Trinity Consultants
Celebrating 50 1974 2024 Years
9400 Holly Ave NE, Bldg 3, Ste B, Albuquerque, NM 87122 / P 505.266.6611 / **trinityconsultants.com**

March 15, 2024

Permit Programs Manager
NMED Air Quality Bureau
525 Camino de los Marquez Suite 1
Santa Fe, NM 87505-1816

RE: Application for Significant Revision to NSR Permit No. 7995-M3
Targa Northern Delaware, LLC – Cadillac Compressor Station

Permit Programs Manager:

On behalf of Targa Northern Delaware, LLC (Targa), Trinity Consultants is submitting this application for a Significant Revision for NSR Permit No. 7995-M3 for the Cadillac Compressor Station, located in Eddy County. Pursuant to 20.2.72.219.D.(1)(a) NMAC, this revision is for the addition of one (1) heater trailer (unit Trailer-1), one (1) air compressor generator (unit GEN-1), and one (1) vapor combustion unit (unit VCU-1); the removal of one (1) Caterpillar 3516 compressor engine (unit 18-0345), and one (1) 300 bbl storage tank (unit TK-4); and the replacement of two (2) Caterpillar 3516 compressor engines (units 18-0341 & 18-0342) with like-kind compressor engines (units ENG-1 & ENG-7, respectively), and five (5) Caterpillar 3606 compressor engines (units 18-0246, 18-0296, 18-0304, ENG-1, & ENG-2) with like-kind replacements (ENG-2 through ENG-6, respectively). The site-wide emission have been updated to reflect a recent inlet gas analysis.

The format and content of this application are consistent with the Bureau's current policy regarding NSR applications; it is a complete application package using the most current application form. Enclosed is a hard copy of the application, including the original certification. Please feel free to contract me at (505) 266-6611 or by email at jaimy.karacaoglu@trinityconsultants.com if you have any questions regarding this application. Alternatively, you may contact Robert Andries at (713) 584-1360 or by email at randries@targaresources.com.

Sincerely,

Jaimy Karacaoglu
Consultant

Trinity Project File 243201.0017

NMED AIR QUALITY BUREAU
NSR SIGNIFICANT REVISION APPLICATION

Targa Northern Delaware, LLC
Cadillac Compressor Station

Prepared By:
Robert Andries – Sr. Environmental Specialist

Targa Northern Delaware, LLC
811 Louisiana
Suite 2100
Houston, TX 77002-1400

Jaimy Karacaoglu - Consultant

TRINITY CONSULTANTS
9400 Holly Ave
Building 3, Suite B
Albuquerque, NM 87122
(505) 266-6611

March 2024

Project 243201.0017

COPY

WARNING – THIS CH[illegible] IS PROTECTED BY SPECIAL SECURITY GUARD [illegible]GRAM™ FEATURES

Targa Resources Partners LP
811 Louisiana Street
Suite 2100
Houston, TX 77002

JPMORGAN CHASE BANK NA
Chicago, IL

CHECK NO. 3500508429
CHECK DATE 01/30/2024

70-2322/719
709373500

* * * Five Hundred Dollars And Zero Cents*

CHECK AMOUNT
$500.00

Pay To The Order Of
STATE OF NEW MEXICO
GENERAL FUND AIR QUALITY BUREAU
SANTA FE NM 87505-1816

HEAT SENSITIVE RUB AREA TO VERIFY

THIS CHECK CONTAINS MULTIPLE SECURITY FEATURES – SEE BACK FOR DETAILS

⑈3500508429⑈ ⑆071923226⑆ 709373500⑈

PAY TO:
STATE OF NEW MEXICO
GENERAL FUND AIR QUALITY BUREAU
SANTA FE NM 87505-1816

Targa Resources Corp.

VENDOR NO.	CHECK DATE	CHECK NO	CHECK TOTAL
1004108	01/30/2024	3500508429	$500.00

INVOICE NUMBER	INVOICE DATE			AMOUNT PAID
CKRQ012024 3	20240130	Robert Andries	$	500.00

RECEIVED
MAR 21 2024
Air Quality Bureau

Cadillac NSR [2024-006]

Air Permit Application
Compliance History Disclosure Form

Pursuant to Subsection 74-2-7(S) of the New Mexico Air Quality Control Act ("AQCA"), NMSA §§ 74-2-1 to -17, the New Mexico Environment Department ("Department") may deny any permit application or revoke any permit issued pursuant to the AQCA if, within ten years immediately preceding the date of submission of the permit application, the applicant met any one of the criteria outlined below. In order for the Department to deem an air permit application administratively complete, or issue an air permit for those permits without an administrative completeness determination process, the applicant must complete this Compliance History Disclosure Form as specified in Subsection 74-2-7(P). An existing permit holder (permit issued prior to June 18, 2021) shall provide this Compliance History Disclosure Form to the Department upon request.

Permittee/Applicant Company Name		**Expected Application Submittal Date**
Targa Northern Delaware, LLC		March 15, 2024
Permittee/Company Contact	**Phone**	**Email**
Robert Andries	(713) 584-1360	randries@targaresources.com

	Within the 10 years preceding the expected date of submittal of the application, has the permittee or applicant:	
1	Knowingly misrepresented a material fact in an application for a permit?	☐ Yes ☒ No
2	Refused to disclose information required by the provisions of the New Mexico Air Quality Control Act?	☐ Yes ☒ No
3	Been convicted of a felony related to environmental crime in any court of any state or the United States?	☐ Yes ☒ No
4	Been convicted of a crime defined by state or federal statute as involving or being in restraint of trade, price fixing, bribery, or fraud in any court of any state or the United States?	☐ Yes ☒ No
5a	Constructed or operated any facility for which a permit was sought, including the current facility, without the required air quality permit(s) under 20.2.70 NMAC, 20.2.72 NMAC, 20.2.74 NMAC, 20.2.79 NMAC, or 20.2.84 NMAC?	☐ Yes ☒ No
5b	If "No" to question 5a, go to question 6. If "Yes" to question 5a, state whether each facility that was constructed or operated without the required air quality permit met at least one of the following exceptions: a. The unpermitted facility was discovered after acquisition during a timely environmental audit that was authorized by the Department; or b. The operator of the facility estimated that the facility's emissions would not require an air permit, **and** the operator applied for an air permit within 30 calendar days of discovering that an air permit was required for the facility.	☐ Yes ☐ No
6	Had any permit revoked or permanently suspended for cause under the environmental laws of any state or the United States?	☐ Yes ☒ No
7	For each "yes" answer, please provide an explanation and documentation.	

Mail Application To:		For Department use only:
New Mexico Environment Department Air Quality Bureau Permits Section 525 Camino de los Marquez, Suite 1 Santa Fe, New Mexico, 87505 Phone: (505) 476-4300 Fax: (505) 476-4375 www.env.nm.gov/aqb		RECEIVED MAR 2 1 2024 Air Quality Bureau

Universal Air Quality Permit Application

Use this application for NOI, NSR, or Title V sources.

Use this application for: the initial application, modifications, technical revisions, and renewals. For technical revisions, complete Sections, 1-A, 1-B, 2-E, 3, 9 and any other sections that are relevant to the requested action; coordination with the Air Quality Bureau permit staff prior to submittal is encouraged to clarify submittal requirements and to determine if more or less than these sections of the application are needed. Use this application for streamline permits as well.

This application is submitted as (check all that apply): ☐ Request for a No Permit Required Determination (no fee)
☐ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).
Construction Status: ☐ Not Constructed ☒ Existing Permitted (or NOI) Facility ☐ Existing Non-permitted (or NOI) Facility
Minor Source: ☐ NOI 20.2.73 NMAC ☒ 20.2.72 NMAC application or revision ☐ 20.2.72.300 NMAC Streamline application
Title V Source: ☐ Title V (new) ☐ Title V renewal ☐ TV minor mod. ☐ TV significant mod. ☐ TV Acid Rain: ☐ New ☐ Renewal
PSD Major Source: ☐ PSD major source (new) ☐ Minor Modification to a PSD source ☐ a PSD major modification

Acknowledgements:

☒ I acknowledge that a pre-application meeting is available to me upon request. ☒ Title V Operating, Title IV Acid Rain, and NPR applications have no fees.

