



1127 Judson Rd., Suite 242
Longview, TX 75601
(903) 692-0843

June 23, 2026

Kentucky Division for Air Quality (DAQ)
Permit Review Branch
300 Sower Boulevard
Frankfort, KY 40601

**SUBJECT: Conditional Major Permit Renewal Application
Texas Gas Transmission, LLC - Graham Lake Compressor Station
Source ID: 21-177-00074; AI# 44343; Permit No. F-21-030**

To Whom It May Concern:

Texas Gas Transmission, LLC (Texas Gas) is submitting this document in order to renew the Conditional Major permit for the above referenced facility pursuant to 401 KAR 52:030, Section 4(1)(c). The permit was issued on January 17, 2022 and expires on January 17, 2027.

Texas Gas is not proposing to add or modify any emission sources at the station with this application and there have not been any off permit changes made during the term of the current permit. There have been no changes in applicable requirements for the emission units at this station during the permit term.

Attachment 1 provides completed DEP7007 forms required for this application. This includes forms DEP7007AI and DEP7007DD. Completed forms DEP7007N and DEP7007V are also included in Attachment 1. As previously noted, all applicable requirements are accurately reflected in the current permit. Attachment 2 provides emission calculations for the significant emission units at the facility as well as fugitive equipment leaks and natural gas venting activities (same as in previous 2020 renewal application). Attachment 3 provides a copy of the current "Certificate of Authority" issued by the Kentucky Secretary of State.

The application forms included in Attachment 1 have been certified by a responsible official of Texas Gas (Mr. Ira "Tony" Case). If you find that there is any additional information required during the course of your review or if you have any questions, please contact me at david.nickel@bwpipelines.com or (903) 692-0843.

Sincerely,

A handwritten signature in black ink that reads "David Nickel".

David Nickel
Environmental Specialist

cc w/att: Graham Lake Compressor Station (air files)

Attachment 1

Completed Application Forms

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: Texas Gas Transmission, LLC - Graham Lake Compressor Station

KY EIS (AFS) #: 21- 177-00074

Permit #: F-21-030

Agency Interest (AI) ID: 44343

Date: 23-Jun-26

Section AI.1: Source Information

Physical Location	Street:	66 Locketown Rd		
Address:	City:	Greenville	County:	Muhlenberg
			Zip Code:	42345
Mailing Address:	Street or P.O. Box:	1127 Judson Rd., Suite 242		
	City:	Longview	State:	Texas
			Zip Code:	75601

Standard Coordinates for Source Physical Location

Longitude: -87.259235 (decimal degrees) Latitude: 37.259235 (decimal degrees)

Primary (NAICS) Category: Pipeline Transport of Natural Gas

Primary NAICS #: 486210

Classification (SIC) Category:

Natural Gas Transmission

Primary SIC #:

4922

Briefly discuss the type of business conducted at this site:

Pipeline-quality natural gas is received into the station via pipeline and flows or is injected into an underground storage field. Upon withdrawal from the storage field, the gas flows through the glycol dehydration unit for moisture removal and then is transported downstream via pipeline (with or without compression, depending on pressures).

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:**

0 (Unmanned)

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

0.25 miles

Property Area:

1.6 acres

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:** Texas Gas Transmission, LLC**Title:** (if individual)**Mailing Address:** **Street or P.O. Box:** 1127 Judson Rd., Suite 242
City: Longview **State:** Texas **Zip Code:** 75601**Email:** (if individual)**Phone:** 903-692-0843**Technical Contact****Name:** David Nickel**Title:** Environmental Specialist**Mailing Address:** **Street or P.O. Box:** 1127 Judson Rd, Suite 242
City: Longview **State:** Texas **Zip Code:** 75601**Email:** david.nickel@bwpipelines.com**Phone:** 903-692-0843**Air Permit Contact for Source****Name:** Same as technical contact**Title:****Mailing Address:** **Street or P.O. Box:**
City: **State:** **Zip Code:****Email:****Phone:**

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	<u>Less than 100 tpy</u>	☐ 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

Ira "Tony" Case
Type or Printed Name of Signatory

23-Jun-26
Date

VP Field Operations
Title of Signatory

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

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

Source Name: Texas Gas Transmission, LLC - Graham Lake Compressor Station

KY EIS (AFS) #: 21- 177-00074

Permit #: F-21-030

Agency Interest (AI) ID: 44343

Date: 6/23/2026

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)
001	Compressor Engine #1	RC01				RC01	5.01 MMBtu/hr	NOx	1.6053	Published Stack Test Data	-	-	8.04	8.04	35.22	24.12
								CO	2.9843	Published Stack Test Data	-	-	14.95	14.95	65.48	44.85
								VOC	0.0296	AP-42	-	-	0.15	0.15	0.65	0.44
								PM ₁₀ / PM _{2.5}	0.0194	AP-42	-	-	0.1	0.1	0.43	0.29
								SO ₂	0.0006	AP-42	-	-	0.003	0.003	0.013	0.009
								Acetaldehyde	0.0028	AP-42	-	-	0.014	0.014	0.061	0.042
								Acrolein	0.0026	AP-42	-	-	0.013	0.013	0.058	0.04
								Benzene	0.0016	AP-42	-	-	0.008	0.008	0.035	0.024
								Formaldehyde	0.0205	AP-42	-	-	0.1	0.1	0.45	0.31
								Toluene	0.0006	AP-42	-	-	0.003	0.003	0.012	0.008
								Xylenes	0.0002	AP-42	-	-	0.001	0.001	0.004	0.003
								Total HAP	-	-	-	-	0.14	0.14	0.62	0.42

