



**ENVIRONMENTAL
INFORMATION
LOGISTICS, LLC**

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New Franklin, OH 44203
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July 19, 2023

Ms. Amy Tempus-Doom
Division for Air Quality - Permit Review Branch
300 Sower Blvd., 2nd Floor
Frankfort, KY 40601
Submitted Electronically – Kentucky Business One Stop Portal

RE: Tri-K Landfill – Stanford, KY
Source I.D. No. 21-137-00014
Title V Operating Permit V-18-034 – Renewal Application

Dear Ms. Tempus-Doom:

The Tri-K Landfill located in Stanford, Kentucky was issued a Title V Operating Permit Renewal on January 26, 2019. 401 KAR 52:020 Section 12 and Condition G.2.a require submittal of a timely and complete renewal application six months before permit expiration. For Tri-K Landfill, that date corresponds to July 26, 2023.

Enclosed is a pdf of the application with the Responsible Official signature. The application consists of the following:

- Emissions Calculation Updates for significant activities and an updated list of insignificant activities;
- Application forms;
- New applicable federal requirements: 40 CFR Part 62 (Federal Plan), Subpart OOO and 40 CFR 63, Subpart AAAA (Revised Landfill NESHAP); and
- List of non-applicable state and federal requirements for permit shield coverage.

Environmental Information Logistics is submitting the application on behalf of the landfill owner, Tri-K Landfill. If you have any questions or comments, please call me at (630) 209-3931 or Chip Simmons of Tri-K Landfill at (502) 401-8891.

Sincerely,
Environmental Information Logistics, LLC

Emily M. Nelson
Senior Project Manager

cc: Chip Simmons, Benson Valley Landfill

Tri-K Landfill
SOURCE I.D. #21-137-00014

Application for Renewal of a Title V Permit

Stanford
Lincoln County, Kentucky

July 2023

Prepared by:

Environmental Information Logistics, LLC
130 E. Main Street
Caledonia, MI 49316

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INTRODUCTION

Republic Services of Kentucky, LLC (Republic) owns and operates the Tri-K Landfill (Tri-K), a municipal solid waste landfill located in Stanford, Lincoln County, Kentucky. Lincoln County has been designated as attainment for all criteria pollutants.

On January 26, 2019, the Kentucky Department for Environmental Protection issued a Title 5 Operating Permit (Air Quality General Permit) for the facility. The permit expires on January 26, 2024, and per General Condition G.2.a, a renewal application is due six months prior to the expiration date of the permit (i.e., by July 26, 2023). Tri-K is requesting a renewal of the Title 5 Air Quality General Permit, with appropriate updates, clarifications, and modifications, in accordance with 401 KAR 52:020 Section 12.

The current permit includes the following significant emission units:

<u>Emissions Unit No.</u>	<u>Emissions Unit Description</u>
001	Municipal Solid Waste (MSW) Landfill
004	Landfill Flare
002	Paved and Unpaved Haul Roads
008	Site Construction
006	Industrial Waste Solidification Process
007	Emergency Generator

There are no new significant emissions units to add for this renewal application. However, the facility is requesting an update to throughput limits for Emissions Unit No. 002 – Paved and Unpaved Haul Roads.

The following insignificant emissions units were identified in the current permit:

- Leachate Tank (30,000 gallons)
- Leachate Tank (30,000 gallons)
- Leachate Tank (30,000 gallons)
- Leachate Tank (30,000 gallons)
- Leachate Tank (30,000 gallons)
- Leachate Tank (140,000 gallons)
- Leachate Tank (155,000 gallons)
- Leachate Tank (155,000 gallons)
- Propane tank (500 gallons)
- Propane tank (500 gallons)
- Propane tank (1,000 gallons)
- Diesel tank (500 gallons)
- Diesel tank (3,000 gallons)
- Diesel tank (3,000 gallons)
- Parts cleaner station
- Composting operation

All of the above-listed insignificant emissions units are still present at the facility; with one

exception. The 1000-gallon propane tank was removed and replaced with two smaller tanks which are listed as new insignificant sources below.

Three additional insignificant emissions unit has been added for this renewal application:

- Leachate Storage Tank (5,000 gallons)
- Propane Tank (500 gallons)
- Propane Tank (500 gallons)

A summary of additional requested updates to the current permit are provided in this application. These include:

- Emissions calculation updates for the landfill and haul roads (Appendix A);
- New applicable regulations (40 CFR 62 Subpart OOO and revised 40 CFR 63 Subpart AAAA); and
- List of non-applicable state and federal requirements for permit shield coverage.

Application forms are provided in Section 2. A site map is included in Appendix B, and a process flow diagram is provided in Appendix C.

Newly Applicable/Revised Federal Regulations

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): On May 21, 2021, the Federal Register published the federal plan requirements for municipal solid waste (MSW) landfills that commenced construction before July 17, 2014, such as Tri-K, and are in states where a state plan has not been approved, such as Kentucky. The rule, 40 CFR 62, Subpart OOO (Federal Plan), went into effect on June 21, 2021. This closes the loop to allow landfills in Kentucky to smoothly transition into the requirements of the revised NESHAP. Tri-K is considered a Legacy Controlled Landfill (as defined in §62.16730), and as such, was not required to submit several reports or comply with the “Increments of Progress” in §62.16712 of the Federal Plan.

The Landfill NESHAP (40 CFR 63 Subpart AAAA) revisions were promulgated on March 26, 2020, and became effective September 27, 2021. All of the operational standards, compliance, and monitoring requirements of the Federal Plan (§62.16717, §62.16720 & §62.16722, respectively) are now superseded by their equivalent NESHAP counterpart (§63.1958, §63.1960 & §63.1961, respectively). Additionally, selective recordkeeping and reporting requirements of the Federal Plan (§62.16724(h), (k) & (q) and §62.16726(e)) are also now superseded by their equivalent provisions of the revised Landfill NESHAP (§63.1981(h), (j) & (k) and §63.1983(e), respectively).

Only the relevant provisions of the Federal Plan which have not been superseded by the Landfill NESHAP should be incorporated. These include the following regulatory citations:

- §62.16710(a) – Scope
- §62.16711(a), (d) – (f) & (h) – Designated Facilities

- §62.16714(a), (b), (c)(2) – (4) & (f) – Standards for MSW Landfill Emissions
- §62.16718(b) – (e) – Test Methods
- §62.16724(d)(6) & (7), (e) – (g), (j) & (l) - Reporting
- §62.16726(a) – (d), (e)(6) & (h) – (j) – Recordkeeping
- §62.16728 – Specifications for Active Systems
- §62.16730 – Definitions

40 CFR 63, Subpart AAAA (Revised – National Emissions Standards for Hazardous Air Pollutants – Municipal Solid Waste Landfills): As stated previously, on March 26, 2020, the EPA promulgated substantial revisions to the Landfill NESHAP (40 CFR 63 Subpart AAAA). The intent was to incorporate the monitoring, recordkeeping, reporting and compliance provisions of the Landfill NSPS (40 CFR 60 Subparts WWW and XXX) into the revised Landfill NESHAP and make the NESHAP the primary air compliance regulation for landfill compliance. These provisions become effective after September 27, 2021. Also on March 26, 2020, the EPA revised the Landfill NSPS to provide a sunset date for 40 CFR 60 Subpart WWW once the MSW landfill “*Becomes subject to the more stringent requirements in an approved and effective state or federal plan that implements subpart Cf of this part*” (see §60.750(d)(1)). On May 21, 2021, the Federal Register published the federal plan requirements for municipal solid waste (MSW) landfills that commenced construction before July 17, 2014. Tri-K is subject to the Federal Plan as stated above. Since the NESHAP is now primarily the governing federal air regulation for landfills, the renewal permit issued for Tri-K should incorporate the revised NESHAP provisions and remove all prior references to 40 CFR 60 Subpart WWW.

APPLICATION FORMS

The following application forms are included in this section:

- DEP Form 7007AI – Administrative Information
- DEP Form 7007B – Manufacturing or Process Operations
- DEP Form 7007N – Emissions, Stacks and Controls Information
- DEP Form 7007V – Applicable Requirements & Compliance Activities
- DEP Form 7007CC – Compliance Certification
- DEP Form 7007DD – Insignificant Activities
- DEP Form 7007GG – Control Equipment
- DEP Form 7007HH – Haul Roads

DEP FORM 7007AI

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007AI

Administrative Information

- ___ Section AI.1: Source Information
___ Section AI.2: Applicant Information
___ Section AI.3: Owner Information
___ Section AI.4: Type of Application
___ Section AI.5: Other Required Information
___ Section AI.6: Signature Block
___ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

___ Additional Documentation attached

Source Name: Republic Services of Kentucky, LLC d/b/a Tri-K Landfill

KY EIS (AFS) #: 21- 137-00014

Permit #: V-18-034

Agency Interest (AI) ID: 2726

Date: 7/19/2023

Section AI.1: Source Information

Physical Location	Street:	<u>1905 KY Highway 3429</u>		
Address:	City:	<u>Stanford</u>	County:	<u>Lincoln</u>
			Zip Code:	<u>40484</u>
Mailing Address:	Street or P.O. Box:	<u>1905 KY Highway 3429</u>		
	City:	<u>Stanford</u>	State:	<u>KY</u>
			Zip Code:	<u>40484</u>

Standard Coordinates for Source Physical Location

Longitude: 84.401 (decimal degrees) **Latitude:** 37.2723 (decimal degrees)

Primary (NAICS) Category: Solid Waste Landfill **Primary NAICS #:** 562212

Classification (SIC) Category:

Refuse Systems

Primary SIC #:

4953

Briefly discuss the type of business conducted at this site:

This site is a permitted municipal solid waste landfill

Description of Area Surrounding Source:☒ Rural Area☐ Industrial Park☐ Residential Area**Is any part of the source located on federal land?**☐ Yes☒ No**Number of Employees:**

12

☐ Urban Area☐ Industrial Area☐ Commercial Area**Approximate distance to nearest residence or commercial property:**

92

Property Area:

576

Is this source portable?☐ Yes☒ No**What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?****NPDES/KPDES:**☒ Currently Hold☐ Need☐ N/A**Solid Waste:**☒ Currently Hold☐ Need☐ N/A**RCRA:**☐ Currently Hold☐ Need☐ N/A**UST:**☐ Currently Hold☐ Need☐ N/A**Type of Regulated Waste Activity:**☐ Mixed Waste Generator☐ Generator☐ Recycler☐ Other: _____☐ U.S. Importer of Hazardous Waste☐ Transporter☒ Treatment/Storage/Disposal Facility☐ N/A

Section AI.2: Applicant Information

Applicant Name: Republic Services of Kentucky, LLC d/b/a Tri-K Landfill

Title: (if individual)

Mailing Address: **Street or P.O. Box:** 1905 KY Highway 3429
City: Stanford **State:** KY **Zip Code:** 40484

Email: (if individual)

Phone: (502) 401-8891

Technical Contact

Name: Chip Simmons

Title: Environmental Manager

Mailing Address: **Street or P.O. Box:** 2157 Highway 151
City: Frankfort **State:** KY **Zip Code:** 40601

Email: CSimmons2@republicservices.com

Phone: (502) 401-8891

Air Permit Contact for Source

Name: Emily Nelson

Title: Senior Project Manager

Mailing Address: **Street or P.O. Box:** 4463 Hilltop Drive
City: New Franklin **State:** OH **Zip Code:** 44203

Email: enelson@eilllc.com

Phone: (630) 209-3931

Section AI.3: Owner Information☒ **Owner same as applicant****Name:** _____**Title:** _____**Mailing Address:** **Street or P.O. Box:** _____
City: _____ **State:** _____ **Zip Code:** _____**Email:** _____**Phone:** _____**List names of owners and officers of the company who have an interest in the company of 5% or more.****Name****Position**

Section AI.4: Type of Application

Current Status:	☒ Title V	☐ Conditional Major	☐ State-Origin	☐ General Permit	☐ Registration	☐ None
	☐ Name Change	☐ Initial Registration	☐ Significant Revision	☐ Administrative Permit Amendment		
Requested Action: (check all that apply)	☒ Renewal Permit	☐ Revised Registration	☐ Minor Revision	☐ Initial Source-wide Operating Permit		
	☐ 502(b)(10) Change	☐ Extension Request	☐ Addition of New Facility	☐ Portable Plant Relocation Notice		
	☐ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submittal	☐ Modification of Existing Facilities		
	☐ Ownership Change	☐ Closure				
Requested Status:	☒ Title V	☐ Conditional Major	☐ State-Origin	☐ PSD	☐ NSR	☐ Other: _____

Is the source requesting a limitation of potential emissions?

☐ Yes☒ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter	_____	☐ Single HAP	_____
☐ Volatile Organic Compounds (VOC)	_____	☐ Combined HAPs	_____
☐ Carbon Monoxide	_____	☐ Air Toxics (40 CFR 68, Subpart F)	_____
☐ Nitrogen Oxides	_____	☐ Carbon Dioxide	_____
☐ Sulfur Dioxide	_____	☐ Greenhouse Gases (GHG)	_____
☐ Lead	_____	☐ Other	_____

For New Construction:

Proposed Start Date of Construction:
(MM/YYYY)

Proposed Operation Start-Up Date: (MM/YYYY)

For Modifications:

Proposed Start Date of Modification:
(MM/YYYY)

Proposed Operation Start-Up Date: (MM/YYYY)

Applicant is seeking coverage under a permit shield.

☒ Yes☐ No

Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.

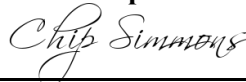
Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- | | |
|--|--|
| ☐ DEP7007A Indirect Heat Exchangers and Turbines | ☒ DEP7007CC Compliance Certification |
| ☒ DEP7007B Manufacturing or Processing Operations | ☒ DEP7007DD Insignificant Activities |
| ☐ DEP7007C Incinerators and Waste Burners | ☐ DEP7007EE Internal Combustion Engines |
| ☐ DEP7007F Episode Standby Plan | ☐ DEP7007FF Secondary Aluminum Processing |
| ☐ DEP7007J Volatile Liquid Storage | ☒ DEP7007GG Control Equipment |
| ☐ DEP7007K Surface Coating or Printing Operations | ☒ DEP7007HH Haul Roads |
| ☐ DEP7007L Mineral Processes | ☐ Confidentiality Claim |
| ☐ DEP7007M Metal Cleaning Degreasers | ☐ Ownership Change Form |
| ☒ DEP7007N Source Emissions Profile | ☐ Secretary of State Certificate |
| ☐ DEP7007P Perchloroethylene Dry Cleaning Systems | ☒ Flowcharts or diagrams depicting process |
| ☐ DEP7007R Emission Offset Credit | ☐ Digital Line Graphs (DLG) files of buildings, roads, etc. |
| ☐ DEP7007S Service Stations | ☒ Site Map |
| ☐ DEP7007T Metal Plating and Surface Treatment Operations | ☐ Map or drawing depicting location of facility |
| ☒ DEP7007V Applicable Requirements and Compliance Activities | ☐ Safety Data Sheet (SDS) |
| ☐ DEP7007Y Good Engineering Practice and Stack Height Determination | ☐ Emergency Response Plan |
| ☐ DEP7007AA Compliance Schedule for Non-complying Emission Units | ☐ Other: _____ |
| ☐ DEP7007BB Certified Progress Report | |

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.



Authorized Signature

Chip Simmons

Type or Printed Name of Signatory

07/19/2023

Date

Environmental Manager

Title of Signatory

*Responsible official as defined by 401 KAR 52:001.

Section AI.7: Notes, Comments, and Explanations

DEP FORM 7007B

Division for Air Quality 300 Sower Boulevard Frankfort, KY 40601 (502) 564-3999	DEP7007B Manufacturing or Processing Operations ___ Section B.1: Process Information ___ Section B.2: Materials and Fuel Information ___ Section B.3: Notes, Comments, and Explanations	Additional Documentation ___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG. ___ Attach a flow diagram ___ Attach SDS
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Source Name:	Republic Services of Kentucky, LLC d/b/a Tri-K Landfill
KY EIS (AFS) #:	21- 137-00014
Permit #:	V-18-034
Agency Interest (AI) ID:	2726
Date:	7/19/2023

Section B.1: Process Information										
Emission Unit #	Emission Unit Name	Describe Emission Unit	Process ID	Process Name	Manufacturer	Model No.	Proposed/Actual Date of Construction Commencement (MM/YYYY)	Is the Process Continuous or Batch?	Number of Batches per 24 Hours (if applicable)	Hours per Batch (if applicable)
001	MSW Landfill	Sanitary Landfilling of Municipal Solid Waste (MSW)	N/A	N/A	N/A	N/A	1974	Continuous	N/A	N/A

[illegible]

Section B.3: Notes, Comments, and Explanations

DEP FORM 7007N

Division for Air Quality 300 Sower Boulevard Frankfort, KY 40601 (502) 564-3999	DEP7007N Source Emissions Profile ___ Section N.1: Emission Summary ___ Section N.2: Stack Information ___ Section N.3: Fugitive Information ___ Section N.4: Notes, Comments, and Explanations	Additional Documentation ___ Complete DEP7007AI
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Source Name:	Republic Services of Kentucky, LLC d/b/a Tri-K Landfill
KY EIS (AFS) #:	21- 137-00014
Permit #:	V-18-034
Agency Interest (AI) ID:	2726
Date:	7/19/2023

N.1: Emission Summary																
Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity <i>(SCC Units/hour)</i>	Pollutant	Uncontrolled Emission Factor <i>(lb/SCC Units)</i>	Emission Factor Source <i>(e.g. AP-42, Stack Test, Mass Balance)</i>	Capture Efficiency <i>(%)</i>	Control Efficiency <i>(%)</i>	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential <i>(lb/hr)</i>	Controlled Potential <i>(lb/hr)</i>	Uncontrolled Potential <i>(tons/yr)</i>	Controlled Potential <i>(tons/yr)</i>
See	Attachment	for	N1													

Attachment for KDEP Form 7007 N1

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity (SCC Units/hour)	Pollutant	Uncontrolled Emission Factor (lb/SCC Units)	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency (%)	Control Efficiency (%)	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential (lb/hr)	Controlled Potential (lb/hr)	Uncontrolled Potential (tons/yr)	Controlled Potential (tons/yr)
001	MSW Landfill	1	Landfilling of MSW Waste	Open Flare	004	None	33,600,000 bcy	VOC	69.8928 lbs/mmcsf LFG produced	Mass Balance see calculations ²	75.00%	98.00%	12.76	3.19	27.94	13.97
004	Open Flare	1	LFG Combustion	N/A - flare IS a control device	N/A	None	3,000 cfm	NOx	32.14 lbs/mmcsf	KDEP EIS	N/A	N/A	5.79	5.79	25.34	25.34
								CO	174.9 lbs/mmcsf				31.48	31.48	137.89	137.89
								VOC	70 lbs/mmcsf				12.60	0.25	55.19	1.10
								PM	8.84 lbs/mmcsf	1.59	1.59	6.97	6.97			
								SO ₂	32.548 lbs/mmcsf ¹	Site-Specific Tested Value	N/A	5.86	5.86	25.66	25.66	
002	Unpaved and Paved Haul Roads (MSW LF)	1	Unpaved Roads	Dust Suppression (Water Truck)	WT- Water Truck	N/A - Fugitive	22,957 VMT ³	PM2.5	0.1372 lb/VMT	KDEP EIS	N/A	40.00%	N/A	N/A	1.57	0.94
								PM10	1.3775 lb/VMT			70.00%			15.81	4.74
								PM	5.1026 lb/VMT			40.00%			58.57	17.57
		2	Paved Roads				14,348 VMT ³	PM2.5	0.0745 lb/VMT			40.00%			0.53	0.32
								PM10	0.3035 lb/VMT			70.00%			2.18	0.65
								PM	1.5165 lb/VMT			10.88			3.26	
007	Emergency Generator	1	Propane Used	None	N/A	None	500 hours/year (EPA Guidance for calculating PTE from Emergency Generators) - equates to 995 gallons propane/yr	CO	563.819 lbs/1000 gallons	KDEP EIS	N/A	N/A	1.12	1.12	0.28	0.28
								NOx	151.2915 lbs/1000 gallons				0.30	0.30	0.08	0.08
								PM	0.70 lbs/1000 gallons				0.0014	0.0014	0.0003	0.0003
								SO2	0.054 lbs/1000 gallons				0.0001	0.0001	0.0000	0.0000
								VOC	21.425 lbs/1000 gallons				0.04	0.04	0.01	0.01
None	Leachate Tanks	1	Leachate Processed	None	N/A	N/A - Fugitive		VOC	0.0000975 lbs/1000 gallons leachate throughput	KDEP EIS	N/A	N/A	0.0002	0.0002	0.0010	0.0010
006	Solidification	1	Liquid Waste	None	N/A	N/A - Fugitive	2,500,000 gallons/year (10,425 tons/yr) liquid waste	VOC	2.8964 lbs/ton material processed	KDEP EIS	N/A	N/A	N/A	N/A	15.10	15.10
008	Site Construction	1	Waste Covering	None	N/A	N/A - Fugitive	330,000 tons/year of waste processed	PM10	0.183 lb/ton material processed	KDEP EIS	N/A	90.00%	N/A	N/A	30.20	3.02
								PM2.5	0.08235 lb/ton material processed						13.59	1.36
								PM	0.183 lb/ton material processed						30.20	3.02

¹SO₂ emissions factor updated based on highest site-specific sulfur value measured over the last four years.²LFG emissions are calculated for the next 10 years only since the site has over 200 years of life remaining. Future projected waste volumes of 330,000 tons/year were used.³Values for paved/unpaved road VMT based on projected road conditions over the next five years (construction of new disposal cell further away than current area). See attached calculations.⁴No limit is specified in the permit for this insignificant activity. An annual throughput of 20,000,000 gallons/year was utilized for the calculation.

Section N.2: Stack Information**UTM Zone:**

Stack ID	Identify all Emission Units (with Process ID) and Control Devices that Feed to Stack	Stack Physical Data			Stack UTM Coordinates		Stack Gas Stream Data		
		Equivalent Diameter (ft)	Height (ft)	Base Elevation (ft)	Northing (m)	Easting (m)	Flowrate (acfm)	Temperature (° F)	Exit Velocity (ft/sec)
FLR	Emissions Unit 001 (MSW Landfill) and Emissions Unit 004 (Flare)	1	28.3	1285 msl			3000 cfm	1200	Meets 40 CFR 60.18 & 40 CFR 63.11

Section N.3: Fugitive Information

UTM Zone:

Emission Unit #	Emission Unit Name	Process ID	Area Physical Data		Area UTM Coordinates		Area Release Data	
			Length of the X Side (ft)	Length of the Y Side (ft)	Northing (m)	Easting (m)	Release Temperature (°F)	Release Height (ft)
004	Open Flare	1						
001	MSW Landfill	1						
002	Paved haul roads	2						
002	Unpaved haul roads	1						
006	Industrial Waste Solidification Process	1						
007	Emergency Generator	1						
008	Site Construction/Operation	1						

Section N.4: Notes, Comments, and Explanations

DEP FORM 7007V

Division for Air Quality 300 Sower Boulevard Frankfort, KY 40601 (502) 564-3999	DEP7007V Applicable Requirements and Compliance Activities ___ Section V.1: Emission and Operating Limitation(s) ___ Section V.2: Monitoring Requirements ___ Section V.3: Recordkeeping Requirements ___ Section V.4: Reporting Requirements ___ Section V.5: Testing Requirements ___ Section V.6: Notes, Comments, and Explanations	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; padding: 5px;">Additional Documentation</td> </tr> <tr> <td style="padding: 5px;">___ Complete DEP7007AI</td> </tr> </table>	Additional Documentation	___ Complete DEP7007AI			
Additional Documentation							
___ Complete DEP7007AI							
Source Name: Republic Services of Kentucky, LLC d/b/a Tri-K Landfill							
KY EIS (AFS) #: 21- 137-00014							
Permit #: V-18-034							
Agency Interest (AI) ID: 2726							
Date: 7/19/2023							
Section V.1: Emission and Operating Limitation(s)							
Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
004	Open Flare	401 KAR 63:015	Opacity	Visible emissions shall not exceed 20% opacity for >3 minutes during any one day			Visual observations
004	Open Flare	40 CFR Part 62 Subpart OOO & 40 CFR 60.18; 40 CFR 63 Subpart AAAA & 40 CFR 63.11	Visible Emissions	VE <5 minutes in 2 hours			Visual observations
001	Landfill	40 CFR Part 63 Subpart AAAA	NMOC & HAPs	Multiple Requirements			Wellhead readings and surface monitoring
Insignificant	Leachate Tanks	40 CFR 60 Subpart Kb	VOC	Vapor pressure <3.5kPa			Leachate is mostly water; negligible vapor pressure
002	Haul Roads	401 KAR 63:010	Fugitive Dust	No fugitive VE Past Property Line			Daily visual observations when site is open
008	Site Construction	401 KAR 63:010	Fugitive Dust	Prevent airborne PM			Daily visual observations when site is open
006	Industrial Waste Solidification Process	401 KAR 63:010	Fugitive emissions	Liquid waste <2,500,000 gallons/yr			Monthly gallons/tons of each industrial waste added, HAPs emissions based on rolling 12-month basis
007	Emergency Generator	40 CFR 63 Subpart ZZZZ	HAPs	<100 hours of operation per calendar year			Monthly hours of operation and amount of propane used each month

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
004	Open Flare	Visible Emissions	401 KAR 63:015	Visual Emissions	Weekly VE observations
004	Open Flare	N/A	40 CFR 63 Subpart AAAA	Flow and Flame Presence	Measure flow and flame presence continuously
001	MSW Landfill	NMOC	40 CFR 63 Subpart AAAA	NMOC & HAPs	Wellhead readings monthly , cover integrity monitoring monthly, and quarterly surface emissions monitoring
002 & 008	Paved & Unpaved Haul Roads, Construction	Fugitive PM	401 KAR 63:010	Fugitive Dust	Daily visual observations when site is open
006	Industrial Waste Soliification Process	Fugitive emissions	401 KAR 63:010	Waste Volumes	Monthly gallons/tons of each industrial waste added, HAPs emissions based on rolling 12-month basis
007	Emergency Generator	HAPs	40 CFR 63 Subpart ZZZZ	Propane usage & Hours of operation	Monitor the amount of propane used (gallons) and the hours of operation for the generator on a monthly basis

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
004	Open Flare	Visual Emissions	401 KAR 63:015	Visual Emissions	Keep records of weekly VE observations
004	Open Flare	N/A	40 CFR 63 Subpart AAAA	Flow and Flame Presence	Recordd flow and flame presence every 15 minutes
001	MSW Landfill	NMOC	40 CFR 63 Subpart AAAA	NMOC & HAPs	Wellhead readings and surface monitoring (electronic)
002 & 008	Paved & Unpaved Haul Roads, Site Construction	Fugitive PM	401 KAR 63:010	Fugitive Dust	Keep records of daily fugitive dust observations
006	Industrial Waste Solidification Process	Fugitive Emissions	401 KAR 63:010	Waste Volumes	Maintan records of monthly gallons/tons of each industrial waste added, HAPs emissions based on rolling 12-month basis
007	Emergency Generator	HAPs	40 CFR 63 Subpart ZZZZ	Propane usage & Hours of operation	Maintain records of the amount of propane used (gallons) and the hours of operation for the generator on a monthly basis

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
004	Open Flare	Visual Emissions	401 KAR 63:015	Visual Emissions	Semiannual Title 5 Operating Report
004	Open Flare	N/A	40 CFR 63 Subpart AAAA	Flow and Flame Presence	Semiannual Title 5 Operating Report & Semiannual NESHAP Report
001	MSW Landfill	NMOC	40 CFR 63 Subpart AAAA	NMOC & HAPs	Semiannual Title 5 Operating Report & Semiannual NESHAP Report
002 & 008	Paved & Unpaved Haul Roads, Site Construction	Fugitive PM	401 KAR 63:010	Fugitive Dust	Semiannual Title 5 Operating Report
006	Industrial Waste Solidification Process	Fugitive Emissions	401 KAR 63:010	Waste Volumes	Semiannual Title 5 Operating Report
007	Emergency Generator	HAPs	40 CFR 63 Subpart ZZZZ	Propane usage & Hours of operation	Semiannual Title 5 Operating Report
ALL	ALL	ALL	401 KAR 52:020	ALL	Annual Emissions Report

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
004	Open Flare	NMOC	40 CFR 60.18 & 40 CFR 63.11	VE, Exit Velocity, Net Heating Value	One-time initial performance test using EPA Method 22, a calibrated flow meter, and, EPA Method 3
001	MSW Landfill	Sulfur	401 KAR 50:045	Sulfur	Collect annual sulfur sample for lab analysis. Conduct stain tube analysis quarterly for sulfur content
002 & 008	Paved & Unpaved Haul Roads, Site Construction	Fugitive PM	401 KAR 63:010	None	
006	Industrial Waste Solidification Process	Fugitive Emissions	401 KAR 63:010	None	
007	Emergency Generator	HAPs	401 KAR 50:045	None	

Section V.6: Notes, Comments, and Explanations

DEP FORM 7007CC

DEP7007CC
Compliance Certification

Section CC.1: Source Information

1) Source Name Republic Services of Kentucky, LLC Tri-K Landfill		2) Agency Interest (AI) ID 2726	
3) Source Location Address (street, city, state, zip) 1905 KY Highway 3429, Stanford, KY 40464			
4) Technical Contact (name, e-mail, phone #) Chip Simmons, Csimmons2@republicservices.com, (502) 401-8891			
5) Permit Number(s) V-18-034	6) County Lincoln	7) KY EIS (AFS) # 21- 137-00014	
8) Submittal Information Are you certifying any requirement(s) as "not in continuous compliance?" ☐ Yes ☒ No What is the reporting period? mm/ N/A dd/ yy TO mm/ N/A dd/ yy			

Section CC.2: Signature Block

9) CERTIFICATION SIGNATURE

I, THE UNDERSIGNED, HEREBY CERTIFY UNDER PENALTY OF LAW, THAT I AM A RESPONSIBLE OFFICIAL, AND THAT I HAVE PERSONALLY EXAMINED, AND AM FAMILIAR WITH, THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ITS ATTACHMENTS. BASED ON MY INQUIRY OF THOSE INDIVIDUALS WITH PRIMARY RESPONSIBILITY FOR OBTAINING THE INFORMATION, I CERTIFY THAT THE STATEMENTS AND INFORMATION IS ON KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE OR INCOMPLETE INFORMATION, INCLUDING THE POSSIBILITY OF FINE OR IMPRISONMENT.