☒ $500 NSR application Filing Fee enclosed OR ☐ The full permit fee associated with 10 fee points (required w/ streamline applications).

☒ Check No.: 3500508429 in the amount of $500.

☒ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.

☒ I acknowledge there is an annual fee for permits in addition to the permit review fee: www.env.nm.gov/air-quality/permit-fees-2/.

☐ This facility qualifies for the small business fee reduction per 20.2.75.11.C. NMAC. The full $500.00 filing fee is included with this application and I understand the fee reduction will be calculated in the balance due invoice. The Small Business Certification Form has been previously submitted or is included with this application. (Small Business Environmental Assistance Program Information: www.env.nm.gov/air-quality/small-biz-eap-2/.)

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.72.219.D.(1)(a) NMAC**
(e.g. application for a new minor source would be 20.2.72.200.A NMAC, one example for a Technical Permit Revision is 20.2.72.219.B.1.b NMAC, a Title V acid rain application would be: 20.2.70.200.C NMAC)

Section 1 – Facility Information

Section 1-A: Company Information

		AI # if known: 38618	Updating Permit/NOI #: 7995-M3
1	Facility Name: Cadillac Compressor Station	Plant primary SIC Code (4 digits): 1311	
		Plant NAIC code (6 digits): 211130	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): From the United States Postal Service in Malaga, NM, head south on Hwy 285 and continue south for 4.1 miles, then turn left onto service road and continue east for 1.3 miles, then turn right and continue south for 1.14 miles and the facility will be on the right.		

2	Plant Operator Company Name: Targa Northern Delaware, LLC	Phone/Fax: (575) 631-7093
a	Plant Operator Address: 811 Louisiana Suite 2100, Houston, TX 77002-1400	
b	Plant Operator's New Mexico Corporate ID or Tax ID: 1948249	
3	Plant Owner(s) name(s): Targa Northern Delaware, LLC	Phone/Fax: (575) 631-7093
a	Plant Owner(s) Mailing Address(s): 811 Louisiana Suite 2100, Houston, TX 77002-1400	
4	Bill To (Company): Targa Northern Delaware, LLC	Phone/Fax: (575) 631-7093
a	Mailing Address: 811 Louisiana Suite 2100, Houston, TX 77002-1400	E-mail: randries@targaresources.com
5	☐ Preparer: ☒ Consultant: Jaimy Karacaoglu	Phone/Fax: (505) 266-6611
a	Mailing Address: 9400 Holly Ave, Bldg 3, Ste B, Albuquerque NM, 87113	E-mail: Jaimy.Karacaoglu@trinityconsultants.com
6	Plant Operator Contact: Jason Fuentes	Phone/Fax: 575-513-9934
a	Address: 201 South 4th St. Artesia NM 88210	E-mail: jason.fuentes@targaresources.com
7	Air Permit Contact: Robert Andries	Title: Sr. Environmental Specialist
a	E-mail: randries@targaresources.com	Phone/Fax: (713) 584-1360
b	Mailing Address: 811 Louisiana Suite 2100, Houston, TX 77002-1400	
c	The designated Air permit Contact will receive all official correspondence (i.e. letters, permits) from the Air Quality Bureau.	

Section 1-B: Current Facility Status

1.a	Has this facility already been constructed? ☒ Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? ☒ Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? ☐ Yes ☒ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ☒ Yes ☐ No
3	Is the facility currently shut down? ☐ Yes ☒ No	If yes, give month and year of shut down (MM/YY): N/A
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes ☒ No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐ Yes ☐ No ☒ N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☐ Yes ☒ No	If yes, the permit No. is: N/A
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ☒ No	If yes, the NPR No. is: N/A
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☒ No	If yes, the NOI No. is: N/A
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☒ Yes ☐ No	If yes, the permit No. is: 7995-M3
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes ☒ No	If yes, the register No. is: N/A

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: 4.167 MMscf/hr	Daily: 100 MMscf/day	Annually: 36,500 MMscf/yr
b	Proposed	Hourly: 4.167 MMscf/hr	Daily: 100 MMscf/day	Annually: 36,500 MMscf/yr
2	What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required)			

a	Current	Hourly: 4.167 MMscf/hr	Daily: 100 MMscf/day	Annually: 36,500 MMscf/yr
b	Proposed	Hourly: 4.167 MMscf/hr	Daily: 100 MMscf/day	Annually: 36,500 MMscf/yr

Section 1-D: Facility Location Information

1	Latitude (decimal degrees): 32.149885°	Longitude (decimal degrees): -104.048548°	County: Eddy	Elevation (ft): 2944
2	UTM Zone: ☐ 12 or ☒ 13	Datum: ☐ NAD 83 ☒ WGS 84		
a	UTM E (in meters, to nearest 10 meters): 589,725	UTM N (in meters, to nearest 10 meters): 3,557,446		
3	Name and zip code of nearest New Mexico town: Malaga, NM 88263			
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): From the United States Postal Service in Malaga, NM, head south on Hwy 285 and continue south for 4.1 miles, then turn left onto service road and continue east for 1.3 miles, then turn right and continue south for 1.14 miles and the facility will be on the right.			
5	The facility is 5.0 miles south-southeast of Malaga, NM.			
6	Land Status of facility (check one): ☒ Private ☐ Indian/Pueblo ☐ Government ☐ BLM ☐ Forest Service ☐ Military			
7	List all municipalities, Indian tribes, and counties within a ten (10) mile radius (20.2.72.203.B.2 NMAC) of the property on which the facility is proposed to be constructed or operated: Malaga, NM, Loving, NM, Eddy County			
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/air-quality/modeling-publications/)? ☒ Yes ☐ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: Carlsbad Caverns National Park ~30.5 km			
9	Name nearest Class I area: Carlsbad Caverns National Park			
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 30,575 m			
11	Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: 8390 m			
12	Method(s) used to delineate the Restricted Area: Continuous fencing "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.			
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☐ Yes ☒ No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.			
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☒ No ☐ Yes If yes, what is the name and permit number (if known) of the other facility?			

Section 1-E: Proposed Operating Schedule (The 1-E.1 & 1-E.2 operating schedules may become conditions in the permit.)

1	Facility **maximum** operating ($\frac{\text{hours}}{\text{day}}$): 24	($\frac{\text{days}}{\text{week}}$): 7	($\frac{\text{weeks}}{\text{year}}$): 52	($\frac{\text{hours}}{\text{year}}$): 8760		
2	Facility's maximum daily operating schedule (if less than 24 $\frac{\text{hours}}{\text{day}}$)? Start: N/A	AM PM	End: N/A	AM PM		
3	Month and year of anticipated start of construction: N/A					
4	Month and year of anticipated construction completion: N/A					
5	Month and year of anticipated startup of new or modified facility: June 2023					
6	Will this facility operate at this site for more than one year? ☒ Yes ☐ No					

Section 1-F: Other Facility Information

1	Are there any current Notice of Violations (NOV), compliance orders, or any other compliance or enforcement issues related to this facility? ☐ Yes ☒ No If yes, specify: N/A		
a	If yes, NOV date or description of issue: N/A		NOV Tracking No: N/A
b	Is this application in response to any issue listed in 1-F, 1 or 1a above? ☐ Yes ☒ No If Yes, provide the 1c & 1d info below:		
c	Document Title: N/A	Date: N/A	Requirement # (or page # and paragraph #): N/A
d	Provide the required text to be inserted in this permit: N/A		
2	Is air quality dispersion modeling or modeling waiver being submitted with this application? ☒ Yes ☐ No		
3	Does this facility require an "Air Toxics" permit under 20.2.72.400 NMAC & 20.2.72.502, Tables A and/or B? ☐ Yes ☒ No		
4	Will this facility be a source of federal Hazardous Air Pollutants (HAP)? ☒ Yes ☐ No		
a	If Yes, what type of source? ☒ **Major** (☒ ≥10 tpy of any single HAP **OR** ☒ ≥25 tpy of any combination of HAPS) **OR** ☐ **Minor** (☐ <10 tpy of any single HAP **AND** ☐ <25 tpy of any combination of HAPS)		
5	Is any unit exempt under 20.2.72.202.B.3 NMAC? ☐ Yes ☑ No		
a	If yes, include the name of company providing commercial electric power to the facility: N/A Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user.		

