = 2)

Q_{CH4} = CH_4 Generation Rate in m^3/hr

C_S = Concentration of sulfur in LFG in ppm_v

Let C_S =	600	ppm_v	Site-specific data [4]
LFG Flowrate =	17,369	SCFM	Facility-wide maximum LFG Generation predicted by LandGEM at 4,750 tpd
Let Q_{CH4} =	14,755	m^3/hr	50% of the LFG is methane

Therefore, Q_S = 2 * 14,755 m^3/hr x 600/1,000,000

17.706 m^3/hr

Equation (4) **Estimate Uncontrolled mass emissions of Pollutant**

$UM_S = Q_S * [(MW_S \times 1\ atm)/(8.205 \times 10^{-5}\ m^3\text{-atm/gmol-K})(1{,}000\ g/kg)(273 + T\ K)]$

Where Molecular weight of S, MW_S =	32.06	g/gmol
Temperature of LFG, T =	25	°C
Therefore, UM_S =	23.216	kg/hr
	51.191	lb/hr

Equation (7) **Estimate Controlled SO_2 emissions [3]**

$CM_{SO2} = UM_S \times ŋcol/100 \times 2.0$

Where CM_{SO2} = Controlled mass emissions of SO_2, lb/hr

UM_S = Uncontrolled mass emissions of sulfur compounds, lb/hr

ŋcol = collection efficiency of GCCS, % = 90

2.0 = Ratio of MW_{SO2} to MW_S

All S present in the LFG will be oxidized to SO_2; i.e., SOx emission factor comprised 100% of SO_2

Therefore, CM_{SO2} =	92.14	lb/hr
Maximum LFG throughput to the flare =	15,632.1	SCFM
SOx emission factor =	**98.24**	**lb/MMSCF**

Notes:

(1) Use an average methane content of 50% in LFG.

(2) Proposed revision to AP-42 Section 2.4 does not propose changes to Eqn (4) or (7); however Eqn (3) changes to divide by the fraction of methane in landfill gas with a default multiplication factor of 2 (based on 50% methane) instead of using a default multiplication factor of 1.82 (based on 55% methane). Since 50% methane content of LFG is used for this site; a multiplication factor of 2 instead of 1.82 has been applied to the above calculations.

(3) Use a collection efficiency of 90%.

(4) Site-specific H_2S concentration based on highest allowable concentration. Landfill gas (LFG) treatment is currently utilized to bring treated H_2S concentrations <600 PPM.

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
CO_2 Emission Factor for Flares

Estimate CO_2 in landfill gas emitted from flare.

CO_2 Emission Factor calculated using US EPA AP-42 Section 2.4 Equations (3), (4), and (6) (Rev 11/98).

Equation (3) **Estimate emission rate of Pollutant, P**

Let P = CO_2 (Carbon Dioxide)

$Q_{CO2} = 1/C_{CH4} * Q_{CH4} * C_{CO2}/(1x10^6)$

Where Q_{CO2} = Emission rate of Pollutant, carbon dioxide, in m^3/hr

C_{CH4} = Methane Content of Landfill Gas (LFG) (0.50 or 50%) [(1)] = 1/Multiplication Factor [(2)]

2 = Multiplication Factor (50% Methane, 1/0.50 = 2)

Q_{CH4} = CH_4 Generation Rate in m^3/hr

C_{CO2} = Concentration of carbon dioxide in LFG in ppm_v

Let C_{CO2} =	400,000 ppm_v	Typical CO_2 concentration in LFG = 40% or 400,000 ppm
LFG Flowrate =	17,369 SCFM	(Assume 90% of this amount will be collected and combusted)
Let Q_{CH4} =	14,755 m^3/hr	50% of the LFG is methane

Therefore, Q_{CO2} = 2 *14,755 m^3/hr x 400,000/1,000,000

11,804.0 m^3/hr

Equation (4) **Estimate Uncontrolled mass emissions of Pollutant**

$UM_{CO2} = Q_{CO2} * [(MW_{CO2} x 1 atm)/(8.205 x10^{-5} m3\text{-}atm/gmol\text{-}K)(1000 g/kg)(273 + T K)]$

Where Molecular weight of CO_2, MW_{CO2} =	44.01	g/gmol
Temperature of LFG, T =	25	°C
Therefore, UM_{CO2} =	21,246	kg/hr
	46,847	lb/hr

Equation (6) **Estimate Controlled CO_2 emissions [(3)]**

$CM_{CO2} = 0.9(UM_{CO2}) + (UM_{CH4} x ŋcol/100 x 2.75)$

Where CM_{CO2} = Controlled mass emissions of CO_2, lb/hr

UM_{CO2} = Uncontrolled mass emissions of CO_2, lb/hr

UM_{CH4} = Uncontrolled mass emissions of CH_4, lb/hr

ŋcol = collection efficiency of GCCS, % = 90

2.75 = Ratio of MW_{CO2} to MW_{CH4}

Use a typical LFG concentration of 50% CH_4 and 40% CO_2.

Where UM_{CH4} =	21,356.40	lb/hr
Therefore, CM_{CO2} =	95,019	lb/hr
Maximum LFG throughput to flare =	15,632.1	SCFM
CO_2 emission factor =	**101,308**	**lb/MMSCF**

Notes:

(1) Use an average methane content of 50% in LFG.

(2) Proposed revision to AP-42 Section 2.4 does not propose changes to Eqn (4) or (7); however Eqn (3) changes to divide by the fraction of methane in landfill gas with a default multiplication factor of 2 (based on 50% methane) instead of using a default multiplication factor of 1.82 (based on 55% methane). Since 50% methane content of LFG is used for this site; a multiplication factor of 2 instead of 1.82 has been applied to the above calculations.

(3) Use a collection efficiency of 90%.

Commonwealth Environmental Systems, L.P. (CES) Landfill
Plan Approval Application - Landfill Expansion
Attachment B - Emission Calculations
CH_4 Emission Factor for Flares

CH_4 Emission Factor calculated using US EPA AP-42 Section 2.4 Equations (3), (4), and (5) (Rev 11/98).

Equation (3) **Estimate emission rate of Pollutant, P**

Let P = CH_4 (Methane)

$Q_{CH4} = 1/C_{CH4} * Q_{CH4} * C_{CH4}/(1x10^6)$

Where Q_{CH4} = Emission rate of Pollutant, $_{Methane}$, in m^3/hr

C_{CH4} = Methane Content of Landfill Gas (LFG) (0.50 or 50%) [(1)] = 1/Multiplication Factor [(2)]

2 = Multiplication Factor (50% Methane, 1/0.50 = 2)

Q_{CH4} = CH_4 Generation Rate in m^3/hr

C_{CH4} = Concentration of methane in LFG in ppm_v

Let C_{CH4} =	500,000 ppm_v	Typical CH_4 concentration in LFG = 50% or 500,000 ppm_v
LFG Flowrate =	17,369 SCFM	(Assume 90% of this amount will be collected and combusted)
Let Q_{CH4} =	14,755 m^3/hr	50% of the LFG is methane

Therefore, Q_{CH4} = 2 *14,755 m^3/hr x 500,000/1,000,000

14,755 m^3/hr

Equation (4) **Estimate Uncontrolled mass emissions of Pollutant**

$UM_{CH4} = Q_{CH4} * [(MW_{CH4} \times 1\ atm)/(8.205 \times 10^{-5}\ m^3\text{-atm/gmol-K})(1000\ g/kg)(273 + T\ K)]$

Where Molecular weight of CH_4, MW_{CH4} =	16.05	g/gmol
Temperature of LFG, T =	25	°C
Therefore, UM_{CH4} =	9,685.44	kg/hr
	21,356.40	lb/hr

Equation (5) **Estimate Controlled CH_4 emissions [(3)]**

$CM_{CH4} = [UM_{CH4} \times ŋcol/100 \times (1 - ŋcnt/100)]$ =

Where ŋcnt = Control efficiency, %, =	98	% flare control efficiency for total hydrocarbons
ŋcol = Collection efficiency of GCCS, % =	90	

CM_{CH4} = Controlled mass emissions of CH_4, lb/hr

UM_{CH4} = Uncontrolled mass emissions of CH_4 , lb/hr

Therefore, CM_{CH4} =	174.34	kg/hr
	384.42	lb/hr
Maximum LFG throughput to flare =	15,632.1	SCFM

CH_4 emission factor =	**410 lb/MMSCF**

Notes:

(1) Use an average methane content of 50% in LFG.