BY: <u>  </u>	<u>07/19/2023</u>
AUTHORIZED SIGNATURE	DATE
<u>Chip Simmons</u>	<u>Environmental Manager</u>
TYPED OR PRINTED NAME OF SIGNATORY	TITLE OF SIGNATORY

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit***Emission Units in Continuous Compliance***

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. (such as test methods, monitoring procedures, recordkeeping and reporting)
001	Section B, Condition 1.a.A - B., 1.d, 1.h-j (Operating Limitations/Compliance Demonstration), 40 CFR 60.752(b), 60.755(b) & 60.759(a) & (b)	Municipal Solid Waste (MSW) Landfill	Design gas system to meet NSPS criteria; install wells in areas requiring control; calculate max gas flow rate	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 1.a.C & D, 1.e, 1.f, 3.a & b., 4.a & c .i - iii, 5.e (Op Limit/Comp Demon., Testing, Monitoring Reqmts, Records), 40 CFR 60.753, 60.755 & 60.758	Landfill Gas Collection System	Monitor all wells monthly for pressure, O2 or N2, temp. w/allowable methods. Correct exceedances. Keep records.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, Condition 1.b.i & c (Operating Limitations), 40 CFR 60.752(b), 60.753, 60.755 & 60.756	Landfill Gas Open Flare and Gas Collection System	Control collected gas w/ open flare, encl. comb. or treat. syst. Operate in accordance w/NSPS	Reported annually in emissions report	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, 1.g, 7.a, b, e & h (Operating Limits/Control Equipment), 40 CFR 60.753(e) & (f) & 60.755(e)	Landfill Gas Open Flare	NSPS applies at all times except during SSM events. Operate with flame present; close valves within 1 hour if flare inoperable	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 1.k (Operating Limitations), 40 CFR 61.154	Municipal Solid Waste (MSW) Landfill	Cover asbestos waste w/6 in. non-asbestos material by end of working day	None	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 1.i & 5.j (Operating Limitations, recordkeeping), 40 CFR 63.6, 63.1960	Municipal Solid Waste (MSW) Landfill	Develop a written Startup, Shutdown and Malfunction Plan; maintain on site.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit*Emission Units in Continuous Compliance*

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. (such as test methods, monitoring procedures, recordkeeping and reporting)
001	Section B, Condition 1.m (Operating Limitations), 40 CFR 60 Subpart XXX	Municipal Solid Waste (MSW) Landfill	Obtain air permit incorporating Subpart XXX requirements if site expands landfill	N/A	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 2.a, 3.e & f, 4.d (Emissions Limits, Testing, Monitoring Reqmts), 40 CFR 60.753(d), 60.755(c)	Municipal Solid Waste (MSW) Landfill	Surface CH ₄ ems < 500 ppm except during SSM events. Monitor quarterly, follow Method 21 procedures	<500 ppm	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, Condition 2.b & 3.g (Emissions Limits, Testing), 40 CFR 60 Subpart WWW, 40 CFR 60.18	Landfill Gas Open Flare	No VE except for 5 minutes in 2 hours	None observed during Initial NSPS Performance Test	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, Condition 2.c, 4.f & 5.l (Emissions Limits, Monitoring & Recordkeeping), 401 KAR 63:015 Section 3	Landfill Gas Open Flare	Flare PM < 20% opacity except for 3 minutes/day; Weekly VE Survey; Method 9 if VE detected > limits	None observed	N/A - Title 5 Air Operating Permit Renewal Application
N/A	Section B, Condition 1.b.ii-iii, 3.c, 7.d (Operational Limits, Testing, Control Equipment), 40 CFR 60.752(b)(2)(iii)(b) & (c)	LFG Enclosed Combustor & Treatment Systems or Other Control Equipment	Control System D.E. 98% or NMOC Outlet Concentration < 20 ppm as hexane, 3% O ₂ , or Other	N/A	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, Condition 3.d, h & 7.f (Testing, Control Equip.), 40 CFR 60 Subpart WWW, 40 CFR 60.18	Landfill Gas Open Flare	Calculate net heating value of gas using Method 3C, three samples over 1/2 hour	N/A - net heating value was greater than required minimum value	N/A - Title 5 Air Operating Permit Renewal Application

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit***Emission Units in Continuous Compliance***

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. (such as test methods, monitoring procedures, recordkeeping and reporting)
004	Section B, Condition 3.i, j & 7.f (Testing, Control Equip.), 40 CFR 60 Subpart WWW, 40 CFR 60.18	Landfill Gas Open Flare	Calculate exit velocity; maximum cannot exceed limits of 40 CFR 60.18	N/A - exit velocity met 60.18 requirements	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 3.k, 6.k & 6.l (Testing & Reporting), 401 KAR 50:045	Municipal Solid Waste (MSW) Landfill	Sample for H2S quarterly with stain tubes & annual with analytical samples (3) - Submit results	N/A	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 3.l (Testing)	Municipal Solid Waste (MSW) Landfill	Notify appropriate field agency 5 days prior to performing a surface scan.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
All	Section B, Condition 3.m (Testing)	All	Conduct Performance Testing required by Division using reference methods in 401 KAR 50:015.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 4.b (Monitoring), 40 CFR 60.755(c)(5)	Municipal Solid Waste (MSW) Landfill	Conduct monthly cover integrity monitoring & implement repairs as needed	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 4.e & 5.k (Monitoring & Recordkeeping)	Municipal Solid Waste (MSW) Landfill	Measure liquid levels quarterly in all gas wells; maintain records & calculations as specified in permit	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit*Emission Units in Continuous Compliance*

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. (such as test methods, monitoring procedures, recordkeeping and reporting)
001	Section B, Condition 5.a. & b.i (Specific Recordkeeping Requirements), 40 CFR 60.758(a) & (b)	Municipal Solid Waste (MSW) Landfill	Maintain design capacity, solid waste, well density, performance test, control specifications	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, Conditions 5.b.ii, c.ii, 7.c.i, 7.i (Recordkeeping, Control Equip), 40 CFR 60.758(b)(4), 60.756(b) & (c)	Landfill Gas Open Flare	Use heat sensing device to detect flame, keep records of flame presence	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, Condition 5.b.ii, c.i, 7.c.ii (Recordkeeping, Control Equip), 40 CFR 60.758(b)(4), 60.756(b) & (c)	Landfill Gas Open Flare	Install & maintain gas flow device recording flow to control device every 15 minutes; keep records of flow	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 5.d (Recordkeeping), 40 CFR 60.758(d)	Municipal Solid Waste (MSW) Landfill	Keep as-built map of existing and future gas system.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 5.f - h (Recordkeeping), 40 CFR 61.154 & 61.151	Municipal Solid Waste (MSW) Landfill	Maintain WSR for asbestos receipts & map of disposal areas. Comply w/61.151 upon site closure.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 6.a - c (Reporting), 40 CFR 60.756(e), 60.757(a), (b) & (c)	Municipal Solid Waste (MSW) Landfill	Submit Initial Design Capacity, NMOC Reports, alt. op. procedures for systems not meeting 60.759	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit*Emission Units in Continuous Compliance*

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. (such as test methods, monitoring procedures, recordkeeping and reporting)
001	Section B, Condition 6.e & j (Reporting), 40 CFR 60.757(f), 40 CFR 63.1980 & 63.10(d)	Municipal Solid Waste (MSW) Landfill	Submit semiannual NSPS, SSM reports & SSM non-procedures	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Section B, Condition 6.j.i.2 & 3 (Specific Recordkeeping Requirements), 40 CFR 63.10(d) & 63.1965	Municipal Solid Waste (MSW) Landfill	Deviation if more than one 15 minute data point is missing per hour, or if SSM plan not followed.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, Condition 6.f (Reporting), 40 CFR 60.8 & 60.757(g)	Landfill Gas Open Flare	Within 180 days of startup conduct/submit performance test. Include items in test report.	Within required 60.18 limits	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, Condition 6.g & i (Reporting), 40 CFR 61.154	Municipal Solid Waste (MSW) Landfill	Notify agency of improperly enclosed asbestos, discrepancies; 45 day disturbance.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
004	Section B, Condition 7.g (Control Equipment), 40 CFR 60.18(d)	Landfill Gas Open Flare	Monitor flare in accordance with 40 CFR 60 Subpart WWW	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
002 & 008	Section B, Condition 1.a & b (Operating Limitations), 401 KAR 63:010	Paved and Unpaved Haul Roads & Site Construction/Operation	Take reasonable precautions to prevent fugitive PM from becoming airborne.	None	N/A - Title 5 Air Operating Permit Renewal Application

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit*Emission Units in Continuous Compliance*

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. (such as test methods, monitoring procedures, recordkeeping and reporting)
002 & 008	Section B, Conditions 2 & 4 (Emissions Limitations, Testing Requirements), 401 KAR 63:010	Paved and Unpaved Haul Roads & Site Construction/Operation	No VE leaving property. Perform VE for dust daily when site is operating	None	N/A - Title 5 Air Operating Permit Renewal Application
002 & 008	Section B, Condition 3 (Testing Requirements), 401 KAR 50:045	Paved and Unpaved Haul Roads & Site Construction/Operation	Conduct performance testing as required by KDEP	None	N/A - Title 5 Air Operating Permit Renewal Application
002 & 008	Section B, Condition 5 (Specific Recordkeeping Requirements), 401 KAR 52:020	Paved and Unpaved Haul Roads & Site Construction/Operation	Maintain log when dust suppression equipment is used; maintain records of VE inspections of lot line.	None	N/A - Title 5 Air Operating Permit Renewal Application
002 & 008	Section B, Condition 7 (Specific Recordkeeping Requirements), 401 KAR 52:020	Paved and Unpaved Haul Roads & Site Construction/Operation	Keep appropriate equipment for dust suppression on site and in working order.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
006	Section B, (Operating Limitations, Specific Monitoring Requirements, Specific Reporting Requirements Conditions 1.a, 4.a.b, 5 and 6) 401 KAR 63:010	Solidification Process	Keep monthly records showing gallons of liquid industrial wastes processed and the pounds of each HAP per gallon	Kept on file - calculated monthly	N/A - Title 5 Air Operating Permit Renewal Application
007	Section B, Conditions 1 - 6, 40 CFR JJJJ & 40 CFR 63 ZZZZ	Emergency Generator	Comply with 40 CFR 60 Sub. JJJJ & 63 Sub ZZZZ as applicable	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit***Emission Units in Continuous Compliance***

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. (such as test methods, monitoring procedures, recordkeeping and reporting)
ALL	Section D, Source Emission Limitations and Testing Requirements	ALL	Compliance is based on emissions and processing rates for 12 consecutive months	Emissions will be submitted in the annual inventory.	N/A - Title 5 Air Operating Permit Renewal Application
All	Section E - Source Control Equipment Requirements	All emission units	Maintain affected facility & pollution control equipment to minimize emissions	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
General	Section F, Conditions 1-4, 7 & 8, KAR 52:020	All emission units	Recordkeeping, agency inspection requirements & emissions exceedance notifications	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
General	Section F, Conditions 5 & 6, KAR 52:020	All emission units	Submission of semi-annual and annual reports	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
General	Section F, Condition 9, KAR 52:020	All emission units	Submission of Annual Compliance Certification	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
General	Section F, Condition 10, 401 KAR 52:020	All emission units	Submit annual emission report	As indicated on the annual report	N/A - Title 5 Air Operating Permit Renewal Application

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit***Emission Units in Continuous Compliance***

10a) Emission Units in Continuous Compliance. *The following emission units were in continuous compliance with each permit term or condition(s) and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or requirement	Actual Emissions or status of requirement	The method used for determining compliance over the reporting period, and whether the method provided continuous or intermittent data. (such as test methods, monitoring procedures, recordkeeping and reporting)
General	Section G, Multiple requirements	All emission units	General Reqmnt's for permit modification, reopening, renewal, source testing, ozone & risk management regs	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Section H, Multiple Requirements	Municipal Solid Waste (MSW) Landfill	Alternate Operating Scenarios	None	N/A - Title 5 Air Operating Permit Renewal Application
001	Updates to Landfill NESHAP (40 CFR 63 Subpart AAAA) effective 9/27/21	Municipal Solid Waste (MSW) Landfill	Multiple - permit will be updated during next renewal cycle.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application
001	Landfill Federal Plan (40 CFR 62 Subpart OOO) effective 6/21/21	Municipal Solid Waste (MSW) Landfill	Multiple - permit will be updated during next renewal cycle.	Not Applicable	N/A - Title 5 Air Operating Permit Renewal Application

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit***Emission Units Subject to Future Compliance Dates***

10b) Emission Units Subject to Future Compliance Dates. *The following emission units will achieve compliance on a timely basis and maintain compliance with future compliance dates as they become applicable during the permit term. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Future Compliance Schedule	Emission Unit Description	Reason for Future Compliance Date
001	Section B, Condition 6.d (Reporting), 40 CFR 60.757: Submit closure report within 30 days of waste cessation	Municipal Solid Waste (MSW) Landfill	This condition only becomes applicable upon closure of the landfill, which did not occur during the reporting time frame. Note that closure report requirements are now found under both the revised Landfill NESHAP and the Federal Plan.
001	Section B, Condition 6.h (Reporting), 40 CFR 61.154: submit copy of records of asbestos disposal location to Agency upon closure of landfill	Municipal Solid Waste (MSW) Landfill	This condition only becomes applicable upon closure of the landfill, which did not occur during the reporting time frame.
001	Section H, Alternate Operating Scenario 1, 40 CFR 60.757: Submit equipment removal report once NMOC < 50 Mg/year	Municipal Solid Waste (MSW) Landfill	This condition only becomes applicable upon closure of the landfill, and demonstration that NMOC emissions have been reduced to less than 50 Mg/year through specified testing. Note: The Federal Plan (40 CFR 62 Subpart OOO) which became applicable to the facility on 6/21/2021 has a lower threshold of 34 mg/year NMOC to remove controls permanently.

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit***Emission Units Not in Continuous Compliance***

10c)(1) Emission Units Not in Continuous Compliance. *The following emission units were not in continuous compliance with each permit term or condition and applicable requirements listed here, such as emission standards, emission control requirements, emission testing, court requirements, work practices, or enhanced monitoring, based on the compliance methods specified below. If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Permit Term, Condition, or Applicable Regulation	Emission Unit Description	Permit Limit or Requirement	Actual Emissions or Status of Requirement	The method used for determining compliance over the reporting period, and whether compliance was continuous or intermittent. (such as test methods, monitoring procedures, recordkeeping and reporting)
N/A					This form is being submitted to complete the facility's air operating permit renewal application (Title 5)

Section CC.3: Identification of Emission Units & Each Term or Condition of the Permit***Emission Units Not in Continuous Compliance (continued)***

10c)(2) Emission Units Not in Continuous Compliance. *For the emission units and requirements listed in 10c)(1) that were not in continuous compliance since the last reporting period, state the duration, magnitude, and reason or reasons for non-compliance. Each row of 10c)(2) must relate to the corresponding row of 10c)(1). If additional space is required, reproduce this page as needed.*

Emission Unit/Permit ID#	Description of duration, magnitude, and reason(s) for non-compliance and corrective steps taken or planned.
N/A	This form is being submitted to complete the facility's air operating permit renewal application (Title 5)

Section CC.4: Notes, Comments, and Explanations

DEP FORM 7007DD

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007DD**Insignificant Activities**

___ Section DD.1: Table of Insignificant Activities

___ Section DD.2: Signature Block

___ Section DD.3: Notes, Comments, and Explanations

Source Name:**Republic Services of Kentucky, LLC d/b/a Tri-K Landfill****KY EIS (AFS) #:****21- 137-00014****Permit #:****V-18-034****Agency Interest (AI) ID:****2726****Date:****7/19/2023****Section DD.1: Table of Insignificant Activities**

*Identify each activity with a unique Insignificant Activity number (IA #); for example: 1, 2, 3... etc.

Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions
1 - 5	Leachate Tanks (30,000 gallons each)		None	
6	Leachate Tank (140,000 gallons each)		None	
7 & 8	Leachate Tanks (155,000 gallons)		None	
9 & 10	Propane Tanks (500 gallons each)		None	
11	Diesel Tank (500 gallons)		None	

Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions
12 & 13	Diesel Tanks (3,000 gallons each)		None	
14	Parts cleaner station		None	
15	Composting operation		None	
16	Leachate Tank (5,000 gallons)		None	
17 & 18	Propane Tanks (500 gallons)		None	

Section DD.2: Signature Block

I, THE UNDERSIGNED, HEREBY CERTIFY UNDER PENALTY OF LAW, THAT I AM A RESPONSIBLE OFFICIAL, AND THAT I HAVE PERSONALLY EXAMINED, AND AM FAMILIAR WITH, THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ITS ATTACHMENTS. BASED ON MY INQUIRY OF THOSE INDIVIDUALS WITH PRIMARY RESPONSIBILITY FOR OBTAINING THE INFORMATION, I CERTIFY THAT THE INFORMATION IS ON KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE OR INCOMPLETE INFORMATION, INCLUDING THE POSSIBILITY OF FINE OR IMPRISONMENT.

By:



Authorized Signature

Chip Simmons

Type/Print Name of Signatory

07/19/2023

Date

Environmental Manager

Title of Signatory

Section DD.3: Notes, Comments, and Explanations

DEP FORM 7007GG

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007GG

Control Equipment

Additional Documentation

- ___ Complete Sections GG.1 through GG.12, as applicable
- ___ Attach manufacturer's specifications for each control device
- ___ Complete DEP7007AI

Source Name: Republic Services of Kentucky, LLC d/b/a Tri-K Landfill

KY EIS (AFS) #: 21- 137-00014

Permit #: V-18-034

Agency Interest (AI) ID: 2726

Date: 7/19/2023

Section GG.1: General Information - Control Equipment

Control Device ID #	Control Device Name	Cost	Manufacturer	Model Name/ Serial #	Date Installed	Inlet Gas Stream Data For <u>All</u> Control Devices					Inlet Gas Stream Data For Condensers, Adsorbers, Afterburners, Incinerators, Oxidizers <u>Only</u>			Equipment Operational Data For <u>All</u> Control Devices		
						Temperature ($^{\circ}F$)	Flowrate (scfm @ 68 $^{\circ}F$)	Average Particle Diameter (μm)	Particle Density (lb/ft ³) or Specific Gravity	Gas Density (lb/ft ³)	Gas Moisture Content (%)	Gas Composition	Fan Type	Pressure Drop Range (in. H ₂ O)	Pollutants Collected/ Controlled	Pollutant Removal (%)
004	Open Flare		Parnell		2007	80°F - 110°F	3000 scfm	N/A	N/A	0.0744				1 - 10 in. H ₂ O	NMOC, CH ₄	98%

Section GG.2: Flare Source Information

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Flare	Type of Flare (e.g. steam-assisted, air- assisted, nonassisted)	Process Gas Flowrate (<i>acfm</i>)	Net Heating Value of Stream(s) (Btu/scf)	Removal Efficiency (%)	Flare Rated Capacity (<i>MMBtu/hr</i>)
001	Emissions Unit 001 - MSW Landfill	Non-assisted	3000	450 - 500 BTU/scf	98% (Methane, NMOC)	88.3

Section GG.3: Cyclone

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Cyclone	Identify Number of Cyclones: Single <u>or</u> Multiple	Identify Type: High-Efficiency, Conventional, <u>or</u> High-Throughput	Inlet Height (ft)	Inlet Width (ft)	Bottom Cone Height (ft)	Body Height (ft)	Body Diameter (ft)	Dust Outlet Tube Diameter (ft)	Gas Outlet Tube Diameter (ft)	Vortex Finder Height (ft)

[illegible]

Section GG.5: Scrubber																		
Control Device ID #	Identify all Emission Units and Control Devices that Feed to Scrubber	Identify Type of Scrubber: Venturi, Packed Bed, Spray Tower, or Other (specify)	For Venturi Scrubbers:	For Packed Bed Scrubbers:		For Spray Towers:		Identify Type of Flow: Concurrent, Countercurrent, or Crossflow	Length in Direction of Gas Flow (ft)	Cross-Sectional Area (ft ²)	Venturi Throat Velocity (ft/s)	Mist Eliminator			Scrubbing Liquid			
			Identify Throat Type: Fixed or Adjustable	Identify Packing Type	Packing Height (in)	Number of Nozzles	Nozzle Pressure (psig)					Identify Type: Mesh or Vane	Cross-Sectional Area (ft ²)	Pressure Drop (in. H ₂ O)	Chemical Composition	Flowrate (gal/min)	Fresh Liquid Makeup Rate (gal/min)	Describe Disposal Method of Scrubber Effluent

Section GG.6: Filter														
Control Device ID #	Identify all Emission Units and Control Devices that Feed to Filter	Identify Type of Filter Unit: Baghouse, Cartridge Collector, or Other (specify)	Identify Type of Filtering Material: Fabric, Paper, Synthetic, or Other (specify)	Total Filter Area (ft ²)	Effective Air-to-Filter Ratio (acfm/ft ²)	Continuous Monitoring Instrumentation (e.g. COMS, BLDS, none)	Additional Materials Introduced into the Control System (e.g. lime, carbon)		Identify Cleaning Method: Shaker, Pulse Air, Reverse Air, Pulse Jet, or Other (specify)	Identify Gas Cooling Method: Ductwork, Heat Exchanger, Bleed-in Air, Water Spray, or Other (specify)	For Ductwork:		For Bleed-in Air:	For Water Spray:
							Material	Injection Rate (lb/hr)			Length (ft)	Diameter (ft)	Flowrate (scfm @ 68 °F)	Flowrate (gal/min)

Section GG.7: Afterburner/Incinerator/Oxidizer

[illegible]

Section GG.8: Adsorber

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Adsorber	Identify Adsorbate	Identify Adsorbent: Activated carbon, Activated alumina, Silica Gel, Synthetic Polymers, Zeolite, or Other (specify)	Dimensions of Each Bed				Type of Regeneration: Replacement, Steam, or Other (specify)	Regeneration Time (minutes)	Method of Regeneration: Alternate Use of Beds, Source Shutdown, or Other (specify)	Time On-line Before Regeneration (minutes)
				Thickness in Direction of Gas Flow (in)	Cross-Sectional Area (in ²)	Weight of Adsorbent per Bed (lb)	Number of Beds				

Section GG.9: Condenser

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Condenser	Identify Type of Condenser: Spray Tower, Jet Ejector, Barometric, Single-Pass Shell-and-Tube, or Multi-Pass Shell-and-Tube (if multi-pass, indicate number of passes)	Identify Type of Coolant: Water, Brine, Liquid Nitrogen, CFC/HFC, or Other (specify)	Coolant Temperature		Coolant Liquid Flowrate (gpm)	Coolant Gas Flowrate (scfm @ 68 °F)	Condensing Surface Area (specify units)	Outlet Gas Temperature (°F)	Outlet Gas Composition
				Inlet (°F)	Outlet (°F)					

Section GG.10: Selective Catalytic Reduction (SCR) / Selective Non-catalytic Reduction (SNCR)

Control Device ID #	Identify all Emission Units and Control Devices that Feed to SCR/SNCR	Type (SCR/SNCR)	Gas Composition	Injection Grid Design (e.g. honeycomb)	Design Temperature Range		Reagent			Maximum Design Ammonia Slip (ppm)	SCR <u>Only</u>			
					Min (°F)	Max (°F)	Type	Injection Rate			Catalyst			
								Min (lb/hr)	Max (lb/hr)		Composition	Volume (ft ³)	Weight (lb)	Replacement Schedule

Section GG.11: Other Control Equipment

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Control Equipment	Type of Control Equipment (provide description and a diagram with dimensions)

Section GG.12: Notes, Comments, and Explanations

DEP FORM 7007HH

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007HH

Haul Roads

_____ Section HH.1: Haul Roads
_____ Section HH.2: Yard Area
_____ Section HH.3: Notes, Comments, and Explanations

Additional Documentation

___ Complete DEP7007AI, DEP7007N
and DEP7007V

___ SDS for dust suppressant

Source Name: Republic Services of Kentucky, LLC d/b/a Tri-K Landfill

KY EIS (AFS) #: 21- 137-00014

Permit #: V-18-034

Agency Interest (AI) ID: 2726

Date: 7/19/2023

Section HH.1: Haul Roads**HH.1A Unpaved Haul Roads:**

Average Number of Days in a Year with 0.01 inches of Precipitation (P): 130 Days

Mean Vehicle Weight (W): 23 Tons

Surface Material Silt Content (s): 6.4 %

Haul Road Length: 1.6 Miles

Maximum Vehicle Miles Traveled in a Year: 22,957 Miles

Describe the dust control method for unpaved haul road(s):

(If dust control suppressants will be utilized, attach the approved Safety Data Sheet(s), as applicable.)

The site uses a water truck to control emissions on haul roads.

Emission factor:

See Attachment for Form 7007N for emissions factors
used by KDEP for this facility's emissions inventories.

HH.1B Paved Haul Roads:

DEP7007HH

Average Number of Days in a Year with 0.01 inches of Precipitation (P): 130 DaysMean Vehicle Weight (W): 23 TonsRoad Surface Silt Loading (sL): 7.4 (G/M²)Haul Road Length: 1 MilesMaximum Vehicle Miles Traveled in a Year: 14,348 Miles

Describe the dust control method for paved haul road(s):
(If dust control suppressants will be utilized, attach the approved Safety Data Sheet(s), as applicable.)

The site uses a water truck to control emissions on haul roads.

Section HH.2: Yard Area (Aggregate Handling And Storage Piles):

Average Number of Days in a Year with 0.01 inches of Precipitation (P): _____ Days

Mean Wind Speed (U): _____ MPH

Material Moisture Content (M): _____ %

Describe the dust control method for yard area:
(If dust control suppressants will be utilized, attach the approved Safety Data Sheet(s), as applicable.)

None

Section HH.3: Notes, Comments, and Explanations

LIST OF NON-APPLICABLE REQUIREMENTS

In Section 4 of DEP Form AI (Other Required Information), a space is provided for the applicant to provide the KDEP with a list of non-applicable requirements on a separate attachment, for which the applicant is requesting permit shield coverage. The list below summarizes the requirements which the applicant has identified as non-applicable:

State Regulations Not Applicable to the Tri-K Landfill

Per a review of the Kentucky Administrative Regulations for Air Quality, the following state regulations were deemed to be not applicable:

Emission Unit ID No., or activity to which requirement does <u>not</u> apply	Citation	Brief description of requirement	Why the requirement does not apply
All Activities	401 KAR 50:020	Air Quality Control Regions	Not Applicable
All Activities	401 KAR 50:066	Conformity of transportation plans, programs, and projects	Not Applicable
All Activities	401 KAR 51:052	Review of new sources in nonattainment areas	Lincoln County is in attainment for all criteria pollutants
All Activities	401 KAR 51:150	NOx requirements for stationary internal combustion engines	No emissions unit of this type are at the facility
All Activities	401 KAR 51:160	NOx requirements for large utility and industrial boilers	No emissions unit of this type are at the facility
All Activities	401 KAR 51:170	NOx requirements for cement kilns	No emissions unit of this type are at the facility
All Activities	401 KAR 51:180	NOx credits for early reduction and emergency	Source not subject to NOx SIP Call
All Activities	401 KAR 51:190	Banking and trading NOx Allowances	Source not subject to NOx SIP Call
All Activities	401 KAR 51:195	NOx Opt-In Provisions	Source not subject to NOx Trading Budget program
All Activities	401 KAR 51:210	CAIR NOx Annual Trading Program	No emissions unit of this type are at the facility
All Activities	401 KAR 51:220	CAIR NOx Ozone Season	No emissions unit of this

Emission Unit ID No., or activity to which requirement does <u>not</u> apply	Citation	Brief description of requirement	Why the requirement does not apply
		Trading Program	type are at the facility
All Activities	401 KAR 51:230	CAIR SO2 Ozone Season Trading Program	No emissions unit of this type are at the facility
All Activities	401 KAR 52:030	Federally enforceable permits for non-major sources	Source is not eligible for this permit since it is required to obtain a Title 5 operating permit.
All Activities	401 KAR 52:040	State-origin permits	Source is not eligible for this permit since it is required to obtain a Title 5 operating permit.
All Activities	401 KAR 52:060	Acid Rain Permits	Source is not subject to acid rain permitting.
All Activities	401 KAR 52:070	Registration of designated sources	Source is not eligible for a registration since it is required to obtain a Title 5 operating permit.
All Activities	401 KAR 52:090	Prohibitory rule for hot mix asphalt plants	No emissions unit of this type are at the facility
All Activities	401 KAR 58:005	Accreditation of Asbestos Professionals	Facility does not conduct asbestos abatement operations.
All Activities	401 KAR 58:010	Local Education Agencies	Regulation only applies to local education agencies
All Activities	401 KAR 58:040	Requirements for Asbestos Abatement Entities	Facility does not conduct asbestos abatement operations.
All Activities	401 KAR 59:001 – 760	New Source Standards	Different source category
All Activities	401 KAR 61:001 – 175	Existing Source Standards	Different source category
All Activities	401 KAR 63:025	Asphalt Paving Operations	No emissions unit of this type are at the facility
All Activities	401 KAR 63:031	Leaks from Gasoline Tank Trucks	No emissions unit of this type are at the facility
All Activities	401 KAR 65	Mobile Source Related Emissions	Stationary Source
All Activities	401 KAR 68	Chemical Accident Prevention	Source does not store chemicals in quantities

Emission Unit ID No., or activity to which requirement does <u>not</u> apply	Citation	Brief description of requirement	Why the requirement does not apply
			which trigger the applicability of 40 CFR Part 68

Federal Regulations Not Applicable to the Tri-K Landfill

Per a review of the Code of Federal Regulations, the following federal regulations were deemed to be not applicable:

Unit Ref. No., or activity to which requirement does <u>not</u> apply	Citation	Brief description of requirement	Why the requirement does not apply
All Activities	40 CFR 53	Ambient Air Reference & Equivalent Methods	Part 53 imposes no emissions limits
All Activities	40 CFR 54	Prior notice of citizen suits	Part 54 imposes no emissions limits
All Activities	40 CFR 55	Outer Continental Shelf Regulations	Not subject to OCS regulations
All Activities	40 CFR 56	Regional Consistency	Part 56 imposes no emissions limits
All Activities	40 CFR 57	Primary Nonferrous Smelters	Not a nonferrous smelter
All Activities	40 CFR 58	Ambient Air Quality Surveillance	Part 58 imposes no emissions limits
All Activities	40 CFR 59	National Volatile Organic Compound Emission Standards for Consumer and Commercial Products	No applicable source categories or processes
All Activities	40 CFR 60 – New Source Performance Standards, Subparts Cb – Ce & D – VVV, Subparts AAAA – IIII, KKKK - UUUUa	New Source Performance Standards for multiple source categories	Different source category. For NSPS Subpart Kb, the vapor pressure of leachate (which is mostly comprised of water) in the storage tanks are expected to be below the applicable control threshold.
001 – MSW Landfill	40 CFR 60 Subpart XXX	NSPS for MSW Landfills That Commenced Construction, or Modification after July 17, 2014	The MSW landfill did not commence construction on a modification after July 17, 2014.
All Activities	40 CFR 61 Subparts B – L, Subparts N – Z, and	National Air Emissions Standards for multiple	Different source category

Unit Ref. No., or activity to which requirement does <u>not</u> apply	Citation	Brief description of requirement	Why the requirement does not apply
	Subparts AA – FF	source categories	
All Activities	40 CFR 62 Subparts A - LLL	State Plans for Designated Facilities	No applicable Part 62 regulations with the exception of Subpart OOO – Federal Plan (MSW Landfills)
All Activities	40 CFR 63 Subparts B – Z, AA – YY, CCC – XXX, CCCC - YYYY, AAAAA – ZZZZ, AAAAAA – BBBB, DDDDD – ZZZZZ, and AAAAAA – HHHHHH	MACT standard for multiple source categories.	Different source category
LFG Gas Emissions	40 CFR Part 64	Compliance Assurance Monitoring (CAM)	Compliance Assurance Monitoring (CAM) is not applicable since the source is subject to an NSPS promulgated after November 15, 1990 (Landfill NSPS – 40 CFR 60 Subpart Cf)
All Activities	40 CFR Part 65	Consolidated Federal Air Rule	Not Applicable
All Activities	40 CFR Part 66	Assessment and Collection of Noncompliance Penalties by EPA	Not Applicable
All Activities	40 CFR Part 67	EPA Approval of State Noncompliance Penalty Program	Not Applicable
All Activities	40 CFR Parts 68	Chemical Accident Prevention Provisions	Source does not store chemicals in quantities which trigger the applicability of this regulation.
All Activities	40 CFR Part 69	Special Exemptions from Requirements of the Clean Air Act	No Claimed Exemptions
All Activities	40 CFR Part 71	Federal Operating Permit Program	Source is located in a state delegated to administer the Part 70 permitting program
All Activities	40 CFR Part 72 – 78	Acid Rain Regulations	No emissions unit of this type are at the facility
All Activities	40 CFR Parts 79 – 80, 85 - 88	Fuels Regulations, Vehicular Standards	Not Applicable