Section 1-G: Streamline Application (This section applies to 20.2.72.300 NMAC Streamline applications only)

1	☐ I have filled out Section 18, "Addendum for Streamline Applications."	☒ N/A (This is not a Streamline application.)

Section 1-H: Current Title V Information - Required for all applications from TV Sources

(Title V-source required information for all applications submitted pursuant to 20.2.72 NMAC (Minor Construction Permits), or 20.2.74/20.2.79 NMAC (Major PSD/NNSR applications), and/or 20.2.70 NMAC (Title V))

1	Responsible Official (R.O.) (20.2.70.300.D.2 NMAC): Jimmy Oxford	Phone: (940) 220-2493
a	R.O. Title: Vice President Operations	R.O. e-mail: JOxford@targaresources.com
b	R. O. Address: 4401 North I-35, Suite 303, Denton TX 76207, United States	
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC): N/A	Phone: N/A
a	A. R.O. Title: N/A	A. R.O. e-mail: N/A
b	A. R. O. Address: N/A	
3	Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship): Targa Resources, Inc.	
4	Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.): Targa Resources, Inc.	
a	Address of Parent Company: 811 Louisiana Suite 2100, Houston, TX 77002-1400	
5	Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.): Targa Northern Delaware, LLC, Targa Midstream Services, LLC, Versado Gas Processors, LLC	
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations: Jaylen Fuentes – (575) 810-6054	

7	Affected Programs to include Other States, local air pollution control programs (i.e. Bernalillo) and Indian tribes: Will the property on which the facility is proposed to be constructed or operated be closer than 80 km (50 miles) from other states, local pollution control programs, and Indian tribes and pueblos (20.2.70.402.A.2 and 20.2.70.7.B)? If yes, state which ones and provide the distances in kilometers: Texas ~16.9 km

Section 1-I – Submittal Requirements

Each 20.2.73 NMAC (**NOI**), a 20.2.70 NMAC (**Title V**), a 20.2.72 NMAC (**NSR** minor source), or 20.2.74 NMAC (**PSD**) application package shall consist of the following:

Hard Copy Submittal Requirements:

1) One hard copy **original signed and notarized application package** printed double sided **'head-to-toe'** 2-hole punched as we bind the document on top, not on the side; except Section 2 (landscape tables), which should be head-to-head. Please use **numbered tab separators** in the hard copy submittal(s) as this facilitates the review process. For NOI submittals only, hard copies of UA1, Tables 2A, 2D & 2F, Section 3 and the signed Certification Page are required. Please include a copy of the check on a separate page.

2) If the application is for a minor NSR, PSD, NNSR, or Title V application, include one working hard **copy** for Department use. This copy should be printed in book form, 3-hole punched, and **must be double sided**. Note that this is in addition to the head-to-to 2-hole punched copy required in 1) above. Minor NSR Technical Permit revisions (20.2.72.219.B NMAC) only need to fill out Sections 1-A, 1-B, 3, and should fill out those portions of other Section(s) relevant to the technical permit revision. TV Minor Modifications need only fill out Sections 1-A, 1-B, 1-H, 3, and those portions of other Section(s) relevant to the minor modification. NMED may require additional portions of the application to be submitted, as needed.

3) The entire NOI or Permit application package, including the full modeling study, should be submitted electronically. Electronic files for applications for NOIs, any type of General Construction Permit (GCP), or technical revisions to NSRs must be submitted with compact disk (CD) or digital versatile disc (DVD). For these permit application submittals, **two** CD copies are required (in sleeves, not crystal cases, please), with additional CD copies as specified below. NOI applications require only a single CD submittal. Electronic files for other New Source Review (construction) permits/permit modifications or Title V permits/permit modifications can be submitted on CD/DVD or sent through AQB's secure file transfer service.

Electronic files sent by (check one):

☐ CD/DVD attached to paper application

☒ Secure electronic transfer. Air Permit Contact Name: Jaimy Karacaoglu, Email: Jaimy.Karacaoglu@trinityconsultants.com

Phone number: (505) 266-6611.

a. If the file transfer service is chosen by the applicant, after receipt of the application, the Bureau will email the applicant with instructions for submitting the electronic files through a secure file transfer service. Submission of the electronic files through the file transfer service needs to be completed within 3 business days after the invitation is received, so the applicant should ensure that the files are ready when sending the hard copy of the application. The applicant will not need a password to complete the transfer. **Do not use the file transfer service for NOIs, any type of GCP, or technical revisions to NSR permits.**

4) Optionally, the applicant may submit the files with the application on compact disk (CD) or digital versatile disc (DVD) following the instructions above and the instructions in 5 for applications subject to PSD review.

5) If **air dispersion modeling** is required by the application type, include the **NMED Modeling Waiver** and/or electronic air dispersion modeling report, input, and output files. The dispersion modeling ***summary report only*** should be submitted as hard copy(ies) unless otherwise indicated by the Bureau.

6) If the applicant submits the electronic files on CD and the application is subject to PSD review under 20.2.74 NMAC (PSD) or NNSR under 20.2.79 NMC include,
   a. one additional CD copy for US EPA,
   b. one additional CD copy for each federal land manager affected (NPS, USFS, FWS, USDI) and,
   c. one additional CD copy for each affected regulatory agency other than the Air Quality Bureau.

   If the application is submitted electronically through the secure file transfer service, these extra CDs do not need to be submitted.

Electronic Submittal Requirements [in addition to the required hard copy(ies)]:

1) All required electronic documents shall be submitted as 2 separate CDs or submitted through the AQB secure file transfer service. Submit a single PDF document of the entire application as submitted and the individual documents comprising the application.

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format. We must be able to review the formulas and inputs that calculated the emissions.

3) It is preferred that this application form be submitted as 4 electronic files (3 MSWord docs: Universal Application section 1 [UA1], Universal Application section 3-19 [UA3], and Universal Application 4, the modeling report [UA4]) and 1 Excel file of the tables (Universal Application section 2 [UA2]). Please include as many of the 3-19 Sections as practical in a single MS Word electronic document. Create separate electronic file(s) if a single file becomes too large or if portions must be saved in a file format other than MS Word.

4) The electronic file names shall be a maximum of 25 characters long (including spaces, if any). The format of the electronic Universal Application shall be in the format: "A-3423-FacilityName". The "A" distinguishes the file as an application submittal, as opposed to other documents the Department itself puts into the database. Thus, all electronic application submittals should begin with "A-". Modifications to existing facilities should use the core permit number (i.e. '3423') the Department assigned to the facility as the next 4 digits. Use 'XXXX' for new facility applications. The format of any separate electronic submittals (additional submittals such as non-Word attachments, re-submittals, application updates) and Section document shall be in the format: "A-3423-9-description", where "9" stands for the section # (in this case Section 9-Public Notice). Please refrain, as much as possible, from submitting any scanned documents as this file format is extremely large, which uses up too much storage capacity in our database. Please take the time to fill out the header information throughout all submittals as this will identify any loose pages, including the Application Date (date submitted) & Revision number (0 for original, 1, 2, etc.; which will help keep track of subsequent partial update(s) to the original submittal. Do not use special symbols (#, @, etc.) in file names. The footer information should not be modified by the applicant.

Table of Contents

Table 2-A: Regulated Emission Sources

Unit and stack numbering must correspond throughout the application package. If applying for a NOI under 20.2.73 NMAC, equipment exemptions under 2.72.202 NMAC do not apply.