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)
003	Compressor Engine #2	RC02				RC02	5.01 MMBtu/hr	NOx	1.6053	Published Stack Test Data	-	-	8.04	8.04	35.22	24.12
								CO	2.9843	Published Stack Test Data	-	-	14.95	14.95	65.48	44.85
								VOC	0.0296	AP-42	-	-	0.15	0.15	0.65	0.44
								PM ₁₀ / PM _{2.5}	0.0194	AP-42	-	-	0.1	0.1	0.43	0.29
								SO ₂	0.0006	AP-42	-	-	0.003	0.003	0.013	0.009
								Acetaldehyde	0.0028	AP-42	-	-	0.014	0.014	0.061	0.042
								Acrolein	0.0026	AP-42	-	-	0.013	0.013	0.058	0.04
								Benzene	0.0016	AP-42	-	-	0.008	0.008	0.035	0.024
								Formaldehyde	0.0205	AP-42	-	-	0.1	0.1	0.45	0.31
								Toluene	0.0006	AP-42	-	-	0.003	0.003	0.012	0.008
								Xylenes	0.0002	AP-42	-	-	0.001	0.001	0.004	0.003
								Total HAP	-	-	-	-	0.14	0.14	0.62	0.42
005	Emergency Generator	AX01				AX01	1.68 MMBtu/hr	NOx	2.21	AP-42	-	-	3.71	3.71	0.93	0.93
								CO	3.72	AP-42	-	-	6.25	6.25	1.56	1.56
								VOC	0.0296	AP-42	-	-	0.05	0.05	0.012	0.012
								PM ₁₀ / PM _{2.5}	0.0194	AP-42	-	-	0.033	0.033	0.008	0.008
								SO ₂	0.0006	AP-42	-	-	0.001	0.001	2.50E+04	2.50E+04
								Acetaldehyde	0.0028	AP-42	-	-	0.005	0.005	0.001	0.001
								Acrolein	0.0026	AP-42	-	-	0.004	0.004	0.001	0.001
								Benzene	0.0016	AP-42	-	-	0.003	0.003	0.001	6.60E+04
								Formaldehyde	0.0205	AP-42	-	-	0.034	0.034	0.009	0.009
								Toluene	0.0006	AP-42	-	-	9.40E-04	9.40E+04	2.30E+04	2.30E+04
								Xylenes	0.0002	AP-42	-	-	3.30E-04	3.30E+04	8.20E+05	8.20E+05
								Total HAP	-	-	-	-	0.047	0.047	0.0012	0.0012

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)
002	Glycol Dehydrator	OX02 (01)		Ground Flare	OX02 (02)	OX02 (01)	1.04 MMscf dehydrated/hr	VOC	3.534 lb/MMscf dehydrated	GRI GLYCalc Software	100.00%	95.00%	3.68	0.18	16.1	0.8
								Benzene	0.939 lb/MMscf dehydrated	GRI GLYCalc Software	100.00%	95.00%	0.98	0.049	4.28	0.21
								n-Hexane	0.052 lb/MMscf dehydrated	GRI GLYCalc Software	100.00%	95.00%	0.054	0.003	0.23	0.012
								Toluene	0.602 lb/MMscf dehydrated	GRI GLYCalc Software	100.00%	95.00%	0.63	0.031	2.74	0.14
								Xylenes	0.663 lb/MMscf dehydrated	GRI GLYCalc Software	100.00%	95.00%	0.69	0.034	3.02	0.15
								Total HAP	2.258 lb/MMscf dehydrated	GRI GLYCalc Software	100.00%	95.00%	2.35	0.12	10.29	0.51
002	Ground Flare	OX02 (02)	Combustion Emissions			OX02 (02)	1 MMBtu/hr	NOx	0.1	AP-42	-	-	0.1	0.1	0.44	0.44
								CO	0.084	AP-42	-	-	0.084	0.084	0.37	0.37
								VOC	0.0055	AP-42	-	-	0.006	0.006	0.024	0.024
								PM ₁₀ / PM _{2.5}	0.0076	AP-42	-	-	0.008	0.008	0.033	0.033
								SO ₂	6.00E+04	AP-42	-	-	0.001	0.001	0.003	0.003
								Benzene	2.10E+06	AP-42	-	-	2.10E+06	2.10E+06	9.20E+06	9.20E+06
								Formaldehyde	7.50E+05	AP-42	-	-	7.50E+05	7.50E+05	3.30E+04	3.30E+04
								n-Hexane	0.0018	AP-42	-	-	0.002	0.002	0.008	0.008
								Toluene	3.40E+06	AP-42	-	-	3.40E+06	3.40E+06	1.50E+05	1.50E+05
								Total HAP	-	-	-	-	0.002	0.002	0.008	0.008

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)
Facility - Wide Totals (Significant Emission Units)								NOx	-	-	-	-	19.9	19.9	71.81	49.62
								CO	-	-	-	-	36.23	36.23	132.89	91.63
								VOC	-	-	-	-	4.03	0.54	17.43	1.73
								PM ₁₀ / PM _{2.5}	-	-	-	-	0.23	0.23	0.89	0.62
								SO ₂	-	-	-	-	0.007	0.007	0.029	0.021
								Acetaldehyde	-	-	-	-	0.03	0.03	0.12	0.09
								Acrolein	-	-	-	-	0.03	0.03	0.12	0.08
								Benzene	-	-	-	-	1	0.07	4.35	0.26
								Ethylbenzene	-	-	-	-	0	0	0	0
								Formaldehyde	-	-	-	-	0.24	0.24	0.91	0.63
								n-Hexane	-	-	-	-	0.055	0.004	0.243	0.02
								Toluene	-	-	-	-	0.63	0.038	2.77	0.15
								Xylenes	-	-	-	-	0.69	0.037	3.03	0.16
								Total HAP	-	-	-	-	2.68	0.45	11.55	1.38

Section N.2: Stack Information**UTM Zone: | 6**

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)
RC01	RC01	0.5	18	436	4,123,712	477,793	2,507	1,025	213
RC02	RC02	0.5	18	436	4,123,717	477,792	2,507	1,025	213
AX01	AX01	0.25	10	433	4,123,682	477,842	823	1,000	279
OX02	OX02(01), OX02(02)	3	25	433	4,123,697	477,843	2,011	1,200	5

Division for Air Quality

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(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

Additional Documentation

___ Complete DEP7007AI

Source Name: Texas Gas Transmission, LLC - Graham Lake Compressor Station

KY EIS (AFS) #: 21- 177-00074

Permit #: F-21-030

Agency Interest (AI) ID: 44343

Date: 6/23/2026

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)
RC01 & RC02	Compressor Engines #1 & #2	401 KAR 52:030	All	None	6,000 hr/yr	6,000 hr/yr	12-month rolling hours

Section V.6: Notes, Comments, and Explanations

No changes are proposed with this renewal application.

All monitoring, recordkeeping, and reporting requirements included in the current permit are being met.

Pursuant to 401 KAR 50:045 and Permit Section B.3, testing is only required if requested by the Cabinet.

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: Texas Gas Transmission, LLC - Graham Lake Compressor Station

KY EIS (AFS) #: 21- 177-00074

Permit #: F-21-030

Agency Interest (AI) ID: 44343

Date: 23-Jun-26

Section DD.1: Table of Insignificant Activities

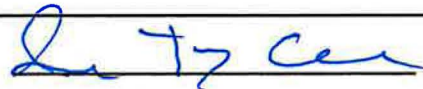
*Identify each activity with a unique Insignificant Activity number (IA #); for example: 1, 2, 3... etc.