Unit Ref. No., or activity to which requirement does not apply	Citation	Brief description of requirement	Why the requirement does not apply
All Activities	40 CFR Part 81	Area Designations	Part 81 imposes no emissions limits
All Activities	40 CFR Part 91	Control of emissions from Marine Spark Ignition Engines	Source does not operate marine vessels.
All Activities	40 CFR Part 92	Control of Air Pollution from Locomotives and Locomotive Engines	Source does not operate locomotives or locomotive engines.
All Activities	40 CFR Part 93	Transportation and General Conformity	Not Applicable
All Activities	40 CFR Part 94	Control of emissions from Marine Compression Ignition Engines	Source does not operate marine vessels.
All Activities	40 CFR Part 95	Mandatory Patent Licenses	Not Applicable
All Activities	40 CFR Part 96 & 97	Federal and State NOX Budget Trading Programs and CAIR Programs	No emissions unit of this type are at the facility

APPENDIX A

Updated Emissions Calculations – Significant Activities

Input Review: Tri K Title 5 Renewal Application

LANDFILL CHARACTERISTICS

Landfill Open Year **1977**
 Landfill Closure Year (with 80-year limit) **2033**

MODEL PARAMETERS

Methane Generation Rate, k **0.040** *year-1*
 Potential Methane Generation Capacity, L0 **100** *m3/Mg*
 NMOC Concentration **313** *ppmv as hexane*
 Methane Content **50** *% by volume*

WASTE ACCEPTANCE RATES

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
1977	111,100	122,210	0	0
1978	111,100	122,210	111,100	122,210
1979	111,100	122,210	222,200	244,420
1980	111,100	122,210	333,300	366,630
1981	111,200	122,320	444,400	488,840
1982	111,100	122,210	555,600	611,160
1983	111,100	122,210	666,700	733,370
1984	111,100	122,210	777,800	855,580
1985	111,100	122,210	888,900	977,790
1986	111,000	122,100	1,000,000	1,100,000
1987	111,000	122,100	1,111,000	1,222,100
1988	111,000	122,100	1,222,000	1,344,200
1989	111,000	122,100	1,333,000	1,466,300
1990	112,000	123,200	1,444,000	1,588,400
1991	111,000	122,100	1,556,000	1,711,600
1992	111,000	122,100	1,667,000	1,833,700
1993	111,000	122,100	1,778,000	1,955,800
1994	111,000	122,100	1,889,000	2,077,900
1995	111,000	122,100	2,000,000	2,200,000
1996	178,572	196,429	2,111,000	2,322,100
1997	110,268	121,294	2,289,572	2,518,529
1998	175,997	193,596	2,399,840	2,639,824
1999	157,570	173,327	2,575,836	2,833,420
2000	289,944	318,938	2,733,406	3,006,746
2001	348,631	383,494	3,023,350	3,325,685
2002	372,225	409,448	3,371,981	3,709,179
2003	431,692	474,861	3,744,206	4,118,627
2004	384,104	422,514	4,175,898	4,593,488
2005	352,412	387,653	4,560,002	5,016,002
2006	408,624	449,486	4,912,414	5,403,656
2007	429,837	472,821	5,321,038	5,853,142
2008	391,315	430,447	5,750,875	6,325,963
2009	375,781	413,359	6,142,190	6,756,409
2010	323,950	356,345	6,517,971	7,169,768
2011	365,870	402,457	6,841,921	7,526,113
2012	365,880	402,468	7,207,791	7,928,570
2013	347,291	382,020	7,573,671	8,331,038
2014	279,339	307,273	7,920,962	8,713,058
2015	403,517	443,869	8,200,301	9,020,331
2016	202,181	222,399	8,603,818	9,464,200

WASTE ACCEPTANCE RATES (Continued)

Year	Waste Accepted		Waste-In-Place	
	(Mg/year)	(short tons/year)	(Mg)	(short tons)
2017	178,390	196,229	8,805,999	9,686,599
2018	122,304	134,534	8,984,389	9,882,828
2019	56,387	62,026	9,106,693	10,017,362
2020	51,833	57,016	9,163,080	10,079,388
2021	51,358	56,494	9,214,913	10,136,404
2022	80,150	88,165	9,266,271	10,192,898
2023	300,000	330,000	9,346,421	10,281,063
2024	300,000	330,000	9,646,421	10,611,063
2025	300,000	330,000	9,946,421	10,941,063
2026	300,000	330,000	10,246,421	11,271,063
2027	300,000	330,000	10,546,421	11,601,063
2028	300,000	330,000	10,846,421	11,931,063
2029	300,000	330,000	11,146,421	12,261,063
2030	300,000	330,000	11,446,421	12,591,063
2031	300,000	330,000	11,746,421	12,921,063
2032	300,000	330,000	12,046,421	13,251,063
2033	300,000	330,000	12,346,421	13,581,063
2034	0	0	12,646,421	13,911,063

Results

Year	Total landfill gas			Methane		
	(Mg/year)	(m3/year)	(av ft ³ /min)	(Mg/year)	(m3/year)	(av ft ³ /min)
1977	0	0	0	0	0	0
1978	1.090E+03	8.730E+05	5.866E+01	2.912E+02	4.365E+05	2.933E+01
1979	2.138E+03	1.712E+06	1.150E+02	5.710E+02	8.559E+05	5.751E+01
1980	3.144E+03	2.518E+06	1.692E+02	8.398E+02	1.259E+06	8.458E+01
1981	4.111E+03	3.292E+06	2.212E+02	1.098E+03	1.646E+06	1.106E+02
1982	5.041E+03	4.037E+06	2.712E+02	1.347E+03	2.018E+06	1.356E+02
1983	5.934E+03	4.751E+06	3.192E+02	1.585E+03	2.376E+06	1.596E+02
1984	6.791E+03	5.438E+06	3.654E+02	1.814E+03	2.719E+06	1.827E+02
1985	7.615E+03	6.098E+06	4.097E+02	2.034E+03	3.049E+06	2.049E+02
1986	8.407E+03	6.732E+06	4.523E+02	2.246E+03	3.366E+06	2.262E+02
1987	9.166E+03	7.340E+06	4.932E+02	2.448E+03	3.670E+06	2.466E+02
1988	9.896E+03	7.924E+06	5.324E+02	2.643E+03	3.962E+06	2.662E+02
1989	1.060E+04	8.486E+06	5.702E+02	2.831E+03	4.243E+06	2.851E+02
1990	1.127E+04	9.025E+06	6.064E+02	3.011E+03	4.513E+06	3.032E+02
1991	1.193E+04	9.552E+06	6.418E+02	3.186E+03	4.776E+06	3.209E+02
1992	1.255E+04	1.005E+07	6.752E+02	3.352E+03	5.025E+06	3.376E+02
1993	1.315E+04	1.053E+07	7.073E+02	3.512E+03	5.264E+06	3.537E+02
1994	1.372E+04	1.099E+07	7.382E+02	3.665E+03	5.493E+06	3.691E+02
1995	1.427E+04	1.143E+07	7.679E+02	3.812E+03	5.714E+06	3.839E+02
1996	1.480E+04	1.185E+07	7.964E+02	3.954E+03	5.926E+06	3.982E+02
1997	1.597E+04	1.279E+07	8.594E+02	4.267E+03	6.395E+06	4.297E+02
1998	1.643E+04	1.316E+07	8.839E+02	4.388E+03	6.578E+06	4.420E+02
1999	1.751E+04	1.402E+07	9.422E+02	4.678E+03	7.011E+06	4.711E+02
2000	1.837E+04	1.471E+07	9.884E+02	4.907E+03	7.356E+06	4.942E+02
2001	2.050E+04	1.641E+07	1.103E+03	5.475E+03	8.206E+06	5.514E+02
2002	2.311E+04	1.851E+07	1.244E+03	6.174E+03	9.254E+06	6.218E+02
2003	2.586E+04	2.071E+07	1.391E+03	6.908E+03	1.035E+07	6.957E+02
2004	2.908E+04	2.329E+07	1.565E+03	7.768E+03	1.164E+07	7.824E+02
2005	3.171E+04	2.539E+07	1.706E+03	8.470E+03	1.270E+07	8.531E+02
2006	3.393E+04	2.717E+07	1.825E+03	9.062E+03	1.358E+07	9.127E+02
2007	3.661E+04	2.931E+07	1.969E+03	9.778E+03	1.466E+07	9.847E+02
2008	3.939E+04	3.154E+07	2.119E+03	1.052E+04	1.577E+07	1.060E+03
2009	4.168E+04	3.338E+07	2.243E+03	1.113E+04	1.669E+07	1.121E+03
2010	4.374E+04	3.502E+07	2.353E+03	1.168E+04	1.751E+07	1.177E+03
2011	4.520E+04	3.619E+07	2.432E+03	1.207E+04	1.810E+07	1.216E+03
2012	4.702E+04	3.765E+07	2.530E+03	1.256E+04	1.883E+07	1.265E+03
2013	4.877E+04	3.905E+07	2.624E+03	1.303E+04	1.952E+07	1.312E+03
2014	5.026E+04	4.025E+07	2.704E+03	1.343E+04	2.012E+07	1.352E+03
2015	5.103E+04	4.086E+07	2.746E+03	1.363E+04	2.043E+07	1.373E+03
2016	5.299E+04	4.243E+07	2.851E+03	1.415E+04	2.122E+07	1.426E+03
2017	5.290E+04	4.236E+07	2.846E+03	1.413E+04	2.118E+07	1.423E+03
2018	5.257E+04	4.210E+07	2.829E+03	1.404E+04	2.105E+07	1.414E+03
2019	5.171E+04	4.141E+07	2.782E+03	1.381E+04	2.070E+07	1.391E+03
2020	5.024E+04	4.023E+07	2.703E+03	1.342E+04	2.011E+07	1.351E+03
2021	4.878E+04	3.906E+07	2.624E+03	1.303E+04	1.953E+07	1.312E+03
2022	4.737E+04	3.793E+07	2.549E+03	1.265E+04	1.897E+07	1.274E+03
2023	4.630E+04	3.707E+07	2.491E+03	1.237E+04	1.854E+07	1.245E+03
2024	4.743E+04	3.798E+07	2.552E+03	1.267E+04	1.899E+07	1.276E+03
2025	4.851E+04	3.884E+07	2.610E+03	1.296E+04	1.942E+07	1.305E+03
2026	4.955E+04	3.968E+07	2.666E+03	1.324E+04	1.984E+07	1.333E+03

Results (Continued)

Year	Total landfill gas			Methane		
	(Mg/year)	(m3/year)	(av ft ³ /min)	(Mg/year)	(m3/year)	(av ft ³ /min)
2027	5.055E+04	4.048E+07	2.720E+03	1.350E+04	2.024E+07	1.360E+03
2028	5.151E+04	4.125E+07	2.772E+03	1.376E+04	2.063E+07	1.386E+03
2029	5.244E+04	4.199E+07	2.821E+03	1.401E+04	2.100E+07	1.411E+03
2030	5.333E+04	4.270E+07	2.869E+03	1.424E+04	2.135E+07	1.435E+03
2031	5.418E+04	4.338E+07	2.915E+03	1.447E+04	2.169E+07	1.457E+03
2032	5.500E+04	4.404E+07	2.959E+03	1.469E+04	2.202E+07	1.480E+03
2033	5.579E+04	4.467E+07	3.001E+03	1.490E+04	2.234E+07	1.501E+03
2034	5.654E+04	4.528E+07	3.042E+03	1.510E+04	2.264E+07	1.521E+03

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m3/year)	(av ft ³ /min)	(Mg/year)	(m3/year)	(av ft ³ /min)
1977	0	0	0	0	0	0
1978	7.990E+02	4.365E+05	2.933E+01	9.795E-01	2.732E+02	1.836E-02
1979	1.567E+03	8.559E+05	5.751E+01	1.921E+00	5.358E+02	3.600E-02
1980	2.304E+03	1.259E+06	8.458E+01	2.825E+00	7.880E+02	5.295E-02
1981	3.013E+03	1.646E+06	1.106E+02	3.693E+00	1.030E+03	6.923E-02
1982	3.695E+03	2.018E+06	1.356E+02	4.529E+00	1.263E+03	8.489E-02
1983	4.349E+03	2.376E+06	1.596E+02	5.331E+00	1.487E+03	9.992E-02
1984	4.977E+03	2.719E+06	1.827E+02	6.101E+00	1.702E+03	1.144E-01
1985	5.581E+03	3.049E+06	2.049E+02	6.841E+00	1.909E+03	1.282E-01
1986	6.161E+03	3.366E+06	2.262E+02	7.553E+00	2.107E+03	1.416E-01
1987	6.718E+03	3.670E+06	2.466E+02	8.235E+00	2.297E+03	1.544E-01
1988	7.253E+03	3.962E+06	2.662E+02	8.891E+00	2.480E+03	1.667E-01
1989	7.767E+03	4.243E+06	2.851E+02	9.521E+00	2.656E+03	1.785E-01
1990	8.260E+03	4.513E+06	3.032E+02	1.013E+01	2.825E+03	1.898E-01
1991	8.742E+03	4.776E+06	3.209E+02	1.072E+01	2.990E+03	2.009E-01
1992	9.198E+03	5.025E+06	3.376E+02	1.127E+01	3.145E+03	2.113E-01
1993	9.635E+03	5.264E+06	3.537E+02	1.181E+01	3.295E+03	2.214E-01
1994	1.006E+04	5.493E+06	3.691E+02	1.233E+01	3.439E+03	2.311E-01
1995	1.046E+04	5.714E+06	3.839E+02	1.282E+01	3.577E+03	2.403E-01
1996	1.085E+04	5.926E+06	3.982E+02	1.330E+01	3.710E+03	2.493E-01
1997	1.171E+04	6.395E+06	4.297E+02	1.435E+01	4.004E+03	2.690E-01
1998	1.204E+04	6.578E+06	4.420E+02	1.476E+01	4.118E+03	2.767E-01
1999	1.283E+04	7.011E+06	4.711E+02	1.573E+01	4.389E+03	2.949E-01
2000	1.346E+04	7.356E+06	4.942E+02	1.651E+01	4.605E+03	3.094E-01
2001	1.502E+04	8.206E+06	5.514E+02	1.841E+01	5.137E+03	3.452E-01
2002	1.694E+04	9.254E+06	6.218E+02	2.077E+01	5.793E+03	3.892E-01
2003	1.895E+04	1.035E+07	6.957E+02	2.323E+01	6.482E+03	4.355E-01
2004	2.131E+04	1.164E+07	7.824E+02	2.613E+01	7.289E+03	4.898E-01
2005	2.324E+04	1.270E+07	8.531E+02	2.849E+01	7.948E+03	5.340E-01
2006	2.486E+04	1.358E+07	9.127E+02	3.048E+01	8.503E+03	5.713E-01
2007	2.683E+04	1.466E+07	9.847E+02	3.289E+01	9.175E+03	6.164E-01
2008	2.887E+04	1.577E+07	1.060E+03	3.539E+01	9.872E+03	6.633E-01
2009	3.055E+04	1.669E+07	1.121E+03	3.745E+01	1.045E+04	7.020E-01
2010	3.205E+04	1.751E+07	1.177E+03	3.929E+01	1.096E+04	7.365E-01
2011	3.313E+04	1.810E+07	1.216E+03	4.061E+01	1.133E+04	7.612E-01
2012	3.446E+04	1.883E+07	1.265E+03	4.224E+01	1.178E+04	7.918E-01
2013	3.574E+04	1.952E+07	1.312E+03	4.381E+01	1.222E+04	8.212E-01
2014	3.684E+04	2.012E+07	1.352E+03	4.515E+01	1.260E+04	8.464E-01
2015	3.740E+04	2.043E+07	1.373E+03	4.585E+01	1.279E+04	8.594E-01
2016	3.884E+04	2.122E+07	1.426E+03	4.761E+01	1.328E+04	8.924E-01
2017	3.877E+04	2.118E+07	1.423E+03	4.752E+01	1.326E+04	8.908E-01
2018	3.853E+04	2.105E+07	1.414E+03	4.723E+01	1.318E+04	8.853E-01
2019	3.790E+04	2.070E+07	1.391E+03	4.646E+01	1.296E+04	8.708E-01
2020	3.682E+04	2.011E+07	1.351E+03	4.513E+01	1.259E+04	8.460E-01
2021	3.575E+04	1.953E+07	1.312E+03	4.382E+01	1.223E+04	8.214E-01
2022	3.472E+04	1.897E+07	1.274E+03	4.256E+01	1.187E+04	7.977E-01
2023	3.393E+04	1.854E+07	1.245E+03	4.159E+01	1.160E+04	7.797E-01
2024	3.476E+04	1.899E+07	1.276E+03	4.261E+01	1.189E+04	7.987E-01
2025	3.555E+04	1.942E+07	1.305E+03	4.358E+01	1.216E+04	8.169E-01
2026	3.632E+04	1.984E+07	1.333E+03	4.452E+01	1.242E+04	8.345E-01

Results (Continued)

Year	Carbon dioxide			NMOC		
	(Mg/year)	(m3/year)	(av ft^3/min)	(Mg/year)	(m3/year)	(av ft^3/min)
2027	3.705E+04	2.024E+07	1.360E+03	4.542E+01	1.267E+04	8.513E-01
2028	3.775E+04	2.063E+07	1.386E+03	4.628E+01	1.291E+04	8.675E-01
2029	3.843E+04	2.100E+07	1.411E+03	4.711E+01	1.314E+04	8.831E-01
2030	3.908E+04	2.135E+07	1.435E+03	4.791E+01	1.337E+04	8.980E-01
2031	3.971E+04	2.169E+07	1.457E+03	4.867E+01	1.358E+04	9.124E-01
2032	4.031E+04	2.202E+07	1.480E+03	4.941E+01	1.378E+04	9.262E-01
2033	4.088E+04	2.234E+07	1.501E+03	5.012E+01	1.398E+04	9.394E-01
2034	4.144E+04	2.264E+07	1.521E+03	5.080E+01	1.417E+04	9.522E-01

Calculate Max Fugitive NMOC/VOC Emissions for next 10 years (assuming a 75% collection efficiency):

50.80	Mg/year *	0.25	=	12.70	Mg/year
				13.97	tons/year
				3.19	lbs/hour

Calculate "fugitive" LFG using 75% collection efficiency, to develop the emissions factor:

3,042 cfm produced *	0.25 =	761 ft3/min fugitive LFG
		399,736,178 ft3/year fugitive LFG
		399.74 mmscf/yr fugitive LFG

Calculate emissions factors for NMOC, CO₂ & Methane, in terms of lbs/mmscf of fugitive LFG:

NMOC

13.97 tons/year *	2000 lbs/ton /	399.74 million ft3/yr fugitive LFG
	=	69.8928 lbs NMOC/million ft3 LFG

CO2

41439.42	Mg/year *	0.20	=	8287.88	Mg/year
				9117	tons/year
				45,613	lbs CO2/million ft3 LFG

CH₄

15103.12	Mg/year *	0.20	=	3020.62	Mg/year
				3323	tons/year

Use 10% Cover Oxidation Factor from 40 CFR 98:

2990 tons/year
14,962 lbs CH₄/million ft³ LFG

Tri-K: Fugitive Landfill HAPs Emissions Title 5 Renewal Application

Fugitive Gas Production Rate (Year 2033) = 761 ft³/min = 11,320,272 m³/year
(assumes 75% collection efficiency)

UNCONTROLLED LANDFILL GAS CONCENTRATIONS (a) - (SCC 50200602)							
CAS number	COMPOUND	Concentration ppmv ¹	MOLECULAR WEIGHT	GRAVIMETRIC CONCENTRATION (mg/M ³)	POTENTIAL TO EMIT***		
					HAPS (Mg/yr)	HAPS (lbs/hr)	HAPS (tons/yr)
71556	1,1,1-Trichloroethane (methyl chloroform)	0.48	133.42	2.62	0.0297	0.0075	0.0327
79345	1,1,2,2-Tetrachloroethane	1.11	167.86	7.62	0.0863	0.0217	0.0952
75343	1,1-Dichloroethane (ethylidene dichloride)	2.35	98.96	9.51	0.1077	0.0271	0.1188
75354	1,1-Dichloroethene (vinylidene chloride)	0.20	96.95	0.79	0.0090	0.0023	0.0099
107062	1,2-Dichloroethane (ethylene dichloride)	0.41	98.96	1.66	0.0188	0.0047	0.0207
78875	1,2-Dichloropropane (propylene dichloride)	0.18	112.99	0.83	0.0094	0.0024	0.0104
107131	Acrylonitrile	6.33	53.06	13.74	0.1555	0.0392	0.1716
75150	Carbon disulfide	0.58	76.14	1.81	0.0204	0.0052	0.0226
56235	Carbon tetrachloride	0.00	153.84	0.00	0.0000	0.0000	0.0000
463581	Carbonyl sulfide	0.49	60.07	1.20	0.0136	0.0034	0.0150
108907	Chlorobenzene	0.25	112.56	1.15	0.0130	0.0033	0.0144
75003	Chloroethane (ethyl chloride)	1.25	64.52	3.30	0.0373	0.0094	0.0412
67663	Chloroform	0.03	119.39	0.15	0.0017	0.0004	0.0018
75092	Dichloromethane (methylene chloride)	14.30	84.94	49.68	0.5624	0.1417	0.6205
100414	Ethylbenzene	4.61	106.16	20.02	0.2266	0.0571	0.2500
110543	Hexane	6.57	86.17	23.15	0.2621	0.0660	0.2892
108101	Methyl isobutyl ketone	1.87	100.07	7.65	0.0866	0.0218	0.0956
127184	Perchloroethylene (tetrachloroethene)	3.73	165.85	25.30	0.2864	0.0721	0.3160
79016	Trichloroethylene	2.82	131.39	15.15	0.1715	0.0432	0.1893
75014	Vinyl chloride	7.34	62.50	18.76	0.2124	0.0535	0.2343
71432	Benzene	1.91	78.11	6.10	0.0691	0.0174	0.0762
74873	Methyl chloride(Chloromethane)	1.21	50.49	2.50	0.0283	0.0071	0.0312
108883	Toluene	39.30	92.13	148.09	1.6764	0.4223	1.8495
1330207	Xylene (isomers and mixtures)	12.10	106.16	52.54	0.5947	0.1498	0.6562
	Mercury Compounds *	0.00	200.61	0.00	0.0000	0.0000	0.0000
Total HAPS:						1.18	5.16
VOM HAPS:						0.96	4.19
Non-VOM HAPS:						0.22	0.97

¹Based on 11/98 AP-42 Factors for Landfill Gas

Calculate Emissions Factors for several HAPs based on million ft3 LFG fugitive production:

400.81 mmscf fugitive LFG

Chlorobenzene: 0.0717 lbs/mm scf fugitive LFG

Toluene: 9.2290 lbs/mmscf fugitive LFG

Xylene: 3.2742 lbs/mmscf fugitive LFG

Tri-K Landfill
Title 5 Renewal Haul Road Fugitive Emissions

Refuse Trucks:

Length of Haul Road, miles (paved)	1.0000
Length of Haul Road, miles (unpaved)	1.6000
Annual Amount Hauled (all waste), tons	330,000
Avg. Weight of Material per Load, tons	23
Annual Vehicle Miles Traveled (refuse trucks paved), VMT =	14,348
Annual Vehicle Miles Traveled (refuse trucks unpaved), VMT =	22,957

Paved Road Emissions

Emission Factor, lb./VMT	PM	=	1.5165
Emission Factor, lb./VMT	PM10	=	0.3035
Emission Factor, lb./VMT	PM2.5	=	0.0745
Overall Control Efficiency % (PM/PM10)		=	70%
Overall Control Efficiency % (PM2.5)		=	40%
Actual Emissions, Tons/yr.	PM	=	3.26
Actual Emissions, Tons/yr.	PM10	=	0.65
Actual Emissions, Tons/yr.	PM2.5	=	0.32

Unpaved Road Emissions

Emission Factor, lb./VMT	PM	=	5.1026
Emission Factor, lb./VMT	PM10	=	1.3775
Emission Factor, lb./VMT	PM2.5	=	0.1372
Overall Control Efficiency % (PM/PM10)		=	70%
Overall Control Efficiency % (PM2.5)		=	40%
Actual Emissions, Tons/yr.	PM	=	17.57
Actual Emissions, Tons/yr.	PM10	=	4.74
Actual Emissions, Tons/yr.	PM2.5	=	0.94

SUMMARY OF EMISSIONS (TPY):

PM	20.83
PM10	5.40
PM2.5	1.27

Tri-K Landfill
Propane Emergency Engine Emissions Calculations
Title 5 Renewal Application

Purpose:

Calculate pollutant emissions from the emergency engine using factors from manufacturer, AP-42 and propane sulfur content estimate of fuel burned.

Data Inputs:

NOx:	8.05	grams/kw-hour (per manufacturer certification sheet)
THC (VOC):	1.14	grams/kw-hour (per manufacturer certification sheet)
CO:	30.00	grams/kw-hour (per manufacturer certification sheet)
PM (total)	0.70	lbs/10 ³ gallon propane (AP-42, Chapter 1.5, Table 1.5-1)
SO2 factor	0.1(S)	lbs/10 ³ gallon propane (AP-42, Chapter 1.5, Table 1.5-1)
"S"	0.54	grains sulfur/100 ft ³ propane (Bernd H. Haneke, Research Triangle Park, EIIP)
SO2:	0.054	lbs/10 ³ gallon propane (calculated)
Rating:	17	kW (per manufacturer specification sheet)

Other Data:

Propane Use:	1.99 gallons/hour liquid propane (from manufacturer specification sheet)
	995 gallons Max PTE for Renewal
	0.995 10 ³ gallons
Run Hours	500 Hours (max per EPA Guidance)

Calculations:

NOx

8.05 <u>grams</u> x	17	kw	x	500	hrs	x	<u>1</u>	<u>Mg</u>	1.1	<u>tons =</u>	0.075	tons/yr
kW-hr							1,000,000	gram		Mg	0.30	lbs/hr

THC/VOC

1.14 <u>grams</u> x	17	kw	x	500	hrs	x	<u>1</u>	<u>Mg</u>	1.1	<u>tons =</u>	0.0107	tons/yr
kW-hr							1,000,000	gram		Mg	0.04	lbs/hr

CO:

30.00 <u>grams</u> x	17	kw	x	500	hrs	x	<u>1</u>	<u>Mg</u>	1.1	<u>tons =</u>	0.2805	tons/yr
kW-hr							1,000,000	gram		Mg	1.12	lbs/hr

PM:

0.70 <u>lbs SO2</u> x	0.995	<u>10³ gallons</u> *	3.785	<u>liters</u> *	<u>1</u>	<u>ton</u>	=	2.91E-09	tons/yr
10 ³ gallons propane		year		gallon	9.07E+08	mg		1.16E-08	lbs/hr

SOx:

0.054 <u>lbs SO2</u> x	0.995	<u>10³ gallons</u> *	3.785	<u>liters</u> *	<u>1</u>	<u>ton</u>	=	2.24E-10	tons/yr
10 ³ gallons propane		year		gallon	9.07E+08	mg		8.97E-10	lbs/hr

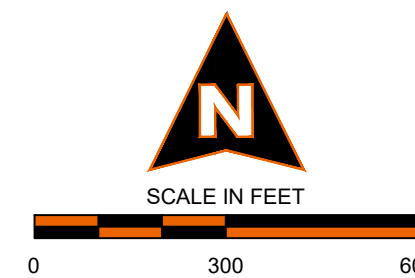
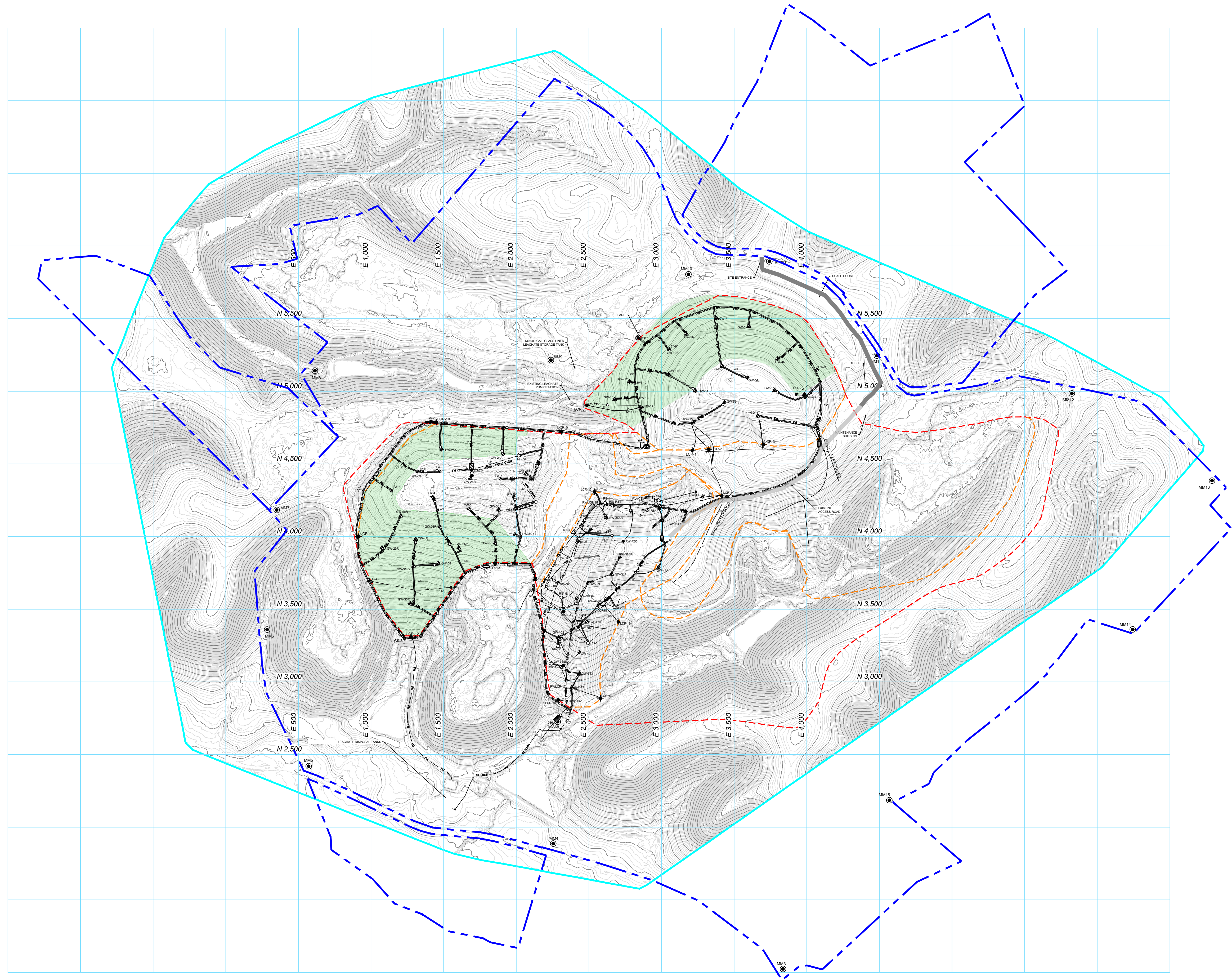
Calculate other emissions factors in terms of lbs pollutant/1000 gallons of propane used, per Kentucky emissions inventory inputs:

NOx:	151.2915 lbs NOx/1000 gallons propane
THC/VOC:	21.4251 lbs VOC/1000 gallons propane
CO:	563.8191 lbs CO/1000 gallons propane