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufacturer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] / Date of Construction/ Reconstruction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classification Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
ENG-1	Compressor Engine	Caterpillar	3516J	N6W00743	1380 hp	1380 hp	8/1/2018 / TBD	Catalyst 1 / ENG-1	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☑ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	18-0341
ENG-2	Compressor Engine	Caterpillar	3606	JFE01219	1875 hp	1875 hp	12/1/2018 / TBD	Catalyst 2 / ENG-2	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☑ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	18-0246
ENG-3	Compressor Engine	Caterpillar	3606	JFE01019	1875 hp	1875 hp	5/1/2018 / TBD	Catalyst 3 / ENG-3	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☑ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	18-0296
ENG-4	Compressor Engine	Caterpillar	3606	JFE01118	1875 hp	1875 hp	8/1/2018 / TBD	Catalyst 4 / ENG-4	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☑ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	18-0304
ENG-5	Compressor Engine	Caterpillar	3606	JFE01220	1875 hp	1875 hp	12/1/2018 / TBD	Catalyst 5 / ENG-5	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☑ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	ENG-1
ENG-6	Compressor Engine	Caterpillar	3606	JFE01182	1875 hp	1875 hp	10/1/2018 / TBD	Catalyst 6 / ENG-6	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☑ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	ENG-2
ENG-7	Compressor Engine	Caterpillar	3516J	JEF03405	1380 hp	1380 hp	TBD / TBD	Catalyst 7 / ENG-7	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☑ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	18-0342
ENG-8	Compressor Engine	Caterpillar	3608	XH701858	1380 hp	1380 hp	TBD / TBD	Catalyst 8 / ENG-8	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
ENG-9	Compressor Engine	Caterpillar	3608	TBD	1380 hp	1380 hp	TBD / TBD	Catalyst 9 / ENG-9	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
ENG-10	Compressor Engine	Caterpillar	3608	TBD	1380 hp	1380 hp	TBD / TBD	Catalyst 10 / ENG-10	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
18-0246	Compressor Engine	Caterpillar	3606	JFE01182	1875 hp	1875 hp	12/1/2018 / 3/30/2019	Catalyst 1 / 18-0246	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☑ To be Replaced	4SLB	N/A
18-0296	Compressor Engine	Caterpillar	3606	JFE01220	1875 hp	1875 hp	1/1/2019 / 3/30/2019	Catalyst 2 / 18-0296	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☑ To be Replaced	4SLB	N/A
18-0304	Compressor Engine	Caterpillar	3606	JFE01220	1875 hp	1875 hp	11/1/2018 / 1/24/2019	Catalyst 3 / 18-0304	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☑ To be Replaced	4SLB	N/A
18-0341	Compressor Engine	Caterpillar	3516	N6W00717	1380 hp	1380 hp	TBD / 10/31/2018	Catalyst 10 / 18-0341	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☑ To be Replaced	4SLB	N/A
18-0342	Compressor Engine	Caterpillar	3516	N6W00760	1380 hp	1380 hp	TBD / 10/31/2018	Catalyst 11 / 18-0342	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☑ To be Replaced	4SLB	N/A
18-0345	Compressor Engine	Caterpillar	3516	N6W00705	1380 hp	1380 hp	TBD / 10/31/2018	Catalyst 12 / 18-0345	20200254	☑ Existing (unchanged) ☑ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
ENG-1	Compressor Engine	Caterpillar	3606	TBD	1875 hp	1875 hp	TBD / TBD	Catalyst 4 / ENG-1	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☑ To be Replaced	4SLB	N/A
ENG-2	Compressor Engine	Caterpillar	3606	TBD	1875 hp	1875 hp	TBD / TBD	Catalyst 5 / ENG-2	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☑ To be Replaced	4SLB	N/A

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufacturer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] / Date of Construction/ Reconstruction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classification Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
ENG-8	Compressor Engine	Caterpillar	3608	TBD	2500 hp	2500 hp	TBD TBD	Catalyst 6 ENG-8	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
ENG-9	Compressor Engine	Caterpillar	3608	TBD	2500 hp	2500 hp	TBD TBD	Catalyst 7 ENG-9	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
ENG-10	Compressor Engine	Caterpillar	3608	TBD	2500 hp	2500 hp	TBD TBD	Catalyst 8 ENG-10	20200254	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
ENG-11	Compressor Engine	Caterpillar	3608	TBD	2500 hp	2500 hp	TBD TBD	Catalyst 9 ENG-11	20200254	☐ Existing (unchanged) ☑ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
Dehy-1	Glycol Dehydrator	Jatco	16067	TBD	100 MMSCFD	100 MMSCFD	TBD TBD	VCU-1 VCU-1	31000301	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	N/A
RBL-1	2.0 MMBtu/hr Reboiler w/ BTEX Condnser	FLAMCO	SB18-12	1702-779	2.0 MMBtu/hr	2.0 MMBtu/hr	TBD TBD	N/A RBL-1	31000302	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	N/A
Trailer-1	Heater Trailer	Allmand	TBD	TBD	13.8 hp	13.8 hp	TBD TBD	N/A Trailer-1	31000205	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
GEN-1	Air Compressor Generator	PSI	14.6L	TBD	396 hp	396 hp	TBD TBD	N/A GEN-1	20200254	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
TK-1	Atmospheric Storage Tank	Tank Partners	N/A	18263	300 bbl	300 bbl	2018 Post 9/18/2015	VCU-1 VCU-1	40400311	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	N/A
TK-2	Atmospheric Storage Tank	Conner Steel Products	N/A	26278	300 bbl	300 bbl	4/28/2010 Post 9/18/2015	VCU-1 VCU-1	40400311	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	N/A
TK-3	Atmospheric Storage Tank	TBD	TBD	TBD	300 bbl	300 bbl	TBD TBD	VCU-1 VCU-1	40400311	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	N/A
TK-4	Atmospheric Storage Tank	TBD	TBD	TBD	300 bbl	300 bbl	TBD TBD	N/A N/A	40400311	☐ Existing (unchanged) ☑ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
VCU-1	Vapor Combustion Unit	Hero Flare	TBD	TBD	52 Mscf/day	52 Mscf/day	TBD TBD	N/A VCU-1	31000205	☐ Existing (unchanged) ☐ To be Removed ☑ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
LOAD	Truck Loading	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	40600132	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	N/A
FUG	Facility-Wide Fugitive Emissions	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31000220	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	N/A
SSM/M	Startup, Shutdown, Maintenance, and Malfunction	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31000888	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	N/A

[1] Unit numbers must correspond to unit numbers in the previous permit unless a complete cross reference table of all units in both permits is provided.

[2] Specify dates required to determine regulatory applicability.

[3] To properly account for power conversion efficiencies, generator set rated capacity shall be reported as the rated capacity of the engine in horsepower, not the kilowatt capacity of the generator set.

[4] "4SLB" means four stroke lean burn engine, "4SRB" means four stroke rich burn engine, "2SLB" means two stroke lean burn engine, "CI" means compression ignition, and "SI" means spark ignition

Table 2-B: Insignificant Activities[1] (20.2.70 NMAC) OR Exempted Equipment (20.2.72 NMAC)

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.env.nm.gov/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at https://www.env.nm.gov/wp-content/uploads/sites/2/2017/10/InsignificantListTitleV.pdf. TV sources may elect to enter both TV Insignificant Activities and Part 72 Exemptions on this form.

Unit Number	Source Description	Manufacturer	Model No.	Max Capacity	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5)	Date of Manufacture /Reconstruction[2]	For Each Piece of Equipment, Check One
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction[2]	
N/A	Methanol Tank	TBD	TBD	100	20.2.72.202.B.5.NMAC	TBD	☑ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
			TBD	bbl		TBD	
N/A	Glycol Tanks	TBD	TBD	500	20.2.72.202.B.5.NMAC	TBD	☑ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
			TBD	gal		TBD	
N/A	Lube Oil Tanks	TBD	TBD	500	20.2.72.202.B.5.NMAC	TBD	☑ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
			TBD	gal		TBD	
N/A	Antifreeze Tanks	TBD	TBD	500	20.2.72.202.B.5.NMAC	TBD	☑ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
			TBD	gal		TBD	
HAUL	Haul Road Emissions	N/A	N/A	N/A	20.2.72.202.B.5.NMAC	N/A	☐ Existing (unchanged) ☐ New/Additional ☑ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
			N/A	N/A		N/A	
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced
							☐ Existing (unchanged) ☐ New/Additional ☐ To Be Modified ☐ To be Removed ☐ Replacement Unit ☐ To be Replaced

[1] Insignificant activities exempted due to size or production rate are defined in 20.2.70.300.D.6, 20.2.70.7.Q NMAC, and the NMED/AQB List of Insignificant Activities, dated September 15, 2008. Emissions from these insignificant activities do not need to be reported, unless specifically requested.