Insignificant Activity #	Description of Activity including Rated Capacity	Serial Number or Other Unique Identifier	Applicable Regulation(s)	Calculated Emissions
004	Glycol Reboiler (0.28 mmBtu/hr)	-	401 KAR 59:010 401 KAR 63:020	Emissions Calculations Attached
-	Triethylene Glycol (TEG) Tank (1,226 gal)	-	None	Negligible
-	Dehydrator Water Tank (630 gal)	-	None	Negligible
-	Lube Oil Tank (500 gal)	-	None	Negligible
IA5	Fugitive Equipment Leaks	-	401 KAR 63:020	VOC = 0.11 tpy (calculations attached)
IA6	Natural Gas Venting Losses	-	401 KAR 63:020	VOC = 0.22 tpy (calculations attached)

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.



Authorized Signature



Date

By:

Ira "Tony" Case

Type/Print Name of Signatory

VP Field Operations

Title of Signatory

Attachment 2
Emission Calculations

Emission Summary
Texas Gas Transmission - Graham Lake Compressor Station AI# 44343

Description	Emission Unit	Emission Point	Annual Potential Controlled Emissions (tpy)												
			NOx	CO	VOC	SO ₂	PM ₁₀ / PM _{2.5}	Acetaldehyde	Acrolein	Benzene	Formaldehyde	n-Hexane	Toluene	Xylenes	Total HAP
Compressor Engine #1	01	RC01	24.12	44.85	0.44	0.009	0.29	0.042	0.040	0.024	0.31	-	0.008	0.003	0.42
Compressor Engine #2	01	RC02	24.12	44.85	0.44	0.009	0.29	0.042	0.040	0.024	0.31	-	0.008	0.003	0.42
Emergency Generator	02	AX01	0.93	1.56	0.01	0.000	0.01	0.001	0.001	0.001	0.01	-	0.000	0.000	0.01
TEG Dehydration Unit	03	OX02	-	-	0.80	-	-	-	-	0.21	-	0.012	0.14	0.15	0.51
Ground Flare Combustion	03	OX02	0.44	0.37	0.02	0.003	0.033	-	-	9.2E-06	3.3E-04	0.008	1.5E-05	-	0.01
Glycol Reboiler	Insignificant	BL02	0.12	0.10	0.007	7.4E-04	0.009	-	-	2.6E-06	9.2E-05	0.002	4.2E-06	-	0.002
Facility-Wide Totals			49.74	91.73	1.74	0.021	0.63	0.085	0.080	0.26	0.63	0.022	0.15	0.16	1.39

Emission Calculations for Internal Combustion Engines and Boilers
Texas Gas Transmission - Graham Lake Compressor Station (Alt# 44343)

Equipment ID	Rated Capacity (bhp)	Heat Rate (Btu/bhp-hr)	Design Heat Input (MMBtu/hr)	Max Annual Operating Hours (hr/yr)	Pollutant	Average Emission Factor	Avg Hourly Emissions (lb/hr)	Annual Potential Emissions (tpy)	Emission Factor Reference
RC01 Superior G-825 Unit 01 4-Stroke Rich Burn	495	10,120	5.01	6,000	NOx	7.369 g/bhp-hr	8.04	24.12	Test data published by AGA for a similar unit.
					CO	13.699 g/bhp-hr	14.95	44.85	Test data published by AGA for a similar unit.
					VOC	2.96E-02 lb/MMBtu	0.15	0.44	AP-42, Table 3.2-3 (revised 7/00).
					SO ₂	5.88E-04 lb/MMBtu	0.003	0.009	AP-42, Table 3.2-3 (revised 7/00).
					PM ₁₀ / PM _{2.5}	1.94E-02 lb/MMBtu	0.10	0.29	AP-42, Table 3.2-3 (revised 7/00). Filterable + Condensable
					Acetaldehyde	2.79E-03 lb/MMBtu	0.014	0.042	AP-42, Table 3.2-3 (revised 7/00).
					Acrolein	2.63E-03 lb/MMBtu	0.013	0.040	AP-42, Table 3.2-3 (revised 7/00).
					Benzene	1.58E-03 lb/MMBtu	0.008	0.024	AP-42, Table 3.2-3 (revised 7/00).
					Formaldehyde	2.05E-02 lb/MMBtu	0.10	0.31	AP-42, Table 3.2-3 (revised 7/00).
					Toluene	5.58E-04 lb/MMBtu	0.003	0.008	AP-42, Table 3.2-3 (revised 7/00).
					Xylenes	1.95E-04 lb/MMBtu	0.001	0.003	AP-42, Table 3.2-3 (revised 7/00).
RC02 Superior G-825 Unit 01 4-Stroke Rich Burn	495	10,120	5.01	6,000	NOx	7.369 g/bhp-hr	8.04	24.12	Test data published by AGA for a similar unit.
					CO	13.699 g/bhp-hr	14.95	44.85	Test data published by AGA for a similar unit.
					VOC	2.96E-02 lb/MMBtu	0.15	0.44	AP-42, Table 3.2-3 (revised 7/00).
					SO ₂	5.88E-04 lb/MMBtu	0.003	0.009	AP-42, Table 3.2-3 (revised 7/00).
					PM ₁₀ / PM _{2.5}	1.94E-02 lb/MMBtu	0.10	0.29	AP-42, Table 3.2-3 (revised 7/00). Filterable + Condensable
					Acetaldehyde	2.79E-03 lb/MMBtu	0.014	0.042	AP-42, Table 3.2-3 (revised 7/00).
					Acrolein	2.63E-03 lb/MMBtu	0.013	0.040	AP-42, Table 3.2-3 (revised 7/00).
					Benzene	1.58E-03 lb/MMBtu	0.008	0.024	AP-42, Table 3.2-3 (revised 7/00).
					Formaldehyde	2.05E-02 lb/MMBtu	0.10	0.31	AP-42, Table 3.2-3 (revised 7/00).
					Toluene	5.58E-04 lb/MMBtu	0.003	0.008	AP-42, Table 3.2-3 (revised 7/00).
					Xylenes	1.95E-04 lb/MMBtu	0.001	0.003	AP-42, Table 3.2-3 (revised 7/00).
AX01 Waukesha 145GK Unit 02 4-Stroke Rich Burn	140	12,000	1.68	500	NOx	2.21E+00 lb/MMBtu	3.71	0.93	AP-42, Table 3.2-3 (revised 7/00).
					CO	3.72E+00 lb/MMBtu	6.25	1.56	AP-42, Table 3.2-3 (revised 7/00).
					VOC	2.96E-02 lb/MMBtu	0.050	0.012	AP-42, Table 3.2-3 (revised 7/00).
					SO ₂	5.88E-04 lb/MMBtu	0.001	2.5E-04	AP-42, Table 3.2-3 (revised 7/00).
					PM ₁₀ / PM _{2.5}	1.94E-02 lb/MMBtu	0.033	0.008	AP-42, Table 3.2-3 (revised 7/00). Filterable + Condensable
					Acetaldehyde	2.79E-03 lb/MMBtu	0.005	0.001	AP-42, Table 3.2-3 (revised 7/00).
					Acrolein	2.63E-03 lb/MMBtu	0.004	0.001	AP-42, Table 3.2-3 (revised 7/00).
					Benzene	1.58E-03 lb/MMBtu	0.003	6.6E-04	AP-42, Table 3.2-3 (revised 7/00).
					Formaldehyde	2.05E-02 lb/MMBtu	0.034	0.009	AP-42, Table 3.2-3 (revised 7/00).
					Toluene	5.58E-04 lb/MMBtu	9.4E-04	2.3E-04	AP-42, Table 3.2-3 (revised 7/00).
					Xylenes	1.95E-04 lb/MMBtu	3.3E-04	8.2E-05	AP-42, Table 3.2-3 (revised 7/00).