APPENDIX B

Site Plan Map

	LIMITS OF AREA BY AERIAL CONTRACTOR
	FACILITY PROPERTY BOUNDARY
	PERMITTED LIMITS OF WASTE
	CONSTRUCTED LIMITS OF WASTE
	EXISTING AERIAL CONTOUR
	EXISTING LANDFILL GAS HEADER
	EXISTING LANDFILL HORIZONTAL COLLECTOR
	EXISTING FORCEMAIN
	EXISTING AIRLINE
	EXISTING LEACHATE COLLECTION LINE
	EXISTING ACTIVE LINES BUT NOT ACCESSABLE
	REDUCER
	EXISTING LFG EXTRACTION WELL / WELLHEAD
	EXISTING COMBINATION WELL
	EXISTING HORIZONTAL COLLECTOR WELLHEAD
	EXISTING HEADER ACCESS RISER
	EXISTING CONTROL VALVE
	EXISTING BLIND FLANGE
	EXISTING CONDENSATE DRIPLEG
	EXISTING ROCK SUMP
	EXISTING AIR RELEASE VALVE
	EXISTING CONDENSATE SUMP
	EXISTING SELF DRAINING CONDENSATE TRAP
	EXISTING CAP FOR LATERAL ABANDONMENT
	EXISTING CMP ROAD CROSSING
	EXISTING FORCEMAIN CLEANOUT
	EXISTING PERIMETER GAS MONITORING PROBE
	EXISTING LEACHATE COLLECTION RISER
	EXISTING ACTUATOR VALVE
	AREA OF FINAL COVER PLACEMENT
	EXISTING PAVED ROADWAYS
	EXISTING UNPAVED ROADWAYS

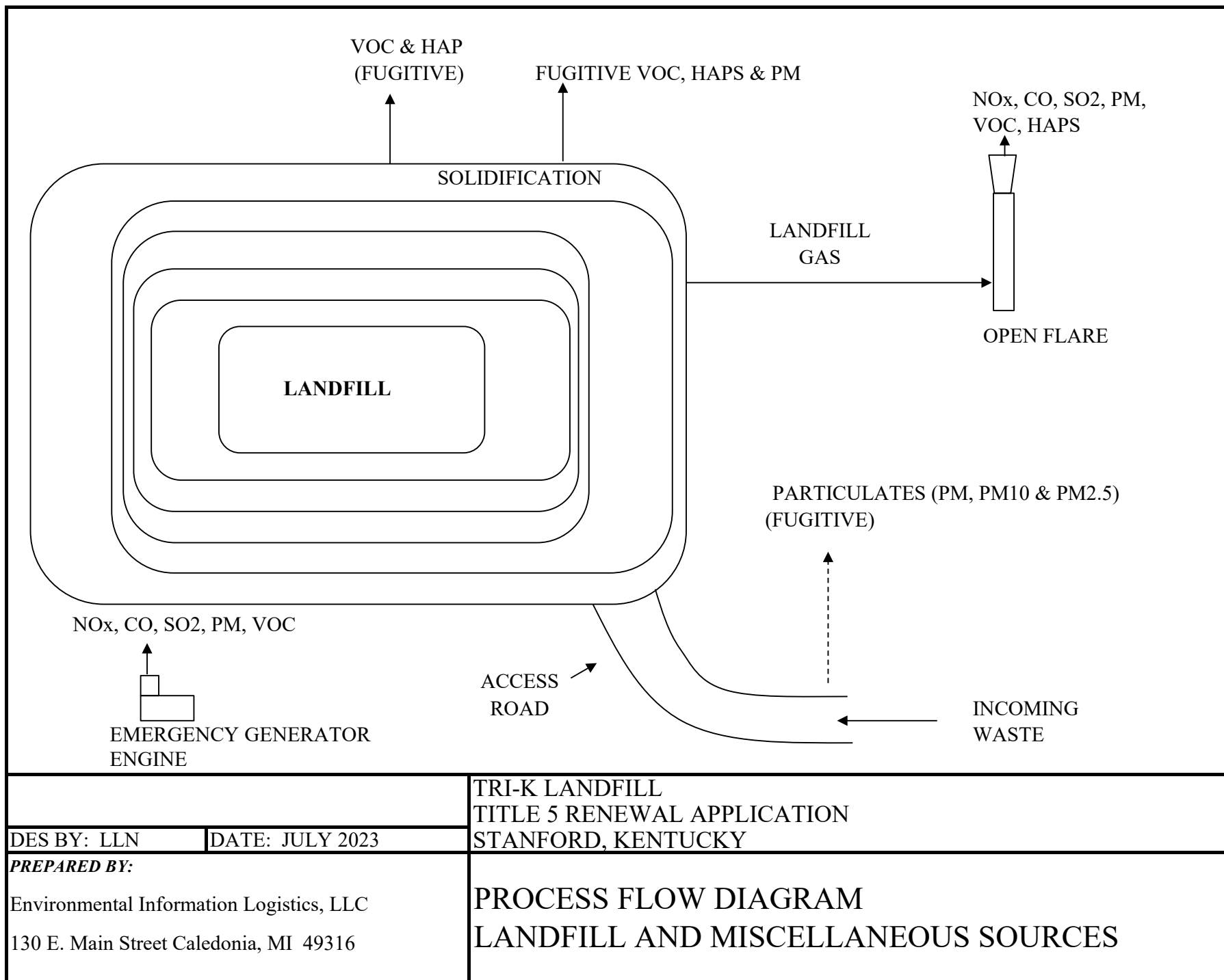


TITLE V

 ENVIRONMENTAL ENGINEERING	PROJECT NUMBER: 2023.245			DRAWING:
	ENG:		AERIAL SURVEY DATE:	12/12/22
	CAD:	BKG	SUBMITTAL DATE:	03/01/23
	CHK:	DD	PLOT DATE:	3/3/23
	REV.	DATE	DESCRIPTION	

APPENDIX C

Process Flow Diagram





**ENVIRONMENTAL
INFORMATION
LOGISTICS, LLC**

**4463 Hilltop Drive
New Franklin, OH 44203
Phone: 630-209-3931
www.eillc.com**

January 30, 2024

Ms. Amy Tempus-Doom
Division for Air Quality - Permit Review Branch
300 Sower Blvd., 2nd Floor
Frankfort, KY 40601
Submitted Electronically – Kentucky Business One Stop Portal

RE: Tri-K Landfill – Stanford, KY
Source I.D. No. 21-137-00014
Title V Operating Permit V-18-034 – Minor Permit Modification Application
Leachate Evaporator Process

Dear Ms. Tempus-Doom:

The Tri-K Landfill located in Stanford, Kentucky is seeking to permit the construction and operation of a series of leachate evaporator systems. The systems will utilize landfill gas, natural gas and/or waste heat to evaporate landfill leachate, providing the site with a cost-effective environmental management tool.

A minor permit modification application has been prepared for the proposed activity. The application consists of the following:

- Application forms;
- Emissions calculations for leachate evaporation, and combustion of landfill gas and/or natural gas in the proposed evaporator unit;
- Calculations for insignificant activities associated with the operation of the unit;
- Greenhouse Gas emissions calculations pursuant to the Tailoring Rule;
- Discussion of PSD/NSR applicability; and
- Review of applicable federal and state regulations.

Environmental Information Logistics is submitting the application on behalf of the landfill owner, Tri-K Landfill. If you have any questions or comments, please call me at (630) 209-3931 or Chip Simmons of Tri-K Landfill at (502) 401-8891.

Sincerely,
Environmental Information Logistics, LLC

Emily M. Nelson
Senior Project Manager

cc: Chip Simmons, Tri-K Landfill (e-copy)
Kent Jensen, Skagen (e-copy)

**AIR PERMIT APPLICATION
FOR CONSTRUCTION & OPERATION
OF
LANDFILL LIQUIDS EVAPORATOR UNITS (TRIAL,
TRANSITION & PERMANENT)**

AT

**TRI-K LANDFILL
STANFORD, KENTUCKY
SOURCE I.D. #21-137-00014**

Republic Services of Kentucky, LLC dba Tri-K Landfill

January 2024

Prepared by:

**Environmental Information Logistics, LLC
130 E. Main Street
Caledonia, MI 49316**

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Section I

SECTION I

EXECUTIVE SUMMARY

Republic Services of Kentucky, LLC (Republic) owns and operates the Tri-K Landfill (Tri-K), a municipal solid waste landfill located in Stanford, Lincoln County, Kentucky. Lincoln County has been designated as attainment for all criteria pollutants.

The purpose of this application is to obtain a permit to construct and operate a series of landfill liquids evaporator units to reduce the volume of leachate/gas condensate sent to the wastewater treatment plant by evaporating as much of the liquid fraction as possible prior to disposal. By managing a larger portion of the leachate waste stream on site, the facility minimizes the liquid volume that must be sent to the wastewater treatment plant via tanker trucks on the public road.

The proposed project will occur in three phases:

- 1) Initially, Tri-K is proposing to utilize a Skagen Faering 700 series evaporator designed to process up to 30,000 gallons/day of landfill leachate/gas condensate (landfill liquids). This unit will operate on landfill gas (referred to as biogas by the manufacturer). The operation of this unit is on a trial basis until such time as Tri-K determines whether the technology is suitable for the landfill. During the operational period of this first unit, Skagen will also be trial testing a small 40,000 BTU/hour thermal oxidizer unit for treatment of PFO's in the evaporated leachate stream for up to two months.
- 2) Should Tri-K elect to retain the evaporator technology at the site, the trial unit would be replaced by a larger transition Skagen unit (Faering 1400 series) which can operate either on biogas or natural gas. This unit would be able to manage up to 60,000 gallons/day of landfill liquids.
- 3) Once the third party Renewable Natural Gas (RNG) plant begins operations, the 60,000 gpd evaporator unit would be downsized to a 50,000 gallon/day permanent hybrid unit (Faering 1200 series) that would operate on waste heat from the RNG plant and natural gas.

There will never be more than one (1) evaporator unit operating at the site at any one time.

This application includes the required Kentucky Department for Environmental Protection (KDEP) Forms, process description and flow diagrams, calculations, and a discussion of applicable regulations. A red-line of the current operating permit is also included with proposed conditions for the three operating scenarios. Installation of the trial biogas evaporator unit is planned for February 2024. Replacement of this unit with the transition biogas/natural gas unit would occur after the trial period has successfully demonstrated the feasibility of this technology. Installation of the final permanent hybrid natural gas/residual heat evaporator unit would likely not occur until late 2025/early 2026.

SECTION II

INTRODUCTION

Republic Services of Kentucky, LLC (Republic) owns and operates the Tri-K Landfill (Tri-K), a municipal solid waste landfill located in Stanford, Lincoln County, Kentucky. Lincoln County has been designated as attainment for all criteria pollutants. The facility is seeking an air construction and operating permit to operate a series of landfill liquids evaporator systems (see Section 1).

Landfill leachate is a by-product of solid waste disposal activities. Rainfall infiltrates into the solid waste mass and comes into contact with refuse, picking up contaminants along the way. It is collected in a series of pipes at the base of the landfill and is pumped into leachate storage tanks. At Tri-K, the leachate is periodically removed from the storage tanks and hauled off-site to a wastewater treatment plant for disposal.

The site takes many measures to minimize leachate volumes, such as limiting the size of the active face exposed to the weather, and applying interim and final cover to the landfill slopes in order to reduce the amount of rainwater that infiltrates into the waste.

Gas condensate is produced when saturated landfill gas is either cooled, or, experiences a change in pipe volume or direction within the collection system piping. Low spots are engineered within the gas collection piping system and collected condensate is periodically transferred from these low spots to on-site storage and management systems.

The proposed leachate evaporator process will assist in reducing the ultimate volume of leachate and gas condensate requiring off-site treatment. Until the RNG plant begins operation, the evaporators will also be able to beneficially use landfill gas that would otherwise be flared. The proposed evaporator units, manufactured by Skagen, will be able to accommodate from 30,000 to 60,000 gallons/day of landfill liquids depending on which phase of the program the site is operating under.

Since the site is subject to the Landfill NESHAP, the evaporators which can operate on biogas will be designed, operated and monitored in accordance with applicable NESHAP requirements. The evaporator which operates on waste heat and natural gas will have engineering controls to minimize emissions. Use of waste heat from the RNG plant provides a clean source of heat for leachate evaporation which can also be considered a beneficial side-effect of the RNG plant.

Skagen Faering Leachate Evaporator Systems incorporate heating technology to substantially reduce the water volume of landfill liquids. The process/technology is described in detail in Section V. The evaporator process utilizes either landfill gas, natural gas or waste heat from the future RNG plant as the heat sources for evaporation, depending on the phase of the project.

Based on the calculations provided in Section VI, the evaporators will emit the following at based on their respective design capacities and fuels (assuming 8760 hours/year of operation). Note that combustion and heating are separated out from the actual process (and related emissions) of leachate evaporation:

Phase 1: Trial Operation of 30,000 gpd Faering 700 Series Evaporator on Biogas:

Parameter	Skagen Faering 700 Series Leachate Evaporator Unit	
	(lbs/hour)	(tons/year)
NOx	1.2	5.26
CO	4.3	18.83
VOC (Combustion)	0.07	0.31
VOC (Evaporation)	2.69	11.80
Total VOC	2.76	12.11
SO ₂	1.31	5.75
PM	1.50	6.57
PM ₁₀ /PM _{2.5}	1.30	5.69
HAPs (Combustion)	0.08	0.40
HAPs (Evaporation)	0.87	3.81
Total HAPs	0.95	4.21

Phase 2: Transition Operation of 60,000 gpd Faering 1400 Series Evaporator on Biogas or Natural Gas (highest emission rate from each prospective fuel type was selected):

Parameter	Skagen Faering 1400 Series Leachate Evaporator Unit	
	(lbs/hour)	(tons/year)
NOx	2.4	10.51
CO	8.6	37.67
VOC (Combustion)	0.14	0.61
VOC (Evaporation)	5.39	23.59
Total VOC	5.53	24.20
SO ₂	2.62	11.5
PM	3.0	13.14
PM ₁₀ /PM _{2.5}	2.6	11.39
HAPs (Combustion)	0.16	0.70
HAPs (Evaporation)	1.74	7.62
Total HAPs	1.90	8.32

Phase 3: Permanent Operation of 50,000 gpd Faering 1200 Series Hybrid Evaporator on RNG Waste Heat and Natural Gas:

Parameter	Skagen Faering 1200 Series Leachate Evaporator Unit	
	(lbs/hour)	(tons/year)
NO _x	1.2	5.26
CO	4.3	18.83
VOC (Combustion)	0.07	0.30
VOC (Evaporation)	4.49	19.66
Total VOC	4.56	19.96
SO ₂	0.01	0.03
PM	3.0	13.14
PM ₁₀ /PM _{2.5}	2.6	11.39
HAPs (Combustion)	0.02	0.10
HAPs (Evaporation)	1.45	6.35
Total HAPs	1.47	6.45

As stated previously, only one evaporator will operate on-site at any one time. The phasing of this project allows the site to first evaluate the feasibility of the technology, and then, to swap in options which take advantage of beneficially using landfill gas to the greatest extent possible until startup of the RNG plant in 2 years.

As shown in the tables above, none of the emissions rates from any of the phases have emissions rates that are over the major source threshold for Prevention of Significant Deterioration (PSD). This proposed project is therefore a minor modification to a minor source under PSD.

SECTION III

Section AI.2: Applicant Information

Applicant Name:	Republic Services of Kentucky, LLC d/b/a Tri-K Landfill			
Title: (if individual)				
Mailing Address:	Street or P.O. Box:	1905 KY Highway 3429		
	City:	Stanford	State:	KY
			Zip Code:	40484
Email: (if individual)				
Phone:	(502) 401-8891			

Technical Contact

Name:	Chip Simmons			
Title:	Environmental Manager			
Mailing Address:	Street or P.O. Box:	2157 Highway 151		
	City:	Frankfort	State:	KY
			Zip Code:	40601
Email:	CSimmons2@republicservices.com			
Phone:	(502) 401-8891			

Air Permit Contact for Source

Name:	Emily Nelson			
Title:	Senior Project Manager			
Mailing Address:	Street or P.O. Box:	4463 Hilltop Drive		
	City:	New Franklin	State:	OH
			Zip Code:	44203
Email:	enelson@eilllc.com			
Phone:	(630) 209-3931			

Section AI.3: Owner Information☒ **Owner same as applicant****Name:** _____**Title:** _____**Mailing Address:** **Street or P.O. Box:** _____
City: _____ **State:** _____ **Zip Code:** _____**Email:** _____**Phone:** _____**List names of owners and officers of the company who have an interest in the company of 5% or more.****Name****Position**

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007AI

Administrative Information

- ☐ Section AI.1: Source Information
☐ Section AI.2: Applicant Information
☐ Section AI.3: Owner Information
☐ Section AI.4: Type of Application
☐ Section AI.5: Other Required Information
☐ Section AI.6: Signature Block
☐ Section AI.7: Notes, Comments, and Explanations

Additional Documentation

☐ Additional Documentation attached

Source Name: Republic Services of Kentucky, LLC d/b/a Tri-K Landfill

KY EIS (AFS) #: 21- 137-00014

Permit #: V-18-034

Agency Interest (AI) ID: 2726

Date: 1/30/2024

Section AI.1: Source Information

Physical Location Address:	Street:	1905 KY Highway 3429		
	City:	Stanford	County:	Lincoln
Mailing Address:	Street or P.O. Box:	1905 KY Highway 3429		
	City:	Stanford	State:	KY
			Zip Code:	40484

Standard Coordinates for Source Physical Location

Longitude: 84.401 (decimal degrees) Latitude: 37.2723 (decimal degrees)

Primary (NAICS) Category: Solid Waste Landfill

Primary NAICS #: 562212

Classification (SIC) Category:

Refuse Systems

Primary SIC #:

4953

Briefly discuss the type of business conducted at this site:

This site is a permitted municipal solid waste landfill

Description of Area Surrounding

☒ Rural Area

☐ Industrial Park

☐ Residential Area

Source:

☐ Urban Area

☐ Industrial Area

☐ Commercial Area

Is any part of the source located on federal land?

☐ Yes

☒ No

Number of Employees:

12

Approximate distance to nearest residence or commercial property:

92

Property Area:

576

Is this source portable?

☐ Yes

☒ No

What other environmental permits or registrations does this source currently hold or need to obtain in Kentucky?

NPDES/KPDES:

☒ Currently Hold

☐ Need

☐ N/A

Solid Waste:

☒ Currently Hold

☐ Need

☐ N/A

RCRA:

☐ Currently Hold

☐ Need

☐ N/A

UST:

☐ Currently Hold

☐ Need

☐ N/A

Type of Regulated Waste Activity:

☐ Mixed Waste Generator

☐ Generator

☐ Recycler

☐ Other: _____

☐ U.S. Importer of Hazardous Waste

☐ Transporter

☒ Treatment/Storage/Disposal Facility

☐ N/A

Section AI.4: Type of Application

Current Status:	☒ Title V	☐ Conditional Major	☐ State-Origin	☐ General Permit	☐ Registration	☐ None
	☐ Name Change	☐ Initial Registration	☐ Significant Revision	☐ Administrative Permit Amendment		
Requested Action: (check all that apply)	☐ Renewal Permit	☐ Revised Registration	☒ Minor Revision	☐ Initial Source-wide Operating Permit		
	☐ 502(b)(10) Change	☐ Extension Request	☐ Addition of New Facility	☐ Portable Plant Relocation Notice		
	☐ Revision	☐ Off Permit Change	☐ Landfill Alternate Compliance Submittal	☐ Modification of Existing Facilities		
	☐ Ownership Change	☐ Closure				
Requested Status:	☒ Title V	☐ Conditional Major	☐ State-Origin	☐ PSD	☐ NSR	☐ Other: _____

Is the source requesting a limitation of potential emissions?

☐ Yes☒ No

Pollutant:	Requested Limit:	Pollutant:	Requested Limit:
☐ Particulate Matter	_____	☐ Single HAP	_____
☐ Volatile Organic Compounds (VOC)	_____	☐ Combined HAPs	_____
☐ Carbon Monoxide	_____	☐ Air Toxics (40 CFR 68, Subpart F)	_____
☐ Nitrogen Oxides	_____	☐ Carbon Dioxide	_____
☐ Sulfur Dioxide	_____	☐ Greenhouse Gases (GHG)	_____
☐ Lead	_____	☐ Other	_____

For New Construction:

Proposed Start Date of Construction:
(MM/YYYY)

Proposed Operation Start-Up Date: (MM/YYYY)

For Modifications:

Proposed Start Date of Modification:
(MM/YYYY)

_____ 02/2024

Proposed Operation Start-Up Date: (MM/YYYY)

_____ 02/2024

Applicant is seeking coverage under a permit shield.

☒ Yes☐ No

Identify any non-applicable requirements for which permit shield is sought on a separate attachment to the application.

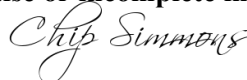
Section AI.5 Other Required Information

Indicate the documents attached as part of this application:

- | | |
|--|--|
| ☐ DEP7007A Indirect Heat Exchangers and Turbines | ☐ DEP7007CC Compliance Certification |
| ☒ DEP7007B Manufacturing or Processing Operations | ☒ DEP7007DD Insignificant Activities |
| ☐ DEP7007C Incinerators and Waste Burners | ☐ DEP7007EE Internal Combustion Engines |
| ☐ DEP7007F Episode Standby Plan | ☐ DEP7007FF Secondary Aluminum Processing |
| ☐ DEP7007J Volatile Liquid Storage | ☒ DEP7007GG Control Equipment |
| ☐ DEP7007K Surface Coating or Printing Operations | ☐ DEP7007HH Haul Roads |
| ☐ DEP7007L Mineral Processes | ☐ Confidentiality Claim |
| ☐ DEP7007M Metal Cleaning Degreasers | ☐ Ownership Change Form |
| ☒ DEP7007N Source Emissions Profile | ☐ Secretary of State Certificate |
| ☐ DEP7007P Perchloroethylene Dry Cleaning Systems | ☒ Flowcharts or diagrams depicting process |
| ☐ DEP7007R Emission Offset Credit | ☐ Digital Line Graphs (DLG) files of buildings, roads, etc. |
| ☐ DEP7007S Service Stations | ☒ Site Map |
| ☐ DEP7007T Metal Plating and Surface Treatment Operations | ☒ Map or drawing depicting location of facility |
| ☒ DEP7007V Applicable Requirements and Compliance Activities | ☐ Safety Data Sheet (SDS) |
| ☐ DEP7007Y Good Engineering Practice and Stack Height Determination | ☐ Emergency Response Plan |
| ☐ DEP7007AA Compliance Schedule for Non-complying Emission Units | ☐ Other: _____ |
| ☐ DEP7007BB Certified Progress Report | |

Section AI.6: Signature Block

I, the undersigned, hereby certify under penalty of law, that I am a responsible official*, and that I have personally examined, and am familiar with, the information submitted in this document and all its attachments. Based on my inquiry of those individuals with primary responsibility for obtaining the information, I certify that the information is on knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false or incomplete information, including the possibility of fine or imprisonment.



Authorized Signature

Chip Simmons

Type or Printed Name of Signatory

01/30/2024

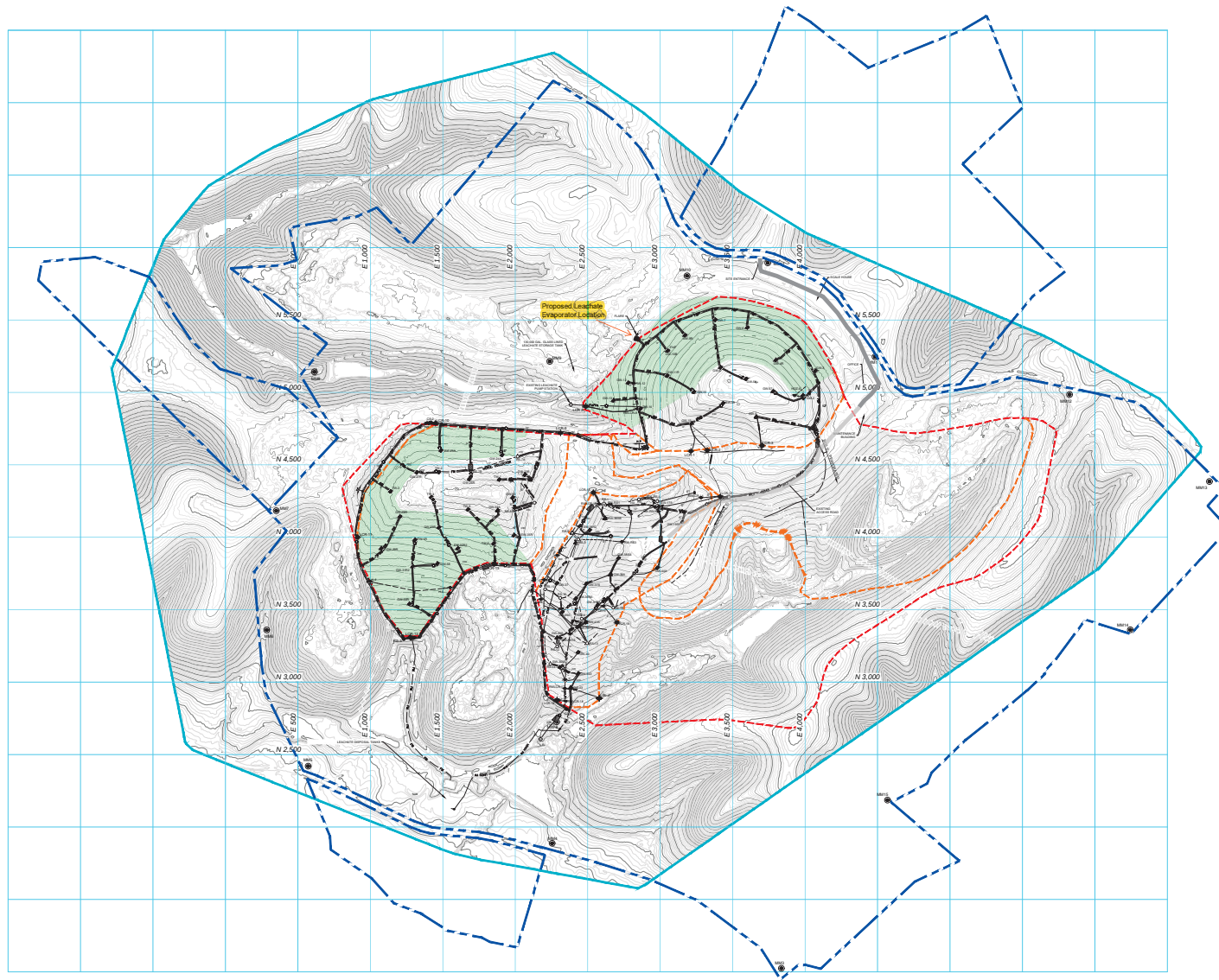
Date

Environmental Manager

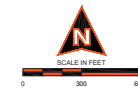
Title of Signatory

*Responsible official as defined by 401 KAR 52:001.

Z:\SHARED\BEL\ENOTR\K-LF2023\2023_245-TITLE V DRAWINGS\PLAN01 PLAN VIEW.DWG 30/2023



LEGEND	
	LIMITS OF AREA BY AERIAL CONTRACTOR
	FACILITY PROPERTY BOUNDARY
	PERMITTED LIMITS OF WASTE
	CONSTRUCTED LIMITS OF WASTE
	EXISTING AERIAL CONTOUR
	EXISTING LANDFILL GAS HEADER
	EXISTING LANDFILL HORIZONTAL COLLECTOR
	EXISTING FORCEMAIN
	EXISTING AIRLINE
	EXISTING LEACHATE COLLECTION LINE
	EXISTING ACTIVE LINES BUT NOT ACCESSABLE
	REDUCER
	EXISTING LFG EXTRACTION WELL / WELLHEAD
	EXISTING COMBINATION WELL
	EXISTING HORIZONTAL COLLECTOR WELLHEAD
	EXISTING HEADER ACCESS RISER
	EXISTING CONTROL VALVE
	EXISTING BLIND FLANGE
	EXISTING CONDENSATE DRIPLEG
	EXISTING ROCK SUMP
	EXISTING AIR RELEASE VALVE
	EXISTING CONDENSATE SUMP
	EXISTING SELF DRAINING CONDENSATE TRAP
	EXISTING CAP FOR LATERAL ABANDONMENT
	EXISTING CMP ROAD CROSSING
	EXISTING FORCEMAIN CLEANOUT
	EXISTING PERIMETER GAS MONITORING PROBE
	EXISTING LEACHATE COLLECTION RISER
	EXISTING ACTUATOR VALVE
	AREA OF FINAL COVER PLACEMENT
	EXISTING PAVED ROADWAYS
	EXISTING UNPAVED ROADWAYS



TRI-K LANDFILL	
TITLE V	
PROJECT NUMBER: 2023-205	
ENG: [blank]	AERIAL SURVEY DATE: 12/12/22
CAD: BKG	SUBMITTAL DATE: 03/15/23
CHK: DD	PLOT DATE: 3/20/23
REV: [blank]	DESCRIPTION: [blank]
DRAWING: 01	
OF 01	

Section IV

SECTION IV

Division for Air Quality 300 Sower Boulevard Frankfort, KY 40601 (502) 564-3999	DEP7007B Manufacturing or Processing Operations ___ Section B.1: Process Information ___ Section B.2: Materials and Fuel Information ___ Section B.3: Notes, Comments, and Explanations	Additional Documentation ___ Complete DEP7007AI, DEP7007N, DEP7007V, and DEP7007GG. ___ Attach a flow diagram ___ Attach SDS
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Source Name:	Republic Services of Kentucky, LLC d/b/a Tri-K Landfill
KY EIS (AFS) #:	21- 137-00014
Permit #:	V-18-034
Agency Interest (AI) ID:	2726
Date:	1/30/2024

Section B.1: Process Information										
Emission Unit #	Emission Unit Name	Describe Emission Unit	Process ID	Process Name	Manufacturer	Model No.	Proposed/Actual Date of Construction Commencement (MM/YYYY)	Is the Process Continuous or Batch?	Number of Batches per 24 Hours (if applicable)	Hours per Batch (if applicable)
008a	Trial Leachate Evaporator	30,000 GPD Evaporator Unit - LFG fired	1	Combust LFG for evap.	Skagen	Faering 700 Series	02/2024	Continuous	N/A	N/A
008a	Trial Leach. Evap.	30,000 GPD Evap. Unit - LFG fired	2	Evaporation of Liquids	Skagen	Faering 700 Series	02/2024	Continuous	N/A	N/A
008b1	Transition Leach. Evap.	60,000 GPD Evap. Unit - LFG	1	Combust LFG for evap.	Skagen	Faering 1400 Series	2024/2025	Continuous	N/A	N/A
008b1	Transition Leach. Evap.	60,000 GPD Evap. Unit - LFG	2	Evaporation of Liquids	Skagen	Faering 1400 Series	2024/2025	Continuous	N/A	N/A
008b2	Transition Leach. Evap.	60,000 GPD Evap. Unit - NG	1	Combust LFG for evap.	Skagen	Faering 1400 Series	2024/2025	Continuous	N/A	N/A
008b2	Transition Leach. Evap.	60,000 GPD Evap. Unit - NG	2	Evaporation of Liquids	Skagen	Faering 1400 Series	2024/2025	Continuous	N/A	N/A
008c	Permanent Leach. Evap.	50,000 GPD Evap Unit - NG & Waste Heat	1	Combust LFG for evap.	Skagen	Faering 1200 Series	2025/2026	Continuous	N/A	N/A
008c	Permanent Leach. Evap.	50,000 GPD Evap Unit - NG & Waste Heat	2	Evaporation of Liquids	Skagen	Faering 1200 Series	2025/2026	Continuous	N/A	N/A