[2] Specify date(s) required to determine regulatory applicability.

Table 2-C: Emissions Control Equipment

Unit and stack numbering must correspond throughout the application package. Only list control equipment for TAPs if the TAP's maximum uncontrolled emissions rate is over its respective threshold as listed in 20.2.72 NMAC, Subpart V, Tables A and B. In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions.

Control Equipment Unit No.	Control Equipment Description	Date Installed	*Controlled Pollutant(s)*	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
Catalyst 1	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-1	CO: 83.2% VOC: 59.0% HCHO: 82.1%	Manufacturer Specification
Catalyst 7	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-7		Manufacturer Specification
Catalyst 2	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-2	CO: 80.0% VOC: 46.8% HCHO: 65.0%	Manufacturer Specification
Catalyst 3	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-3		Manufacturer Specification
Catalast 4	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-4		Manufacturer Specification
Catalyst 5	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-5		Manufacturer Specification
Catalyst 6	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-6		Manufacturer Specification
Catalyst 8	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-8	CO: 75.5% VOC: 38.8% HCHO: 80.0%	Manufacturer Specification
Catalyst 9	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-9		Manufacturer Specification
Catalyst 10	Oxidation Catalyst	TBD	CO, VOC, HCHO	ENG-10		Manufacturer Specification
VCU-1	Vapor Combustion Unit	TBD	VOC, H_2S, Total HAP	TK-1 through TK-3, Dehy-1	98%	Manufacturer Specification

[1] List each control device on a separate line. For each control device, list all emission units controlled by the control device.

Table 2-D: Maximum Emissions (under normal operating conditions)

☐ **This Table was intentionally left blank because it would be identical to Table 2-E.**

Maximum Emissions are the emissions at maximum capacity and prior to (in the absence of) pollution control, emission-reducing process equipment, or any other emission reduction. Calculate the hourly emissions using the worst case hourly emissions for each pollutant. For each pollutant, calculate the annual emissions as if the facility were operating at maximum plant capacity without pollution controls for 8760 hours per year, unless otherwise approved by the Department. List Hazardous Air Pollutants (HAP) & Toxic Air Pollutants (TAPs) in Table 2-I. Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-1	1.52	6.66	9.07	39.71	4.49	19.66	0.045	0.20	0.20	0.87	0.20	0.87	-	-	1.39	6.09	-	-
ENG-2	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73	-	-
ENG-3	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73	-	-
ENG-4	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73	-	-
ENG-5	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73	-	-
ENG-6	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73	-	-
ENG-7	1.52	6.66	9.07	39.71	4.49	19.66	0.045	0.20	0.20	0.87	0.20	0.87	-	-	1.39	6.09	-	-
ENG-8	2.76	12.07	15.43	67.59	7.01	30.72	0.075	0.33	0.33	1.44	0.33	1.44	-	-	1.60	7.02	-	-
ENG-9	2.76	12.07	15.43	67.59	7.01	30.72	0.075	0.33	0.33	1.44	0.33	1.44	0.33	1.44	-	-	-	-
ENG-10	2.76	12.07	15.43	67.59	7.01	30.72	0.07	0.33	0.33	1.44	0.33	1.44	0.33	1.44	-	-	-	-
Trailer-1	0.16	0.71	0.15	0.65	8.52E-03	0.037	2.05E-03	8.98E-03	9.13E-03	0.040	9.13E-03	0.040	9.13E-03	0.040	-	-	-	-
GEN-1	0.80	3.50	1.60	6.99	0.78	3.43	0.013	0.056	0.029	0.13	0.029	0.13	0.029	0.13	-	-	-	-
Dehy-1	-	-	-	-	82.02	359.27	-	-	-	-	-	-	-	-	0.042	0.19	-	-
RBL-1	0.20	0.86	0.16	0.72	0.011	0.047	8.85E-03	0.039	0.015	0.065	0.015	0.065	0.015	0.065	-	-	-	-
TK-1	-	-	-	-	34.55	0.60	-	-	-	-	-	-	-	-	0.035	7.69E-04	-	-
TK-2	-	-	-	-	34.55	0.60	-	-	-	-	-	-	-	-	0.035	7.69E-04	-	-
TK-3	-	-	-	-	34.55	0.60	-	-	-	-	-	-	-	-	0.035	7.69E-04	-	-
VCU-1	3.16E-03	0.014	2.66E-03	0.012	1.74E-04	7.62E-04	1.43E-04	6.26E-04	2.41E-04	1.05E-03	2.41E-04	1.05E-03	2.41E-04	1.05E-03	-	-	-	-
LOAD	-	-	-	-	27.16	0.58	-	-	-	-	-	-	-	-	0.035	7.41E-06	-	-
FUG	-	-	-	-	5.02	21.98	-	-	-	-	-	-	-	-	3.64E-04	1.59E-03	-	-
Totals	22.80	99.88	118.01	516.90	272.07	621.15	0.62	2.72	2.67	11.72	2.67	11.72	0.71	3.11	9.97	43.05	-	-

[1]**Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but PM is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

Table 2-E: Requested Allowable Emissions

Unit & stack numbering must be consistent throughout the application package. Fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or $1.41E^{-4}$).

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-1	1.52	6.66	1.52	6.66	1.84	8.07	0.045	0.20	0.20	0.87	0.20	0.87	-	-	0.42	1.82	-	-
ENG-2	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38	-	-
ENG-3	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38	-	-
ENG-4	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38	-	-
ENG-5	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38	-	-
ENG-6	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38	-	-
ENG-7	1.52	6.66	1.52	6.66	1.84	8.07	0.045	0.20	0.20	0.87	0.20	0.87	-	-	0.42	1.82	-	-
ENG-8	2.76	12.07	3.79	16.58	4.29	18.79	0.075	0.33	0.33	1.44	0.33	1.44	0.33	1.44	-	-	-	-
ENG-9	2.76	12.07	3.79	16.58	4.29	18.79	0.075	0.33	0.33	1.44	0.33	1.44	0.33	1.44	-	-	-	-
ENG-10	2.76	12.07	3.79	16.58	4.29	18.79	0.075	0.33	0.33	1.44	0.33	1.44	0.33	1.44	-	-	-	-
Trailer-1	0.16	3.24E-03	0.15	2.98E-03	8.52E-03	1.70E-04	0.29	5.80E-03	9.13E-03	1.83E-04	9.13E-03	1.83E-04	9.13E-03	1.83E-04	-	-	-	-
GEN-1	0.80	3.50	1.60	6.99	0.78	3.43	0.013	0.056	0.029	0.13	0.029	0.13	0.029	0.13	-	-	-	-
Dehy-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RBL-1	0.20	0.86	0.16	0.72	0.011	0.047	8.85E-03	0.039	0.015	0.065	0.015	0.065	0.015	0.065	-	-	-	-
TK-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VCU-1	0.51	1.41	0.42	1.18	3.58	7.12	0.079	0.35	0.038	0.11	0.038	0.11	0.038	0.11	8.55E-04	3.79E-03	-	-
LOAD	-	-	-	-	27.16	0.58	-	-	-	-	-	-	-	-	0.035	7.41E-06	-	-
FUG	-	-	-	-	5.02	21.98	-	-	-	-	-	-	-	-	3.64E-04	1.59E-03	-	-
Totals	23.31	100.56	27.07	117.22	65.58	160.23	0.99	3.07	2.71	11.78	2.71	11.78	1.08	4.61	3.58	15.54	-	-

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

Table 2-F: Additional Emissions during Startup, Shutdown, and Routine Maintenance (SSM)

☐ This table is intentionally left blank since all emissions at this facility due to routine or predictable startup, shutdown, or scehduled maintenance are no higher than those listed in Table 2-E and a malfunction emission limit is not already permitted or requested. If you are required to report GHG emissions as described in Section 6a, include any GHG emissions during Startup, Shutdown, and/or Scheduled Maintenance (SSM) in Table 2-P. Provide an explanations of SSM emissions in Section 6 and 6a.