**Emission Calculations for Internal Combustion Engines and Boilers
Texas Gas Transmission - Graham Lake Compressor Station (Alt# 44343)**

Equipment ID	Rated Capacity (bhp)	Heat Rate (Btu/bhp-hr)	Design Heat Input (MMBtu/hr)	Max Annual Operating Hours (hr/yr)	Pollutant	Average Emission Factor	Avg Hourly Emissions (lb/hr)	Annual Potential Emissions (tpy)	Emission Factor Reference
BL02 ETI Reboiler Insignificant			0.28	8,760	NO _x	100 lb/MMscf	0.03	0.12	AP-42, Table 1.4-1 (revised 7/00). Use 1,000 Btu/scf for heat content.
					CO	84 lb/MMscf	0.02	0.10	AP-42, Table 1.4-1 (revised 7/00). Use 1,000 Btu/scf for heat content.
					VOC	5.5 lb/MMscf	0.002	0.007	AP-42, Table 1.4-1 (revised 7/00). Use 1,000 Btu/scf for heat content.
					SO ₂	0.6 lb/MMscf	1.7E-04	7.4E-04	AP-42, Table 1.4-1 (revised 7/00). Use 1,000 Btu/scf for heat content.
					PM ₁₀ / PM _{2.5}	7.6 lb/MMscf	0.002	0.009	AP-42, Table 1.4-1 (revised 7/00). Filterable + Condensable
					Benzene	2.1E-03 lb/MMscf	5.9E-07	2.6E-06	AP-42, Table 1.4-1 (revised 7/00). Use 1,000 Btu/scf for heat content.
					Formaldehyde	7.5E-02 lb/MMscf	2.1E-05	9.2E-05	AP-42, Table 1.4-1 (revised 7/00). Use 1,000 Btu/scf for heat content.
					n-Hexane	1.8 lb/MMscf	5.0E-04	0.002	AP-42, Table 1.4-1 (revised 7/00). Use 1,000 Btu/scf for heat content.
					Toluene	3.4E-03 lb/MMscf	9.5E-07	4.2E-06	AP-42, Table 1.4-1 (revised 7/00). Use 1,000 Btu/scf for heat content.

General Notes:

The rated capacity of each unit is taken from the nameplate and/or manufacturer's data.

The design heat rate for each unit is taken from manufacturer's data or standard assumptions.

The reference for each emission factor is listed in the table. For emission factors based on test data, the supporting test data was submitted to DAQ on 10/12/2015. The emission factors generally match those found in the 1996 initial Title V application but have been updated as necessary. Additional HAPs are being reported with this renewal application.

Average hourly emissions are based on the average emission factor for each pollutant and the unit's rated capacity. For emission factors expressed in lb/MMBtu, the design heat rate is used in conjunction with the rated capacity to estimate emissions.

Annual potential emissions from each compressor engine are based on a proposed limit of 6,000 operating hours per year (hr/yr) for each unit. This limit is being proposed in order to limit potential emissions below major source thresholds. The annual emission estimates are based on the average hourly emission rate for each pollutant.

Annual potential emissions from the emergency generator are based on 500 hr/yr per US EPA guidance. Annual potential emissions from the Glycol Reboiler are based on full-time operation (8,760 hr/yr). The annual emission estimates are based on the average hourly emission rate for each pollutant.

Based on guidance from US EPA in AP-42, it is assumed that all particulate matter from natural gas combustion is less than 1 micron and therefore PM₁₀ is equal to PM_{2.5} for all of these sources.

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Graham Lake Dehy-Annual PtE

File Name: C:\Client Files\TexasGas\STATE\Kentucky\Graham Lake\TV Renewal-2015\Emission

Calcs\GL Dehy PtE-2015.ddf

Date: October 23, 2015

DESCRIPTION:

Description: Gas composition based on data collected at the Midland field on April 12, 2011. Other parameters based on the design and normal operation for the dehy system.

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

CONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.0364	0.874	0.1596
Ethane	0.0118	0.284	0.0518
Propane	0.0047	0.113	0.0207
Isobutane	0.0021	0.051	0.0092
n-Butane	0.0038	0.091	0.0166
Isopentane	0.0022	0.054	0.0098
n-Pentane	0.0019	0.045	0.0082
n-Hexane	0.0027	0.064	0.0117
Cyclohexane	0.0034	0.081	0.0148
Other Hexanes	0.0020	0.048	0.0088
Heptanes	0.0141	0.339	0.0618
Methylcyclohexane	0.0047	0.112	0.0204
2,2,4-Trimethylpentane	0.0001	0.003	0.0006
Benzene	0.0488	1.172	0.2139
Toluene	0.0313	0.751	0.1371
Xylenes	0.0345	0.827	0.1510
C8+ Heavies	0.0274	0.658	0.1202
Total Emissions	0.2320	5.569	1.0163
Total Hydrocarbon Emissions	0.2320	5.569	1.0163
Total VOC Emissions	0.1838	4.410	0.8049
Total HAP Emissions	0.1174	2.818	0.5144
Total BTEX Emissions	0.1146	2.751	0.5020