Section B.2: Materials and Fuel Information

**Maximum yearly fuel usage rate only applies if applicant request operating restrictions through federally enforceable limitations.*

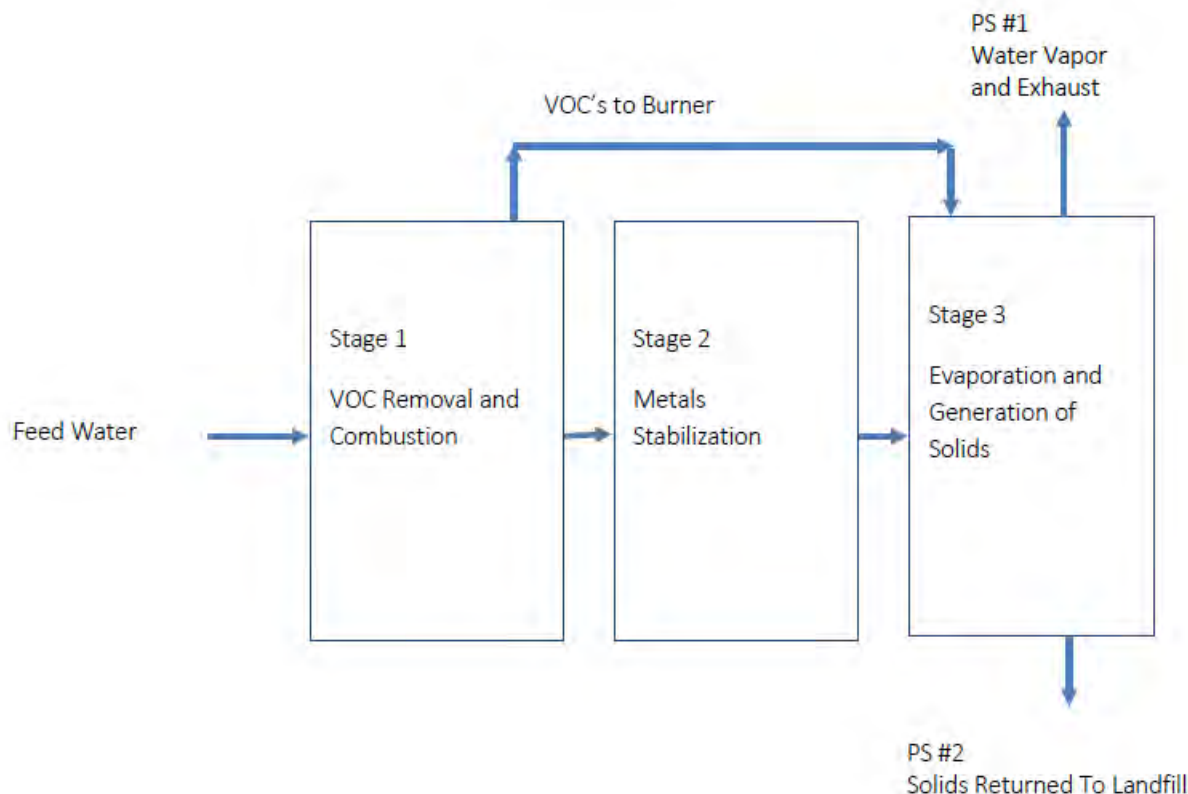
Emission Unit #	Emission Unit Name	Name of Raw Materials Input	Maximum Quantity of Each Raw Material Input		Total Process Weight Rate for Emission Unit (tons/hr)	Name of Finished Materials	Maximum Quantity of Each Finished Material Output		Fuel Type	Maximum Hourly Fuel Usage Rate		Maximum Yearly Fuel Usage Rate		Sulfur Content (%)	Ash Content (%)
				(Specify Units/hr)				(Specify Units/hr)			(Specify Units)		(Specify Units)		
008a	Trial Leachate Evaporator	Process ID 1: LFG				N/A - this is a waste disposal process	N/A - this is a waste disposal process		LFG	13.83	mmBtu / hr	121,151	mmBtu	0.03%	0
008a	Trial Leach. Evap.	Process ID 2: Landfill liquids	1250	Gal/hour	5.21	Same as above	Same as above								
008b1	Transition Leach. Evap.	Process ID 1: LFG				Same as above	Same as above		LFG	27.66	mmBtu / hr	242,302	mmBtu	0.03%	0
008b1	Transition Leach. Evap.	Process ID 2: Landfill liquids	2500	Gal/hour	10.43	Same as above	Same as above								
008b2	Transition Leach. Evap.	Process ID 1: NG				Same as above	Same as above		NG	26.33	mmBtu / hr	230,651	mmBtu	0.001%	0.000%
008b2	Transition Leach. Evap.	Process ID 2: Landfill liquids	2500	Gal/hour	10.43	Same as above	Same as above								
008c	Permanent Leach. Evap.	Process ID 1: NG				Same as above	Same as above		NG	13.17	mmBtu / hr	115,369	mmBtu	0.001%	0.000%
008c	Permanent Leach. Evap.	Process ID 2: Landfill liquids	2083	Gal/hour	8.69	Same as above	Same as above								

Section B.3: Notes, Comments, and Explanations

The leachate evaporator units can be splint into two distinct processes. The first process is combustion of a fuel (natural gas or landfill gas) to produce heat for evaporating landfill liquids. Note that for the permanent unit, waste heat from an adjacent future RNG plant will also be utilized to offset use of natural gas. The second process is the evaporation of the landfill liquids. Emissions from this process are based on the quantity of liquids evaporated (gallons) and the concentration of VOC and HAP compounds in the liquids.

PROCESS DESCRIPTION/FLOW DIAGRAM

The process for each proposed evaporator unit is identical to the diagram shown below:

**Stage 1: Volatile Organic Compound (VOC) Stripping**

This step removes some of the VOCs, ammonia and H₂S from the leachate. In municipal landfills, the VOC concentrations are low, but typically contain ammonia and H₂S. The combination of VOC's, ammonia and H₂S will be referred to collectively as VOC's.

The captured VOC's are collected from the top of the stripper tower and routed to the Stage 3 burner for combustion. Burner destruction efficiency of the organics is designed at 98%. The liquid phase from this stage is fed to the evaporation tank in stage 2.

Stage 2: Metals Stabilization

Stage 2 is a metals stabilization process which targets the removal of barium, radium, and potentially other metal parameters (such as strontium) that could be concerns for leaching and migration in landfills. This stage is not required at typical municipal landfill site. All units are wired for this system should it later be required.

Stage 3: Evaporation

The final processing stage in each Faering Series unit is the evaporation of leachate and resulting generation and precipitation of dissolved solids. The leachate is evaporated using a direct heat injection burner system or in the case of the hybrid unit, can utilize waste heat in one of two tanks.

The resulting vapor stream, Product Stream #1 (PS#1), is comprised of unconsumed oxygen, the exhaust gas from the burner, and the water vapor produced through evaporation. This stream flows through a two-stage demister system to remove particulate before release to atmosphere. As the leachate is evaporated the dissolved solids fall out. These solids are accumulated at the bottom of the tank and centrifuged to remove free leachate. The free leachate from the centrifuge is recycled back into the evaporation tank. The resulting solids cake is collected in a lined dump trailer for return to the landfill. These solids are represented as Product Stream #2 (PS#2).

Additives

If the leachate is subject to foaming, a leachate conditioning agent may be used. Based on the operation at other municipal landfill locations, addition rates are expected to be 10-20 gallons per day. The leachate conditioning agent is injected as a liquid. It is a silica based, nontoxic material.

Operation

Each unit will be manned 12 hours a day, 7 days a week, by Skagen technicians and an engineer until the unit is fully commissioned. Once at steady state, the monitoring will evolve to 24/7 remote monitoring with a technician on site 8 hours per day, 5 days per week. The process is instrumented and automated with all information for the operation (flow rates, pressures, temperatures) being transmitted continuously for remote monitoring and control. The unit can be operated from within an onsite office trailer or from any remote location. Each evaporator unit is fully contained and mobile.

Monitors will meter and record fuel volumes continuously, as well as landfill liquid volumes introduced. For the units operating on landfill gas, a temperature monitor and recorder will be included in the equipment package for NESHAP compliance.

The leachate evaporators will be operated in a continuous mode, with infrequent downtime for maintenance or repairs. By-products of LFG combustion will be present in the portion of the exhaust gas directed to the evaporator (CO, NO_x, SO₂, VOC, NMOC, HAP and PM), as well as any VOC and HAP evaporated from the leachate.

SKAGEN

ENERGY
SERVICES



SKAGEN LEACHATE EVAPORATION PERMITTING PACKAGE

Tri-K | KENTUCKY

Figure 1.4
F1400 Series Evaporator Photo



Figure 1.7
F1200 Series Evaporator Photo



Figure 2.1
F700 Evaporator Configuration

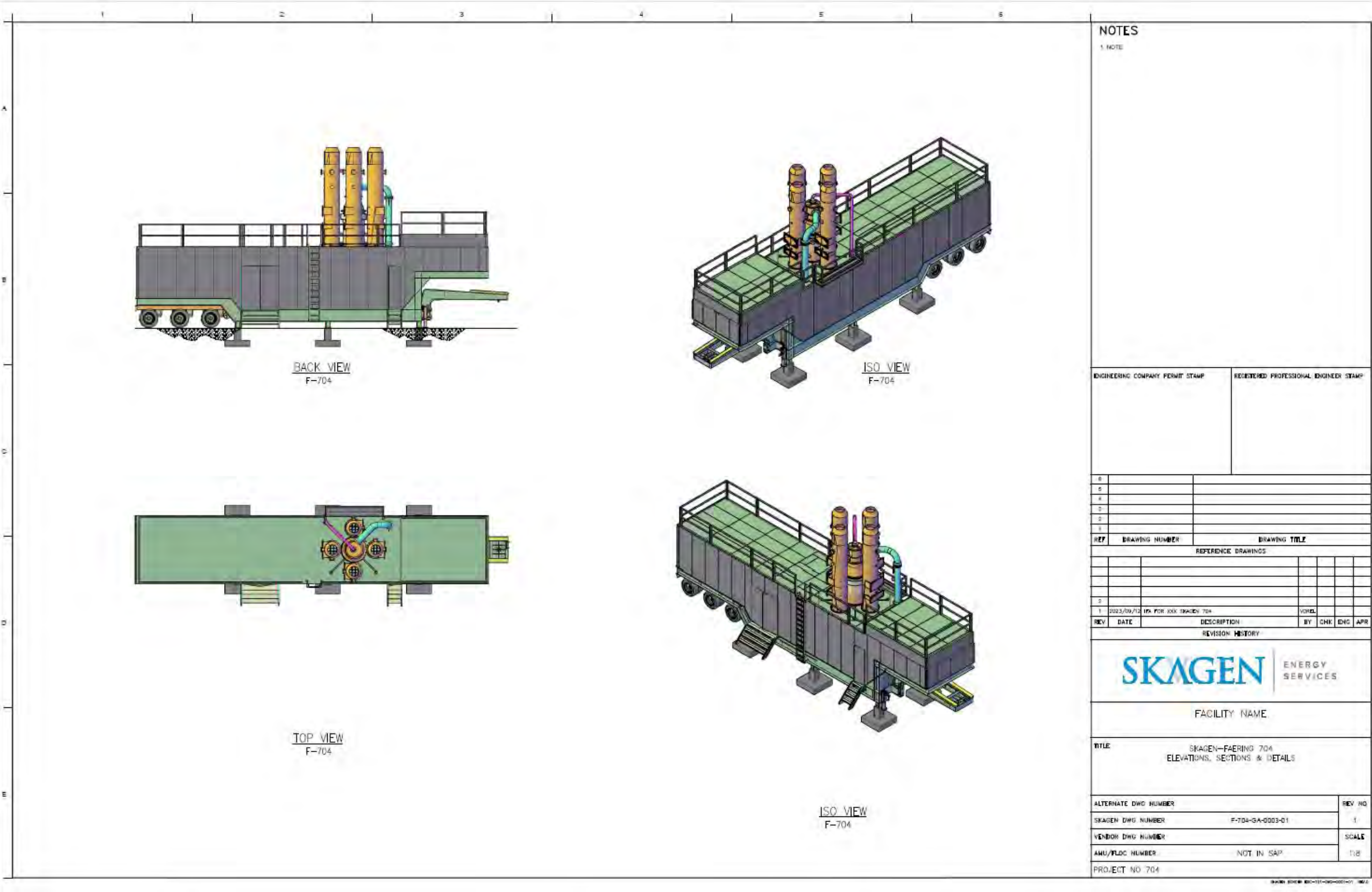


Figure 2.2
F1200 Evaporator Configuration

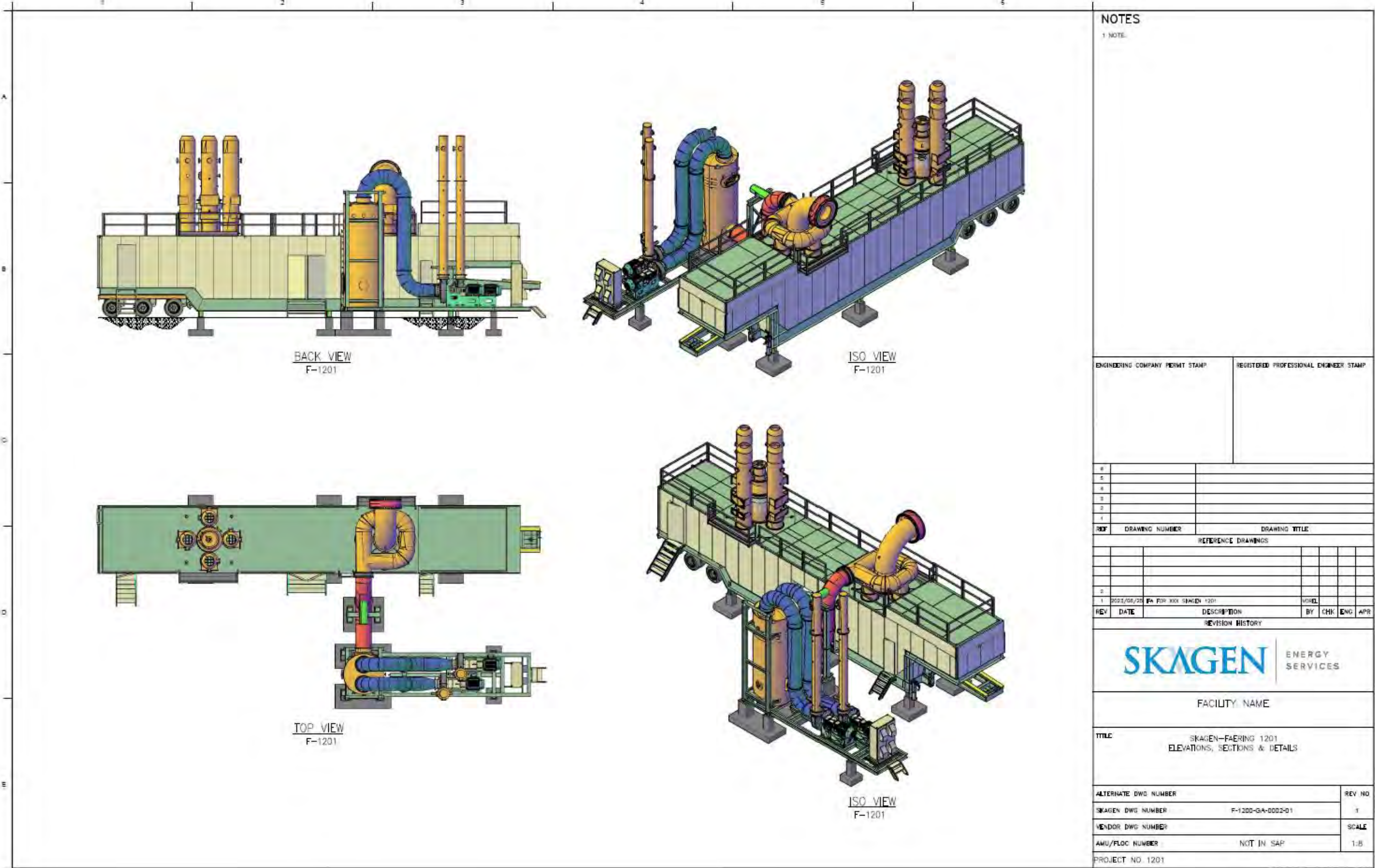


Figure 2.3
F1400 Evaporator Configuration

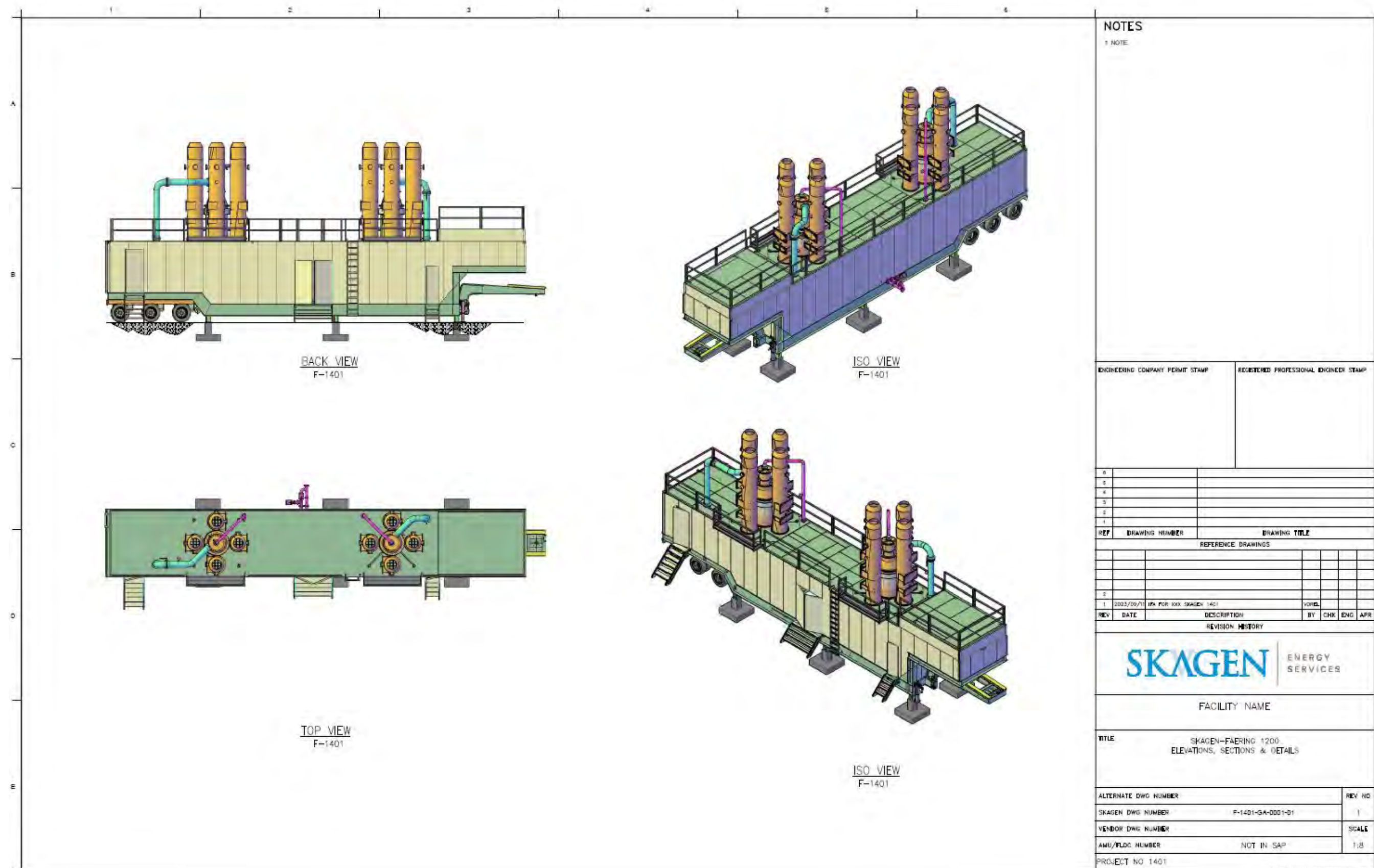
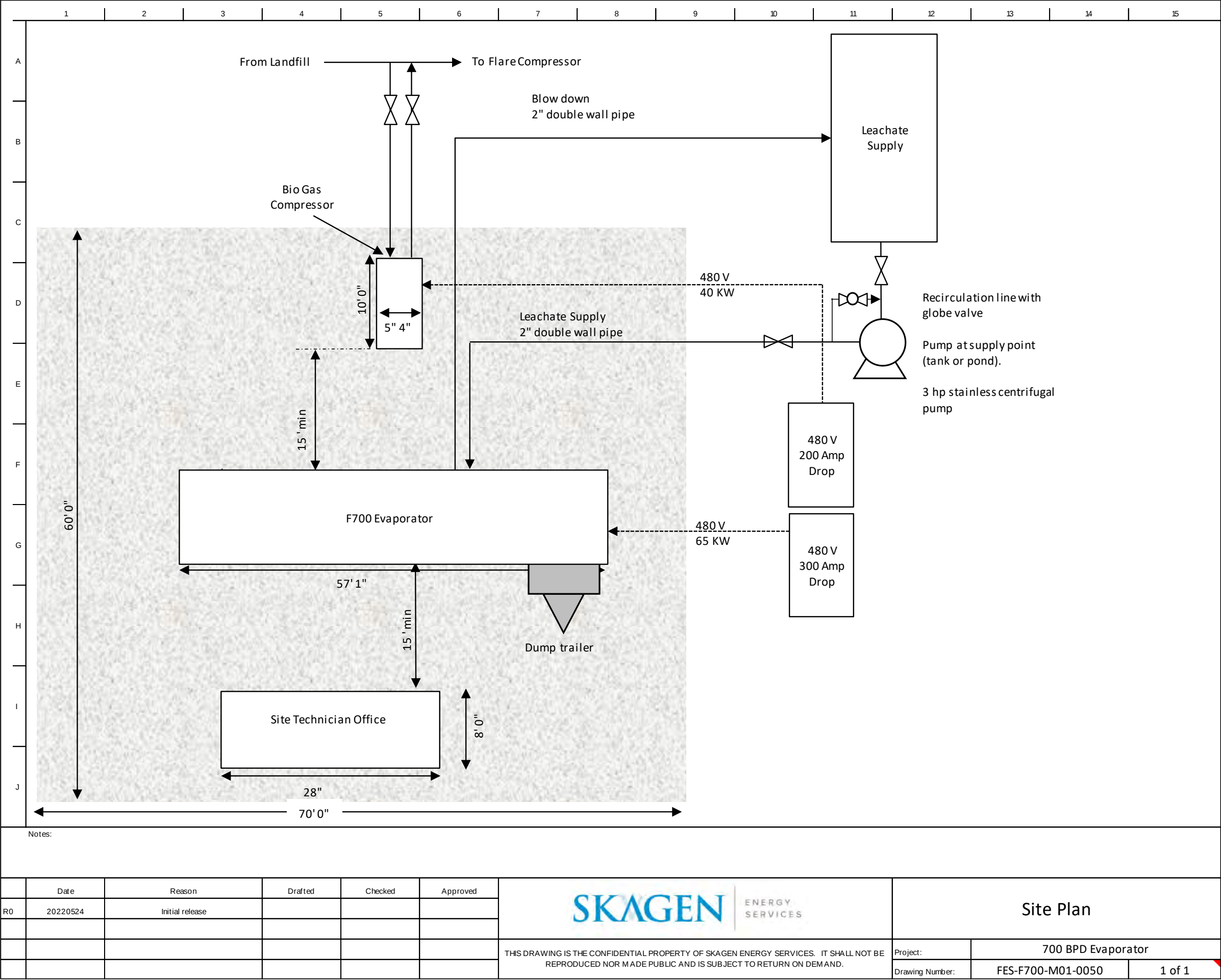


Figure 2.3
Typical Site Layout



From: Kent Jensen, P. Eng., President
Skagen Energy Services Inc

Date: October 24, 2023

RE: Faering 700 Series – Emissions Certificate

The F700 platform can fuel natural gas, or landfill gas. The design basis for the fuel is as follows:

Type:	Landfill Gas
Composition	50% methane
Lower heating value	525 BTU/scf
Fuel Flow Rate:	439 scfm

Type:	Natural gas
Composition	98% methane
Lower heating value	1050 BTU/scf
Flow Rate:	209 scfm

Evaporation rate:	30,000 gallons/day
Assumed ammonia in the feed:	1800 mg/L

Estimated Emission Range at Design Flow:

		Lower	Upper
Relevant to Bio gas only:			
Overall Destruction Efficiency (DRE) of Biogas	%	98	99
Relevant to all fuels:			
NOX	lb/hr	0.7	1.2
CO	lb/hr	2.1	4.3
Condensable particulate matter ¹	lb/hr	0.5	1.5
Filterable particulate matter (pm2.5+pm10) ²	lb/hr	0.8	1.3

Notes: 1 - EPA method 202
2 - EPA method 5



From: Kent Jensen, P. Eng., President
Skagen Energy Services Inc

Date: October 24, 2023

RE: Faering 1200 Series – Emissions Certificate

The F1200 platform is a two tank system. The fueled tank operates on natural gas, or landfill gas. The waste heat tank operates on the exhaust from any heat source. The emissions below are those from the evaporator, and exclude those already being emitted from the heat source.

Type:	Landfill Gas
Composition	50% methane
Lower heating value	525 BTU/scf
Fuel Flow Rate:	439 scfm

Type:	Natural gas
Composition	98% methane
Lower heating value	1050 BTU/scf
Flow Rate:	209 scfm

Evaporation rate:	50,000 gallons/day
Assumed ammonia in the feed:	1800 mg/L

Estimated Emission Range at Design Flow:

		Lower	Upper
Relevant to Bio gas only:			
Overall Destruction Efficiency (DRE) of Biogas	%	98	99
Relevant to all fuels:			
NOX	lb/hr	0.7	1.2
CO	lb/hr	2.1	4.3
Condensable particulate matter ¹	lb/hr	1.0	3.0
Filterable particulate matter (pm2.5+pm10) ²	lb/hr	1.6	2.6

Notes: 1 - EPA method 202
2 - EPA method 5



From: Kent Jensen, P. Eng., President
Skagen Energy Services Inc

Date: October 24, 2023

RE: Faering 1400 Series – Emissions Certificate

The F1400 platform can fuel natural gas, or landfill gas. The design basis for the fuel is as follows:

Type:	Landfill Gas
Composition	50% methane
Lower heating value	525 BTU/scf
Fuel Flow Rate:	878 scfm

Type:	Natural gas
Composition	98% methane
Lower heating value	1050 BTU/scf
Flow Rate:	418 scfm

Evaporation rate:	60,000 gallons/day
Assumed ammonia in the feed:	1800 mg/L

Estimated Emission Range at Design Flow:

		Lower	Upper
Relevant to Bio gas only:			
Overall Destruction Efficiency (DRE) of Biogas	%	98	99
Relevant to all fuels:			
NOX	lb/hr	1.4	2.4
CO	lb/hr	4.2	8.6
Condensable particulate matter ¹	lb/hr	1.0	3.0
Filterable particulate matter (pm2.5+pm10) ²	lb/hr	1.6	2.6

Notes: 1 - EPA method 202

2 - EPA method 5

SECTION V

DISCUSSION OF INSIGNIFICANT ACTIVITIES

There are several pieces of ancillary equipment that would be considered insignificant under KAR 52:020 Section 6:

Anti-Foam Storage Drums/Totes

Depending on the incoming leachate characteristics, an anti-foam agent might be added to the leachate for successful operation of the system. The leachate conditioning agent is injected as a liquid. It is a silica based, nontoxic material.

Trial Thermal Oxidizer

Skagen is requesting approval to operate a small thermal oxidizer (Tann Pilot RTO) for up to 2 months during operation of the trial unit. The trial will take a slip stream of the exhaust (2-3 percent) and will put it through the Tann Pilot RTO for additional treatment. The burner rating on this is 40,000 BTU/hr (about the same as a 4 burner barbecue grill).

- Skagen plans to conduct testing on this unit to establish the temperature and residence time required to reach 98% PFOS destruction. The Skagen evaporator currently captures 93% of the PFOS. This system, if successful and commercialized, would be designed to destroy 98% of the remaining 7% for an overall capture of 99.9%.
- Fuel consumption required to process all the exhaust gas (a full-sized commercial unit) is 3-5% to the fuel consumption on the evaporator, should this trial become successful and the equipment be utilized on future evaporators. During the trial, propane fuel will be utilized.
- Other elements of the testing include NH₃ and VOC emission reductions, and NOX measurement to ensure that these constituents remain compliant.

Calculations for this unit are attached.

Division for Air Quality

300 Sower Boulevard
Frankfort, KY 40601
(502) 564-3999

DEP7007DD**Insignificant Activities**

- ___ Section DD.1: Table of Insignificant Activities
___ Section DD.2: Signature Block
___ Section DD.3: Notes, Comments, and Explanations

Source Name:**Republic Services of Kentucky, LLC d/b/a Tri-K Landfill****KY EIS (AFS) #:****21- 137-00014****Permit #:****V-18-034****Agency Interest (AI) ID:****2726****Date:****1/30/2024****Section DD.1: Table of Insignificant Activities**

*Identify each activity with a unique Insignificant Activity number (IA #); for example: 1, 2, 3... etc.

Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions
17	TANN Pilot RTO System (trial unit)		401 KAR 63:015, Section 3	See Appendix C of Application
18	Anti-Foam Agent Storage		None	N/A - silica based, non-toxic agent (10 - 20 gallons/day)

Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions

Section DD.2: Signature Block

I, THE UNDERSIGNED, HEREBY CERTIFY UNDER PENALTY OF LAW, THAT I AM A RESPONSIBLE OFFICIAL, AND THAT I HAVE PERSONALLY EXAMINED, AND AM FAMILIAR WITH, THE INFORMATION SUBMITTED IN THIS DOCUMENT AND ALL ITS ATTACHMENTS. BASED ON MY INQUIRY OF THOSE INDIVIDUALS WITH PRIMARY RESPONSIBILITY FOR OBTAINING THE INFORMATION, I CERTIFY THAT THE INFORMATION IS ON KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE OR INCOMPLETE INFORMATION, INCLUDING THE POSSIBILITY OF FINE OR IMPRISONMENT.



01/30/2024

Authorized Signature

Date

By:

Chip Simmons

Environmental Manager

Type/Print Name of Signatory

Title of Signatory

Section DD.3: Notes, Comments, and Explanations

The TANN Pilot RTO system will be operated for less than 2 months. The manufacturer (Skagen) will be conducting testing of this

unit to determine combustion efficiency for any PFO compounds in the leachate, as well as additional destruction efficiency for

VOC and HAP compounds in the landfill leachate. The unit will be operated on propane.

If the trial is successful, Skagen may incorporate units of this type on future evaporator platforms, to provide additional controls which are

environmentally beneficial. Targeting PFO's compounds for destruction will allow for reduction of a persistent environmental pollutant.

Tri-K Landfill
TANN RTO - Propane-fueled

Emission Factors

POLLUTANT	EMISSION FACTOR ^{1,2} (LB/10 ³ gallons)	EMISSION FACTOR (LB/MMBTU)
PM	0.7	0.00765
NOx	13	0.14208
SO2	0.1	0.00109
CO	7.5	0.08197
VOM (as TOC)	1	0.01093

(1) Emissions factors from AP-42 Chapter 1.5, Table 1.5-1, 07/08; Factors for

(2) Per AP-42, to convert from lbs/10³ gallons to lbs/MMBTU, divide by a heating value of 91.5 MMBTU/10³ gallons.