All applications for facilities that have emissions during routine our predictable startup, shutdown or scheduled maintenance (SSM)[1], including NOI applications, must include in this table the Maximum Emissions during routine or predictable startup, shutdown and scheduled maintenance (20.2.7 NMAC, 20.2.72.203.A.3 NMAC, 20.2.73.200.D.2 NMAC). In Section 6 and 6a, provide emissions calculations for all SSM emissions reported in this table. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (https://www.env.nm.gov/aqb/permit/aqb_pol.html) for more detailed instructions. Numbers shall be expressed to at least 2 decimal points (e.g. 0.41, 1.41, or 1.41E-4).

Unit No.	NOx		CO		VOC		SOx		PM[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
SSM/M	-	-	-	-	1,720.50	7.87	-	-	-	-	-	-	0.16	7.28E-04	68.87	0.37	-	-
Totals	-	-	-	-	1,720.50	7.87	-	-	-	-	-	-	0.16	7.28E-04	68.87	0.37	-	-

[1] For instance, if the short term steady-state Table 2-E emissions are 5 lb/hr and the SSM rate is 12 lb/hr, enter 7 lb/hr in this table. If the annual steady-state Table 2-E emissions are 21.9 TPY, and the number of scheduled SSM events result in annual emissions of 31.9 TPY, enter 10.0 TPY in the table below.

[2] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for PM unless PM is set equal to PM10 and PM2.5. Particulate matter (PM) is not subject to an ambient air quality standard, but it is a regulated air pollutant under PSD (20.2.74 NMAC) and Title V (20.2.70 NMAC).

Table 2-G: Stack Exit and Fugitive Emission Rates for Special Stacks

☑ I have elected to leave this table blank because this facility does not have any stacks/vents that split emissions from a single source or combine emissions from more than one source listed in table 2-A. Additionally, the emission rates of all stacks match the Requested allowable emission rates stated in Table 2-E.

Use this table to list stack emissions (requested allowable) from split and combined stacks. List Toxic Air Pollutants (TAPs) and Hazardous Air Pollutants (HAPs) in Table 2-I. List all fugitives that are associated with the normal, routine, and non-emergency operation of the facility. Unit and stack numbering must correspond throughout the application package. Refer to Table 2-E for instructions on use of the "-" symbol and on significant figures.

Stack No.	Serving Unit Number(s) from Table 2-A	NOx		CO		VOC		SOx		PM		PM10		PM2.5		☐ H_2S or ☐ Lead	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals:																	

Table 2-H: Stack Exit Conditions

Unit and stack numbering must correspond throughout the application package. Include the stack exit conditions for each unit that emits from a stack, including blowdown venting parameters and tank emissions. If the facility has multiple operating scenarios, complete a separate Table 2-H for each scenario and, for each, type scenario name here:

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H=Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter (ft)
						(acfs)	(dscfs)			
ENG-1	ENG-1	Vertical	No	25.50	847	136.37	N/A	N/A	97.67	1.33
ENG-2	ENG-2	Vertical	No	28.00	814	197.33	N/A	N/A	90.45	1.67
ENG-3	ENG-3	Vertical	No	28.00	814	197.33	N/A	N/A	90.45	1.67
ENG-4	ENG-4	Vertical	No	28.00	814	197.33	N/A	N/A	90.45	1.67
ENG-5	ENG-5	Vertical	No	28.00	814	197.33	N/A	N/A	90.45	1.67
ENG-6	ENG-6	Vertical	No	28.00	814	197.33	N/A	N/A	90.45	1.67
ENG-7	ENG-7	Vertical	No	25.50	847.00	136.37	N/A	N/A	97.67	1.33
ENG-8	ENG-8	Vertical	No	28.00	835	266.57	N/A	N/A	84.85	2.00
ENG-9	ENG-9	Vertical	No	28.00	835	266.57	N/A	N/A	84.85	2.00
ENG-10	ENG-10	Vertical	No	28.00	835	266.57	N/A	N/A	84.85	2.00
Trailer-1	Trailer-1	Vertical	No	6.99	782	13.72	N/A	N/A	9.83	1.33
GEN-1	GEN-1	Vertical	No	8.21	1382	21.01	N/A	N/A	240.74	0.33
RBL-1	RBL-1	Vertical	No	19.00	600	23.42	N/A	N/A	29.82	1.00
VCU-1	TK-1 through TK-3, Dehy-1	Vertical	No	12.50	1000	83.17	N/A	N/A	6.62	4.00

Table 2-I: Stack Exit and Fugitive Emission Rates for HAPs and TAPs

In the table below, report the Potential to Emit for each HAP from each regulated emission unit listed in Table 2-A, only if the entire facility emits the HAP at a rate greater than or equal to one (1) ton per year For each such emission unit, HAPs shall be reported to the nearest 0.1 tpy. Each facility-wide Individual HAP total and the facility-wide Total HAPs shall be the sum of all HAP sources calculated to the nearest 0.1 ton per year. Per 20.2.72.403.A.1 NMAC, facilities not exempt [see 20.2.72.402.C NMAC] from TAP permitting shall report each TAP that has an uncontrolled emission rate in excess of its pounds per hour screening level specified in 20.2.72.502 NMAC. TAPs shall be reported using one more significant figure than the number of significant figures shown in the pound per hour threshold corresponding to the substance. Use the HAP nomenclature as it appears in Section 112 (b) of the 1990 CAAA and the TAP nomenclature as it listed in 20.2.72.502 NMAC. Include tank-flashing emissions estimates of HAPs in this table. For each HAP or TAP listed, fill all cells in this table with the emission numbers or a "-" symbol. A "-" symbol indicates that emissions of this pollutant are not expected or the pollutant is emitted in a quantity less than the threshold amounts described above.

Stack No.	Unit No.(s)	Total HAPs		Formaldehyde ☑ HAP or ☐ TAP		Acetaldehyde ☑ HAP or ☐ TAP		Acrolein ☑ HAP or ☐ TAP		Toluene ☑ HAP or ☐ TAP		Benzene ☑ HAP or ☐ TAP		n-Hexane ☑ HAP or ☐ TAP		Xylene ☑ HAP or ☐ TAP	
		lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-1	ENG-1	0.42	1.82	0.21	0.93	0.11	0.47	0.067	0.29	5.29E-03	0.023	5.70E-03	0.025	0.014	0.063	2.39E-03	0.010
ENG-2	ENG-2	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013
ENG-3	ENG-3	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013
ENG-4	ENG-4	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013
ENG-5	ENG-5	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013
ENG-6	ENG-6	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013
ENG-7	ENG-7	0.42	1.82	0.21	0.93	0.11	0.47	0.067	0.29	5.29E-03	0.023	5.70E-03	0.025	0.014	0.063	2.39E-03	0.010
ENG-8	ENG-8	0.59	2.58	0.25	1.11	0.18	0.78	0.11	0.48	8.73E-03	0.038	9.42E-03	0.041	0.024	0.10	3.94E-03	0.017
ENG-9	ENG-9	0.59	2.58	0.25	1.11	0.18	0.78	0.11	0.48	8.73E-03	0.038	9.42E-03	0.041	0.024	0.10	3.94E-03	0.017
ENG-10	ENG-10	0.59	2.58	0.25	1.11	0.18	0.78	0.11	0.48	8.73E-03	0.038	9.42E-03	0.041	0.024	0.10	3.94E-03	0.017
Trailer-1	Trailer-1	1.15E-04	2.31E-06	1.18E-03	2.36E-05	7.67E-04	1.53E-05	9.25E-05	1.85E-06	4.09E-04	8.18E-06	9.33E-04	1.87E-05	-	-	-	-
GEN-1	GEN-1	0.25	1.10	0.19	0.85	0.031	0.13	0.019	0.083	1.50E-03	6.55E-03	1.61E-03	7.07E-03	4.03E-03	0.018	6.75E-04	2.95E-03
VCU-1	Dehy-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RBL-1	RBL-1	3.69E-03	0.016	1.47E-04	6.44E-04	-	-	-	-	6.67E-06	2.92E-05	4.12E-06	1.80E-05	3.53E-03	0.015	-	-
VCU-1	TK-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VCU-1	TK-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VCU-1	TK-3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VCU-1	VCU-1	0.75	0.96	-	-	-	-	-	-	0.21	0.25	0.38	0.39	0.10	0.23	0.043	0.080
N/A	LOAD	4.80	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-
N/A	FUG	0.91	3.97	-	-	-	-	-	-	0.30	1.33	0.17	0.74	0.13	0.55	0.28	1.23
N/A	SSM/M	68.87	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Totals:		80.90	29.79	2.83	12.38	1.46	6.40	0.90	3.93	0.59	1.89	0.63	1.46	0.43	1.64	0.35	1.45

Table 2-J: Fuel

Specify fuel characteristics and usage. Unit and stack numbering must correspond throughout the application package.