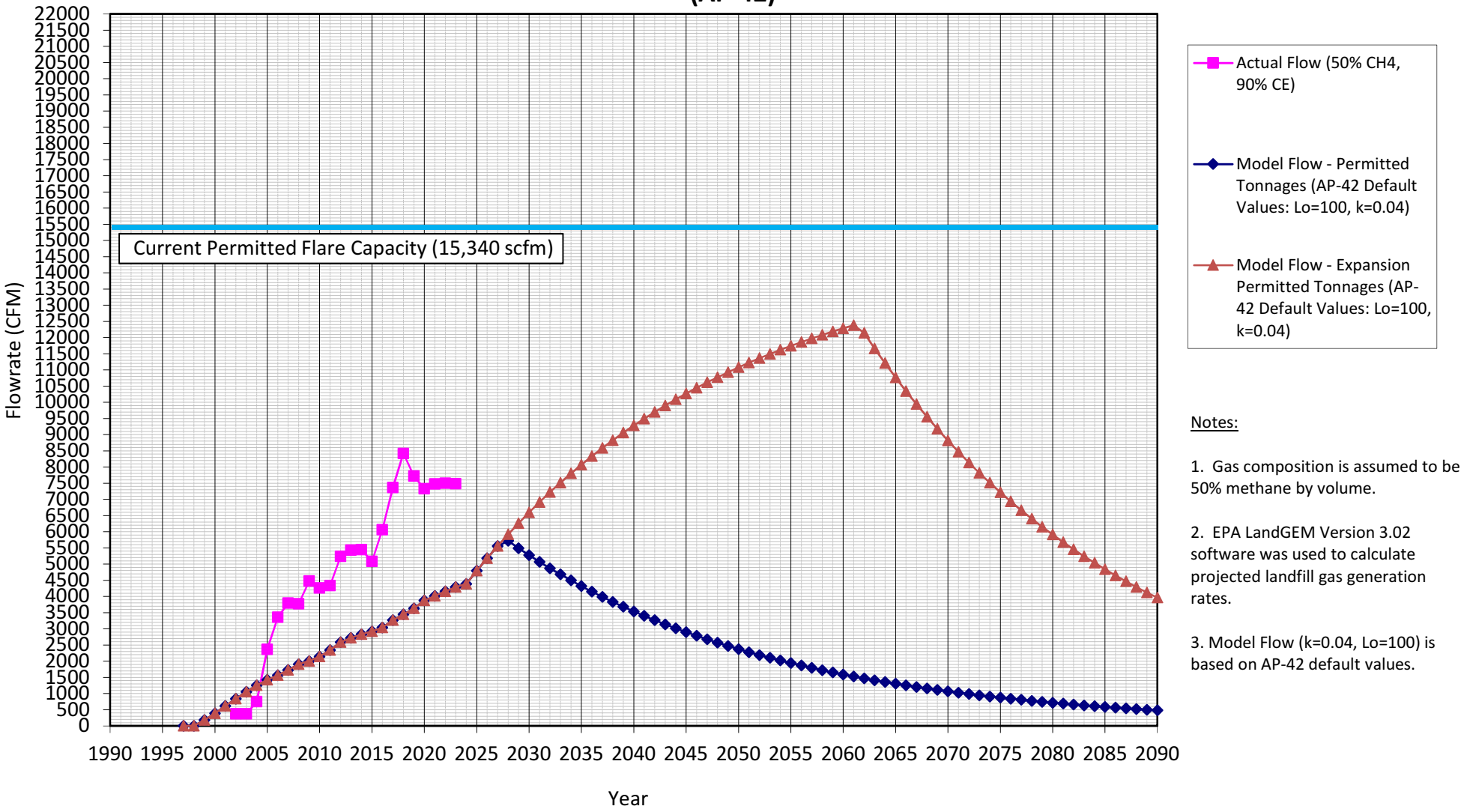
(2) Proposed revision to AP-42 Section 2.4 does not propose changes to Eqn (4) or (7); however Eqn (3) changes to divide by the fraction of methane in landfill gas with a default multiplication factor of 2 (based on 50% methane) instead of using a default multiplication factor of 1.82 (based on 55% methane). Since 50% methane content of LFG is used for this site; a multiplication factor of 2 instead of 1.82 has been applied to the above calculations.

(3) Use a collection efficiency of 90%.

ATTACHMENT C

U.S. EPA LANDGEM MODEL

Figure 1
CES Landfill - Maximum Expansion Projected Gas Generation Collection Rates
(AP-42)



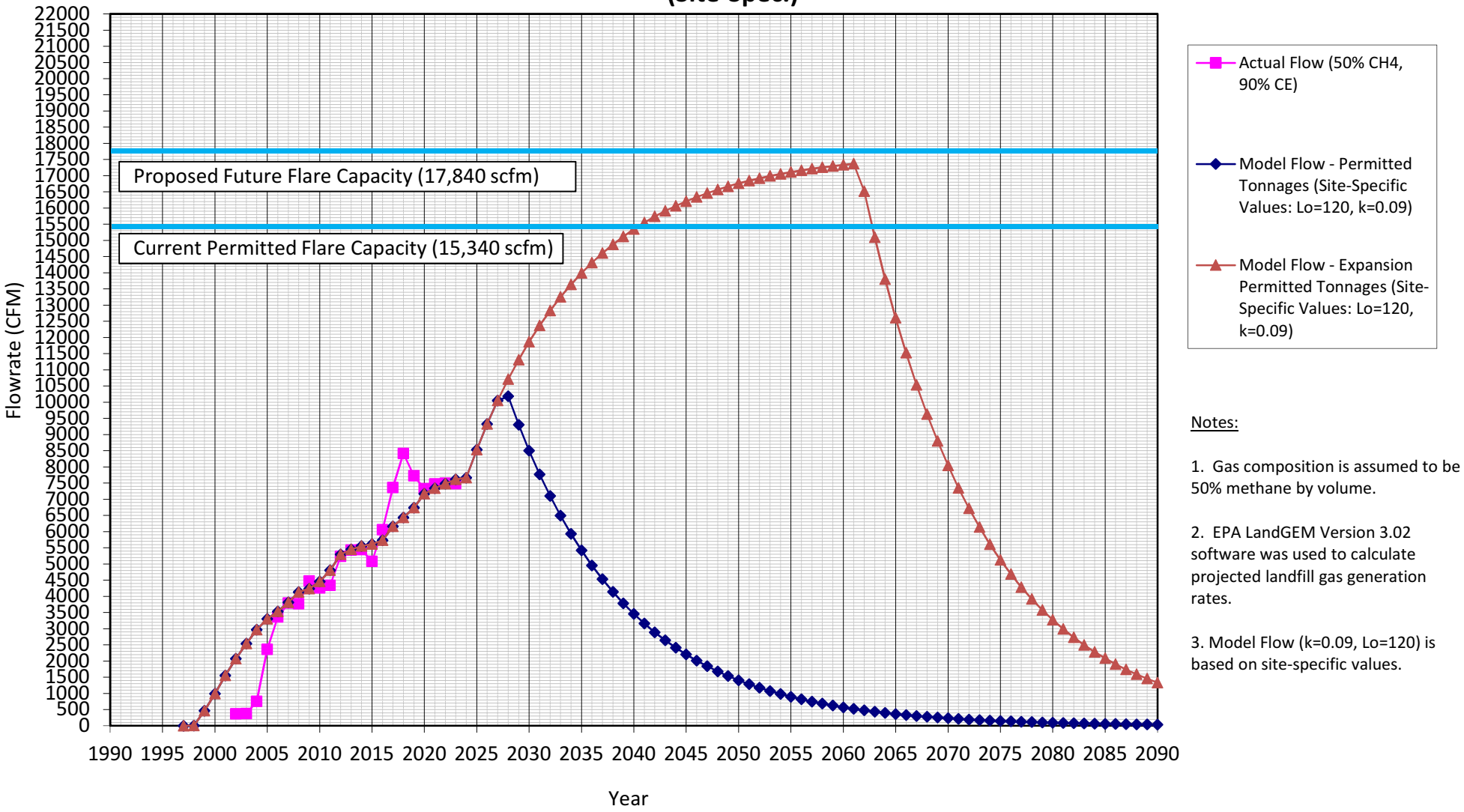
Notes:

1. Gas composition is assumed to be 50% methane by volume.

2. EPA LandGEM Version 3.02 software was used to calculate projected landfill gas generation rates.

3. Model Flow (k=0.04, Lo=100) is based on AP-42 default values.

Figure 2
CES Landfill - Maximum Expansion Projected Gas Generation Collection Rates (Site-Spec.)



Notes:

1. Gas composition is assumed to be 50% methane by volume.

2. EPA LandGEM Version 3.02 software was used to calculate projected landfill gas generation rates.

3. Model Flow (k=0.09, Lo=120) is based on site-specific values.

TABLE 1
COMMONWEALTH LANDFILL - EXISTING PERMIT CONDITIONS
WASTE PLACEMENT SCHEDULE

YEAR [1]	PERMITTED AVG TONS / DAY [2]	ACTUAL AVG TONS / DAY [3], [8]	WORKING DAYS / YR [4]	ANNUAL ACCEPTANCE RATE [6], [7]		CUMULATIVE MASS	
				TONS/YR	MG/YR [5]	MG TOTAL	TONS TOTAL
1997	1,500	158	15	2,371	2,151	2,151	2,371
1998	1,500	1,195	306	365,751	331,804	333,955	368,122
1999	2,100	1,457	306	445,799	404,422	738,377	813,921
2000	2,100	1,678	306	513,590	465,921	1,204,298	1,327,511
2001	2,100	1,678	306	513,590	465,921	1,670,219	1,841,101
2002	2,100	1,678	306	513,590	465,921	2,136,140	2,354,691
2003	2,100	1,678	306	513,590	465,921	2,602,061	2,868,281
2004	2,100	1,509	306	461,625	418,779	3,020,841	3,329,906
2005	2,100	1,341	306	410,470	372,372	3,393,213	3,740,376
2006	2,100	1,511	306	462,394	419,477	3,812,690	4,202,770
2007	2,950	1,664	306	509,152	461,895	4,274,585	4,711,922
2008	4,375	1,179	306	360,891	327,394	4,601,980	5,072,813
2009	4,750	1,517	306	464,067	420,995	5,022,974	5,536,880
2010	4,750	1,891	306	578,601	524,898	5,547,873	6,115,481
2011	4,750	2,821	254	716,493	649,991	6,197,864	6,831,974
2012	4,750	1,904	254	483,742	438,844	6,636,708	7,315,716
2013	4,750	1,779	254	451,953	410,005	7,046,712	7,767,668
2014	4,750	1,682	254	427,124	387,481	7,434,193	8,194,793
2015	4,750	1,861	254	472,644	428,775	7,862,968	8,667,436
2016	4,750	2,880	254	731,497	663,603	8,526,572	9,398,934
2017	4,750	2,509	254	637,371	578,214	9,104,785	10,036,305
2018	4,750	2,671	254	678,492	615,518	9,720,303	10,714,797
2019	4,750	3,137	254	796,808	722,852	10,443,155	11,511,605
2020	4,750	2,447	254	621,606	563,912	11,007,067	12,133,211
2021	4,750	2,401	254	609,883	553,277	11,560,344	12,743,094
2022	4,750	2,434	254	618,173	560,797	12,121,141	13,361,267
2023	4,750	2,200	254	558,759	506,897	12,628,038	13,920,025
2024	4,750	4,750	254	1,206,500	1,094,519	13,722,557	15,126,525
2025	4,750	4,750	254	1,206,500	1,094,519	14,817,075	16,333,025
2026	4,750	4,750	254	1,206,500	1,094,519	15,911,594	17,539,525
2027	4,750	4,750	166	788,653	715,454	16,627,048	18,328,178
			TOTAL:			**16,627,048**	**18,328,178**

Notes:

(1) Waste in place values are at the end of each year listed.