RATED CAPACITY OF HEATER (MMBTU/HR)

0.040

MAXIMUM ANNUAL HOURS OF OPERATION:

8760

Pollutant	EMISSIONS (LB/HR)	EMISSIONS (TONS/YR)
PM	0.00031	0.0013
NOx	0.00568	0.0249
SO2	0.00004	0.0002
CO	0.00328	0.0144
VOM (as TOC)	0.00044	0.0019

Pilot RTO System



TANN's pilot test unit is utilized to determine the effectiveness of the RTO technology in special processes where the inlet stream is largely unknown. In most cases RTOs are an obvious choice for the best available control technology (BACT), however in some cases they are new to the industry and testing can be very beneficial.

TANN's pilot system is modeled after our normal design practices to ensure the test results can be projected to the larger scale system. The pilot RTO utilizes (2) ceramic media bed chambers, (1) reaction chamber, (1) main exhaust fan, (2) flow direction valves, (1) controls system, and (1) burner. Pilot studies can be a very cost effective tool for determining VOC removal efficiency, predicting ceramic media contamination and the effectiveness of odor control.



Oxidizer Specifications

Oxidizer Type: **RTO**

Capacity: **200 CFM**

Maximum Inlet Temperature: **150F**

Media Chambers: **(2)**

Ceramic Media: **Random packed saddles**

Directional Valves: **Poppet style**

Normal operating temperature: **1,400-1,600F**

Exhaust stack: **7'**

Controls: **Included**

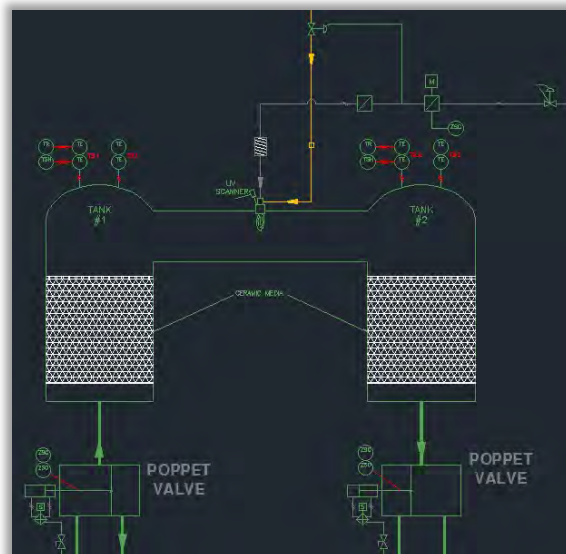
Data Logger: **Included**

Utilities Required

Fuel: **40,000 Btu's/hr**

Power: **480V 3 Phase**

Compressed Air: **2 CFM @ 80psi**



SECTION VI

Division for Air Quality

300 Sower Boulevard

Frankfort, KY 40601

(502) 564-3999

DEP7007GG

Control Equipment

Additional Documentation

- ___ Complete Sections GG.1 through GG.12, as applicable
- ___ Attach manufacturer's specifications for each control device
- ___ Complete DEP7007AI

Source Name: Republic Services of Kentucky, LLC d/b/a Tri-K Landfill

KY EIS (AFS) #: 21- 137-00014

Permit #: V-18-034

Agency Interest (AI) ID: 2726

Date: 1/30/2024

Section GG.1: General Information - Control Equipment

Control Device ID #	Control Device Name	Cost	Manufacturer	Model Name/ Serial #	Date Installed	Inlet Gas Stream Data For <u>All</u> Control Devices					Inlet Gas Stream Data For Condensers, Adsorbers, Afterburners, Incinerators, Oxidizers Only			Equipment Operational Data For <u>All</u> Control Devices		
						Temperature (°F)	Flowrate (scfm @ 68 °F)	Average Particle Diameter (μm)	Particle Density (lb/ft ³) or Specific Gravity	Gas Density (lb/ft ³)	Gas Moisture Content (%)	Gas Composition	Fan Type	Pressure Drop Range (in. H ₂ O)	Pollutants Collected/ Controlled	Pollutant Removal (%)
AS-1	Air Stripper	\$ 37,019	Skagen	T001	Feb '24	71.6	1307			0.0786				65	H2S Ammonia	95% 5%
008a	Trial Leach. Evap.	\$ 164,205	Skagen	Faering 700	Feb '24	100 deg. F	439			0.0744				1 - 10 in. H2O	NMOC, CH4	98%
008b1	Trans. Leach. Evap.	\$ 328,410	Skagen	Faering 1400	2024 / 2025	100 deg. F	878			0.0744				1 - 10 in. H2O	NMOC, CH4	98%

Section GG.11: Other Control Equipment

Control Device ID #	Identify all Emission Units and Control Devices that Feed to Control Equipment	Type of Control Equipment (provide description and a diagram with dimensions)
AS-1	All leachate evaporator units (trial, transition & permanent) will be equipped with an air stripper.	Air stripper. The captured VOC's are collected from the top of the stripper tower and routed to the Stage 3 burner for combustion. Burner destruction efficiency of the organics is designed at 98%. To provide a conservative estimate of emissions, no reductions from use of the stripper are accounted for in the PTE calculations for evaporation.
008a	Emission Unit 001 - MSW Landfill	The evaporator units, when combusting LFG as a fuel, will act as enclosed combustors for landfill gas controls. Diagrams of the unit are provided in the manufacturers information.
008b1	Emission Unit 001 - MSW Landfill	Same as above.

Section VII

SECTION VII

Division for Air Quality 300 Sower Boulevard Frankfort, KY 40601 (502) 564-3999	DEP7007N Source Emissions Profile __ Section N.1: Emission Summary __ Section N.2: Stack Information __ Section N.3: Fugitive Information __ Section N.4: Notes, Comments, and Explanations	Additional Documentation __ Complete DEP7007AI
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Source Name:	Republic Services of Kentucky, LLC d/b/a Tri-K Landfill
KY EIS (AFS) #:	21- 137-00014
Permit #:	V-18-034
Agency Interest (AI) ID:	2726
Date:	1/30/2024

N.1: Emission Summary																
Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity (SCC Units/hour)	Pollutant	Uncontrolled Emission Factor (lb/SCC Units)	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency (%)	Control Efficiency (%)	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential (lb/hr)	Controlled Potential (lb/hr)	Uncontrolled Potential (tons/yr)	Controlled Potential (tons/yr)
See	Attachment	for	N1													

Section N.2: Stack Information**UTM Zone:**

Stack ID	Identify all Emission Units (with Process ID) and Control Devices that Feed to Stack	Stack Physical Data			Stack UTM Coordinates		Stack Gas Stream Data		
		Equivalent Diameter (ft)	Height (ft)	Base Elevation (ft)	Northing (m)	Easting (m)	Flowrate (acfm)	Temperature (° F)	Exit Velocity (ft/sec)
008a Stack	EU-008a Process 1 & 2 (Total of stacks 1 - 4)	1.7	29	1285 msl			8977	177	16
008b Stack	EU-008b1/b2 Process 1 & 2 (Total of stacks 1 - 4)	1.7	29	1285 msl			8977	177	16
008b Stack	EU-008b1/b2 Process 1 & 2 (Total of stacks 5 - 8)	1.7	29	1285 msl			8977	177	16
008c Stack	EU-008c Process 1 & 2 (Stacks 1 - 4)	1.7	29	1285 msl			8977	177	16
008c Stack	EU-008c Process 1 & 2 (Stacks 5 - 6)	0.3	32	1285 msl			8226	173	52

Attachment for KDEP Form 7007 N1

Emission Unit #	Emission Unit Name	Process ID	Process Name	Control Device Name	Control Device ID	Stack ID	Maximum Design Capacity (SCC Units/hour)	Pollutant	Uncontrolled Emission Factor (lb/SCC Units)	Emission Factor Source (e.g. AP-42, Stack Test, Mass Balance)	Capture Efficiency (%)	Control Efficiency ⁽¹⁾ (%)	Hourly Emissions		Annual Emissions	
													Uncontrolled Potential (lb/hr)	Controlled Potential (lb/hr)	Uncontrolled Potential (tons/yr)	Controlled Potential (tons/yr)
008a	Trial Leachate Evaporator	1	Combust LFG for Evaporation	None - 008a is an enclosed combustor controlling LFG for EU-001	None	008a Stack	13.83 mmbtu/hr	NOx CO SO2 PM PM10/PM2.5 VOC HAPs VOC HAPs	See Calculations	Manufacturers Data Site Data Manufacturers Data AP-42 Site Data	100%	98%	See Calculations	See Calculations	See Calculations	See Calculations
		2	Evaporation of Liquids	Air Stripper	AS-1		1250 gallons/hr				100%	98%				
008b1	Transition Leach. Evap. (LFG)	1	Combust LFG for Evaporation	None - 008a is an enclosed combustor controlling LFG for EU-001	None		27.66 mmbtu/hr	NOx CO SO2 PM PM10/PM2.5 VOC HAPs VOC HAPs	See Calculations	Manufacturers Data Site Data Manufacturers Data AP-42 Site Data	100%	98%	See Calculations	See Calculations	See Calculations	See Calculations
		2	Evaporation of Liquids	Air Stripper	AS-1		2500 gallons/hr				100%	98%				
008b2	Transition Leach. Evap. (NG)	1	Combust NG for Evaporation	None	None		26.33 mmbtu/hr	NOx CO SO2 PM PM10/PM2.5 VOC HAPs VOC HAPs	See Calculations	Manufacturers Data AP-42 Manufacturers Data AP-42 Site Data	100%	98%	See Calculations	See Calculations	See Calculations	See Calculations
		2	Evaporation of Liquids	Air Stripper	AS-1		2500 gallons/hr				100%	98%				
008c	Permanent Leach. Evap.	1	Combust NG for Evaporation	None	None		13.17 mmbtu/hr	NOx CO SO2 PM PM10/PM2.5 VOC HAPs VOC HAPs	See Calculations	Manufacturers Data AP-42 Manufacturers Data AP-42 Site Data	100%	98%	See Calculations	See Calculations	See Calculations	See Calculations
		2	Evaporation of Liquids	Air Stripper	AS-1		2083 gallons/hr				100%	98%				

SECTION VIII

___ Section V.6: Notes, Comments, and Explanations

Source Name: Republic Services of Kentucky, LLC d/b/a Tri-K Landfill

KY EIS (AFS) #: 21- 137-00014

Permit #: V-18-034

Agency Interest (AI) ID: 2726

Date: 1/30/2024

Section V.1: Emission and Operating Limitation(s)

Emission Unit #	Emission Unit Description	Applicable Regulation or Requirement	Pollutant	Emission Limit (if applicable)	Voluntary Emission Limit or Exemption (if applicable)	Operating Requirement or Limitation (if applicable)	Method of Determining Compliance with the Emission and Operating Requirement(s)
008a, 008b1, 008b2 & 008c	All leachate evaporators - fuel combustion	401 KAR 59:010 Section 3(1)(a)	Opacity	Visible emissions shall not exceed 20% opacity for >3 minutes during any one day			Visual observations
008a, 008b1, 008b2 & 008c	All leachate evaporators	401 KAR 59:010 Section 3(2)	PM	Process PM emissions cannot exceed allowable standards			Calculations (one time) in application. Compliance with permitted throughputs for fuel and liquids.
008a & 008b1	Leachate evaporators combusting LFG	40 CFR Part 62 Subpart OOO & 40 CFR 63 Subpart AAAA	NMOC & HAPs	< 20 ppm NMOC outlet concentration @3% O2			Initial Performance test & subsequent temperature monitoring
008a, 008b1, 008b2 & 008c	All leachate evaporators - evaporation (process ID 2)	401 KAR 52:020 Section 10	VOC & HAPs		See proposed emissions limits in calculations	258.2 mg/l total VOC loading	Measure VOC inlet concentration of leachate every 5 years

Section V.2: Monitoring Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Monitored	Description of Monitoring
008a & 008b1	Leachate evaporators combusting LFG	Visible Emissions	401 KAR 59:010 Section 3(1)(a)	Visual Emissions	Weekly VE observations (to match open flare schedule in 401 KAR 63:015)
008b2 & 008c	Leachate evaporators combusting NG	Visible Emissions	401 KAR 59:010 Section 3(1)(a)	Visual Emissions	Monthly VE Observations
008a & 008b1	Leachate evaporators combusting LFG	NMOC	40 CFR 63 Subpart AAAAA	NMOC & HAPs	Measure LFG flow and combustion temperature every 15 minutes
008b2 & 008c	Leachate evaporators combusting NG	All	401 KAR 52:020, Section 10	Fuel Flow	Monitor natural gas flow (mmscf) to evaporators on a monthly basis (for purposes of annual emissions calculations)
008a, 008b1, 008b2 & 008c	All leachate evaporators	VOC & HAPs	401 KAR 52:020, Section 10	Leachate Volume	Monitor flow of landfill liquids to all evaporators continuously (for purposes of annual emissions calculations)

Section V.3: Recordkeeping Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Recorded	Description of Recordkeeping
008a & 008b1	Leachate evaporators combusting LFG	Visible Emissions	401 KAR 59:010 Section 3(1)(a)	Visual Emissions	Keep records of weekly VE observations
008b2 & 008c	Leachate evaporators combusting NG	Visible Emissions	401 KAR 59:010 Section 3(1)(a)	Visual Emissions	Keep records of monthly VE observations
008a & 008b1	Leachate evaporators combusting LFG	NMOC	40 CFR 63 Subpart AAAA	NMOC & HAPs	Record flow and combustion temperature every 15 minutes
008b2 & 008c	Leachate evaporators combusting NG	All	401 KAR 52:020, Section 10	Fuel Flow	Keep records of monthly fuel flow (mmscf)
008a, 008b1, 008b2 & 008c	All leachate evaporators	VOC & HAPs	401 KAR 52:020, Section 10	Leachate Volume	Keep records of leachate volumes (monthly gallons evaporated)

Section V.4: Reporting Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Reported	Description of Reporting
008a & 008b1	Leachate evaporators combusting LFG	Visible Emissions	401 KAR 59:010 Section 3(1)(a)	Visual Emissions	Semiannual Title 5 Operating Report
008b2 & 008c	Leachate evaporators combusting NG	Visible Emissions	401 KAR 59:010 Section 3(1)(a)	Visual Emissions	Semiannual Title 5 Operating Report
008a & 008b1	Leachate evaporators combusting LFG	NMOC	40 CFR 63 Subpart AAAAA	NMOC & HAPs	Semiannual Title 5 Operating Report & Semiannual NESHAP Report
008b2 & 008c	Leachate evaporators combusting NG	All	401 KAR 52:020, Section 10	Fuel Flow	Semiannual Title 5 Operating Report & Annual Emissions Report
008a, 008b1, 008b2 & 008c	All leachate evaporators	VOC & HAPs	401 KAR 52:020, Section 10	Leachate Volume	Semiannual Title 5 Operating Report & Annual Emissions Report

Section V.5: Testing Requirements

Emission Unit #	Emission Unit Description	Pollutant	Applicable Regulation or Requirement	Parameter Tested	Description of Testing
008a & 008b1	Leachate evaporators combusting LFG	NMOC	40 CFR 63 Subpart AAAA	NMOC Outlet Concentration	One-time initial performance test using EPA Method 25C or 25A
008a, 008b1, 008b2 & 008c	All leachate evaporators	VOC & HAPs	401 KAR 52:020 Section 10	VOC/HAP content of Leachate	Measure VOC inlet concentration of leachate every 5 years using EPA 624, SW8260B, EPA 8011 or EPA 8260

REGULATORY ANALYSIS AND DISCUSSION OF PSD/NSR STATUSCounty Attainment Status

The proposed evaporator process will be located at the Tri-K Landfill in Lincoln County, Kentucky. The following table summarizes the attainment status of the area for each criteria pollutant, pursuant to 40 CFR 81.318:

Constituent	Attainment Status
TSP	Lincoln County is Better than National Standards
1971 SO ₂ NAAQS (Primary and Secondary)	Lincoln County is Better than National Standards
2010 SO ₂ NAAQS (Primary)	Lincoln County: Unclassifiable/Attainment
CO	Lincoln County: Unclassifiable/Attainment
NO ₂ (1971 Annual Standard)	Statewide: Cannot be Classified or is Better than National Standards
NO ₂ (2010 1-Hour Standard)	Lincoln County: Unclassifiable/Attainment
Ozone (1-hour Standard)	Lincoln County: Unclassifiable/Attainment (1 hour standard was revoked effective June 15, 2005)
Ozone (1997 8-hour NAAQS - Primary and Secondary)	Lincoln County: Unclassifiable/Attainment
Ozone (2008 8-hour NAAQS - Primary and Secondary)	Lincoln County: Unclassifiable/Attainment
Ozone (2015 8-hour NAAQS - Primary and Secondary)	Lincoln County: 1/16/2018 – Attainment/Unclassifiable
1997 PM-2.5 (Annual NAAQS – Primary and Secondary)	Lincoln County: Unclassifiable/Attainment
2012 PM-2.5 (Annual NAAQS – Primary)	Lincoln County: Unclassifiable/Attainment
1997 PM-2.5 (24-hour NAAQS – Primary and Secondary)	Lincoln County: Unclassifiable/Attainment
2006 PM-2.5 (24-hour NAAQS – Primary and Secondary)	Lincoln County: Unclassifiable/Attainment

Prevention of Significant Deterioration (PSD)

Tri-K Landfill has demonstrated annual potential emissions below the applicable PSD major source threshold (of 250 TPY) for each related pollutant. Based on the calculations provided in Section VII, each of the proposed evaporator process phases will emit the following at full rated capacity of the respective evaporator unit operating 8760 hours/year:

Phase 1: Trial Operation of 30,000 gpd Faering 700 Series Evaporator on Biogas:

Parameter	Skagen Faering 700 Series Leachate Evaporator Unit	
	(lbs/hour)	(tons/year)
NO _x	1.2	5.26
CO	4.3	18.83
VOC (Combustion)	0.07	0.31
VOC (Evaporation)	2.69	11.80
Total VOC	2.76	12.11
SO ₂	1.31	5.75
PM	1.50	6.57
PM ₁₀ /PM _{2.5}	1.30	5.69
HAPs (Combustion)	0.08	0.40
HAPs (Evaporation)	0.87	3.81
Total HAPs	0.95	4.21

Phase 2: Transition Operation of 60,000 gpd Faering 1400 Series Evaporator on Biogas or Natural Gas (highest emission rate from each prospective fuel type was selected):

Parameter	Skagen Faering 1400 Series Leachate Evaporator Unit	
	(lbs/hour)	(tons/year)
NO _x	2.4	10.51
CO	8.6	37.67
VOC (Combustion)	0.14	0.61
VOC (Evaporation)	5.39	23.59
Total VOC	5.53	24.20
SO ₂	2.62	11.5
PM	3.0	13.14
PM ₁₀ /PM _{2.5}	2.6	11.39
HAPs (Combustion)	0.16	0.70
HAPs (Evaporation)	1.74	7.62
Total HAPs	1.90	8.32

Phase 3: Permanent Operation of 50,000 gpd Faering 1200 Series Hybrid Evaporator on RNG Waste Heat and Natural Gas:

Parameter	Skagen Faering 1200 Series Leachate Evaporator Unit	
	(lbs/hour)	(tons/year)
NO _x	1.2	5.26
CO	4.3	18.83
VOC (Combustion)	0.07	0.30
VOC (Evaporation)	4.49	19.66
Total VOC	4.56	19.96
SO ₂	0.01	0.03
PM	3.0	13.14
PM ₁₀ /PM _{2.5}	2.6	11.39
HAPs (Combustion)	0.02	0.10
HAPs (Evaporation)	1.45	6.35
Total HAPs	1.47	6.45

This represents a minor modification to a minor source, which does not trigger the special permitting requirements of PSD. The proposed modifications are under 250 tons/year, which is minor. The existing source remains minor under PSD.

It should be noted that this analysis of potential emissions increases is very conservative, since it does not take into account the emissions off-set of less landfill gas being sent to the open flare. Specifically, a portion of the landfill gas stream that is currently going to the flare would instead be diverted to the leachate evaporator, resulting in an overall decrease in emissions from the flare on an annual basis.

PSD Applicability for Greenhouse Gases

The Supreme Court issued a ruling on June 23, 2014, holding that the EPA Tailoring Rule is invalid and that GHG is subject to review only if PSD is otherwise triggered for other regulated pollutants. In this case, PSD review is not triggered and consequently no Greenhouse Gas review is required.

New Source Review (NSR)

The facility is not subject to New Source Review (NSR) regulations as it is in attainment for all criteria pollutants.

New Source Performance Standards (NSPS):

There are no NSPS standards that are applicable to the process of evaporating leachate.

However, since some phases of the evaporator project will utilize landfill gas in the combustion process, it would be considered a control device under the Landfill NSPS Cf and the Federal Plan (40 CFR 62 Subpart OOO). As such, it will need to demonstrate compliance with the enclosed combustor requirements of these regulations. Testing, monitoring, and recordkeeping for enclosed combustors include the following:

- Performance testing within 180 days of startup to demonstrate that NMOC emissions are less than 20 ppm at 3% oxygen, and to establish a “compliance temperature”.

This technology is in use at other landfill sites, and the manufacturer indicates the equipment can meet the federal regulatory emissions limits for enclosed combustors.

National Emissions Standards for Hazardous Air Pollutants (NESHAPS):

There are no NESHAPs that are applicable to this proposed process. For those phases of the project which will be using landfill gas, the Landfill NESHAP – 40 CFR 63 Subpart AAAA would be applicable to the enclosed combustor portion. Specifically, the facility will be required to:

- Monitor flow continuously and record it every 15 minutes; and
- Monitor and record the combustion temperature.

Data must be evaluated and compared to 3-hour rolling block averages to verify that no deviations of the temperatures monitored during the initial performance test have occurred (i.e. all 3-hour periods of operation during which the average temperature was more than 28 degrees Celsius (82 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with § 63.1959(b)(2)(iii) was determined).

State Regulations

The leachate evaporator process would potentially be subject to the following Kentucky Air Regulations:

Citation	Regulatory Requirement
401 KAR 52:020, Section 22	Provide the Division with all information necessary to determine its subject emissions within 30 days of the date the Kentucky Emissions Inventory System (KYEIS) emissions survey is mailed to the permittee.
401 KAR 59:010 Section 3(1)	Opacity cannot exceed twenty (20) percent for more than three (3) minutes in any one (1) day.
401 KAR 59:010 Section 3(2)	Regulates PM emissions from the New Process Operations. Calculations provided in the application demonstrate compliance with this regulation.

Appendix A

Appendix A – Emissions Calculations for Combustion (Trial, Transition & Permanent Units)

Tri-K Landfill

Maximum Landfill Gas Flow Rate:	439	cfm
	26,340	scfh
	231	mmscf/year
Maximum Operating Hours	8760	hours/year
Gas Quality	525	btu/ft3 (LHV per Skagen)
Other Data:		
Cs	300	ppm (Engineering Estimate - site-specific measured concentrations typically average 100 ppm)
CH4	50%	Estimated Landfill Methane Concentration
NMOC/VOC	595	ppm as hexane (AP-42, Chapter 2.4, 11/98)
D.E.	98%	Manufacturer's Certificate Faering 700 Evaporator Series

Calculate maximum throughput in mmbtu/hr:

$$439 \text{ cfm} \times 525 \text{ btu/ft}^3 \times 1 \text{ mmbtu/1,000,000 btu} = 0.23 \text{ mmbtu/min}$$

$$= 13.83 \text{ mmbtu/hr}$$

Emission Factors:

NOx	1.20 lbs/hour	Manufacturer's Certificate Faering 700 Evaporator Series
CO	4.30 lbs/hour	Manufacturer's Certificate Faering 700 Evaporator Series
PM (condensable)	1.50 lbs/hour	Manufacturer's Certificate Faering 700 Evaporator Series
PM (filterable - PM2.5 & PM10)	1.30 lbs/hour	Manufacturer's Certificate Faering 700 Evaporator Series

Calculate Potential Emissions for Criteria Pollutants

SO2

<u>300</u>	ppm H2S x	<u>64</u>	<u>mol. Wt. SO2 x</u>	26,340	scfh x	8760	<u>hrs x</u>	<u>1 T x</u>	=	actual	=
1,000,000		385.4	scf/lb-mole				yr	2000 lbs	5.75	tons/year	1.31 lbs/hour

NO_x

1.20 lbs/hour x	8760 hrs x	1 ton/2000 lbs =	actual 5.26 tons/year
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NMOC/VOC (LFG Combustion Only - VOC from leachate evaporation calculated separately)

		<u>86</u>	mol. Wt. hexane						=	0.070	lbs/hour
595	ppm VOM/1,000,000 x	385.4	scf/lb-mol x	26,340	scfh	x	(1-0.98) x	8760	hrs x	1 ton/2000 lbs =	0.306 tons/year

CO

4.30 lbs/hour x	8760 hrs x	1 ton/2000 lbs =	actual 18.83 tons/year
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PM (Condensible)

1.50 lbs/hour x	8760 hrs x	1 ton/2000 lbs =	actual 6.57 tons/year
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Maximum Landfill Gas Flow Rate through Evaporato	439	scfm	
	26,340	scfh =	6,534,647 m^3/yr
Maximum Operating Hours:	8,760	hrs	2.307E+08 ft^3/yr

CAS number	COMPOUND*	Concentration ppmv ¹	MOLECULAR WEIGHT	GRAVIMETRIC CONCENTRATION (mg/M ³)	Potential Emissions (Destruction Efficiency = 98%)		
					HAPs (Mg/yr)	HAPs (lbs/hr)	HAPs (tons/yr)
71556	1,1,1-Trichloroethane (methyl chloroform)	0.48	133.42	2.62	0.0003	0.0001	0.0004
79345	1,1,2,2-Tetrachloroethane	1.11	167.86	7.62	0.0010	0.0003	0.0011
75343	1,1-Dichloroethane (ethylidene dichloride)	2.35	98.96	9.51	0.0012	0.0003	0.0014
75354	1,1-Dichloroethene (vinylidene chloride)	0.20	96.95	0.79	0.0001	0.0000	0.0001
107062	1,2-Dichloroethane (ethylene dichloride)	0.41	98.96	1.66	0.0002	0.0001	0.0002
78875	1,2-Dichloropropane (propylene dichloride)	0.18	112.99	0.83	0.0001	0.0000	0.0001
107131	Acrylonitrile	6.33	53.06	13.74	0.0018	0.0005	0.0020
75150	Carbon Disulfide	0.58	76.14	1.81	0.0002	0.0001	0.0003
56235	Carbon Tetrachloride	0.00	153.84	0.00	0.0000	0.0000	0.0000
463581	Carbonyl Sulfide	0.49	60.07	1.20	0.0002	0.0000	0.0002
108907	Chlorobenzene	0.25	112.56	1.15	0.0002	0.0000	0.0002
75003	Chloroethane (ethyl chloride)	1.25	64.52	3.30	0.0004	0.0001	0.0005
67663	Chloroform	0.03	119.39	0.15	0.0000	0.0000	0.0000
75092	Dichloromethane (methylene chloride)	14.30	84.94	49.68	0.0065	0.0016	0.0072
100414	Ethylbenzene	4.61	106.16	20.02	0.0026	0.0007	0.0029
110543	Hexane	6.57	86.17	23.15	0.0030	0.0008	0.0033
108101	Methyl Isobutyl Ketone	1.87	100.07	7.65	0.0010	0.0003	0.0011
127184	Perchloroethylene (tetrachloroethene)	3.73	165.85	25.30	0.0033	0.0008	0.0036
79016	Trichloroethylene	2.82	131.39	15.15	0.0020	0.0005	0.0022
75014	Vinyl chloride	7.34	62.50	18.76	0.0025	0.0006	0.0027
71432	Benzene	1.91	78.11	6.10	0.0008	0.0002	0.0009
74873	Methyl chloride(Chloromethane)	1.21	50.49	2.50	0.0003	0.0001	0.0004
1330207	Xylene (Isomers & Mixtures)	39.30	106.16	170.64	0.0223	0.0056	0.0246
108883	Toluene	12.10	92.13	45.59	0.0060	0.0015	0.0066
7647010	Hydrochloric Acid ²	N/A	N/A	N/A	0.2629	0.0659	0.2892
	Mercury Compounds	0.00	200.61	0.00	0.0000	0.0000	0.0000
Total HAPs:						0.08	0.4

²Hydrochloric Acid calculations are taken from a final paper published by USEPA on April 12, 2007: Field Measurements at Five Municipal Solid Waste Landfills with Landfill Gas Control Technology. Emissions rate was for enclosed flares - highest of two tested values used (2.5 lbs/Hcl/mmscf).