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.7286	17.486	3.1913
Ethane	0.2366	5.678	1.0362
Propane	0.0945	2.267	0.4138
Isobutane	0.0421	1.010	0.1844
n-Butane	0.0759	1.821	0.3324
Isopentane	0.0449	1.077	0.1966
n-Pentane	0.0373	0.896	0.1635
n-Hexane	0.0536	1.287	0.2349

Cyclohexane	0.0675	1.621	0.2958
Other Hexanes	0.0404	0.970	0.1769
Heptanes	0.2823	6.775	1.2364
Methylcyclohexane	0.0931	2.235	0.4078
2,2,4-Trimethylpentane	0.0026	0.062	0.0113
Benzene	0.9769	23.445	4.2787
Toluene	0.6262	15.030	2.7430
Xylenes	0.6893	16.544	3.0193
C8+ Heavies	0.5487	13.168	2.4031
Total Emissions	4.6405	111.371	20.3252
Total Hydrocarbon Emissions	4.6405	111.371	20.3252
Total VOC Emissions	3.6753	88.207	16.0977
Total HAP Emissions	2.3487	56.368	10.2871
Total BTEX Emissions	2.2924	55.019	10.0409

FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.3260	7.823	1.4277
Ethane	0.0303	0.727	0.1326
Propane	0.0061	0.145	0.0265
Isobutane	0.0018	0.044	0.0079
n-Butane	0.0025	0.061	0.0111
Isopentane	0.0013	0.032	0.0058
n-Pentane	0.0009	0.021	0.0039
n-Hexane	0.0007	0.017	0.0031
Cyclohexane	0.0002	0.005	0.0010
Other Hexanes	0.0007	0.017	0.0031
Heptanes	0.0019	0.045	0.0081
Methylcyclohexane	0.0002	0.006	0.0010
2,2,4-Trimethylpentane	<0.0001	0.001	0.0001
Benzene	0.0005	0.012	0.0022
Toluene	0.0002	0.005	0.0009
Xylenes	0.0001	0.002	0.0004
C8+ Heavies	0.0004	0.009	0.0017
Total Emissions	0.3738	8.971	1.6372
Total Hydrocarbon Emissions	0.3738	8.971	1.6372
Total VOC Emissions	0.0176	0.421	0.0769
Total HAP Emissions	0.0015	0.037	0.0067
Total BTEX Emissions	0.0008	0.019	0.0035

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	6.5193	156.462	28.5544
Ethane	0.6056	14.534	2.6524
Propane	0.1212	2.909	0.5309
Isobutane	0.0363	0.871	0.1589
n-Butane	0.0506	1.214	0.2215
Isopentane	0.0264	0.634	0.1157
n-Pentane	0.0177	0.425	0.0775
n-Hexane	0.0143	0.343	0.0626
Cyclohexane	0.0043	0.104	0.0190
Other Hexanes	0.0140	0.337	0.0615

Heptanes	0.0371	0.890	0.1625
Methylcyclohexane	0.0048	0.114	0.0208
2,2,4-Trimethylpentane	0.0007	0.016	0.0029
Benzene	0.0098	0.236	0.0431
Toluene	0.0041	0.098	0.0179
Xylenes	0.0019	0.045	0.0083
C8+ Heavies	0.0079	0.189	0.0345
Total Emissions	7.4759	179.422	32.7444
Total Hydrocarbon Emissions	7.4759	179.422	32.7444
Total VOC Emissions	0.3511	8.425	1.5376
Total HAP Emissions	0.0308	0.739	0.1348
Total BTEX Emissions	0.0158	0.379	0.0693

COMBINED REGENERATOR VENT/FLASH GAS EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.3624	8.697	1.5873
Ethane	0.0421	1.011	0.1844
Propane	0.0108	0.259	0.0472
Isobutane	0.0039	0.094	0.0172
n-Butane	0.0063	0.152	0.0277
Isopentane	0.0036	0.086	0.0156
n-Pentane	0.0028	0.066	0.0120
n-Hexane	0.0034	0.082	0.0149
Cyclohexane	0.0036	0.086	0.0157
Other Hexanes	0.0027	0.065	0.0119
Heptanes	0.0160	0.383	0.0699
Methylcyclohexane	0.0049	0.117	0.0214
2,2,4-Trimethylpentane	0.0002	0.004	0.0007
Benzene	0.0493	1.184	0.2161
Toluene	0.0315	0.756	0.1380
Xylenes	0.0346	0.829	0.1514
C8+ Heavies	0.0278	0.668	0.1219
Total Emissions	0.6058	14.540	2.6535
Total Hydrocarbon Emissions	0.6058	14.540	2.6535
Total VOC Emissions	0.2013	4.832	0.8818
Total HAP Emissions	0.1190	2.855	0.5211
Total BTEX Emissions	0.1154	2.770	0.5055

COMBINED REGENERATOR VENT/FLASH GAS EMISSION CONTROL REPORT:

Component	Uncontrolled tons/yr	Controlled tons/yr	% Reduction
Methane	31.7457	1.5873	95.00
Ethane	3.6886	0.1844	95.00
Propane	0.9447	0.0472	95.00
Isobutane	0.3433	0.0172	95.00
n-Butane	0.5539	0.0277	95.00
Isopentane	0.3123	0.0156	95.00
n-Pentane	0.2410	0.0120	95.00
n-Hexane	0.2976	0.0149	95.00
Cyclohexane	0.3148	0.0157	95.00

Other Hexanes	0.2384	0.0119	95.00
Heptanes	1.3989	0.0699	95.00
Methylcyclohexane	0.4286	0.0214	95.00
2,2,4-Trimethylpentane	0.0142	0.0007	95.00
Benzene	4.3217	0.2161	95.00
Toluene	2.7609	0.1380	95.00
Xylenes	3.0275	0.1514	95.00
C8+ Heavies	2.4376	0.1219	95.00
Total Emissions	53.0696	2.6535	95.00
Total Hydrocarbon Emissions	53.0696	2.6535	95.00
Total VOC Emissions	17.6354	0.8818	95.00
Total HAP Emissions	10.4219	0.5211	95.00
Total BTEX Emissions	10.1101	0.5055	95.00

EQUIPMENT REPORTS:

COMBUSTION DEVICE

Ambient Temperature: 0.00 deg. F
 Excess Oxygen: 0.00 %
 Combustion Efficiency: 95.00 %
 Supplemental Fuel Requirement: 2.63e-002 MM BTU/hr

Component	Emitted	Destroyed
Methane	5.00%	95.00%
Ethane	5.00%	95.00%
Propane	5.00%	95.00%
Isobutane	5.00%	95.00%
n-Butane	5.00%	95.00%
Isopentane	5.00%	95.00%
n-Pentane	5.00%	95.00%
n-Hexane	5.00%	95.00%
Cyclohexane	5.00%	95.00%
Other Hexanes	5.00%	95.00%
Heptanes	5.00%	95.00%
Methylcyclohexane	5.00%	95.00%
2,2,4-Trimethylpentane	5.00%	95.00%
Benzene	5.00%	95.00%
Toluene	5.00%	95.00%
Xylenes	5.00%	95.00%
C8+ Heavies	5.00%	95.00%

ABSORBER

Specified Absorber Stages: 0.75
 Calculated Dry Gas Dew Point: 1.33 lbs. H2O/MMSCF
 Temperature: 60.0 deg. F
 Pressure: 770.0 psig
 Dry Gas Flow Rate: 25.0000 MMSCF/day
 Glycol Losses with Dry Gas: 0.0324 lb/hr
 Wet Gas Water Content: Saturated
 Calculated Wet Gas Water Content: 20.08 lbs. H2O/MMSCF

Calculated Lean Glycol Recirc. Ratio: 15.36 gal/lb H2O

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Component	Remaining in Dry Gas	Absorbed in Glycol
Water	6.61%	93.39%
Carbon Dioxide	99.69%	0.31%
Nitrogen	99.98%	0.02%
Methane	99.98%	0.02%
Ethane	99.94%	0.06%
Propane	99.89%	0.11%
Isobutane	99.82%	0.18%
n-Butane	99.76%	0.24%
Isopentane	99.74%	0.26%
n-Pentane	99.65%	0.35%
n-Hexane	99.36%	0.64%
Cyclohexane	97.17%	2.83%
Other Hexanes	99.53%	0.47%
Heptanes	98.71%	1.29%
Methylcyclohexane	96.70%	3.30%
2,2,4-Trimethylpentane	99.48%	0.52%
Benzene	78.09%	21.91%
Toluene	68.86%	31.14%
Xylenes	52.58%	47.42%
C8+ Heavies	97.98%	2.02%

FLASH TANK

Flash Control: Combustion device
Flash Control Efficiency: 95.00 %
Flash Temperature: 140.0 deg. F
Flash Pressure: 70.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.97%	0.03%
Carbon Dioxide	54.56%	45.44%
Nitrogen	9.93%	90.07%
Methane	10.05%	89.95%
Ethane	28.09%	71.91%
Propane	43.80%	56.20%
Isobutane	53.71%	46.29%
n-Butane	60.01%	39.99%
Isopentane	63.14%	36.86%
n-Pentane	68.00%	32.00%
n-Hexane	79.06%	20.94%
Cyclohexane	94.15%	5.85%
Other Hexanes	74.47%	25.53%
Heptanes	88.44%	11.56%
Methylcyclohexane	95.34%	4.66%
2,2,4-Trimethylpentane	79.81%	20.19%
Benzene	99.05%	0.95%
Toluene	99.40%	0.60%
Xylenes	99.76%	0.24%
C8+ Heavies	98.75%	1.25%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	65.21%	34.79%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	0.79%	99.21%
n-Pentane	0.74%	99.26%
n-Hexane	0.63%	99.37%
Cyclohexane	3.40%	96.60%
Other Hexanes	1.34%	98.66%
Heptanes	0.57%	99.43%
Methylcyclohexane	4.20%	95.80%
2,2,4-Trimethylpentane	1.88%	98.12%
Benzene	5.05%	94.95%
Toluene	7.95%	92.05%
Xylenes	12.93%	87.07%
C8+ Heavies	12.18%	87.82%

STREAM REPORTS:

WET GAS STREAM

Temperature: 60.00 deg. F
 Pressure: 784.70 psia
 Flow Rate: 1.04e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	4.23e-002	2.09e+001
Carbon Dioxide	1.55e+000	1.88e+003
Nitrogen	3.84e-001	2.95e+002
Methane	9.62e+001	4.24e+004
Ethane	1.60e+000	1.32e+003
Propane	1.57e-001	1.90e+002
Isobutane	2.80e-002	4.47e+001
n-Butane	3.30e-002	5.27e+001
Isopentane	1.40e-002	2.77e+001
n-Pentane	8.00e-003	1.58e+001
n-Hexane	4.50e-003	1.06e+001
Cyclohexane	1.10e-003	2.54e+000
Other Hexanes	4.90e-003	1.16e+001
Heptanes	9.00e-003	2.48e+001
Methylcyclohexane	1.10e-003	2.97e+000
2,2,4-Trimethylpentane	2.00e-004	6.27e-001
Benzene	2.10e-003	4.50e+000
Toluene	8.00e-004	2.02e+000
Xylenes	5.00e-004	1.46e+000
C8+ Heavies	5.90e-003	2.76e+001

Total Components	100.00	4.63e+004
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DRY GAS STREAM

Temperature: 60.00 deg. F
 Pressure: 784.70 psia
 Flow Rate: 1.04e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.80e-003	1.38e+000
Carbon Dioxide	1.55e+000	1.87e+003
Nitrogen	3.84e-001	2.95e+002
Methane	9.62e+001	4.24e+004
Ethane	1.60e+000	1.32e+003
Propane	1.57e-001	1.90e+002
Isobutane	2.80e-002	4.46e+001
n-Butane	3.29e-002	5.25e+001
Isopentane	1.40e-002	2.77e+001
n-Pentane	7.97e-003	1.58e+001
n-Hexane	4.47e-003	1.06e+001
Cyclohexane	1.07e-003	2.47e+000
Other Hexanes	4.88e-003	1.15e+001
Heptanes	8.89e-003	2.44e+001
Methylcyclohexane	1.06e-003	2.87e+000
2,2,4-Trimethylpentane	1.99e-004	6.24e-001
Benzene	1.64e-003	3.52e+000
Toluene	5.51e-004	1.39e+000
Xylenes	2.63e-004	7.66e-001
C8+ Heavies	5.78e-003	2.70e+001
Total Components	100.00	4.63e+004