(2) Increases in permitted acceptance rates in 2007 and 2008 are based on a ramp up schedule to transition from the previous permitted acceptance rate to the current permitted acceptance rate.

(3) Actual waste in place values were used to calculate the acceptance rate for 1997-1999. Waste acceptance rates from 2000-2003 were calculated based on an actual waste in place value of 2,826,355 tons of waste determined on November 31, 2003. Actual waste acceptance rates were provided for 2004 to 2007.

(4) Calculation based on 306 working days per year from 1998-2010. Calculation based on 254 working days per year from 2011-2026 to account for the site no longer accepting waste on Saturdays.

(5) Tons to Mg conversion = Tons * 0.907185 Mg/Ton

(6) The existing area permitted capacity was converted to tons using a site specific density of 0.6153 tons/cy.

(7) 2008 through 2023 waste acceptance rates were obtained from AIMS Emission Statement Reports.

(8) Permitted waste acceptance rates were used from 2024 to 2027.

TABLE 2
COMMONWEALTH LANDFILL - EXISTING PERMIT CONDITIONS
PROJECTED METHANE GAS GENERATION RATE
AP-42 DEFAULT VALUES

Model Parameters

Lo: 100 m^3 / Mg
k: 0.04 1/yr
NMOC: 727.6 ppm (Average of 2003 Flare 1, 2008 Flare 2, and 2020 Flare 3 Stack Test NMOC Values)
Methane: 50% volume
Carbon Dioxide: 50% volume

Landfill Parameters

Landfill type: No Co-Disposal
Year Opened : 1997 Current Year : 2024 Closure Year : 2027
Capacity: 16,627,048 Mg

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
1997	0	0	0	0
1998	2,151	1	1	0
1999	333,955	88	176	7
2000	738,377	191	383	15
2001	1,204,298	307	614	24
2002	1,670,219	418	836	32
2003	2,136,140	524	1,049	41
2004	2,602,061	627	1,254	49
2005	3,020,841	713	1,426	55
2006	3,393,213	783	1,566	61
2007	3,812,690	863	1,727	67
2008	4,274,585	951	1,903	74
2009	4,601,980	1,000	2,001	78
2010	5,022,974	1,072	2,145	83
2011	5,547,873	1,169	2,338	91
2012	6,197,864	1,295	2,589	101
2013	6,636,708	1,360	2,719	106
2014	7,046,712	1,415	2,829	110
2015	7,434,193	1,461	2,923	114
2016	7,862,968	1,517	3,035	118
2017	8,526,572	1,633	3,266	127
2018	9,104,785	1,722	3,443	134
2019	9,720,303	1,817	3,633	141
2020	10,443,155	1,936	3,872	150
2021	11,007,067	2,009	4,018	156
2022	11,560,344	2,076	4,153	161
2023	12,121,141	2,143	4,286	166
2024	12,628,038	2,193	4,386	170
2025	13,722,557	2,396	4,792	186

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2026	14,817,075	2,591	5,182	201
2027	15,911,594	2,778	5,556	216
2028	16,627,048	2,858	5,716	222
2029	16,627,048	2,746	5,492	213
2030	16,627,048	2,638	5,277	205
2031	16,627,048	2,535	5,070	197
2032	16,627,048	2,435	4,871	189
2033	16,627,048	2,340	4,680	182
2034	16,627,048	2,248	4,496	175
2035	16,627,048	2,160	4,320	168
2036	16,627,048	2,075	4,151	161
2037	16,627,048	1,994	3,988	155
2038	16,627,048	1,916	3,832	149
2039	16,627,048	1,841	3,681	143
2040	16,627,048	1,769	3,537	137
2041	16,627,048	1,699	3,398	132
2042	16,627,048	1,633	3,265	127
2043	16,627,048	1,569	3,137	122
2044	16,627,048	1,507	3,014	117
2045	16,627,048	1,448	2,896	112
2046	16,627,048	1,391	2,782	108
2047	16,627,048	1,337	2,673	104
2048	16,627,048	1,284	2,568	100
2049	16,627,048	1,234	2,468	96
2050	16,627,048	1,185	2,371	92
2051	16,627,048	1,139	2,278	88
2052	16,627,048	1,094	2,189	85
2053	16,627,048	1,051	2,103	82
2054	16,627,048	1,010	2,020	78
2055	16,627,048	971	1,941	75
2056	16,627,048	933	1,865	72
2057	16,627,048	896	1,792	70
2058	16,627,048	861	1,722	67
2059	16,627,048	827	1,654	64
2060	16,627,048	795	1,589	62
2061	16,627,048	763	1,527	59
2062	16,627,048	734	1,467	57
2063	16,627,048	705	1,410	55
2064	16,627,048	677	1,354	53
2065	16,627,048	651	1,301	51
2066	16,627,048	625	1,250	49
2067	16,627,048	601	1,201	47
2068	16,627,048	577	1,154	45
2069	16,627,048	554	1,109	43
2070	16,627,048	533	1,065	41
2071	16,627,048	512	1,024	40
2072	16,627,048	492	983	38
2073	16,627,048	472	945	37
2074	16,627,048	454	908	35

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2075	16,627,048	436	872	34
2076	16,627,048	419	838	33
2077	16,627,048	403	805	31
2078	16,627,048	387	774	30
2079	16,627,048	372	743	29
2080	16,627,048	357	714	28
2081	16,627,048	343	686	27
2082	16,627,048	330	659	26
2083	16,627,048	317	633	25
2084	16,627,048	304	609	24
2085	16,627,048	292	585	23
2086	16,627,048	281	562	22
2087	16,627,048	270	540	21
2088	16,627,048	259	519	20
2089	16,627,048	249	498	19
2090	16,627,048	239	479	19
2091	16,627,048	230	460	18
2092	16,627,048	221	442	17
2093	16,627,048	212	425	16
2094	16,627,048	204	408	16
2095	16,627,048	196	392	15
2096	16,627,048	188	377	15
2097	16,627,048	181	362	14
2098	16,627,048	174	348	13
2099	16,627,048	167	334	13
2100	16,627,048	160	321	12
2101	16,627,048	154	308	12
2102	16,627,048	148	296	12
2103	16,627,048	142	285	11
2104	16,627,048	137	273	11
2105	16,627,048	131	263	10
2106	16,627,048	126	252	10
2107	16,627,048	121	243	9
2108	16,627,048	117	233	9
2109	16,627,048	112	224	9
2110	16,627,048	108	215	8
2111	16,627,048	103	207	8
2112	16,627,048	99	199	8
2113	16,627,048	95	191	7
2114	16,627,048	92	183	7
2115	16,627,048	88	176	7
2116	16,627,048	85	169	7
2117	16,627,048	81	163	6
2118	16,627,048	78	156	6
2119	16,627,048	75	150	6
2120	16,627,048	72	144	6
2121	16,627,048	69	139	5
2122	16,627,048	67	133	5
2123	16,627,048	64	128	5

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2124	16,627,048	61	123	5
2125	16,627,048	59	118	5
2126	16,627,048	57	113	4
2127	16,627,048	54	109	4
2128	16,627,048	52	105	4
2129	16,627,048	50	101	4
2130	16,627,048	48	97	4
2131	16,627,048	46	93	4
2132	16,627,048	45	89	3
2133	16,627,048	43	86	3
2134	16,627,048	41	82	3
2135	16,627,048	40	79	3
2136	16,627,048	38	76	3
2137	16,627,048	37	73	3

TABLE 3
COMMONWEALTH LANDFILL - EXISTING PERMIT CONDITIONS
PROJECTED METHANE GAS GENERATION RATE
SITE-SPECIFIC VALUES

Model Parameters

Lo: 120 m^3 / Mg
k: 0.09 1/yr
NMOC: 727.6 ppm (Average of 2003 Flare 1, 2008 Flare 2, and 2020 Flare 3 Stack Test NMOC Values)
Methane: 50% volume
Carbon Dioxide: 50% volume

Landfill Parameters

Landfill type: No Co-Disposal
Year Opened : 1997 Current Year : 2024 Closure Year : 2027
Capacity: 16,627,048 Mg

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
1997	0	0	0	0
1998	2,151	1	3	0
1999	333,955	233	465	18
2000	738,377	495	989	38
2001	1,204,298	777	1,554	60
2002	1,670,219	1,035	2,069	80
2003	2,136,140	1,270	2,541	99
2004	2,602,061	1,486	2,972	115
2005	3,020,841	1,650	3,300	128
2006	3,393,213	1,767	3,535	137
2007	3,812,690	1,908	3,816	148
2008	4,274,585	2,066	4,131	160
2009	4,601,980	2,116	4,232	164
2010	5,022,974	2,227	4,455	173
2011	5,547,873	2,402	4,803	187
2012	6,197,864	2,648	5,296	206
2013	6,636,708	2,726	5,452	212
2014	7,046,712	2,777	5,554	216
2015	7,434,193	2,808	5,616	218
2016	7,862,968	2,865	5,731	223
2017	8,526,572	3,081	6,163	239
2018	9,104,785	3,219	6,438	250
2019	9,720,303	3,371	6,742	262
2020	10,443,155	3,585	7,170	278
2021	11,007,067	3,669	7,339	285
2022	11,560,344	3,739	7,479	290
2023	12,121,141	3,808	7,617	296
2024	12,628,038	3,834	7,668	298
2025	13,722,557	4,267	8,534	331