Tri-K Landfill
Skagen Energy Services Evaporator - 60,000 Gallons/Day Trial Unit (Faering 1400 Series)
Criteria Pollutants From LFG or NG Combustion

Maximum Landfill Gas Flow Rate: 878 cfm
52,680 scfh
461 mmscf/year

Maximum Natural Gas Flow Rate: 418 cfm
25,080 scfh
220 mmscf/year

Maximum Operating Hours 8760 hours/year

LFG Gas Quality 525 btu/ft³ (LHV per Skagen)

NG Gas Quality 1050 btu/ft³ (LHV per Skagen)

Other Data:

Cs LFG 300 ppm (Engineering Estimate - site-specific measured concentrations typically average 100 ppm)

Cs (NG) 0.6 lbs/10⁶ scf (AP-42, Chapter 1.4 - Table 1.4-2 (7/1998))

CH₄ 50% Estimated Landfill Methane Concentration

NG CH₄ 98% Assumed NG Methane Concentration

NMOC/VOC LFG 595 ppm as hexane (AP-42, Chapter 2.4, 11/98)

VOC NG 5.5 lbs/10⁶ scf (AP-42, Chapter 1.4 - Table 1.4-2 (7/1998))

D.E. (both fuels) 98% Manufacturer's Certificate Faering 700 Evaporator Series

Calculate maximum LFG throughput in mmbtu/hr:

$$878 \text{ cfm} \times 525 \text{ btu/ft}^3 \times 1 \text{ mmbtu/1,000,000 btu} = 0.46 \text{ mmbtu/min}$$

$$= 27.66 \text{ mmbtu/hr}$$

Calculate maximum NG throughput in mmbtu/hr:

$$418 \text{ cfm} \times 1050 \text{ btu/ft}^3 \times 1 \text{ mmbtu/1,000,000 btu} = 0.44 \text{ mmbtu/min}$$

$$= 26.33 \text{ mmbtu/hr}$$

Emission Factors:

NO _x	2.40 lbs/hour	Manufacturer's Certificate Faering 1400 Evaporator Series
CO	8.60 lbs/hour	Manufacturer's Certificate Faering 1400 Evaporator Series
PM (condensable)	3.00 lbs/hour	Manufacturer's Certificate Faering 1400 Evaporator Series
PM (filterable - PM _{2.5} & PM ₁₀)	2.60 lbs/hour	Manufacturer's Certificate Faering 1400 Evaporator Series

Calculate Potential Emissions for Criteria Pollutants

SO₂ (LFG Combustion)

<u>300</u>	ppm H2S x	<u>64</u>	<u>mol. Wt. SO2 x</u>	52,680	scfh x	8760	<u>hrs x</u>	<u>1 T x</u>	=	actual	=		
1,000,000		385.4	scf/lb-mole				yr	2000 lbs		11.50	tons/year	2.62	lbs/hour

SO₂ (NG Combustion)

0.6	<u>lbs Cs x</u>	25,080	<u>scf NG x</u>	98%	<u>CH4 x</u>	1 MMSCF x	8760	<u>hrs x</u>	<u>1 T =</u>	=	
	MMSCF NG		hr		LFG	1,000,000		year	2000 lbs	0.06 tons/year	0.01 lbs/hour

NO_x (Both Fuels)

										actual
2.40	lbs/hour x	8760	hrs x	1 ton/2000 lbs =						10.51 tons/year

NMOC/VOC (LFG Combustion Only - VOC from leachate evaporation calculated separately)

595	ppm VOM/1,000,000 x	86	mol. Wt. hexane							=	0.14	lbs/hour
		385.4	scf/lb-mol x	52,680	scfh x	(1-0.98) x	8760	hrs x	1 ton/2000 lbs =		0.613	tons/year

VOC (NG Combustion Only - VOC from leachate evaporation calculated separately)

5.5	<u>lbs VOC x</u>	25,080	<u>scf NG x</u>	98%	<u>CH4 x</u>	1 MMSCF x	8760	<u>hrs x</u>	<u>1 T =</u>	=	
	MMSCF NG		hr		NG	1,000,000		year	2000 lbs	0.59 tons/year	0.14 lbs/hour

CO (both fuels)

										actual
8.60	lbs/hour x	8760	hrs x	1 ton/2000 lbs =						37.67 tons/year

PM (Condensible) - both fuels

										actual
3.00	lbs/hour x	8760	hrs x	1 ton/2000 lbs =						13.14 tons/year

PM (Filterable - PM_{2.5} & PM₁₀) - both fuels

										actual
2.60	lbs/hour x	8760	hrs x	1 ton/2000 lbs =						11.39 tons/year

Tri-K Landfill
Evaporator HAPS Emissions Calcs from LFG Combustion
60,000 GPD Transition Unit

Maximum Landfill Gas Flow Rate through Evaporator 878 scfm
52,680 scfh = 13,069,295 m³/yr
Maximum Operating Hours: 8,760 hrs 4.615E+08 ft³/yr

UNCONTROLLED LANDFILL GAS CONCENTRATIONS (a) - (SCC 50200602)

CAS number	COMPOUND*	Concentration ppmv ¹	MOLECULAR WEIGHT	GRAVIMETRIC CONCENTRATION (mg/M ³)	Potential Emissions (Destruction Efficiency = 98%)		
					HAPs (Mg/yr)	HAPs (lbs/hr)	HAPs (tons/yr)
71556	1,1,1-Trichloroethane (methyl chloroform)	0.48	133.42	2.62	0.0007	0.0002	0.0008
79345	1,1,2,2-Tetrachloroethane	1.11	167.86	7.62	0.0020	0.0005	0.0022
75343	1,1-Dichloroethane (ethylidene dichloride)	2.35	98.96	9.51	0.0025	0.0006	0.0027
75354	1,1-Dichloroethene (vinylidene chloride)	0.20	96.95	0.79	0.0002	0.0001	0.0002
107062	1,2-Dichloroethane (ethylene dichloride)	0.41	98.96	1.66	0.0004	0.0001	0.0005
78875	1,2-Dichloropropane (propylene dichloride)	0.18	112.99	0.83	0.0002	0.0001	0.0002
107131	Acrylonitrile	6.33	53.06	13.74	0.0036	0.0009	0.0040
75150	Carbon Disulfide	0.58	76.14	1.81	0.0005	0.0001	0.0005
56235	Carbon Tetrachloride	0.00	153.84	0.00	0.0000	0.0000	0.0000
463581	Carbonyl Sulfide	0.49	60.07	1.20	0.0003	0.0001	0.0003
108907	Chlorobenzene	0.25	112.56	1.15	0.0003	0.0001	0.0003
75003	Chloroethane (ethyl chloride)	1.25	64.52	3.30	0.0009	0.0002	0.0010
67663	Chloroform	0.03	119.39	0.15	0.0000	0.0000	0.0000
75092	Dichloromethane (methylene chloride)	14.30	84.94	49.68	0.0130	0.0033	0.0143
100414	Ethylbenzene	4.61	106.16	20.02	0.0052	0.0013	0.0058
110543	Hexane	6.57	86.17	23.15	0.0061	0.0015	0.0067
108101	Methyl Isobutyl Ketone	1.87	100.07	7.65	0.0020	0.0005	0.0022
127184	Perchloroethylene (tetrachloroethene)	3.73	165.85	25.30	0.0066	0.0017	0.0073
79016	Trichloroethylene	2.82	131.39	15.15	0.0040	0.0010	0.0044
75014	Vinyl chloride	7.34	62.50	18.76	0.0049	0.0012	0.0054
71432	Benzene	1.91	78.11	6.10	0.0016	0.0004	0.0018
74873	Methyl chloride(Chloromethane)	1.21	50.49	2.50	0.0007	0.0002	0.0007
1330207	Xylene (Isomers & Mixtures)	39.30	106.16	170.64	0.0446	0.0112	0.0492
108883	Toluene	12.10	92.13	45.59	0.0119	0.0030	0.0131
7647010	Hydrochloric Acid ²	N/A	N/A	N/A	0.5258	0.1317	0.5784
	Mercury Compounds	0.00	200.61	0.00	0.0000	0.0000	0.0000
Total HAPS:						0.16	0.7

¹Based on 11/98 AP-42 Factors for Landfill Gas

²Hydrochloric Acid calculations are taken from a final paper published by USEPA on April 12, 2007: Field Measurements at Five Municipal Solid Waste Landfills with Landfill Gas Control Technology. Emissions rate was for enclosed flares - highest of two tested values used (2.5 lbs/HCl/mmscf).

60,000 GPD Transition Unit

Compound	CAS No.	Emissions Factor lb/10 ⁶ SCF	Maximum Emissions Rate lbs/hour tons/year	
2-Methylnapthalene	91576	2.40E-05	6.02E-07	2.64E-06
3-Methylchloranthrene	56495	1.80E-06	4.51E-08	1.98E-07
Acenaphthene	83329	1.80E-06	4.51E-08	1.98E-07
Anthracene	120127	2.40E-06	6.02E-08	2.64E-07
Benz(a)anthracene	56553	1.80E-06	4.51E-08	1.98E-07
Benzene	71432	2.10E-03	5.27E-05	2.31E-04
Benzo(a)pyrene	50328	1.20E-06	3.01E-08	1.32E-07
Benzo(b)fluoranthene	205992	1.80E-06	4.51E-08	1.98E-07
benzo(g,h,i)perylene	191242	1.20E-06	3.01E-08	1.32E-07
Benzo(k)fluoranthene	205823	1.80E-06	4.51E-08	1.98E-07
Chrysene	218019	1.80E-06	4.51E-08	1.98E-07
Dibenzo(a,h)anthracene	53703	1.20E-06	3.01E-08	1.32E-07
Dichlorobenze	25321226	1.20E-03	3.01E-05	1.32E-04
Fluoranthene	206440	3.00E-06	7.52E-08	3.30E-07
Fluorene	86737	2.80E-06	7.02E-08	3.08E-07
Formaldehyde	50000	7.50E-02	1.88E-03	8.24E-03
Hexane	110543	1.80E+00	4.51E-02	1.98E-01
Ineno(1,2,3-cd)pyrene	193395	1.80E-06	4.51E-08	1.98E-07
Napthalene	91203	6.10E-04	1.53E-05	6.70E-05
Phenanathrene	85018	1.70E-05	4.26E-07	1.87E-06
Pyrene	129000	5.00E-06	1.25E-07	5.49E-07
Toluene	108883	3.40E-03	8.53E-05	3.73E-04
TOTAL			0.04721	0.20678

Source: AP-42 Chapter 1.4, External Combustion Sources, Natural Gas Combustion, Table 1.4-3.

NG Flow rate:	220	mmscf/yr
	8760	hours/year

2.60 lbs/hour x	8760 hrs x	1 ton/200C	actual 11.39 tons/year
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Tri-K Landfill
Potential HAPS Emissions from Natural Gas Combustion in Faering 1200 Evaporator

Compound	CAS No.	Emissions Factor lb/10 ⁶ SCF	Maximum Emissions Rate	
			lbs/hour	tons/year
2-Methylnapthalene	91576	2.40E-05	3.01E-07	1.32E-06
3-Methylchloranthrene	56495	1.80E-06	2.26E-08	9.89E-08
Acenaphthene	83329	1.80E-06	2.26E-08	9.89E-08
Anthracene	120127	2.40E-06	3.01E-08	1.32E-07
Benz(a)anthracene	56553	1.80E-06	2.26E-08	9.89E-08
Benzene	71432	2.10E-03	2.63E-05	1.15E-04
Benzo(a)pyrene	50328	1.20E-06	1.50E-08	6.59E-08
Benzo(b)fluoranthene	205992	1.80E-06	2.26E-08	9.89E-08
benzo(g,h,i)perylene	191242	1.20E-06	1.50E-08	6.59E-08
Benzo(k)fluoranthene	205823	1.80E-06	2.26E-08	9.89E-08
Chrysene	218019	1.80E-06	2.26E-08	9.89E-08
Dibenzo(a,h)anthracene	53703	1.20E-06	1.50E-08	6.59E-08
Dichlorobenze	25321226	1.20E-03	1.50E-05	6.59E-05
Fluoranthene	206440	3.00E-06	3.76E-08	1.65E-07
Fluorene	86737	2.80E-06	3.51E-08	1.54E-07
Formaldehyde	50000	7.50E-02	9.41E-04	4.12E-03
Hexane	110543	1.80E+00	2.26E-02	9.89E-02
Ineno(1,2,3-cd)pyrene	193395	1.80E-06	2.26E-08	9.89E-08
Napthalene	91203	6.10E-04	7.65E-06	3.35E-05
Phenanathrene	85018	1.70E-05	2.13E-07	9.34E-07
Pyrene	129000	5.00E-06	6.27E-08	2.75E-07
Toluene	108883	3.40E-03	4.26E-05	1.87E-04
TOTAL			0.02361	0.10339

Source: AP-42 Chapter 1.4, External Combustion Sources, Natural Gas Combustion, Table 1.4-3 (7/1998).

NG Flow rate: 110 mmscf/yr
8760 hours/year

Skagen Biogas Evaporators - Greenhouse Gas Pollutant Emissions
Tri-K Landfill - Stanford, Kentucky

Use the following equation from 40 CFR 98 Subpart C (Tier 1 Calculation Methodology):

$CO_2 = 1 \times 10^{-3} \times \text{Fuel} \times \text{HHV} \times \text{EF}$ (Equation C-1)

Where:
CO₂ = Annual CO₂ mass emissions for the specific fuel type (metric tons)
Fuel = Mass or volume of fuel combusted per year
HHV = Default high heat value of the fuel, from Table C-1 of Subpart C (mmBTU per mass or volume, as applicable)
EF = Fuel-specific default CO₂ emission factor, from Table C-1 of this subpart (kg CO₂/mmBtu)
1 x 10⁻³ = Conversion factor from kilograms to metric tons

Other Information:

Fuel Type	Heating Value (mmbtu/scf)
Landfill Gas	525
Natural Gas	1,050

From 40 CFR 98 Tables C-1 & C-2

Parameter	Default Emission Factor NG (kg/mmbtu)	Default Emission Factor LFG (kg/mmbtu)
CO ₂	53.06	52.07
N ₂ O	0.0001	0.00063
CH ₄	0.001	0.0032

Global warming potential (GWP) of methane (CH₄) = 25 (Reference 1)
Global warming potential (GWP) of nitrous oxide (N₂O) = 298 (Reference 1)

- References:
1. Table A–1 to Subpart A of 40 CFR Part 98 - Global Warming Potentials

Device/Emissions Unit	Rated Capacity (mmbtu/hour)	Rated Fuel Usage (mmscf/hr)	Max Throughput mmscf/year	Maximum Annual Operating Hours	Combustion CO ₂ Emissions Metric Tons/year	Pass-through CO ₂ Emissions Metric Tons/year	Combined CO ₂ CO ₂ Emissions Metric Tons/year	CH ₄ Emissions Metric Tons/year	Conversion to CO ₂ e Metric tons/year	N ₂ O Emissions Metric Tons/year	Conversion to CO ₂ e Metric tons/year	Total GHG Emissions Metric tons/yr CO ₂ e	Anthropogenic GHG emissions Metric tons/yr CO ₂ e
Trial LFG Evaporator (Faering 700)	13.83	0.026	230.76	8760	6,308.32	6,195.45	12,503.77	0.3877	9.6921	0.0763	22.7449	12,536.20	32.4369
Faering 1400 Evaporator - LFG	27.66	0.053	461.53	8760	12,616.64	12,390.89	25,007.53	0.7754	19.3841	0.1527	45.4897	25,072.41	64.8738
Faering 1400 Evaporator - NG	26.33	0.025	219.67	8760	12,238.33	11,795.09	24,033.42	0.2307	5.7663	0.0115	3.4380	24,042.62	9.2043
Hybrid NG/Waste Heat Evaporator (Faering 1200)	13.17	0.013	109.88	8760	6,121.49	5,899.78	12,021.27	0.1154	2.8842	0.0115	3.4380	12,027.60	6.3222

Tri-K Landfill Leachate Evaporator Project
Process Weight Rate Compliance Calculations for PM Emissions

Calculate Process Emissions Rates for 30,000 gpd, 50,000 gpd and 60,000 gpd concentrators:

30,000 <u>gallons</u> x day	8.34 <u>lbs</u> x gallon	1 day = 24 hours	10,425 lbs/hour process rate 5.2125 tons/hour
50,000 <u>gallons</u> x day	8.34 <u>lbs</u> x gallon	1 day = 24 hours	17,375 lbs/hour process rate 8.6875 tons/hour
60,000 <u>gallons</u> x day	8.34 <u>lbs</u> x gallon	1 day = 24 hours	20,850 lbs/hour process rate 10.425 tons/hour

Calculate allowable PM emissions rates for each process throughput rate:

Per 401 KAR 59:010, Section 3(2), for process rates from 1,000 to 60,000 lb/hr: $E = 3.59P^{0.62}$

Where,

E = maximum allowable rate of
emissions in lb/hr, and

P = process weight in tons/hr

30,000 gpd unit allowable PM rate = 10 lbs/hour

50,000 gpd unit allowable PM rate = 14 lbs/hour

60,000 gpd unit allowable PM rate = 15 lbs/hour

Per the evaporator emissions calculations, the PM emissions rate for each unit is:

30,000 gpd unit PM emissions rate = 1.5 lbs/hour

50,000 gpd unit PM emissions rate = 3.0 lbs/hour

60,000 gpd unit PM emissions rate = 3.0 lbs/hour

UNITS IN ALL THREE PHASES OF THE PROJECT COMPLY WITH THE ALLOWABLE EMISSIONS RATES.

Appendix B

Appendix B – Emissions Calculations for Landfill Liquid Evaporation

Tri-K Landfill
Calculation of VOC and HAPS Emissions from Evaporation of Leachate
Three Phases of Leachate Evaporator Units

The maximum potential to emit VOC and HAPS from the Evaporator can be calculated by assuming complete stripping of compounds (i.e., 100% volatilization) from the landfill leachate based on the maximum influent VOC & HAPS concentration. The following formula is utilized to predict maximum emissions:

$$\text{Maximum PTE (tons/yr)} = \frac{C_p (\text{mg/l}) * Q * 3.785 (\text{l/gal})}{9.07 \times 10^6 (\text{mg/ton})}$$

Where:

C_p = VOM/HAP concentration

Q = Yearly Process Flow (Gallons)

Estimated Yearly Liquid Volume
Through Each Evaporator (Q)

= 10,950,000 gallons (based on 30,000 gpd throughput)
18,250,000 gallons (based on 50,000 gpd throughput)
21,900,000 gallons (based on 60,000 gpd throughput)

Compound/CAS Number	CAS Number	VOC	HAP	C_p Maximum Loading* (mg/l)	30,000 gpd Phase		50,000 gpd Phase		60,000 gpd Phase	
					Emissions (tons/yr)	lbs/hr	Emissions (tons/yr)	lbs/hr	Emissions (tons/yr)	lbs/hr
Acetone	67641			0.4840	0.02212	0.00505	0.03686	0.00842	0.04423	0.01010
Acetonitrile**	75058	X	X	0.1000	0.00457	0.00104	0.00762	0.00174	0.00914	0.00209
Acrolein**	107028	X	X	0.0500	0.00228	0.00052	0.00381	0.00087	0.00457	0.00104
Benzene**	71432	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Bromobenzene**	108861	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Bromochloromethane**	74975	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Bromodichloromethane**	75274	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Bromoform**	75252	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
2-Butanone (MEK)	78933	X		0.3140	0.01435	0.00328	0.02391	0.00546	0.02870	0.00655
n-butylbenzene**	104518	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
sec-butylbenzene**	135988	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
tert-butylbenzene**	9998066	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Carbon disulfide	75150	X	X	0.0208	0.00095	0.00022	0.00158	0.00036	0.00190	0.00043
Carbon Tetrachloride**	56235	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Chlorobenzene**	108907	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Chloroethane**	75003	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Chloroform**	67663	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Chloromethane**	74873	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
2-Chlorotoluene**	95498	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
4-Chlorotoluene**	106434	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,2-Dibromo-3-chloropropane**	96128	X	X	0.0100	0.00046	0.00010	0.00076	0.00017	0.00091	0.00021
Dibromochloromethane**	124481	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,2-Dibromomethane**	106934	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Dibromomethane**	74953	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,2-Dichlorobenzene**	95501	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,3-Dichlorobenzene**	541731	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,4-Dichlorobenzene**	106467	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
trans-1,4-Dichloro-2-butene**	110576	X		0.1000	0.00457	0.00104	0.00762	0.00174	0.00914	0.00209
Dichlorodifluoromethane**	75718	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,1-Dichloroethane**	75343	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,2-Dichloroethane**	107062	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,1-Dichloroethene**	75354	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
cis-1,2-Dichloroethene**	156592	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
trans-1,2-Dichloroethene**	156605	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,2-Dichloropropane**	78875	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,3-Dichloropropane**	142289	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
2,2-Dichloropropane**	594207	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,1-Dichloropropene**	563586	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
cis-1,3-Dichloropropene**	10061015	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
trans-1,3-Dichloropropene**	10061026	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Ethylbenzene**	100414	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Ethyl methacrylate**	97632	X		0.1000	0.00457	0.00104	0.00762	0.00174	0.00914	0.00209
Hexachloro-1,3-butadiene**	87683	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
n-Hexane**	110543	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
2-Hexanone**	591786	X		0.0250	0.00114	0.00026	0.00190	0.00043	0.00228	0.00052
Iodomethane**	74884	X	X	0.0100	0.00046	0.00010	0.00076	0.00017	0.00091	0.00021
Isopropylbenzene (Cumene)**	98828	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
p-Isopropyltoluene**	99876	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Methacrylonitrile**	126987	X		0.1000	0.00457	0.00104	0.00762	0.00174	0.00914	0.00209
Methylene Chloride**	75092	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
2-Methylnaphthalene**	91576	X		0.0100	0.00046	0.00010	0.00076	0.00017	0.00091	0.00021
4-Methyl-2-pentanone (MIBK)**	108101	X	X	0.0250	0.00114	0.00026	0.00190	0.00043	0.00228	0.00052
Methyl-tert-butyl ether**	1634044	X	X	0.0040	0.00018	0.00004	0.00030	0.00007	0.00037	0.00008
Naphthalene**	91203	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Propionitrile**	107120	X		0.1000	0.00457	0.00104	0.00762	0.00174	0.00914	0.00209
n-Propylbenzene**	103651	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Styrene**	100425	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,1,1,2-Tetrachloroethane**	630206	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,1,2,2-Tetrachloroethane**	79345	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Tetrachloroethene**	127184	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Toluene**	108883	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,2,3-Trichlorobenzene**	87616	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,2,4-Trichlorobenzene**	120821	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,1,1-Trichloroethane**	71556	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,1,2-Trichloroethane**	79005	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Trichloroethene**	79016	X	X	0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Trichlorofluoromethane**	75694	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,2,3-Trichloropropane**	96184	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,2,4-Trimethylbenzene**	95636	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
1,3,5-Trimethylbenzene**	108678	X		0.0050	0.00023	0.00005	0.00038	0.00009	0.00046	0.00010
Vinyl acetate**	108054	X	X	0.0500	0.00228	0.00052	0.00381	0.00087	0.00457	0.00104
Vinyl chloride**	75014	X	X	0.0020	0.00009	0.00002	0.00015	0.00003	0.00018	0.00004
Xylene (Total)**	1330207	X	X	0.0100	0.00046	0.00010	0.00076	0.00017	0.00091	0.00021
Total VOC				1.2908	0.05898	0.01347	0.09831	0.02244	0.11797	0.02693
Total Combined HAPs				0.4168	0.01905	0.00435	0.03174	0.00725	0.03809	0.00870

* Maximum Loading Potential is based on highest detected concentrations of volatile organic material based on leachate analytical data from October 2023 samples from three leachate tanks. The report limit for non-detected compounds was used as a concentration for that compound to provide a conservative estimate of emissions (marked with **)

Note: Each phase of the evaporator unit project will utilize an air stripper, which will remove most of the volatile organic compounds. The exhaust gas from the air stripper is sent to the unit's gas combustion burner, where per the manufacturer, VOC/HAPs destruction efficiency is 98%. However, since the organic content of the leachate is already very low, no emissions reductions from the stripper are required or accounted for in the calculations.

In order to provide a conservative estimate of future emissions due to fluctuations in leachate quality, a loading and emissions rate of 200 times the current calculated values is requested for each of the phases:

Max VOC Loading Rate: 258.2 mg/l

Evaporator Unit Phase	VOM (tpy)	VOM (lb/hr)	HAPS (tpy)	HAPS (lb/hr)
30,000 gpd	11.80	2.69	3.81	0.87
50,000 gpd	19.66	4.49	6.35	1.45
60,000 gpd	23.59	5.39	7.62	1.74



November 16, 2023

Mr. Bill Knarr
Kenvirons, Inc.
770 Wilkinson Blvd
Frankfort, KY 40601

RE: Project: Tri-K Landfill Leachate
Pace Project No.: 50359489

Dear Mr. Knarr:

Enclosed are the analytical results for sample(s) received by the laboratory on November 11, 2023. The results relate only to the samples included in this report. Results reported herein conform to the applicable TNI/NELAC Standards and the laboratory's Quality Manual, where applicable, unless otherwise noted in the body of the report.

The test results provided in this final report were generated by each of the following laboratories within the Pace Network:

- Pace Analytical Services - Indianapolis

If you have any questions concerning this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink that reads "Randal Rastorfer".

Randal Rastorfer
randal.rastorfer@pacelabs.com
(614)301-3304
Project Manager

Enclosures

cc: Mr. Ben Bray, Kenvirons, Inc.
Leah Gearhart, Kenvirons



REPORT OF LABORATORY ANALYSIS

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CERTIFICATIONS

Project: Tri-K Landfill Leachate

Pace Project No.: 50359489

Pace Analytical Services Indianapolis

7726 Moller Road, Indianapolis, IN 46268

Illinois Accreditation #: 200074

Indiana Drinking Water Laboratory #: C-49-06

Kansas/TNI Certification #: E-10177

Kentucky UST Agency Interest #: 80226

Kentucky WW Laboratory ID #: 98019

Michigan Drinking Water Laboratory #9050

Ohio VAP Certified Laboratory #: CL0065

Oklahoma Laboratory #: 9204

Texas Certification #: T104704355

Wisconsin Laboratory #: 999788130

USDA Foreign Soil Permit #: 525-23-13-23119

USDA Compliance Agreement #: IN-SL-22-001

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SAMPLE SUMMARY

Project: Tri-K Landfill Leachate

Pace Project No.: 50359489

Lab ID	Sample ID	Matrix	Date Collected	Date Received
50359489001	Leachate - Tanks 2&3	Water	11/09/23 12:15	11/11/23 09:15
50359489002	Leachate - Tank 1	Water	11/09/23 12:35	11/11/23 09:15

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SAMPLE ANALYTE COUNT

Project: Tri-K Landfill Leachate

Pace Project No.: 50359489

Lab ID	Sample ID	Method	Analysts	Analytes Reported	Laboratory
50359489001	Leachate - Tanks 2&3	EPA 8260	TMW	78	PASI-I
50359489002	Leachate - Tank 1	EPA 8260	TMW	78	PASI-I

PASI-I = Pace Analytical Services - Indianapolis

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**SUMMARY OF DETECTION**

Project: Tri-K Landfill Leachate

Pace Project No.: 50359489

Lab Sample ID	Client Sample ID					
Method	Parameters	Result	Units	Report Limit	Analyzed	Qualifiers
50359489001	Leachate - Tanks 2&3					
	Field pH	8.28	Std. Units		11/09/23 12:15	
	Field Temperature	19.5	deg C		11/09/23 12:15	
	Field Specific Conductance	23560	umhos/cm		11/09/23 12:15	
	Oxygen, Dissolved	1.17	mg/L		11/09/23 12:15	
	Field Turbidity	85.2	NTU		11/09/23 12:15	
EPA 8260	Acetone	484	ug/L	100	11/15/23 00:57	
EPA 8260	2-Butanone (MEK)	314	ug/L	25.0	11/15/23 00:57	
EPA 8260	Carbon disulfide	20.8	ug/L	10.0	11/15/23 00:57	
50359489002	Leachate - Tank 1					
	Field pH	8.09	Std. Units		11/09/23 12:35	
	Field Temperature	18.2	deg C		11/09/23 12:35	
	Field Specific Conductance	15303	umhos/cm		11/09/23 12:35	
	Oxygen, Dissolved	0.89	mg/L		11/09/23 12:35	
	Field Turbidity	>1000	NTU		11/09/23 12:35	

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ANALYTICAL RESULTS

Project: Tri-K Landfill Leachate

Pace Project No.: 50359489

Sample: Leachate - Tanks 2&3		Lab ID: 50359489001	Collected: 11/09/23 12:15	Received: 11/11/23 09:15	Matrix: Water			
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual
Field Data		Analytical Method: Pace Analytical Services - Indianapolis						
Field pH	8.28	Std. Units		1		11/09/23 12:15		
Field Temperature	19.5	deg C		1		11/09/23 12:15		
Field Specific Conductance	23560	umhos/cm		1		11/09/23 12:15		
Oxygen, Dissolved	1.17	mg/L		1		11/09/23 12:15	7782-44-7	
Field Turbidity	85.2	NTU		1		11/09/23 12:15		
8260/5030 MSV		Analytical Method: EPA 8260 Pace Analytical Services - Indianapolis						
Acetone	484	ug/L	100	1		11/15/23 00:57	67-64-1	
Acetonitrile	ND	ug/L	100	1		11/15/23 00:57	75-05-8	
Acrolein	ND	ug/L	50.0	1		11/15/23 00:57	107-02-8	
Acrylonitrile	ND	ug/L	100	1		11/15/23 00:57	107-13-1	
Benzene	ND	ug/L	5.0	1		11/15/23 00:57	71-43-2	
Bromobenzene	ND	ug/L	5.0	1		11/15/23 00:57	108-86-1	
Bromochloromethane	ND	ug/L	5.0	1		11/15/23 00:57	74-97-5	
Bromodichloromethane	ND	ug/L	5.0	1		11/15/23 00:57	75-27-4	
Bromoform	ND	ug/L	5.0	1		11/15/23 00:57	75-25-2	
Bromomethane	ND	ug/L	5.0	1		11/15/23 00:57	74-83-9	
2-Butanone (MEK)	314	ug/L	25.0	1		11/15/23 00:57	78-93-3	
n-Butylbenzene	ND	ug/L	5.0	1		11/15/23 00:57	104-51-8	
sec-Butylbenzene	ND	ug/L	5.0	1		11/15/23 00:57	135-98-8	
tert-Butylbenzene	ND	ug/L	5.0	1		11/15/23 00:57	98-06-6	
Carbon disulfide	20.8	ug/L	10.0	1		11/15/23 00:57	75-15-0	
Carbon tetrachloride	ND	ug/L	5.0	1		11/15/23 00:57	56-23-5	
Chlorobenzene	ND	ug/L	5.0	1		11/15/23 00:57	108-90-7	
Chloroethane	ND	ug/L	5.0	1		11/15/23 00:57	75-00-3	
Chloroform	ND	ug/L	5.0	1		11/15/23 00:57	67-66-3	
Chloromethane	ND	ug/L	5.0	1		11/15/23 00:57	74-87-3	
2-Chlorotoluene	ND	ug/L	5.0	1		11/15/23 00:57	95-49-8	
4-Chlorotoluene	ND	ug/L	5.0	1		11/15/23 00:57	106-43-4	
1,2-Dibromo-3-chloropropane	ND	ug/L	10.0	1		11/15/23 00:57	96-12-8	
Dibromochloromethane	ND	ug/L	5.0	1		11/15/23 00:57	124-48-1	
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		11/15/23 00:57	106-93-4	
Dibromomethane	ND	ug/L	5.0	1		11/15/23 00:57	74-95-3	
1,2-Dichlorobenzene	ND	ug/L	5.0	1		11/15/23 00:57	95-50-1	
1,3-Dichlorobenzene	ND	ug/L	5.0	1		11/15/23 00:57	541-73-1	
1,4-Dichlorobenzene	ND	ug/L	5.0	1		11/15/23 00:57	106-46-7	
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		11/15/23 00:57	110-57-6	
Dichlorodifluoromethane	ND	ug/L	5.0	1		11/15/23 00:57	75-71-8	
1,1-Dichloroethane	ND	ug/L	5.0	1		11/15/23 00:57	75-34-3	
1,2-Dichloroethane	ND	ug/L	5.0	1		11/15/23 00:57	107-06-2	
1,1-Dichloroethene	ND	ug/L	5.0	1		11/15/23 00:57	75-35-4	
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		11/15/23 00:57	156-59-2	
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		11/15/23 00:57	156-60-5	
1,2-Dichloropropane	ND	ug/L	5.0	1		11/15/23 00:57	78-87-5	
1,3-Dichloropropane	ND	ug/L	5.0	1		11/15/23 00:57	142-28-9	

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Tri-K Landfill Leachate

Pace Project No.: 50359489

Sample: Leachate - Tanks 2&3		Lab ID: 50359489001		Collected: 11/09/23 12:15		Received: 11/11/23 09:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260/5030 MSV		Analytical Method: EPA 8260 Pace Analytical Services - Indianapolis							
2,2-Dichloropropane	ND	ug/L	5.0	1		11/15/23 00:57	594-20-7		
1,1-Dichloropropene	ND	ug/L	5.0	1		11/15/23 00:57	563-58-6		
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		11/15/23 00:57	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		11/15/23 00:57	10061-02-6		
Ethylbenzene	ND	ug/L	5.0	1		11/15/23 00:57	100-41-4		
Ethyl methacrylate	ND	ug/L	100	1		11/15/23 00:57	97-63-2		
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		11/15/23 00:57	87-68-3		
n-Hexane	ND	ug/L	5.0	1		11/15/23 00:57	110-54-3		
2-Hexanone	ND	ug/L	25.0	1		11/15/23 00:57	591-78-6		
Iodomethane	ND	ug/L	10.0	1		11/15/23 00:57	74-88-4		
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		11/15/23 00:57	98-82-8		
p-Isopropyltoluene	ND	ug/L	5.0	1		11/15/23 00:57	99-87-6		
Methacrylonitrile	ND	ug/L	100	1		11/15/23 00:57	126-98-7		
Methylene Chloride	ND	ug/L	5.0	1		11/15/23 00:57	75-09-2		
2-Methylnaphthalene	ND	ug/L	10.0	1		11/15/23 00:57	91-57-6		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		11/15/23 00:57	108-10-1		
Methyl-tert-butyl ether	ND	ug/L	4.0	1		11/15/23 00:57	1634-04-4		
Naphthalene	ND	ug/L	5.0	1		11/15/23 00:57	91-20-3		
Propionitrile	ND	ug/L	100	1		11/15/23 00:57	107-12-0		
n-Propylbenzene	ND	ug/L	5.0	1		11/15/23 00:57	103-65-1		
Styrene	ND	ug/L	5.0	1		11/15/23 00:57	100-42-5		
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		11/15/23 00:57	630-20-6		
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		11/15/23 00:57	79-34-5		
Tetrachloroethene	ND	ug/L	5.0	1		11/15/23 00:57	127-18-4		
Toluene	ND	ug/L	5.0	1		11/15/23 00:57	108-88-3		
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		11/15/23 00:57	87-61-6		
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		11/15/23 00:57	120-82-1		
1,1,1-Trichloroethane	ND	ug/L	5.0	1		11/15/23 00:57	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	5.0	1		11/15/23 00:57	79-00-5		
Trichloroethene	ND	ug/L	5.0	1		11/15/23 00:57	79-01-6		
Trichlorofluoromethane	ND	ug/L	5.0	1		11/15/23 00:57	75-69-4		
1,2,3-Trichloropropane	ND	ug/L	5.0	1		11/15/23 00:57	96-18-4		
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		11/15/23 00:57	95-63-6		
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		11/15/23 00:57	108-67-8		
Vinyl acetate	ND	ug/L	50.0	1		11/15/23 00:57	108-05-4		
Vinyl chloride	ND	ug/L	2.0	1		11/15/23 00:57	75-01-4		
Xylene (Total)	ND	ug/L	10.0	1		11/15/23 00:57	1330-20-7		
Surrogates									
Dibromofluoromethane (S)	105	%.	82-128	1		11/15/23 00:57	1868-53-7	pH	
4-Bromofluorobenzene (S)	103	%.	79-124	1		11/15/23 00:57	460-00-4		
Toluene-d8 (S)	105	%.	73-122	1		11/15/23 00:57	2037-26-5		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Tri-K Landfill Leachate