LEAN GLYCOL STREAM

Temperature: 60.00 deg. F
 Flow Rate: 5.00e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.87e+001	2.78e+003
Water	1.30e+000	3.66e+001
Carbon Dioxide	2.09e-011	5.89e-010
Nitrogen	2.02e-013	5.68e-012
Methane	8.65e-018	2.44e-016
Ethane	1.41e-008	3.97e-007
Propane	3.12e-010	8.78e-009
Isobutane	8.35e-011	2.35e-009
n-Butane	1.11e-010	3.14e-009
Isopentane	1.27e-005	3.58e-004
n-Pentane	9.82e-006	2.76e-004
n-Hexane	1.21e-005	3.41e-004
Cyclohexane	8.44e-005	2.38e-003
Other Hexanes	1.95e-005	5.50e-004
Heptanes	5.70e-005	1.60e-003
Methylcyclohexane	1.45e-004	4.08e-003
2,2,4-Trimethylpentane	1.76e-006	4.95e-005

Benzene	1.84e-003	5.19e-002
Toluene	1.92e-003	5.41e-002
Xylenes	3.64e-003	1.02e-001
C8+ Heavies	2.70e-003	7.61e-002

Total Components	100.00	2.82e+003
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RICH GLYCOL STREAM

Temperature: 60.00 deg. F
 Pressure: 784.70 psia
 Flow Rate: 5.08e+000 gpm
 NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.74e+001	2.78e+003
Water	1.97e+000	5.61e+001
Carbon Dioxide	2.06e-001	5.88e+000
Nitrogen	1.99e-003	5.68e-002
Methane	2.54e-001	7.25e+000
Ethane	2.95e-002	8.42e-001
Propane	7.56e-003	2.16e-001
Isobutane	2.75e-003	7.84e-002
n-Butane	4.43e-003	1.26e-001
Isopentane	2.51e-003	7.17e-002
n-Pentane	1.94e-003	5.53e-002
n-Hexane	2.39e-003	6.83e-002
Cyclohexane	2.60e-003	7.42e-002
Other Hexanes	1.93e-003	5.50e-002
Heptanes	1.13e-002	3.21e-001
Methylcyclohexane	3.57e-003	1.02e-001
2,2,4-Trimethylpentane	1.16e-004	3.30e-003
Benzene	3.64e-002	1.04e+000
Toluene	2.40e-002	6.84e-001
Xylenes	2.78e-002	7.94e-001
C8+ Heavies	2.22e-002	6.33e-001
Total Components	100.00	2.85e+003

FLASH TANK OFF GAS STREAM

Temperature: 140.00 deg. F
 Pressure: 84.70 psia
 Flow Rate: 1.88e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.63e-001	1.46e-002
Carbon Dioxide	1.23e+001	2.67e+000
Nitrogen	3.68e-001	5.11e-002
Methane	8.20e+001	6.52e+000
Ethane	4.06e+000	6.06e-001
Propane	5.54e-001	1.21e-001
Isobutane	1.26e-001	3.63e-002
n-Butane	1.75e-001	5.06e-002
Isopentane	7.38e-002	2.64e-002
n-Pentane	4.95e-002	1.77e-002

n-Hexane	3.35e-002	1.43e-002
Cyclohexane	1.04e-002	4.34e-003
Other Hexanes	3.29e-002	1.40e-002
Heptanes	7.47e-002	3.71e-002
Methylcyclohexane	9.76e-003	4.75e-003
2,2,4-Trimethylpentane	1.18e-003	6.67e-004
Benzene	2.54e-002	9.83e-003
Toluene	8.96e-003	4.09e-003
Xylenes	3.59e-003	1.89e-003
C8+ Heavies	9.33e-003	7.88e-003
Total Components	100.00	1.02e+001

FLASH TANK GLYCOL STREAM

Temperature: 140.00 deg. F
Flow Rate: 5.06e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.77e+001	2.78e+003
Water	1.97e+000	5.61e+001
Carbon Dioxide	1.13e-001	3.21e+000
Nitrogen	1.98e-004	5.64e-003
Methane	2.56e-002	7.29e-001
Ethane	8.32e-003	2.37e-001
Propane	3.32e-003	9.45e-002
Isobutane	1.48e-003	4.21e-002
n-Butane	2.67e-003	7.59e-002
Isopentane	1.59e-003	4.52e-002
n-Pentane	1.32e-003	3.76e-002
n-Hexane	1.90e-003	5.40e-002
Cyclohexane	2.46e-003	6.99e-002
Other Hexanes	1.44e-003	4.09e-002
Heptanes	9.99e-003	2.84e-001
Methylcyclohexane	3.42e-003	9.72e-002
2,2,4-Trimethylpentane	9.27e-005	2.64e-003
Benzene	3.62e-002	1.03e+000
Toluene	2.39e-002	6.80e-001
Xylenes	2.79e-002	7.92e-001
C8+ Heavies	2.20e-002	6.25e-001
Total Components	100.00	2.84e+003

FLASH GAS EMISSIONS

Flow Rate: 5.27e+002 scfh
Control Method: Combustion Device
Control Efficiency: 95.00

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.17e+001	1.55e+001
Carbon Dioxide	3.66e+001	2.24e+001
Nitrogen	1.31e-001	5.11e-002
Methane	1.46e+000	3.26e-001
Ethane	7.24e-002	3.03e-002

Propane	9.89e-003	6.06e-003
Isobutane	2.25e-003	1.81e-003
n-Butane	3.13e-003	2.53e-003
Isopentane	1.32e-003	1.32e-003
n-Pentane	8.82e-004	8.85e-004
n-Hexane	5.97e-004	7.15e-004
Cyclohexane	1.86e-004	2.17e-004
Other Hexanes	5.86e-004	7.02e-004
Heptanes	1.33e-003	1.85e-003
Methylcyclohexane	1.74e-004	2.38e-004
2,2,4-Trimethylpentane	2.10e-005	3.33e-005
Benzene	4.53e-004	4.92e-004
Toluene	1.60e-004	2.05e-004
Xylenes	6.40e-005	9.44e-005
C8+ Heavies	1.66e-004	3.94e-004

Total Components	100.00	3.83e+001

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 4.75e+002 scfh

Component	Conc. (vol%)	Loading (lb/hr)