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2026	14,817,075	4,663	9,325	362
2027	15,911,594	5,024	10,049	390
2028	16,627,048	5,091	10,181	395
2029	16,627,048	4,652	9,305	361
2030	16,627,048	4,252	8,504	330
2031	16,627,048	3,886	7,772	302
2032	16,627,048	3,552	7,103	276
2033	16,627,048	3,246	6,492	252
2034	16,627,048	2,967	5,933	230
2035	16,627,048	2,711	5,422	211
2036	16,627,048	2,478	4,956	192
2037	16,627,048	2,265	4,529	176
2038	16,627,048	2,070	4,139	161
2039	16,627,048	1,892	3,783	147
2040	16,627,048	1,729	3,458	134
2041	16,627,048	1,580	3,160	123
2042	16,627,048	1,444	2,888	112
2043	16,627,048	1,320	2,639	103
2044	16,627,048	1,206	2,412	94
2045	16,627,048	1,102	2,205	86
2046	16,627,048	1,007	2,015	78
2047	16,627,048	921	1,841	72
2048	16,627,048	841	1,683	65
2049	16,627,048	769	1,538	60
2050	16,627,048	703	1,406	55
2051	16,627,048	642	1,285	50
2052	16,627,048	587	1,174	46
2053	16,627,048	537	1,073	42
2054	16,627,048	490	981	38
2055	16,627,048	448	896	35
2056	16,627,048	410	819	32
2057	16,627,048	374	749	29
2058	16,627,048	342	684	27
2059	16,627,048	313	625	24
2060	16,627,048	286	572	22
2061	16,627,048	261	522	20
2062	16,627,048	239	477	19
2063	16,627,048	218	436	17
2064	16,627,048	199	399	15
2065	16,627,048	182	364	14
2066	16,627,048	167	333	13
2067	16,627,048	152	304	12
2068	16,627,048	139	278	11
2069	16,627,048	127	254	10
2070	16,627,048	116	232	9
2071	16,627,048	106	212	8
2072	16,627,048	97	194	8
2073	16,627,048	89	177	7
2074	16,627,048	81	162	6

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2075	16,627,048	74	148	6
2076	16,627,048	68	135	5
2077	16,627,048	62	124	5
2078	16,627,048	57	113	4
2079	16,627,048	52	103	4
2080	16,627,048	47	94	4
2081	16,627,048	43	86	3
2082	16,627,048	39	79	3
2083	16,627,048	36	72	3
2084	16,627,048	33	66	3
2085	16,627,048	30	60	2
2086	16,627,048	28	55	2
2087	16,627,048	25	50	2
2088	16,627,048	23	46	2
2089	16,627,048	21	42	2
2090	16,627,048	19	38	1
2091	16,627,048	18	35	1
2092	16,627,048	16	32	1
2093	16,627,048	15	29	1
2094	16,627,048	13	27	1
2095	16,627,048	12	24	1
2096	16,627,048	11	22	1
2097	16,627,048	10	20	1
2098	16,627,048	9	19	1
2099	16,627,048	9	17	1
2100	16,627,048	8	16	1
2101	16,627,048	7	14	1
2102	16,627,048	7	13	1
2103	16,627,048	6	12	0
2104	16,627,048	5	11	0
2105	16,627,048	5	10	0
2106	16,627,048	5	9	0
2107	16,627,048	4	8	0
2108	16,627,048	4	8	0
2109	16,627,048	3	7	0
2110	16,627,048	3	6	0
2111	16,627,048	3	6	0
2112	16,627,048	3	5	0
2113	16,627,048	2	5	0
2114	16,627,048	2	4	0
2115	16,627,048	2	4	0
2116	16,627,048	2	4	0
2117	16,627,048	2	3	0
2118	16,627,048	2	3	0
2119	16,627,048	1	3	0
2120	16,627,048	1	3	0
2121	16,627,048	1	2	0
2122	16,627,048	1	2	0
2123	16,627,048	1	2	0

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2124	16,627,048	1	2	0
2125	16,627,048	1	2	0
2126	16,627,048	1	2	0
2127	16,627,048	1	1	0
2128	16,627,048	1	1	0
2129	16,627,048	1	1	0
2130	16,627,048	1	1	0
2131	16,627,048	0	1	0
2132	16,627,048	0	1	0
2133	16,627,048	0	1	0
2134	16,627,048	0	1	0
2135	16,627,048	0	1	0
2136	16,627,048	0	1	0
2137	16,627,048	0	1	0

TABLE 4
COMMONWEALTH LANDFILL - PROPOSED EXPANSION PERMIT CONDITIONS
WASTE PLACEMENT SCHEDULE

YEAR [1]	PERMITTED AVG TONS / DAY [2]	ACTUAL AVG TONS / DAY [3], [8]	WORKING DAYS / YR [4]	ANNUAL ACCEPTANCE RATE [6], [7]		CUMULATIVE MASS	
				TONS/YR	MG/YR [5]	MG TOTAL	TONS TOTAL
1997	1,500	158	15	2,371	2,151	2,151	2,371
1998	1,500	1,195	306	365,751	331,804	333,955	368,122
1999	2,100	1,457	306	445,799	404,422	738,377	813,921
2000	2,100	1,678	306	513,590	465,921	1,204,298	1,327,511
2001	2,100	1,678	306	513,590	465,921	1,670,219	1,841,101
2002	2,100	1,678	306	513,590	465,921	2,136,140	2,354,691
2003	2,100	1,678	306	513,590	465,921	2,602,061	2,868,281
2004	2,100	1,509	306	461,625	418,779	3,020,841	3,329,906
2005	2,100	1,341	306	410,470	372,372	3,393,213	3,740,376
2006	2,100	1,511	306	462,394	419,477	3,812,690	4,202,770
2007	2,950	1,664	306	509,152	461,895	4,274,585	4,711,922
2008	4,375	1,179	306	360,891	327,394	4,601,980	5,072,813
2009	4,750	1,517	306	464,067	420,995	5,022,974	5,536,880
2010	4,750	1,891	306	578,601	524,898	5,547,873	6,115,481
2011	4,750	2,821	254	716,493	649,991	6,197,864	6,831,974
2012	4,750	1,904	254	483,742	438,844	6,636,708	7,315,716
2013	4,750	1,779	254	451,953	410,005	7,046,712	7,767,668
2014	4,750	1,682	254	427,124	387,481	7,434,193	8,194,793
2015	4,750	1,861	254	472,644	428,775	7,862,968	8,667,436
2016	4,750	2,880	254	731,497	663,603	8,526,572	9,398,934
2017	4,750	2,509	254	637,371	578,214	9,104,785	10,036,305
2018	4,750	2,671	254	678,492	615,518	9,720,303	10,714,797
2019	4,750	3,137	254	796,808	722,852	10,443,155	11,511,605
2020	4,750	2,447	254	621,606	563,912	11,007,067	12,133,211
2021	4,750	2,401	254	609,883	553,277	11,560,344	12,743,094
2022	4,750	2,434	254	618,173	560,797	12,121,141	13,361,267
2023	4,750	2,200	254	558,759	506,897	12,628,038	13,920,025
2024	4,750	4,750	254	1,206,500	1,094,519	13,722,557	15,126,525
2025	4,750	4,750	254	1,206,500	1,094,519	14,817,075	16,333,025
2026	4,750	4,750	254	1,206,500	1,094,519	15,911,594	17,539,525
2027	4,750	4,750	254	1,206,500	1,094,519	17,006,113	18,746,025
2028	4,750	4,750	254	1,206,500	1,094,519	18,100,632	19,952,525
2029	4,750	4,750	254	1,206,500	1,094,519	19,195,150	21,159,025
2030	4,750	4,750	254	1,206,500	1,094,519	20,289,669	22,365,525
2031	4,750	4,750	254	1,206,500	1,094,519	21,384,188	23,572,025
2032	4,750	4,750	254	1,206,500	1,094,519	22,478,706	24,778,525
2033	4,750	4,750	254	1,206,500	1,094,519	23,573,225	25,985,025
2034	4,750	4,750	254	1,206,500	1,094,519	24,667,744	27,191,525
2035	4,750	4,750	254	1,206,500	1,094,519	25,762,262	28,398,025
2036	4,750	4,750	254	1,206,500	1,094,519	26,856,781	29,604,525
2037	4,750	4,750	254	1,206,500	1,094,519	27,951,300	30,811,025
2038	4,750	4,750	254	1,206,500	1,094,519	29,045,819	32,017,525
2039	4,750	4,750	254	1,206,500	1,094,519	30,140,337	33,224,025
2040	4,750	4,750	254	1,206,500	1,094,519	31,234,856	34,430,525
2041	4,750	4,750	254	1,206,500	1,094,519	32,329,375	35,637,025
2042	4,750	4,750	254	1,206,500	1,094,519	33,423,893	36,843,525
2043	4,750	4,750	254	1,206,500	1,094,519	34,518,412	38,050,025
2044	4,750	4,750	254	1,206,500	1,094,519	35,612,931	39,256,525
2045	4,750	4,750	254	1,206,500	1,094,519	36,707,449	40,463,025
2046	4,750	4,750	254	1,206,500	1,094,519	37,801,968	41,669,525
2047	4,750	4,750	254	1,206,500	1,094,519	38,896,487	42,876,025
2048	4,750	4,750	254	1,206,500	1,094,519	39,991,006	44,082,525
2049	4,750	4,750	254	1,206,500	1,094,519	41,085,524	45,289,025
2050	4,750	4,750	254	1,206,500	1,094,519	42,180,043	46,495,525
2051	4,750	4,750	254	1,206,500	1,094,519	43,274,562	47,702,025
2052	4,750	4,750	254	1,206,500	1,094,519	44,369,080	48,908,525
2053	4,750	4,750	254	1,206,500	1,094,519	45,463,599	50,115,025
2054	4,750	4,750	254	1,206,500	1,094,519	46,558,118	51,321,525

TABLE 4
COMMONWEALTH LANDFILL - PROPOSED EXPANSION PERMIT CONDITIONS
WASTE PLACEMENT SCHEDULE

YEAR [1]	PERMITTED AVG TONS / DAY [2]	ACTUAL AVG TONS / DAY [3], [8]	WORKING DAYS / YR [4]	ANNUAL ACCEPTANCE RATE [6], [7]		CUMULATIVE MASS	
				TONS/YR	MG/YR [5]	MG TOTAL	TONS TOTAL
2055	4,750	4,750	254	1,206,500	1,094,519	47,652,636	52,528,025
2056	4,750	4,750	254	1,206,500	1,094,519	48,747,155	53,734,525
2057	4,750	4,750	254	1,206,500	1,094,519	49,841,674	54,941,025
2058	4,750	4,750	254	1,206,500	1,094,519	50,936,193	56,147,525
2059	4,750	4,750	254	1,206,500	1,094,519	52,030,711	57,354,025
2060	4,750	4,750	254	1,206,500	1,094,519	53,125,230	58,560,525
2061	4,750	4,750	107	509,366	462,090	53,587,320	59,069,892
			TOTAL:			**53,587,320**	**59,069,892**

Notes:

(1) Waste in place values are at the end of each year listed.