Pace Project No.: 50359489

Sample: Leachate - Tank 1		Lab ID: 50359489002		Collected: 11/09/23 12:35		Received: 11/11/23 09:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
Field Data		Analytical Method: Pace Analytical Services - Indianapolis							
Field pH	8.09	Std. Units		1		11/09/23 12:35			
Field Temperature	18.2	deg C		1		11/09/23 12:35			
Field Specific Conductance	15303	umhos/cm		1		11/09/23 12:35			
Oxygen, Dissolved	0.89	mg/L		1		11/09/23 12:35	7782-44-7		
Field Turbidity	>1000	NTU		1		11/09/23 12:35			
8260/5030 MSV		Analytical Method: EPA 8260 Pace Analytical Services - Indianapolis							
Acetone	ND	ug/L	100	1		11/15/23 01:28	67-64-1		
Acetonitrile	ND	ug/L	100	1		11/15/23 01:28	75-05-8		
Acrolein	ND	ug/L	50.0	1		11/15/23 01:28	107-02-8		
Acrylonitrile	ND	ug/L	100	1		11/15/23 01:28	107-13-1		
Benzene	ND	ug/L	5.0	1		11/15/23 01:28	71-43-2		
Bromobenzene	ND	ug/L	5.0	1		11/15/23 01:28	108-86-1		
Bromochloromethane	ND	ug/L	5.0	1		11/15/23 01:28	74-97-5		
Bromodichloromethane	ND	ug/L	5.0	1		11/15/23 01:28	75-27-4		
Bromoform	ND	ug/L	5.0	1		11/15/23 01:28	75-25-2		
Bromomethane	ND	ug/L	5.0	1		11/15/23 01:28	74-83-9		
2-Butanone (MEK)	ND	ug/L	25.0	1		11/15/23 01:28	78-93-3		
n-Butylbenzene	ND	ug/L	5.0	1		11/15/23 01:28	104-51-8		
sec-Butylbenzene	ND	ug/L	5.0	1		11/15/23 01:28	135-98-8		
tert-Butylbenzene	ND	ug/L	5.0	1		11/15/23 01:28	98-06-6		
Carbon disulfide	ND	ug/L	10.0	1		11/15/23 01:28	75-15-0		
Carbon tetrachloride	ND	ug/L	5.0	1		11/15/23 01:28	56-23-5		
Chlorobenzene	ND	ug/L	5.0	1		11/15/23 01:28	108-90-7		
Chloroethane	ND	ug/L	5.0	1		11/15/23 01:28	75-00-3		
Chloroform	ND	ug/L	5.0	1		11/15/23 01:28	67-66-3		
Chloromethane	ND	ug/L	5.0	1		11/15/23 01:28	74-87-3		
2-Chlorotoluene	ND	ug/L	5.0	1		11/15/23 01:28	95-49-8		
4-Chlorotoluene	ND	ug/L	5.0	1		11/15/23 01:28	106-43-4		
1,2-Dibromo-3-chloropropane	ND	ug/L	10.0	1		11/15/23 01:28	96-12-8		
Dibromochloromethane	ND	ug/L	5.0	1		11/15/23 01:28	124-48-1		
1,2-Dibromoethane (EDB)	ND	ug/L	5.0	1		11/15/23 01:28	106-93-4		
Dibromomethane	ND	ug/L	5.0	1		11/15/23 01:28	74-95-3		
1,2-Dichlorobenzene	ND	ug/L	5.0	1		11/15/23 01:28	95-50-1		
1,3-Dichlorobenzene	ND	ug/L	5.0	1		11/15/23 01:28	541-73-1		
1,4-Dichlorobenzene	ND	ug/L	5.0	1		11/15/23 01:28	106-46-7		
trans-1,4-Dichloro-2-butene	ND	ug/L	100	1		11/15/23 01:28	110-57-6		
Dichlorodifluoromethane	ND	ug/L	5.0	1		11/15/23 01:28	75-71-8		
1,1-Dichloroethane	ND	ug/L	5.0	1		11/15/23 01:28	75-34-3		
1,2-Dichloroethane	ND	ug/L	5.0	1		11/15/23 01:28	107-06-2		
1,1-Dichloroethene	ND	ug/L	5.0	1		11/15/23 01:28	75-35-4		
cis-1,2-Dichloroethene	ND	ug/L	5.0	1		11/15/23 01:28	156-59-2		
trans-1,2-Dichloroethene	ND	ug/L	5.0	1		11/15/23 01:28	156-60-5		
1,2-Dichloropropane	ND	ug/L	5.0	1		11/15/23 01:28	78-87-5		
1,3-Dichloropropane	ND	ug/L	5.0	1		11/15/23 01:28	142-28-9		

REPORT OF LABORATORY ANALYSIS

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ANALYTICAL RESULTS

Project: Tri-K Landfill Leachate

Pace Project No.: 50359489

Sample: Leachate - Tank 1		Lab ID: 50359489002		Collected: 11/09/23 12:35		Received: 11/11/23 09:15		Matrix: Water	
Parameters	Results	Units	Report Limit	DF	Prepared	Analyzed	CAS No.	Qual	
8260/5030 MSV		Analytical Method: EPA 8260 Pace Analytical Services - Indianapolis							
2,2-Dichloropropane	ND	ug/L	5.0	1		11/15/23 01:28	594-20-7		
1,1-Dichloropropene	ND	ug/L	5.0	1		11/15/23 01:28	563-58-6		
cis-1,3-Dichloropropene	ND	ug/L	5.0	1		11/15/23 01:28	10061-01-5		
trans-1,3-Dichloropropene	ND	ug/L	5.0	1		11/15/23 01:28	10061-02-6		
Ethylbenzene	ND	ug/L	5.0	1		11/15/23 01:28	100-41-4		
Ethyl methacrylate	ND	ug/L	100	1		11/15/23 01:28	97-63-2		
Hexachloro-1,3-butadiene	ND	ug/L	5.0	1		11/15/23 01:28	87-68-3		
n-Hexane	ND	ug/L	5.0	1		11/15/23 01:28	110-54-3		
2-Hexanone	ND	ug/L	25.0	1		11/15/23 01:28	591-78-6		
Iodomethane	ND	ug/L	10.0	1		11/15/23 01:28	74-88-4		
Isopropylbenzene (Cumene)	ND	ug/L	5.0	1		11/15/23 01:28	98-82-8		
p-Isopropyltoluene	ND	ug/L	5.0	1		11/15/23 01:28	99-87-6		
Methacrylonitrile	ND	ug/L	100	1		11/15/23 01:28	126-98-7		
Methylene Chloride	ND	ug/L	5.0	1		11/15/23 01:28	75-09-2		
2-Methylnaphthalene	ND	ug/L	10.0	1		11/15/23 01:28	91-57-6		
4-Methyl-2-pentanone (MIBK)	ND	ug/L	25.0	1		11/15/23 01:28	108-10-1		
Methyl-tert-butyl ether	ND	ug/L	4.0	1		11/15/23 01:28	1634-04-4		
Naphthalene	ND	ug/L	5.0	1		11/15/23 01:28	91-20-3		
Propionitrile	ND	ug/L	100	1		11/15/23 01:28	107-12-0		
n-Propylbenzene	ND	ug/L	5.0	1		11/15/23 01:28	103-65-1		
Styrene	ND	ug/L	5.0	1		11/15/23 01:28	100-42-5		
1,1,1,2-Tetrachloroethane	ND	ug/L	5.0	1		11/15/23 01:28	630-20-6		
1,1,2,2-Tetrachloroethane	ND	ug/L	5.0	1		11/15/23 01:28	79-34-5		
Tetrachloroethene	ND	ug/L	5.0	1		11/15/23 01:28	127-18-4		
Toluene	ND	ug/L	5.0	1		11/15/23 01:28	108-88-3		
1,2,3-Trichlorobenzene	ND	ug/L	5.0	1		11/15/23 01:28	87-61-6		
1,2,4-Trichlorobenzene	ND	ug/L	5.0	1		11/15/23 01:28	120-82-1		
1,1,1-Trichloroethane	ND	ug/L	5.0	1		11/15/23 01:28	71-55-6		
1,1,2-Trichloroethane	ND	ug/L	5.0	1		11/15/23 01:28	79-00-5		
Trichloroethene	ND	ug/L	5.0	1		11/15/23 01:28	79-01-6		
Trichlorofluoromethane	ND	ug/L	5.0	1		11/15/23 01:28	75-69-4		
1,2,3-Trichloropropane	ND	ug/L	5.0	1		11/15/23 01:28	96-18-4		
1,2,4-Trimethylbenzene	ND	ug/L	5.0	1		11/15/23 01:28	95-63-6		
1,3,5-Trimethylbenzene	ND	ug/L	5.0	1		11/15/23 01:28	108-67-8		
Vinyl acetate	ND	ug/L	50.0	1		11/15/23 01:28	108-05-4		
Vinyl chloride	ND	ug/L	2.0	1		11/15/23 01:28	75-01-4		
Xylene (Total)	ND	ug/L	10.0	1		11/15/23 01:28	1330-20-7		
Surrogates									
Dibromofluoromethane (S)	106	%.	82-128	1		11/15/23 01:28	1868-53-7	pH	
4-Bromofluorobenzene (S)	104	%.	79-124	1		11/15/23 01:28	460-00-4		
Toluene-d8 (S)	105	%.	73-122	1		11/15/23 01:28	2037-26-5		

REPORT OF LABORATORY ANALYSIS

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Appendix C – Red-line of Current Operating Permit (Applicable Regs & Proposed Conditions)

SECTION B - EMISSION UNITS, EMISSION POINTS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS

Emission Unit 001 - Municipal Solid Waste (MSW) Landfill

Description: A MSW landfill that has accepted waste since November 8, 1987, commenced construction, reconstruction, or modification after May 30, 1991 and before July 17, 2014, having a design capacity equal to or greater than 2.5 million megagrams by mass or 2.5 million cubic meters by volume, and an NMOC emission rate (Calculated according to 40 CFR 60.754) greater than 50 Mg/yr. This landfill is required to operate a Gas Collection and Control System (GCCS) for capturing and routing landfill gas to the flare.

Permitted Design Capacity: 33,600,000 cubic yards (25,689,043 cubic meters)

Construction commenced: 1974, modified 1995

Emission Unit 004 - Landfill Flare

Description: Open Landfill Flare

Maximum capacity: 3000 scfm of landfill gas

Construction commenced: 2007

Emission Unit 008a – Leachate Evaporator (LFG Operations – Trial Period Test Unit)

Description: Skagen Faering 700 Series

Maximum Capacity: 30,000 gallons/day

Fuel: Landfill Gas

Construction Commenced: 2024

Controls: None

Emission Unit 008b1 – Leachate Evaporator (Transition Unit – when operated on LFG)

Description: Skagen Faering 1400 Series

Maximum Capacity: 60,000 gallons/day

Fuel: Landfill Gas

Construction Commenced: 2024/2025

Controls: None

APPLICABLE REGULATIONS:

40 CFR 60.18, *General control device and work practice requirements*

40 CFR 61, Subpart M, *National Emission Standard for Asbestos.*

401 KAR 53:010, *Ambient air quality standards.*

401 KAR 60:005, Section 2(2)(yyy), 40 C.F.R. 60.750 to 60.759 (Subpart WWW), *Standards of Performance for Municipal Solid Waste Landfills.*

401 KAR 63:002, Section 2(4)(hhh), 40 C.F.R. 63.1930 to 63.1990, Table 1 (Subpart AAAA), *National Emission Standards for Hazardous Air Pollutants: Municipal Solid Waste Landfills.*

401 KAR 63:015, *Flares*

1. Operating Limitations:

SECTION B - EMISSION UNITS, EMISSION POINTS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)**Compliance Demonstration:**

Refer to **3. Testing Requirements** (g) and **7. Specific Control Equipment Operating Conditions**.

- c. The permittee shall not cause, suffer, or allow the emission into the open air of particulate matter from any flare which is greater than twenty (20) percent opacity for more than three (3) minutes in any one (1) day. [401 KAR 63:015, Section 3]

Compliance Demonstration:

Refer to **4. Specific Monitoring Requirements** (f) and **5. Specific Recordkeeping Requirements** (k). Observation of any visible emissions during the weekly qualitative observations shall necessitate an opacity determination using U.S. EPA Reference Method 9. The determination shall be performed within 24 hours of the initial observance of visible emissions from the flare or, if the flare is shut down within 24 hours, immediately upon startup of the flare. If the resulting opacity measurement exceeds 20%, corrective actions shall be taken to correct the condition causing excess emissions. After corrective actions have been taken, another U.S. EPA Reference Method 9 observation shall be performed and the permittee shall notify the Regional Office listed on the front of this permit.

- d. Enclosed combustors cannot operate for more than 3 hours with average combustion temperatures of more than 28 degrees Celsius (82 degrees Fahrenheit) below the average combustion temperature during the most recent performance test at which compliance with § 63.1959(b)(2)(iii) was determined.[40 CFR 63.1981(c)(1)(i)]

Compliance Demonstration:

Refer to **3. Testing Requirements** (c) and **7. Specific Control Equipment Operating Conditions**.

3. Testing Requirements:

- a. The nitrogen level shall be determined using Method 3C, unless an alternative test method is established as allowed by 40 CFR 60.752(b)(2)(i). [40 CFR 60.753(c)(1)]
- b. Unless an alternative test method is established as allowed by 40 CFR 60.752(b)(2)(i), the oxygen shall be determined by an oxygen meter using Method 3A or 3C except that: [40 CFR 60.753(c)(2)]
 - i. The span shall be set so that the regulatory limit is between 20 and 50 percent of the span; [40 CFR 60.753(c)(2)(i)]
 - ii. A data recorder is not required; [40 CFR 60.753(c)(2)(ii)]
 - iii. Only two calibration gases are required, a zero and span, and ambient air may be used as the span; [40 CFR 60.753(c)(2)(iii)]
 - iv. A calibration error check is not required; [40 CFR 60.753(c)(2)(iv)]
 - v. The allowable sample bias, zero drift, and calibration drift are ± 10 percent. [40 CFR 60.753(c)(2)(v)]
- c. For the performance test required in 40 CFR 60.752(b)(2)(iii)(B), Method 25, 25C, or Method 18 of appendix A of 40 CFR 60 must be used to determine compliance with the 98

SECTION B - EMISSION UNITS, EMISSION POINTS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

weight-percent efficiency or the 20 ppmv outlet concentration level, unless another method to demonstrate compliance has been approved by the Division as provided by 40 CFR 60.752(b)(2)(i)(B). Method 3 or 3A shall be used to determine oxygen for correcting the NMOC concentration as hexane to 3 percent. In cases where the outlet concentration is less than 50 ppm NMOC as carbon (8 ppm NMOC as hexane), Method 25A should be used in place of Method 25. If using Method 18 of appendix A of 40 CFR 60, the minimum list of compounds to be tested shall be those published in the most recent Compilation of Air Pollutant Emission Factors (AP-42). The following equation shall be used to calculate efficiency: [40 CFR 60.754(d)]

$$\text{Control Efficiency} = (NMOC_{in} - NMOC_{out}) / (NMOC_{in})$$

Where,

NMOC_{in} = mass of NMOC entering control device

NMOC_{out} = mass of NMOC exiting control device

For the leachate evaporator (an enclosed combustor), the unit shall be tested with a water feed and not a landfill liquids feed, to avoid the interference of VOC compounds in the landfill liquids with the detection of NMOC solely attributed to landfill gas combustion.

- d. For the performance test required in 40 CFR 60.752(b)(2)(iii)(A), the net heating value of the combusted landfill gas as determined in 40 CFR 60.18(f)(3) is calculated from the concentration of methane in the landfill gas as measured by Method 3C. A minimum of three 30-minute Method 3C samples are determined. The measurement of other organic components, hydrogen, and carbon monoxide is not applicable. Method 3C may be used to determine the landfill gas molecular weight for calculating the flare gas exit velocity under 40 CFR 60.18(f)(4). [40 CFR 60.754(e)]
- e. The following procedures shall be used for compliance with the surface methane operational standard as provided in 40 CFR 60.753(d): [40 CFR 60.755(c)]
 - i. After installation of the collection system, the permittee shall monitor surface concentrations of methane along the entire perimeter of the collection area and along a pattern that traverses the landfill at 30 meter intervals (or a site-specific established spacing) for each collection area on a quarterly basis using an organic vapor analyzer, flame ionization detector, or other portable monitor meeting the specifications provided in 40 CFR 60.755(d). [40 CFR 60.755(c)(1)]
 - ii. The background concentration shall be determined by moving the probe inlet upwind and downwind outside the boundary of the landfill at a distance of at least 30 meters from the perimeter wells. [40 CFR 60.755(c)(2)]
 - iii. Surface emission monitoring shall be performed in accordance with section 8.3.1 of Method 21 of appendix A of 40 CFR 60, except that the probe inlet shall be placed within 5 to 10 centimeters of the ground. Monitoring shall be performed during typical meteorological conditions. [40 CFR 60.755(c)(3)]
 - iv. Any reading of 500 parts per million or more above background at any location shall be recorded as a monitored exceedance and the actions specified in 40 CFR 60.755(c)(4) (i) through (v) shall be taken. As long as the specified actions are taken,

SECTION B - EMISSION UNITS, EMISSION POINTS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

- program for the waste generator (identified in the waste shipment record), and if different, the Division of Air Quality Regional Office listed on the front page of this permit. The report shall describe the discrepancy and attempts to reconcile it, and submit a copy of the waste shipment record along with the report. [40 CFR 61.154(e)(3)]
- h. The permittee shall submit to the Division, upon closure of the facility, a copy of records of asbestos waste disposal locations and quantities. [40 CFR 61.154(h)]
 - i. The permittee shall notify the Division in writing at least 45 days prior to excavating or otherwise disturbing any asbestos-containing waste material that has been deposited at a waste disposal site and is covered. If the excavation will begin on a date other than the one contained in the original notice, notice of the new start date must be provided to the Division at least 10 working days before excavation begins and in no event shall excavation begin earlier than the date specified in the original notification. Include the following information in the notice: [40 CFR 61.154(j)]
 - i. Scheduled starting and completion dates. [40 CFR 61.154(j)(1)]
 - ii. Reason for disturbing the waste. [40 CFR 61.154(j)(2)]
 - iii. Procedures to be used to control emissions during the excavation, storage, transport, and ultimate disposal of the excavated asbestos-containing waste material. If deemed necessary, the Division may require changes in the emission control procedures to be used. [40 CFR 61.154(j)(3)]
 - iv. Location of any temporary storage site and the final disposal site. [40 CFR 61.154(j)(4)]
 - j. The permittee shall include in the semiannual reports information on all deviations that occurred during the 6-month period. Deviations for continuous emission monitors or numerical continuous parameter monitors shall be determined using a 3 hour monitoring block average. [40 CFR 63.1955(c)]
 - i. A deviation is defined in 40 CFR 63.1990. For the purposes of the landfill monitoring and SSM plan requirements, deviations include the items in 40 CFR 63.1965(a) through (c). [40 CFR 63.1965]
 - 1. A deviation occurs when the control device operating parameter boundaries described in 40 CFR 60.758(c)(1) of 40 CFR 60, Subpart WWW are exceeded. [40 CFR 63.1965(a)]
 - 2. A deviation occurs when 1 hour or more of the hours during the 3-hour block averaging period does not constitute a valid hour of data. A valid hour of data must have measured values for at least three 15-minute monitoring periods within the hour. [40 CFR 63.1965(b)]
 - 3. A deviation occurs when a SSM plan is not developed or maintained on site. [40 CFR 63.1965(c)]
 - ii. Averages are calculated in the same way as they are calculated in 40 CFR part 60, subpart WWW, except that the data collected during the events listed in 40 CFR 63.1975(a), (b), (c), and (d) are not to be included in any average computed under 40 CFR 63, Subpart AAAA. **Beginning no later than September 27, 2021, averages are calculated according to § 63.1983(b)(2)(i) for average combustion temperature and § 63.1983(c)(1)(i) for 3-hour average combustion temperature for enclosed combustors,**

SECTION B - EMISSION UNITS, EMISSION POINTS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

except that the data collected during the event listed in paragraph (a) of this section are not to be included in any average computed under this subpart.: [40 CFR 63.1975]

1. Monitoring system breakdowns, repairs, calibration checks, and zero (low-level) and high-level adjustments. [40 CFR 63.1975(a)]
 2. Startups. [40 CFR 63.1975(b)]
 3. Shutdowns. [40 CFR 63.1975(c)]
 4. Malfunctions. [40 CFR 63.1975(d)]
- k. The permittee shall include the results of any quarterly H₂S gas detection tube measurements taken during the semi-annual period in the semi-annual reports required by **SECTION F**.
- l. The permittee shall include the results of any annual analytical H₂S gas testing (Using U.S. EPA Method 15/16, ASTM D4084, ASTM D5504, or an alternate method as approved by the Division) performed during the semi-annual period in the semi-annual reports required by **SECTION F**.

7. Specific Control Equipment Operating Conditions:

- a. The permittee shall operate the system such that all collected gases are vented to a control system designed and operated in compliance with 40 CFR 60.752(b)(2)(iii). In the event the collection or control system is inoperable, the gas mover system shall be shut down and all valves in the collection and control system contributing to venting of the gas to the atmosphere shall be closed within 1 hour. [40 CFR 60.753(e)]
- b. The permittee shall operate the control or treatment system at all times when the collected gas is routed to the system. [40 CFR 60.753(f)]
- c. If the permittee seeks to comply with § 63.1959(b)(2)(iii) using an enclosed combustor, the permittee must calibrate, maintain, and operate according to the manufacturer's specifications, the following equipment:
 - (i) A temperature monitoring device equipped with a continuous recorder and having a minimum accuracy of ± 1 percent of the temperature being measured expressed in degrees Celsius or ± 0.5 degrees Celsius, whichever is greater. A temperature monitoring device is not required for boilers or process heaters with design heat input capacity equal to or greater than 44 megawatts. [40 CFR 63.1961(b)(1)]
 - (ii) A device that records flow to the control device and bypass of the control device (if applicable). The permittee must [40 CFR 63.1961(b)(2)]:
 - (1) Install, calibrate, and maintain a gas flow rate measuring device that must record the flow to the control device at least every 15 minutes; [40 CFR 63.1961(b)(2)(i)] and
 - (2) Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism must be

SECTION B - EMISSION UNITS, EMISSION POINTS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line. [40 CFR 63.1961(b)(2)(ii)]

- d. If the permittee seeks to comply with 40 CFR 60.752(b)(2)(iii) using an open flare, the permittee shall install, calibrate, maintain, and operate according to the manufacturer's specifications the following equipment: [40 CFR 60.756(c)]
 - i. A heat sensing device, such as an ultraviolet beam sensor or thermocouple, at the pilot light or the flame itself to indicate the continuous presence of a flame. [40 CFR 60.756(c)(1)]
 - ii. A device that records flow to or bypass of the flare. The permittee shall either: [40 CFR 60.756(c)(2)]
 - 1. Install, calibrate, and maintain a gas flow rate measuring device that shall record the flow to the control device at least every 15 minutes; or [40 CFR 60.756(c)(2)(i)]
 - 2. Secure the bypass line valve in the closed position with a car-seal or a lock-and-key type configuration. A visual inspection of the seal or closure mechanism shall be performed at least once every month to ensure that the valve is maintained in the closed position and that the gas flow is not diverted through the bypass line. [40 CFR 60.756(c)(2)(ii)]
- e. If the permittee seeks to demonstrate compliance with 40 CFR 60.752(b)(2)(iii) using a device other than an open flare or an enclosed combustor shall provide information satisfactory to the Division as provided in 40 CFR 60.752(b)(2)(i)(B) describing the operation of the control device, the operating parameters that would indicate proper performance, and appropriate monitoring procedures. The Division shall review the information and either approve it, or request that additional information be submitted. The Division may specify additional appropriate monitoring procedures. [40 CFR 60.756(d)]
- f. Flares shall be operated with a flame present at all times, as determined by the methods specified in 40 CFR 60.18(f). [40 CFR 60.18(c)(2)]
- g. For the flare, the permittee has the choice of adhering to either the heat content specifications in 40 CFR 60.18(c)(3)(ii) and the maximum tip velocity specifications in 40 CFR 60.18(c)(4), or adhering to the requirements in 40 CFR 60.18(c)(3)(i). [40 CFR 60.18(c)(3)]
- h. The permittee shall monitor the flare to ensure that it is operated and maintained in conformance with its design. The permittee shall monitor the flare in accordance with 40 CFR 60, Subpart WWW. [40 CFR 60.18(d)]
- i. The flare shall be operated at all times when emissions may be vented to it. [40 CFR 60.18(e)]

SECTION B - EMISSION UNITS, EMISSION POINTS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

- j. The presence of a flare pilot flame shall be monitored using a thermocouple or any other equivalent device to detect the presence of a flame. [40 CFR 60.18(f)(2)]

8. Alternate Operating Scenarios:

Refer to **Section H** for alternate operating scenarios regarding removal of the gas collection system, requests for Higher Operating Values (HOVs), requests for Revised Standard Operation Procedures (RSOPs), and requests for decommissioning.

SECTION B - EMISSION UNITS, EMISSION POINTS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

Emission Unit 008b2 – Leachate Evaporator (Transition Unit – when operated on NG)

Description: Skagen Faering 1400 Series
Maximum Capacity: 60,000 gallons/day
Fuel: Natural Gas
Construction Commenced: 2024/2025
Controls: None

Emission Unit 008c – Leachate Evaporator (Permanent Natural Gas/Residual Heat Operations)

Description: Skagen Faering 1200 Series
Maximum Capacity: 50,000 gallons/day
Fuel: Natural Gas/Residual Heat from Archaea RNG Plant
Construction Commenced: 2025
Controls: None

APPLICABLE REGULATIONS:

401KAR 52:020, 59:010, Section 3(1) – opacity & 59:010, Section 3(2) – Process PM Emissions

1. Operating Limitations

For Emissions Unit 008c, the permittee shall utilize either natural gas or residual heat from the RNG plant to evaporate landfill-derived liquids. No other fuel is permitted unless an application to modify the permit is submitted.

2. Emission Limitations

- a. The permittee shall not cause, suffer, or allow the emission into the open air of particulate matter from a control device or stack associated with any affected facility which is greater than twenty (20) percent opacity for more than three (3) minutes in any one (1) day. [401 KAR 59:010, Section 3(1)(a)]

Compliance Demonstration:

Refer to **4. Specific Monitoring Requirements** (c) and **5. Specific Recordkeeping Requirements** (c). Observation of any non-water visible emissions during the monthly qualitative observations shall necessitate an opacity determination using U.S. EPA Reference Method 9. The determination shall be performed within 24 hours of the initial observance of visible emissions from the flare or, if the flare is shut down within 24 hours, immediately upon startup of the flare. If the resulting opacity measurement exceeds 20%, corrective actions shall be taken to correct the condition causing excess emissions. After corrective actions have been taken, another U.S. EPA Reference Method 9 observation shall be performed and the permittee shall notify the Regional Office listed on the front of this permit.

SECTION B - EMISSION UNITS, EMISSION POINTS, APPLICABLE REGULATIONS, AND OPERATING CONDITIONS (CONTINUED)

- b. Emissions of PM from the process were demonstrated by the permittee to be less than the allowable rates established by 401 KAR 59:010, Section 3(2). No further demonstration is necessary.

3. Testing Requirements

Every five years, analyze the leachate entering the evaporator using either Methods EPA 624, SW8260B, EPA 8011 or EPA 8260 for comparison to the maximum requested VOC loading rate of 129.1 mg/l. [401 KAR 52:020, Section 10]

4. Specific Monitoring Requirements

- a. The permittee shall monitor the amount of natural gas used (mmscf) on a monthly basis. [401 KAR 52:020, Section 10]
- b. The permittee shall monitor the volume (in gallons) of landfill liquids fed to the evaporator continuously. [401 KAR 52:020, Section 10]
- c. The permittee shall perform a qualitative observation of visible emissions from the evaporator monthly. [401 KAR 52:020, Section 10]

5. Specific Recordkeeping Requirements

- a. The permittee shall maintain records of the amount of natural gas used (mmscf) and hours of operation for the evaporator on a monthly basis. [401 KAR 52:020, Section 10]
- b. The permittee shall maintain records of the volume of landfill liquids fed to the evaporator on a monthly basis. [401 KAR 52:020, Section 10]
- c. The permittee shall maintain a log of the qualitative visual observations for the evaporator including; date, time, initials of observer, whether emissions were visible and records of corrective actions taken as a result of visible emissions, and records of any U.S. EPA Reference Method 9 opacity readings performed. [401 KAR 52:020, Section 10]

6. Specific Reporting Requirements:

Refer to **Section F.5 and F.6.**

SECTION C - INSIGNIFICANT ACTIVITIES

The following listed activities have been determined to be insignificant activities for this source pursuant to 401 KAR 52:020, Section 6. Although these activities are designated as insignificant the permittee must comply with the applicable regulation. Process and emission control equipment at each insignificant activity subject to an opacity standard shall be inspected monthly and a qualitative visible emissions evaluation made. Results of the inspection, evaluation, and any corrective action shall be recorded in a log.

<u>Description</u>	<u>Generally Applicable Regulation</u>
1. Leachate tank (30,000 gallon)	None
2. Leachate tank (30,000 gallon)	None
3. Leachate tank (30,000 gallon)	None
4. Leachate tank (30,000 gallon)	None
5. Leachate tank (30,000 gallon)	None
6. Leachate tank (140,000 gallon)	None
7. Leachate tank (155,000 gallon)	None
8. Leachate tank (155,000 gallon)	None
9. Propane tank (500 gallon)	None
10. Propane tank (500 gallon)	None
11. Propane tank (1,000 gallon)	None
12. Diesel tank (500 gallon)	None
13. Diesel tank (3,000 gallon)	None
14. Diesel tank (3,000 gallon)	None
15. Parts cleaner station	None
16. Composting operation	401 KAR 63:010
17. Tann Pilot RTO System (40,000 BTU/hr)	401 KAR 63:015, Section 3
18. Anti-foam agent storage	None