Water	8.67e+001	1.95e+001
Carbon Dioxide	5.83e+000	3.21e+000
Nitrogen	1.61e-002	5.64e-003
Methane	3.63e+000	7.29e-001
Ethane	6.29e-001	2.37e-001
Propane	1.71e-001	9.45e-002
Isobutane	5.79e-002	4.21e-002
n-Butane	1.04e-001	7.59e-002
Isopentane	4.97e-002	4.49e-002
n-Pentane	4.14e-002	3.73e-002
n-Hexane	4.98e-002	5.36e-002
Cyclohexane	6.42e-002	6.75e-002
Other Hexanes	3.75e-002	4.04e-002
Heptanes	2.25e-001	2.82e-001
Methylcyclohexane	7.58e-002	9.31e-002
2,2,4-Trimethylpentane	1.81e-003	2.59e-003
Benzene	1.00e+000	9.77e-001
Toluene	5.43e-001	6.26e-001
Xylenes	5.19e-001	6.89e-001
C8+ Heavies	2.58e-001	5.49e-001

Total Components	100.00	2.74e+001

COMBUSTION DEVICE OFF GAS STREAM

Temperature: 1000.00 deg. F
Pressure: 14.70 psia
Flow Rate: 1.77e+000 scfh

Component	Conc. (vol%)	Loading (lb/hr)

Methane	4.87e+001	3.64e-002
Ethane	8.43e+000	1.18e-002

Propane	2.30e+000	4.72e-003
Isobutane	7.76e-001	2.10e-003
n-Butane	1.40e+000	3.79e-003
Isopentane	6.67e-001	2.24e-003
n-Pentane	5.54e-001	1.87e-003
n-Hexane	6.67e-001	2.68e-003
Cyclohexane	8.60e-001	3.38e-003
Other Hexanes	5.02e-001	2.02e-003
Heptanes	3.02e+000	1.41e-002
Methylcyclohexane	1.02e+000	4.66e-003
2,2,4-Trimethylpentane	2.43e-002	1.29e-004
Benzene	1.34e+001	4.88e-002
Toluene	7.28e+000	3.13e-002
Xylenes	6.96e+000	3.45e-002
C8+ Heavies	3.45e+000	2.74e-002

Total Components	100.00	2.32e-001

Combustion Emission Estimates for Ground Flare
Texas Gas Transmission - Graham Lake Compressor Station AI# 44343

Unit ID	Emission Unit	Unit Description	Rated Capacity (MMBtu/hr)	NG Heat Content (Btu/scf)	Maximum Annual Operation (hr/yr)	Pollutant	Emission Factor (lb/MMscf)	Average Hourly Emissions (lb/hr)	Annual Potential Emissions (tpy)
OX02	03	Ground Flare	1.0	1,000	8,760	NOx	100	0.10	0.44
						CO	84	0.084	0.37
						VOC	5.5	0.006	0.024
						PM ₁₀ / PM _{2.5}	7.6	0.008	0.033
						SO ₂	0.6	0.001	0.003
						Benzene	2.1E-03	2.1E-06	9.2E-06
						Formaldehyde	7.5E-02	7.5E-05	3.3E-04
						n-Hexane	1.8	0.002	0.008
						Toluene	3.4E-03	3.4E-06	1.5E-05
						Total HAP	--	0.002	0.008

Notes:

The heat input capacity for the ground flare is based on manufacturer's data for this unit.

The emission factors for all pollutants are taken from EPA's AP-42 document (Section 1.4). The factors for natural gas-fired boilers are likely more appropriate than those for traditional flares since the combustion chamber for the ground flare is enclosed rather than open. A natural gas heat content of 1,000 Btu/scf is used to convert from lb/MMscf to lb/MMBtu.

Potential emissions from the unit are based on full-time operation (8,760 hr/yr). The ground flare may operate even when the glycol dehydrator is not in operation.

**Emission Estimates for Equipment Leaks and Natural Gas Venting
Texas Gas Transmission - Graham Lake Compressor Station AI# 44343**

Potential Emissions from Equipment Leaks					
VOC Content in Natural Gas (wt%)	Component Type	Emission Factor (lb/hr-item)	Component Count (# of items)	Average Hourly VOC Emissions (lb/hr)	Annual Potential VOC Emissions (tpy)
1%	Valve	0.0099	150	0.015	0.07
	OEL	0.0044	12	0.001	0.002
	PRV	0.0194	6	0.001	0.005
	Compressor Seals	0.0053	8	0.000	0.002
	Flanges/Connectors	0.0009	1,000	0.009	0.04
	TOTAL	--	--	0.026	0.11

Notes:

The number of each type of component is based on actual component counts and conservative assumptions.

The emission factors for each type of component are taken from EPA's *Protocol for Equipment Leak Emission Estimates* (EPA-453/R-95-017, November 1995).

The VOC content of natural gas are based on a sample collected and analyzed at a nearby station in 2019.

Potential emissions from equipment leaks are based on full-time operation (8,760 hr/yr).

Potential Emissions from Natural Gas Venting				
Estimated Annual Gas Lost (MMscf/yr)	Molar Volume of Gas at Std Conditions (scf/lb-mol)	Molecular Weight of Natural Gas (lb/lb-mol)	VOC Content in Natural Gas (wt%)	Annual Potential VOC Emissions (tpy)
1.0	385.5	17.0	1%	0.22

Notes:

The amount of natural gas lost from purges, blowdowns, and other various losses is a conservative estimate.

The VOC content of natural gas are based on a sample collected and analyzed at a nearby station in 2019.

Attachment 3

**Certificate of Authority
from
Kentucky Secretary of State**

Commonwealth of Kentucky
Michael G. Adams, Secretary of State

Michael G. Adams
Secretary of State
P. O. Box 718
Frankfort, KY 40602-0718
(502) 564-3490
<http://www.sos.ky.gov>

Certificate of Authorization

Authentication number: 373011

Visit <https://web.sos.ky.gov/ftshow/certvalidate.aspx> to authenticate this certificate.

I, Michael G. Adams, Secretary of State of the Commonwealth of Kentucky, do hereby certify that according to the records in the Office of the Secretary of State,

TEXAS GAS TRANSMISSION, LLC

, a limited liability company authorized under the laws of the state of Delaware, is authorized to transact business in the Commonwealth of Kentucky, and received the authority to transact business in Kentucky on May 16, 2003.

I further certify that all fees and penalties owed to the Secretary of State have been paid; that an application for certificate of withdrawal has not been filed; that the most recent annual report required by KRS 14A.6-010 has been delivered to the Secretary of State; and is therefore in good standing.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my Official Seal at Frankfort, Kentucky, this 9th day of July, 2026, in the 235th year of the Commonwealth.



Michael G. Adams

Michael G. Adams
Secretary of State
Commonwealth of Kentucky
373011/0560219