(2) Increases in permitted acceptance rates in 2007 and 2008 are based on a ramp up schedule to transition from the previous permitted acceptance rate to the current permitted acceptance rate.

(3) Actual waste in place values were used to calculate the acceptance rate for 1997-1999. Waste acceptance rates from 2000-2003 were calculated based on an actual waste in place value of 2,826,355 tons of waste determined on November 31, 2003. Actual waste acceptance rates were provided for 2004 to 2007.

(4) Calculation based on 306 working days per year from 1998-2010. Calculation based on 254 working days per year from 2011-2028 to account for the site no longer accepting waste on Saturdays.

(5) Tons to Mg conversion = Tons * 0.907185 Mg/Ton

(6) The existing area permitted capacity was converted to tons using a site specific density of 0.6153 tons/cy.

(7) 2008 through 2023 waste acceptance rates were obtained from AIMS Emission Statement Reports.

(8) Permitted waste acceptance rates were used from 2024 to 2061.

TABLE 5
COMMONWEALTH LANDFILL - PROPOSED EXPANSION PERMIT CONDITIONS
PROJECTED METHANE GAS GENERATION RATE
AP-42 DEFAULT VALUES

Model Parameters

Lo: 100 m^3 / Mg
k: 0.04 1/yr
NMOC: 727.6 ppm (Average of 2003 Flare 1, 2008 Flare 2, and 2020 Flare 3 Stack Test NMOC Values)
Methane: 50% volume
Carbon Dioxide: 50% volume

Landfill Parameters

Landfill type: No Co-Disposal
Year Opened : Upon PADEP Approval Current Year : 2024 Closure Year : 2061
Capacity: 53,587,320 Mg

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
1997	0	0	0	0
1998	2,151	1	1	0
1999	333,955	88	176	7
2000	738,377	191	383	15
2001	1,204,298	307	614	24
2002	1,670,219	418	836	32
2003	2,136,140	524	1,049	41
2004	2,602,061	627	1,254	49
2005	3,020,841	713	1,426	55
2006	3,393,213	783	1,566	61
2007	3,812,690	863	1,727	67
2008	4,274,585	951	1,903	74
2009	4,601,980	1,000	2,001	78
2010	5,022,974	1,072	2,145	83
2011	5,547,873	1,169	2,338	91
2012	6,197,864	1,295	2,589	101
2013	6,636,708	1,360	2,719	106
2014	7,046,712	1,415	2,829	110
2015	7,434,193	1,461	2,923	114
2016	7,862,968	1,517	3,035	118
2017	8,526,572	1,633	3,266	127
2018	9,104,785	1,722	3,443	134
2019	9,720,303	1,817	3,633	141
2020	10,443,155	1,936	3,872	150
2021	11,007,067	2,009	4,018	156
2022	11,560,344	2,076	4,153	161
2023	12,121,141	2,143	4,286	166
2024	12,628,038	2,193	4,386	170
2025	13,722,557	2,396	4,792	186
2026	14,817,075	2,591	5,182	201

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2027	15,911,594	2,778	5,556	216
2028	17,006,113	2,958	5,916	230
2029	18,100,632	3,131	6,262	243
2030	19,195,150	3,297	6,594	256
2031	20,289,669	3,457	6,914	269
2032	21,384,188	3,610	7,221	280
2033	22,478,706	3,758	7,515	292
2034	23,573,225	3,899	7,798	303
2035	24,667,744	4,035	8,071	313
2036	25,762,262	4,166	8,332	324
2037	26,856,781	4,292	8,583	333
2038	27,951,300	4,412	8,824	343
2039	29,045,819	4,528	9,056	352
2040	30,140,337	4,640	9,279	360
2041	31,234,856	4,747	9,493	369
2042	32,329,375	4,849	9,699	377
2043	33,423,893	4,948	9,896	384
2044	34,518,412	5,043	10,086	392
2045	35,612,931	5,134	10,269	399
2046	36,707,449	5,222	10,444	406
2047	37,801,968	5,306	10,612	412
2048	38,896,487	5,387	10,774	418
2049	39,991,006	5,465	10,929	424
2050	41,085,524	5,539	11,079	430
2051	42,180,043	5,611	11,222	436
2052	43,274,562	5,680	11,360	441
2053	44,369,080	5,746	11,492	446
2054	45,463,599	5,810	11,620	451
2055	46,558,118	5,871	11,742	456
2056	47,652,636	5,930	11,859	461
2057	48,747,155	5,986	11,972	465
2058	49,841,674	6,040	12,081	469
2059	50,936,193	6,092	12,185	473
2060	52,030,711	6,142	12,285	477
2061	53,125,230	6,191	12,381	481
2062	53,587,320	6,070	12,140	471
2063	53,587,320	5,832	11,664	453
2064	53,587,320	5,603	11,206	435
2065	53,587,320	5,383	10,767	418
2066	53,587,320	5,172	10,345	402
2067	53,587,320	4,970	9,939	386
2068	53,587,320	4,775	9,549	371
2069	53,587,320	4,587	9,175	356
2070	53,587,320	4,408	8,815	342
2071	53,587,320	4,235	8,469	329
2072	53,587,320	4,069	8,137	316
2073	53,587,320	3,909	7,818	304
2074	53,587,320	3,756	7,512	292
2075	53,587,320	3,609	7,217	280
2076	53,587,320	3,467	6,934	269

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2077	53,587,320	3,331	6,662	259
2078	53,587,320	3,201	6,401	249
2079	53,587,320	3,075	6,150	239
2080	53,587,320	2,954	5,909	229
2081	53,587,320	2,839	5,677	220
2082	53,587,320	2,727	5,455	212
2083	53,587,320	2,620	5,241	204
2084	53,587,320	2,518	5,035	196
2085	53,587,320	2,419	4,838	188
2086	53,587,320	2,324	4,648	181
2087	53,587,320	2,233	4,466	173
2088	53,587,320	2,145	4,291	167
2089	53,587,320	2,061	4,123	160
2090	53,587,320	1,980	3,961	154
2091	53,587,320	1,903	3,806	148
2092	53,587,320	1,828	3,656	142
2093	53,587,320	1,757	3,513	136
2094	53,587,320	1,688	3,375	131
2095	53,587,320	1,621	3,243	126
2096	53,587,320	1,558	3,116	121
2097	53,587,320	1,497	2,994	116
2098	53,587,320	1,438	2,876	112
2099	53,587,320	1,382	2,763	107
2100	53,587,320	1,328	2,655	103
2101	53,587,320	1,275	2,551	99
2102	53,587,320	1,225	2,451	95
2103	53,587,320	1,177	2,355	91
2104	53,587,320	1,131	2,263	88
2105	53,587,320	1,087	2,174	84
2106	53,587,320	1,044	2,089	81
2107	53,587,320	1,003	2,007	78
2108	53,587,320	964	1,928	75
2109	53,587,320	926	1,852	72
2110	53,587,320	890	1,780	69
2111	53,587,320	855	1,710	66
2112	53,587,320	821	1,643	64
2113	53,587,320	789	1,578	61
2114	53,587,320	758	1,517	59
2115	53,587,320	729	1,457	57
2116	53,587,320	700	1,400	54
2117	53,587,320	673	1,345	52
2118	53,587,320	646	1,292	50
2119	53,587,320	621	1,242	48
2120	53,587,320	596	1,193	46
2121	53,587,320	573	1,146	45
2122	53,587,320	551	1,101	43
2123	53,587,320	529	1,058	41
2124	53,587,320	508	1,017	39
2125	53,587,320	488	977	38
2126	53,587,320	469	938	36

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2127	53,587,320	451	902	35
2128	53,587,320	433	866	34
2129	53,587,320	416	832	32
2130	53,587,320	400	800	31
2131	53,587,320	384	768	30
2132	53,587,320	369	738	29
2133	53,587,320	355	709	28
2134	53,587,320	341	681	26
2135	53,587,320	327	655	25
2136	53,587,320	315	629	24
2137	53,587,320	302	604	23

TABLE 6
COMMONWEALTH LANDFILL - PROPOSED EXPANSION PERMIT CONDITIONS
PROJECTED METHANE GAS GENERATION RATE
SITE-SPECIFIC VALUES

Model Parameters

Lo: 120 m^3 / Mg
k: 0.09 1/yr
NMOC: 727.6 ppm (Average of 2003 Flare 1, 2008 Flare 2, and 2020 Flare 3 Stack Test NMOC Values)
Methane: 50% volume
Carbon Dioxide: 50% volume

Landfill Parameters

Landfill type: No Co-Disposal
Year Opened : Upon PADEP Approval Current Year : 2024 Closure Year : 2061
Capacity: 53,587,320 Mg

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
1997	0	0	0	0
1998	2,151	1	3	0
1999	333,955	233	465	18
2000	738,377	495	989	38
2001	1,204,298	777	1,554	60
2002	1,670,219	1,035	2,069	80
2003	2,136,140	1,270	2,541	99
2004	2,602,061	1,486	2,972	115
2005	3,020,841	1,650	3,300	128
2006	3,393,213	1,767	3,535	137
2007	3,812,690	1,908	3,816	148
2008	4,274,585	2,066	4,131	160
2009	4,601,980	2,116	4,232	164
2010	5,022,974	2,227	4,455	173
2011	5,547,873	2,402	4,803	187
2012	6,197,864	2,648	5,296	206
2013	6,636,708	2,726	5,452	212
2014	7,046,712	2,777	5,554	216
2015	7,434,193	2,808	5,616	218
2016	7,862,968	2,865	5,731	223
2017	8,526,572	3,081	6,163	239
2018	9,104,785	3,219	6,438	250
2019	9,720,303	3,371	6,742	262
2020	10,443,155	3,585	7,170	278
2021	11,007,067	3,669	7,339	285
2022	11,560,344	3,739	7,479	290
2023	12,121,141	3,808	7,617	296
2024	12,628,038	3,834	7,668	298
2025	13,722,557	4,267	8,534	331
2026	14,817,075	4,663	9,325	362

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2027	15,911,594	5,024	10,049	390
2028	17,006,113	5,355	10,710	416
2029	18,100,632	5,657	11,314	439
2030	19,195,150	5,933	11,866	461
2031	20,289,669	6,185	12,371	480
2032	21,384,188	6,416	12,832	498
2033	22,478,706	6,627	13,253	515
2034	23,573,225	6,819	13,639	530
2035	24,667,744	6,995	13,991	543
2036	25,762,262	7,156	14,312	556
2037	26,856,781	7,303	14,607	567
2038	27,951,300	7,438	14,875	578
2039	29,045,819	7,560	15,121	587
2040	30,140,337	7,673	15,345	596
2041	31,234,856	7,775	15,551	604
2042	32,329,375	7,869	15,738	611
2043	33,423,893	7,955	15,910	618
2044	34,518,412	8,033	16,066	624
2045	35,612,931	8,105	16,209	630
2046	36,707,449	8,170	16,340	635
2047	37,801,968	8,230	16,460	639
2048	38,896,487	8,284	16,569	643
2049	39,991,006	8,334	16,669	647
2050	41,085,524	8,380	16,760	651
2051	42,180,043	8,422	16,844	654
2052	43,274,562	8,460	16,920	657
2053	44,369,080	8,495	16,989	660
2054	45,463,599	8,527	17,053	662
2055	46,558,118	8,556	17,111	665
2056	47,652,636	8,582	17,164	667
2057	48,747,155	8,607	17,213	669
2058	49,841,674	8,629	17,258	670
2059	50,936,193	8,649	17,298	672
2060	52,030,711	8,668	17,335	673
2061	53,125,230	8,685	17,369	675
2062	53,587,320	8,259	16,518	642
2063	53,587,320	7,548	15,097	586
2064	53,587,320	6,899	13,797	536
2065	53,587,320	6,305	12,610	490
2066	53,587,320	5,762	11,525	448
2067	53,587,320	5,266	10,533	409
2068	53,587,320	4,813	9,626	374
2069	53,587,320	4,399	8,798	342
2070	53,587,320	4,020	8,040	312
2071	53,587,320	3,674	7,348	285
2072	53,587,320	3,358	6,716	261
2073	53,587,320	3,069	6,138	238
2074	53,587,320	2,805	5,610	218
2075	53,587,320	2,563	5,127	199
2076	53,587,320	2,343	4,686	182

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2077	53,587,320	2,141	4,282	166
2078	53,587,320	1,957	3,914	152
2079	53,587,320	1,788	3,577	139
2080	53,587,320	1,634	3,269	127
2081	53,587,320	1,494	2,988	116
2082	53,587,320	1,365	2,730	106
2083	53,587,320	1,248	2,495	97
2084	53,587,320	1,140	2,281	89
2085	53,587,320	1,042	2,084	81
2086	53,587,320	952	1,905	74
2087	53,587,320	871	1,741	68
2088	53,587,320	796	1,591	62
2089	53,587,320	727	1,454	56
2090	53,587,320	665	1,329	52
2091	53,587,320	607	1,215	47
2092	53,587,320	555	1,110	43
2093	53,587,320	507	1,015	39
2094	53,587,320	464	927	36
2095	53,587,320	424	847	33
2096	53,587,320	387	775	30
2097	53,587,320	354	708	27
2098	53,587,320	323	647	25
2099	53,587,320	296	591	23
2100	53,587,320	270	540	21
2101	53,587,320	247	494	19
2102	53,587,320	226	451	18
2103	53,587,320	206	412	16
2104	53,587,320	188	377	15
2105	53,587,320	172	345	13
2106	53,587,320	157	315	12
2107	53,587,320	144	288	11
2108	53,587,320	132	263	10
2109	53,587,320	120	240	9
2110	53,587,320	110	220	9
2111	53,587,320	100	201	8
2112	53,587,320	92	184	7
2113	53,587,320	84	168	7
2114	53,587,320	77	153	6
2115	53,587,320	70	140	5
2116	53,587,320	64	128	5
2117	53,587,320	59	117	5
2118	53,587,320	53	107	4
2119	53,587,320	49	98	4
2120	53,587,320	45	89	3
2121	53,587,320	41	82	3
2122	53,587,320	37	75	3
2123	53,587,320	34	68	3
2124	53,587,320	31	62	2
2125	53,587,320	28	57	2
2126	53,587,320	26	52	2

Model Results

Year	Refuse In Place (Mg)	Methane Gen. Rate (Cubic ft/min)	Total LFG @ 50% CH4 (Cubic ft/min)	NMOC (MG/yr)
2127	53,587,320	24	48	2
2128	53,587,320	22	43	2
2129	53,587,320	20	40	2
2130	53,587,320	18	36	1
2131	53,587,320	17	33	1
2132	53,587,320	15	30	1
2133	53,587,320	14	28	1
2134	53,587,320	13	25	1
2135	53,587,320	12	23	1
2136	53,587,320	11	21	1
2137	53,587,320	10	19	1

ATTACHMENT D

SUPPLEMENTAL COMPLIANCE REVIEW FORM

COMMONWEALTH OF PENNSYLVANIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
BUREAU OF AIR QUALITY

AIR POLLUTION CONTROL ACT COMPLIANCE REVIEW FORM

Fully and accurately provide the following information, as specified. Attach additional sheets as necessary.

Type of Compliance Review Form Submittal (check all that apply)

☐ Original Filing
☒ Amended Filing

Date of Last Compliance Review Form Filing: 8/22/2022

Type of Submittal

☒ New Plan Approval ☐ New Operating Permit ☐ Renewal of Operating Permit
☐ Extension of Plan Approval ☐ Change of Ownership ☐ Periodic Submission (@ 6 mos)
☐ Other: _____

SECTION A. GENERAL APPLICATION INFORMATION

Name of Applicant/Permittee/("applicant")
(non-corporations-attach documentation of legal name)
Commonwealth Environmental Systems, L.P.

Address 99 Commonwealth Road
Hegins, PA 17938

Telephone 570-695-3590 **Taxpayer ID#** 23-2792722

Permit, Plan Approval or Application ID# 101615

Identify the form of management under which the applicant conducts its business (check appropriate box)

☐ Individual ☐ Syndicate ☐ Government Agency
☐ Municipality ☐ Municipal Authority ☐ Joint Venture
☐ Proprietorship ☐ Fictitious Name ☐ Association
☐ Public Corporation ☐ Partnership ☐ Other Type of Business, specify below:
☐ Private Corporation ☒ Limited Partnership

Describe below the type(s) of business activities performed.
Solid Waste Disposal, leachate collection and treatment and methane collection, treatment and beneficial use.

SECTION B. GENERAL INFORMATION REGARDING "APPLICANT"

If applicant is a corporation or a division or other unit of a corporation, provide the names, principal places of business, state of incorporation, and taxpayer ID numbers of all domestic and foreign parent corporations (including the ultimate parent corporation), and all domestic and foreign subsidiary corporations of the ultimate parent corporation with operations in Pennsylvania. Please include all corporate divisions or units, (whether incorporated or unincorporated) and privately held corporations. (A diagram of corporate relationships may be provided to illustrate corporate relationships.) Attach additional sheets as necessary.

Unit Name	Principal Places of Business	State of Incorporation	Taxpayer ID	Relationship to Applicant
See Attached				

SECTION C. SPECIFIC INFORMATION REGARDING APPLICANT AND ITS "RELATED PARTIES"

Pennsylvania Facilities. List the name and location (mailing address, municipality, county), telephone number, and relationship to applicant (parent, subsidiary or general partner) of applicant and all Related Parties' places of business, and facilities in Pennsylvania. Attach additional sheets as necessary.

Unit Name	Street Address	County and Municipality	Telephone No.	Relationship to Applicant
See Attached				

Provide the names and business addresses of all general partners of the applicant and parent and subsidiary corporations, if any.

Name	Business Address
See Attached	

List the names and business address of persons with overall management responsibility for the process being permitted (i.e. plant manager).

Name	Business Address
Michael Piepoli, Site Manager	99 Commonwealth Road Hegins, PA 17938

Plan Approvals or Operating Permits. List all plan approvals or operating permits issued by the Department or an approved local air pollution control agency under the APCA to the applicant or related parties that are currently in effect or have been in effect at any time 5 years prior to the date on which this form is notarized. This list shall include the plan approval and operating permit numbers, locations, issuance and expiration dates. Attach additional sheets as necessary.

Air Contamination Source	Plan Approval/ Operating Permit#	Location	Issuance Date	Expiration Date
See Attached				

Compliance Background. (Note: Copies of specific documents, if applicable, must be made available to the Department upon its request.) List all documented conduct of violations or enforcement actions identified by the Department pursuant to the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. Attach additional sheets as necessary. See the definition of "documented conduct" for further clarification. Unless specifically directed by the Department, deviations which have been previously reported to the Department in writing, relating to monitoring and reporting, need not be reported.

Date	Location	Plan Approval/ Operating Permit#	Nature of Documented Conduct	Type of Department Action	Status: Litigation Existing/Continuing or Corrected/Date	Dollar Amount Penalty
03/29/24	Keystone Sanitary Landfill, Inc.	35-00014	Refer to violations dated 1/25/23	Consent Order and Agreement	Existing/Continuing	$215,000
01/08/24	Keystone Sanitary Landfill, Inc.	35-00014	PA Code 243.218(b)(1) 273.217(b) 273.217(a) 273.218(c)	Violation	Existing/Continuing	$
02/01/23	Keystone Sanitary Landfill, Inc.	35-00014	PA Code 273.218(b)(2) 273.233(B)(1) 273.201(C)(2)	Violation	Existing/Continuing	$
01/25/23	Keystone Sanitary landfill, Inc.	35-00014	PA Code 273.218(b)(2) 273.218 (C) 273218(B)(3)	Violation	Existing/Continuing	$
09/06/22	Commonwealth Environmental Systems, LP	54-00054	PA Code 127.641(a)	Violation	Complied/Closed	$
01/27/20	Keystone Sanitary Landfill, Inc.	35-00014	Section E Group 3 Condition 018(a)(5)	Violation	Complied/Closed	$
10/17/18	Keystone Sanitary Landfill, Inc.	35-00014	File Review	Violation	Complied/Closed	$
						$
						$
						$

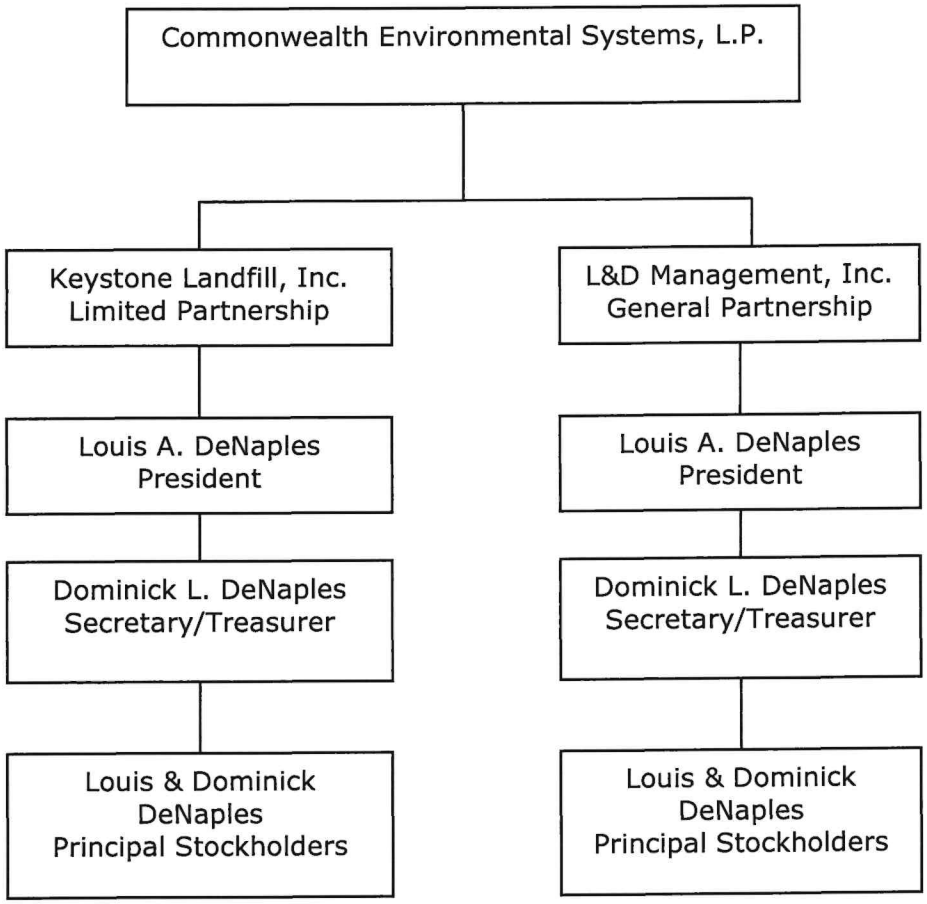
List all incidents of deviations of the APCA, regulations, terms and conditions of an operating permit or plan approval or order by applicant or any related party, using the following format grouped by source and location in reverse chronological order. This list must include items both currently known and unknown to the Department. Attach additional sheets as necessary. See the definition of "deviations" for further clarification.

Date	Location	Plan Approval/ Operating Permit#	Nature of Deviation	Incident Status: Litigation Existing/Continuing Or Corrected/Date
12/24/22	Dunmore, PA	35-00014	Malfunction	Corrected 12/24/22

CONTINUING OBLIGATION. Applicant is under a continuing obligation to update this form using the Compliance Review Supplemental Form if any additional deviations occur between the date of submission and Department action on the application.

VERIFICATION STATEMENT
Subject to the penalties of Title 18 Pa.C.S. Section 4904 and 35 P.S. Section 4009(b)(2), I verify under penalty of law that I am authorized to make this verification on behalf of the Applicant/Permittee. I further verify that the information contained in this Compliance Review Form is true and complete to the best of my belief formed after reasonable inquiry. I further verify that reasonable procedures are in place to ensure that "documented conduct" and "deviations" as defined in 25 Pa Code Section 121.1 are identified and included in the information set forth in this Compliance Review Form.
Signature — 8/22/2024 (Date)
Michael Piepoli (Name (Print or Type))
Site Manager (Title)

Section B. General Information Regarding Applicant



Current Partners

Keystone Landfill, Inc.
249 Dunham Drive
Dunmore, PA 18512
Limited Partner
Taxpayer ID # 23-1949696

L&D Management, Inc.
249 Dunham Drive
Dunmore, PA 18512
General Partner
Taxpayer ID # 23-2637847

Officers, Directors and Principal Stockholders

Louis A. DeNaples
400 Mill Street
Dunmore, PA 18512

Dominick L. DeNaples
400 Mill Street
Dunmore, PA 18512

Section C. Specific Information Regarding Applicant and its Related Parties

Keystone Sanitary Landfill, Inc.
249 Dunham Drive
Dunmore, PA 18512
Dunmore/Throop Boroughs, Lackawanna Co.
570-343-5782

DMS Shredding, Inc.
Rear 9 Fellows Avenue
Wilkes Barre, PA 18703
Hanover Township, Luzerne Co.
570-819-3339

Lackawanna Recycling Center, Inc.
3400 Boulevard Avenue
Scranton, PA 18512
Scranton, Lackawanna Co.
570-963-6868

D's U Pull It, Inc.
400 Mill Street
Dunmore, PA 18512
Dunmore, Lackawanna Co.
570-343-7673

DeNaples Auto Parts, Inc.
400 Mill Street
Dunmore, PA 18512
Dunmore, Lackawanna Co.
570-343-7673

Plan Approvals or Operating Permits

Title V Permit # 35-00014
Keystone Sanitary Landfill, Dunmore
PADEP
Air Quality Program
Wilkes Barre, PA
Issued Date: 9/21/2021– Expires 9/21/2026

Title V Permit # 35-00014A
Phase III Plan Approval
Keystone Sanitary Landfill, Dunmore
PADEP
Air Quality Program
Wilkes Barre, PA
Issued 1/3/2022 – Expires 1/1/2024 Administratively Extended 6/30/2024 –
"Operating coverage under the permit shield" (awaiting Title V update)

Title V Permit # 54-00054A
CES, Hegins
PADEP
Air Quality Program
Wilkes Barre, PA
Issued 8/18/2020 – Expires 8/17/2025

Permit # 40-00096
DMS Shredding, Wilkes Barre
PADEP
Air Quality Program
Wilkes Barre, PA
Issued 5/18/2022 –Expires 6/13/2027

Plan Approval # 35-322013 – Flares
Keystone Sanitary Landfill, Dunmore
PaDEP
Air Quality Program
Wilkes Barre, PA
Issued 6/24/2013

Plan Approval # 35-322-012 – Increase in Tonnage
Keystone Sanitary Landfill, Dunmore
PaDEP
Air Quality Program
Wilkes Barre, PA
Issued 2014

Permit # GP11-35-009 – AQ General Permit
Keystone Sanitary Landfill, Dunmore
PaDEP
Air Quality Program
Wilkes Barre, PA
Issued 2/23/2016

Plan Approval # 54-00054A – Flare
CES, Hegins
PADEP
Air Quality Program
Wilkes Barre, PA
Issued 4/18/19 – Expires 5/31/2020

Permit # GP3-54-015 – AQ General Permit
Commonwealth Environmental Systems, L.P.
PaDEP
Air Quality Program
Wilkes Barre, PA
Issued 10/18/2022 Expires 10/17/2027

Permit # GP3-35-035 – AQ General Plan Approval
Keystone Sanitary Landfill, Inc.
PADEP
Air Quality Program
Wilkes Barre, PA
Issued 12/24/2023 – Expires 12/27/2028

Permit # GP9-35-034 – AQ General Plan Approval
Keystone Sanitary Landfill, Inc.
PADEP
Air Quality Program
Wilkes Barre, PA
Issued 12/24/2023 – Expires 12/27/2028

ATTACHMENT E

PROOF OF MUNICIPAL/COUNTY NOTIFICATIONS

Earthres Group, Inc.
toll free 800-264-4553

www.earthres.com

EARTHRES
ENGINEERING FOR SUCCESS℠

HEADQUARTERS / PHILADELPHIA REGION
P. O. Box 468, Pipersville, PA 18947
phone 215-766-1211

APPALACHIAN REGIONAL OFFICE
P. O. Box 794, Morgantown, WV 26505
phone 304-212-6866

August 22, 2024

Schuylkill County Commissioners
Schuylkill County Courthouse
401 North Second Street, 3rd Floor
Pottsville, PA 17901

SUBJECT: Commonwealth Environmental Systems, L.P. (CES) Landfill
Notifications of Air Quality Plan Approval Application
Foster, Frailey, and Reilly Townships, Schuylkill County
EARTHRES Project No. 011035.080

Dear Commissioners

Pursuant to 25 Pa. Code §127.43a and §127.413, this letter is to notify Schuylkill County that an Air Quality Plan Approval Application is being filed with the Pennsylvania Department of Environmental Protection (PADEP) Northeast Regional Office (NERO) for an expansion of the existing Commonwealth Environmental Systems, L.P. (CES) Landfill. The Landfill is located at 99 Commonwealth Road, Foster Township, Schuylkill County, Pennsylvania.

A 30-day comment period regarding the application begins upon your receipt of this notice. Questions and/or comments regarding the application should be directed to the Pennsylvania Department of Environmental Protection, Northeast Regional Office, Bureau of Air Quality, 2 Public Square, Wilkes-Barre, Pennsylvania 18701-1915. The telephone number is (570) 826-2511.

Please contact me at (215) 766-1211 with any questions or concerns.

Sincerely,
Earthres Group, Inc.

Shae Portner, G.I.T.
Project Manager

cc: Dominick L. DeNaples Jr., Keystone Sanitary Landfill
Michael Piepoli, P.E., CES Landfill
Nicole C. Wilson, P.E., Earthres Group, Inc.

Earthres Group, Inc.
toll free 800-264-4553

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phone 215-766-1211

APPALACHIAN REGIONAL OFFICE
P. O. Box 794, Morgantown, WV 26505
phone 304-212-6866

August 22, 2024

Board of Supervisors
Foster Township
1000 Wyoming Ave.
Freeland, PA 18224

SUBJECT: Commonwealth Environmental Systems, L.P. (CES) Landfill
Notifications of Air Quality Plan Approval Application
Foster, Frailey, and Reilly Townships, Schuylkill County
EARTHRES Project No. 011035.080

Dear Supervisors:

Pursuant to 25 Pa. Code §127.43a and §127.413, this letter is to notify Foster Township that an Air Quality Plan Approval Application is being filed with the Pennsylvania Department of Environmental Protection (PADEP) Northeast Regional Office (NERO) for an expansion of the existing Commonwealth Environmental Systems, L.P. (CES) Landfill. The Landfill is located at 99 Commonwealth Road, Foster Township, Schuylkill County, Pennsylvania.

A 30-day comment period regarding the application begins upon your receipt of this notice. Questions and/or comments regarding the application should be directed to the Pennsylvania Department of Environmental Protection, Northeast Regional Office, Bureau of Air Quality, 2 Public Square, Wilkes-Barre, Pennsylvania 18701-1915. The telephone number is (570) 826-2511.

Please contact me at (215) 766-1211 with any questions or concerns.

Sincerely,
Earthres Group, Inc.

Shae Portner, G.I.T.
Project Manager

cc: Dominick L. DeNaples Jr., Keystone Sanitary Landfill
Michael Piepoli, P.E., CES Landfill
Nicole C. Wilson, P.E., Earthres Group, Inc.

Earthres Group, Inc.
toll free 800-264-4553

www.earthres.com

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HEADQUARTERS / PHILADELPHIA REGION
P. O. Box 468, Pipersville, PA 18947
phone 215-766-1211

APPALACHIAN REGIONAL OFFICE
P. O. Box 794, Morgantown, WV 26505
phone 304-212-6866

August 22, 2024

Frailey Township Supervisors
c/o Municipal Building
23 Maryland Street
Donaldson, PA 17081

SUBJECT: Commonwealth Environmental Systems, L.P. (CES) Landfill
Notifications of Air Quality Plan Approval Application
Foster, Frailey, and Reilly Townships, Schuylkill County
EARTHRES Project No. 011035.080

Dear Supervisors:

Pursuant to 25 Pa. Code §127.43a and §127.413, this letter is to notify Frailey Township that an Air Quality Plan Approval Application is being filed with the Pennsylvania Department of Environmental Protection (PADEP) Northeast Regional Office (NERO) for an expansion of the existing Commonwealth Environmental Systems, L.P. (CES) Landfill. The Landfill is located at 99 Commonwealth Road, Foster Township, Schuylkill County, Pennsylvania.

A 30-day comment period regarding the application begins upon your receipt of this notice. Questions and/or comments regarding the application should be directed to the Pennsylvania Department of Environmental Protection, Northeast Regional Office, Bureau of Air Quality, 2 Public Square, Wilkes-Barre, Pennsylvania 18701-1915. The telephone number is (570) 826-2511.

Please contact me at (215) 766-1211 with any questions or concerns.

Sincerely,
Earthres Group, Inc.

Shae Portner, G.I.T.
Project Manager

cc: Dominick L. DeNaples Jr., Keystone Sanitary Landfill
Michael Piepoli, P.E., CES Landfill
Nicole C. Wilson, P.E., Earthres Group, Inc.

Earthres Group, Inc.
toll free 800-264-4553

www.earthres.com

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phone 215-766-1211

APPALACHIAN REGIONAL OFFICE
P. O. Box 794, Morgantown, WV 26505
phone 304-212-6866

August 22, 2024

Reilly Township Supervisors
c/o Municipal Building
Spruce St, P.O. Box 1
Branchdale, PA 17923

SUBJECT: Commonwealth Environmental Systems, L.P. (CES) Landfill
Notifications of Air Quality Plan Approval Application
Foster, Frailey, and Reilly Townships, Schuylkill County
EARTHRES Project No. 011035.080

Dear Supervisors:

Pursuant to 25 Pa. Code §127.43a and §127.413, this letter is to notify Reilly Township that an Air Quality Plan Approval Application is being filed with the Pennsylvania Department of Environmental Protection (PADEP) Northeast Regional Office (NERO) for an expansion of the existing Commonwealth Environmental Systems, L.P. (CES) Landfill. The Landfill is located at 99 Commonwealth Road, Foster Township, Schuylkill County, Pennsylvania.

A 30-day comment period regarding the application begins upon your receipt of this notice. Questions and/or comments regarding the application should be directed to the Pennsylvania Department of Environmental Protection, Northeast Regional Office, Bureau of Air Quality, 2 Public Square, Wilkes-Barre, Pennsylvania 18701-1915. The telephone number is (570) 826-2511.

Please contact me at (215) 766-1211 with any questions or concerns.

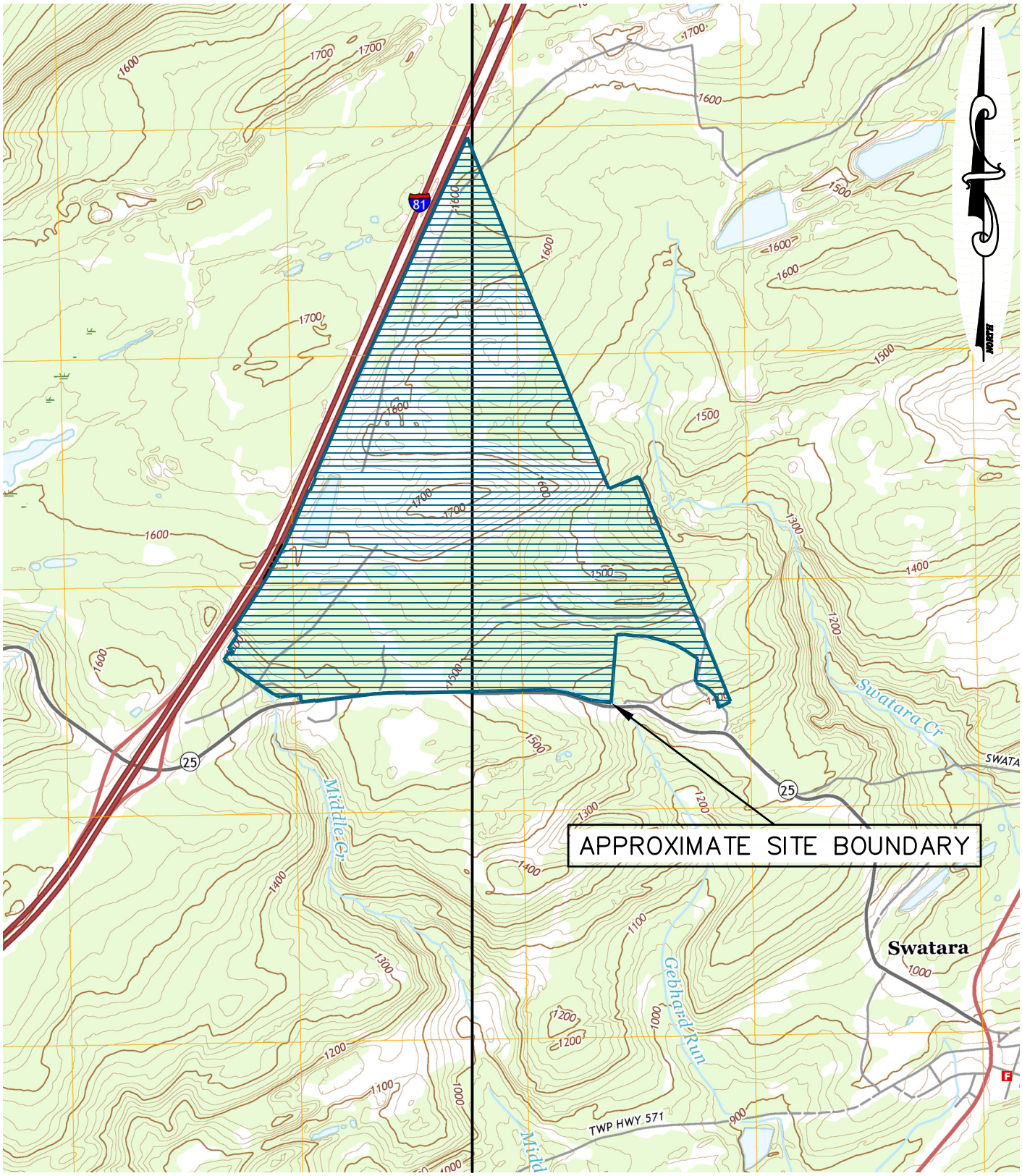
Sincerely,
Earthres Group, Inc.

Shae Portner, G.I.T.
Project Manager

cc: Dominick L. DeNaples Jr., Keystone Sanitary Landfill
Michael Piepoli, P.E., CES Landfill
Nicole C. Wilson, P.E., Earthres Group, Inc.

FIGURE 1

SITE LOCATION MAP



SOURCE: USGS 7.5 MINUTE QUADRANGLE - TREMONT, PA & MINERSVILLE, PA

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HEADQUARTERS
PHILADELPHIA REGION
P. O. Box 468
6912 Old Easton Road
Pipersville, PA 18947

APPALACHIAN
REGIONAL OFFICE
P. O. Box 794
8000 Coombs Farm Drive
Morgantown, WV 26505

DRAWN BY:	CHECKED BY:
SP	NCW
DATE:	PROJECT NO:
07/01/2024	011035.080

DRAWING SCALE: 1" = 2000'

FIGURE 1
SITE LOCATION MAP

AIR QUALITY PLAN APPROVAL APPLICATION
COMMONWEALTH ENVIRONMENTAL SYSTEMS, L.P. LANDFILL
99 COMMONWEALTH ROAD
SCHUYLKILL COUNTY, PA