Unit No.	Fuel Type (low sulfur Diesel, ultra low sulfur diesel, Natural Gas, Coal, ...)	Fuel Source: purchased commercial, pipeline quality natural gas, residue gas, raw/field natural gas, process gas (e.g. SRU tail gas) or other	Specify Units				
			Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash
ENG-1	Natural Gas	Residue Gas	1,291.29 Btu/scf	7.93 Mscf/hr	69.46 MMscf/yr	N/A	N/A
ENG-2	Natural Gas	Residue Gas	1,291.29 Btu/scf	9.89 Mscf/hr	86.67 MMscf/yr	N/A	N/A
ENG-3	Natural Gas	Residue Gas	1,291.29 Btu/scf	9.89 Mscf/hr	86.67 MMscf/yr	N/A	N/A
ENG-4	Natural Gas	Residue Gas	1,291.29 Btu/scf	9.89 Mscf/hr	86.67 MMscf/yr	N/A	N/A
ENG-5	Natural Gas	Residue Gas	1,291.29 Btu/scf	9.89 Mscf/hr	86.67 MMscf/yr	N/A	N/A
ENG-6	Natural Gas	Residue Gas	1,291.29 Btu/scf	9.89 Mscf/hr	86.67 MMscf/yr	N/A	N/A
ENG-7	Natural Gas	Residue Gas	1,291.29 Btu/scf	7.93 Mscf/hr	69.46 MMscf/yr	N/A	N/A
ENG-8	Natural Gas	Residue Gas	1,291.29 Btu/scf	13.09 Mscf/hr	114.66 MMscf/yr	N/A	N/A
ENG-9	Natural Gas	Residue Gas	1,291.29 Btu/scf	13.09 Mscf/hr	114.66 MMscf/yr	N/A	N/A
ENG-10	Natural Gas	Residue Gas	1,291.29 Btu/scf	13.09 Mscf/hr	114.66 MMscf/yr	N/A	N/A
Trailer-1	Diesel	Diesel	137,000 Btu/gal	3.20 gal/hr	128.00 gal/yr	N/A	N/A
GEN-1	Natural Gas	Residue Gas	1,291.29 Btu/scf	2.24 Mscf/hr	19.65 MMscf/yr	N/A	N/A
RBL-1	Natural Gas	Residue Gas	1,291.29 Btu/scf	1.55 Mscf/hr	13.57 MMscf/yr	N/A	N/A
VCU-1	Natural Gas	Residue Gas	1,291.29 Btu/scf	25.00 scf/hr	0.22 MMscf/yr	N/A	N/A

Table 2-K: Liquid Data for Tanks Listed in Table 2-L

For each tank, list the liquid(s) to be stored in each tank. If it is expected that a tank may store a variety of hydrocarbon liquids, enter "mixed hydrocarbons" in the Composition column for that tank and enter the corresponding data of the most volatile liquid to be stored in the tank. If tank is to be used for storage of different materials, list all the materials in the "All Calculations" attachment, run the newest version of TANKS on each, and use the material with the highest emission rate to determine maximum uncontrolled and requested allowable emissions rate. The permit will specify the most volatile category of liquids that may be stored in each tank. Include appropriate tank-flashing modeling input data. Use additional sheets if necessary. Unit and stack numbering must correspond throughout the application package.

Tank No.	SCC Code	Material Name	Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb*mol)	Average Storage Conditions		Max Storage Conditions	
						Temperature (°F)	True Vapor Pressure (psia)	Temperature (°F)	True Vapor Pressure (psia)
TK-1	40400311	Condensate/Oily Waste Water	Mixed Hydrocarbons	7.80	22.81	75.78	12.88	95.00	9.08
TK-2	40400311	Condensate/Oily Waste Water	Mixed Hydrocarbons	7.80	22.81	75.78	12.88	95.00	9.08
TK-3	40400311	Condensate/Oily Waste Water	Mixed Hydrocarbons	7.80	22.81	75.78	12.88	95.00	9.08

Table 2-L: Tank Data

Include appropriate tank-flashing modeling input data. Use an addendum to this table for unlisted data categories. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.
See reference Table 2-L2. Note: 1.00 bbl = 10.159 M3 = 42.0 gal

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity		Diameter (M)	Vapor Space (M)	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn- overs (per year)
					(bbl)	(M^3)			Roof	Shell			
TK-1	Post 9/18/2015	Condensate/Oily Waste Water	N/A	Fixed Roof	300	47.70	3.66	3.11	Dark Green	Dark Green	Good	120,993.87	9.60
TK-2	Post 9/18/2015	Condensate/Oily Waste Water	N/A	Fixed Roof	300	47.70	3.66	3.11	Dark Green	Dark Green	Good	120993.87	9.60
Tk-3	TBD	Condensate/Oily Waste Water	N/A	Fixed Roof	300	47.70	3.66	3.11	Dark Green	Dark Green	Good	120993.87	9.60

Table 2-L2: Liquid Storage Tank Data Codes Reference Table

Roof Type	Seal Type, Welded Tank Seal Type		Seal Type, Riveted Tank Seal Type		Roof, Shell Color	Paint Condition
FX: Fixed Roof	Mechanical Shoe Seal	Liquid-mounted resilient seal	Vapor-mounted resilient seal	Seal Type	WH: White	Good
IF: Internal Floating Roof	A: Primary only	A: Primary only	A: Primary only	A: Mechanical shoe, primary only	AS: Aluminum (specular)	Poor
EF: External Floating Roof	B: Shoe-mounted secondary	B: Weather shield	B: Weather shield	B: Shoe-mounted secondary	AD: Aluminum (diffuse)	
P: Pressure	C: Rim-mounted secondary	C: Rim-mounted secondary	C: Rim-mounted secondary	C: Rim-mounted secondary	LG: Light Gray	
					MG: Medium Gray	
					BL: Black	
					OT: Other (specify)	

Note: 1.00 bbl = 0.159 M^3 = 42.0 gal

Table 2-M: Materials Processed and Produced (Use additional sheets as necessary.)

Material Processed				Material Produced			
Description	Chemical Composition	Phase (Gas, Liquid, or Solid)	Quantity (specify units)	Description	Chemical Composition	Phase	Quantity (specify units)
Natural Gas	Mixed Hydrocarbons	Gas	100 MMscf/day	Natural Gas	Mixed Hydrocarbons	Gas	100 MMscf/day
				Condensate	Condensate	Liquid	23.68 bbl/day

Table 2-N: CEM Equipment

Enter Continuous Emissions Measurement (CEM) Data in this table. If CEM data will be used as part of a federally enforceable permit condition, or used to satisfy the requirements of a state or federal regulation, include a copy of the CEM's manufacturer specification sheet in the Information Used to Determine Emissions attachment. Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Stack No.	Pollutant(s)	Manufacturer	Model No.	Serial No.	Sample Frequency	Averaging Time	Range	Sensitivity	Accuracy
N/A - There is no CEM Equipment at this facility									

Table 2-O: Parametric Emissions Measurement Equipment

Unit and stack numbering must correspond throughout the application package. Use additional sheets if necessary.

Unit No.	Parameter/Pollutant Measured	Location of Measurement	Unit of Measure	Acceptable Range	Frequency of Maintenance	Nature of Maintenance	Method of Recording	Averaging Time
N/A - There are no parametric measurement equipment at this facility.								

Table 2-P: Greenhouse Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC are required to complete this Table. Power plants, Title V major sources, and PSD major sources must report and calculate all GHG emissions for each unit. Applicants must report potential emission rates in short tons per year (see Section 6.a for assistance). Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table. For minor source facilities that are not power plants, are not Title V, or are not PSD, there are three options for reporting GHGs 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHG as a second separate unit; OR 3) check the following box.

☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

		CO_2 ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC ton/yr[2]									Total GHG Mass Basis ton/yr[4]	Total CO_2e ton/yr[5]
Unit No.	GWPs [1]	1	298	25	22,800	footnote 3										
ENG-1	mass GHG	5,246.37	9.89E-03	0.11	-	-									5,246.49	-
	CO_2e	5,246.37	2.95	2.72	-	-									-	5,252.04
ENG-2	mass GHG	6,546.05	0.012	0.14	-	-									6,546.20	-
	CO_2e	6,546.05	3.68	3.39	-	-									-	6,553.12
ENG-3	mass GHG	6,546.05	0.012	0.14	-	-									6,546.20	-
	CO_2e	6,546.05	3.68	3.39	-	-									-	6,553.12
ENG-4	mass GHG	6,546.05	0.012	0.14	-	-									6,546.20	-
	CO_2e	6,546.05	3.68	3.39	-	-									-	6,553.12
ENG-5	mass GHG	6,546.05	0.012	0.14	-	-									6,546.20	-
	CO_2e	6,546.05	3.68	3.39	-	-									-	6,553.12
ENG-6	mass GHG	6,546.05	0.012	0.14	-	-									6,546.20	-
	CO_2e	6,546.05	3.68	3.39	-	-									-	6,553.12
ENG-7	mass GHG	5,246.37	9.89E-03	0.11	-	-									5,246.49	-
	CO_2e	5,246.37	2.95	2.72	-	-									-	5,252.04
ENG-8	mass GHG	8,660.18	0.016	0.18	-	-									8,660.38	-
	CO_2e	8,660.18	4.86	4.49	-	-									-	8,669.53
ENG-9	mass GHG	8,660.18	0.016	0.18	-	-									8,660.38	-
	CO_2e	8,660.18	4.86	4.49	-	-									-	8,669.53
ENG-10	mass GHG	8,660.18	0.016	0.18	-	-									8,660.38	-
	CO_2e	8,660.18	4.86	4.49	-	-									-	8,669.53
Trailer-1	mass GHG	3.26	2.65E-05	1.32E-04	-	-									3.26	-
	CO_2e	3.26	7.88E-03	3.31E-03	-	-									-	3.27
GEN-1	mass GHG	1,483.80	2.80E-03	0.031	-	-									1,483.83	-
	CO_2e	1,483.80	0.83	0.77	-	-									-	1,485.40
Dehy-1	mass GHG	-	-	-	-	-									-	-
	CO_2e	-	-	-	-	-									-	-
RBL-1	mass GHG	1,024.72	1.93E-03	0.021	-	-									1,024.74	-
	CO_2e	1,024.72	0.58	0.53	-	-									-	1,025.83
TK-1	mass GHG	-	-	-	-	-									-	-
	CO_2e	-	-	-	-	-									-	-
TK-2	mass GHG	-	-	-	-	-									-	-
	CO2e	-	-	-	-	-									-	-
TK-3	mass GHG	-	-	-	-	-									-	-
	CO_2e	-	-	-	-	-									-	-
VCU-1	mass GHG	2,642.25	4.98E-03	0.055	-	-									2,642.31	-
	CO2e	2,642.25	1.48	1.37	-	-									-	2,645.10
LOAD	mass GHG	9.16E-03	-	6.21E-03	-	-									0.015	-
	CO_2e	9.16E-03	-	0.16	-	-									-	0.16

		CO_2 ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC ton/yr[2]									Total GHG Mass Basis ton/yr[4]	Total CO_2e ton/yr[5]
Unit No.	GWPs [1]	1	298	25	22,800	footnote 3										
FUG	mass GHG	26.81	-	37.45	-	-									64.26	-
	CO2e	26.81	-	936.20	-	-									-	963.01
SSM/M	mass GHG	0.15	-	17.65	-	-									17.80	-
	CO_2e	0.15	-	441.25	-	-									-	441.41
Total	mass GHG	74,384.54	0.14	56.65	-	-									74,441.33	-
	CO_2e	74,384.54	41.77	1,416.15	-	-									-	75,842.46

[1] GWP (Global Warming Potential): Applicants must use the most current GWPs codified in Table A-1 of 40 CFR part 98. GWPs are subject to change, therefore, applicants need to check 40 CFR 98 to confirm GWP values.

[2] For HFCs or PFCs describe the specific HFC or PFC compound and use a separate column for each individual compound.

[3] For each new compound, enter the appropriate GWP for each HFC or PFC compound from Table A-1 in 40 CFR 98.

[4] Green house gas emissions on a mass basis is the ton per year green house gas emission before adjustment with its GWP.

[5] CO_2e means Carbon Dioxide Equivalent and is calculated by multiplying the TPY mass emissions of the green house gas by its GWP.

Section 3

Application Summary

The **Application Summary** shall include a brief description of the facility and its process, the type of permit application, the applicable regulation (i.e. 20.2.72.200.A.X, or 20.2.73 NMAC) under which the application is being submitted, and any air quality permit numbers associated with this site. If this facility is to be collocated with another facility, provide details of the other facility including permit number(s). In case of a revision or modification to a facility, provide the lowest level regulatory citation (i.e. 20.2.72.219.B.1.d NMAC) under which the revision or modification is being requested. Also describe the proposed changes from the original permit, how the proposed modification will affect the facility's operations and emissions, de-bottlenecking impacts, and changes to the facility's major/minor status (both PSD & Title V).

The **Process Summary** shall include a brief description of the facility and its processes.

Startup, Shutdown, and Maintenance (SSM) routine or predictable emissions: Provide an overview of how SSM emissions are accounted for in this application. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions.

Targa Northern Delaware, LLC (Targa) is submitting this application for a significant revision to NSR Permit No. 7995-M3 pursuant to 20.2.72.219.D.(1)(a) NMAC for their Cadillac Compressor Station (Cadillac). The facility is located in Eddy County, New Mexico. With this application, Targa seeks to: add one (1) heater trailer (unit Trailer-1), one (1) air compressor generator (unit GEN-1), and one (1) vapor combustion unit (unit VCU-1); remove one (1) Caterpillar 3516 compressor engine (unit 18-0345), and one (1) 300 bbl storage tank (unit TK-4); replace two (2) Caterpillar 3516 compressor engines (units 18-0341 & 18-0342) with like-kind compressor engines (units ENG-1 & ENG-7, respectively), and five (5) Caterpillar 3606 compressor engines (units 18-0246, 18-0296, 18-0304, ENG-1, & ENG-2) with like-kind replacements (ENG-2 through ENG-6, respectively); and to modify all other units based on a recent inlet gas analysis (units ENG-8 through ENG-10, Dehy-1, RBL-1, TK-1 through TK-3, LOAD, FUG, SSM/M).

Low pressure field gas is gathered from various wells in the area and sent to an inlet separator. The gas from the separator is compressed by ten (10) natural gas driven compressor engines (units ENG-1 through ENG-10). Once the gas is compressed, it is treated using a glycol dehydration system (unit Dehy-1) to remove entrained water. The dry gas is then sent off site via pipeline for further processing.

The glycol dehydration unit incorporates three distinct sources of air emissions: (1) flash tank, (2) BTEX condenser still vent, and a (3) natural gas fired reboiler (unit RBL-1). Flash tank emissions are recycled to the inlet, however, during periods where the inlet pressure is too high, the emissions are routed to the storage tanks (units TK-1 through TK-3). The BTEX condenser still vent emissions are routed to the reboiler as fuel, however, during periods in which the reboiler does not call for fuel, the emission are routed to the tanks.

Liquids from the inlet separator, as well as from compressor interstage knockout are sent to three (3) atmospheric storage tanks (units TK-1 though TK-3). Flash, working ,and breathing emissions as well as dehy flash gas (during high inlet pressure periods) and BTEX condenser still vent (during periods in which the reboiler does not call for fuel) are controlled with a vapor combustion unit (unit VCU) with a 100% capture efficiency and a 98% DRE. While liquids may be transported offsite via pipeline, loading emissions (unit LOAD) are represented for the entire facility throughput for liquids along with associated haul road emissions (unit HAUL), the latter of which is exempt pursuant to 20.2.72.202.B.(5) NMAC.

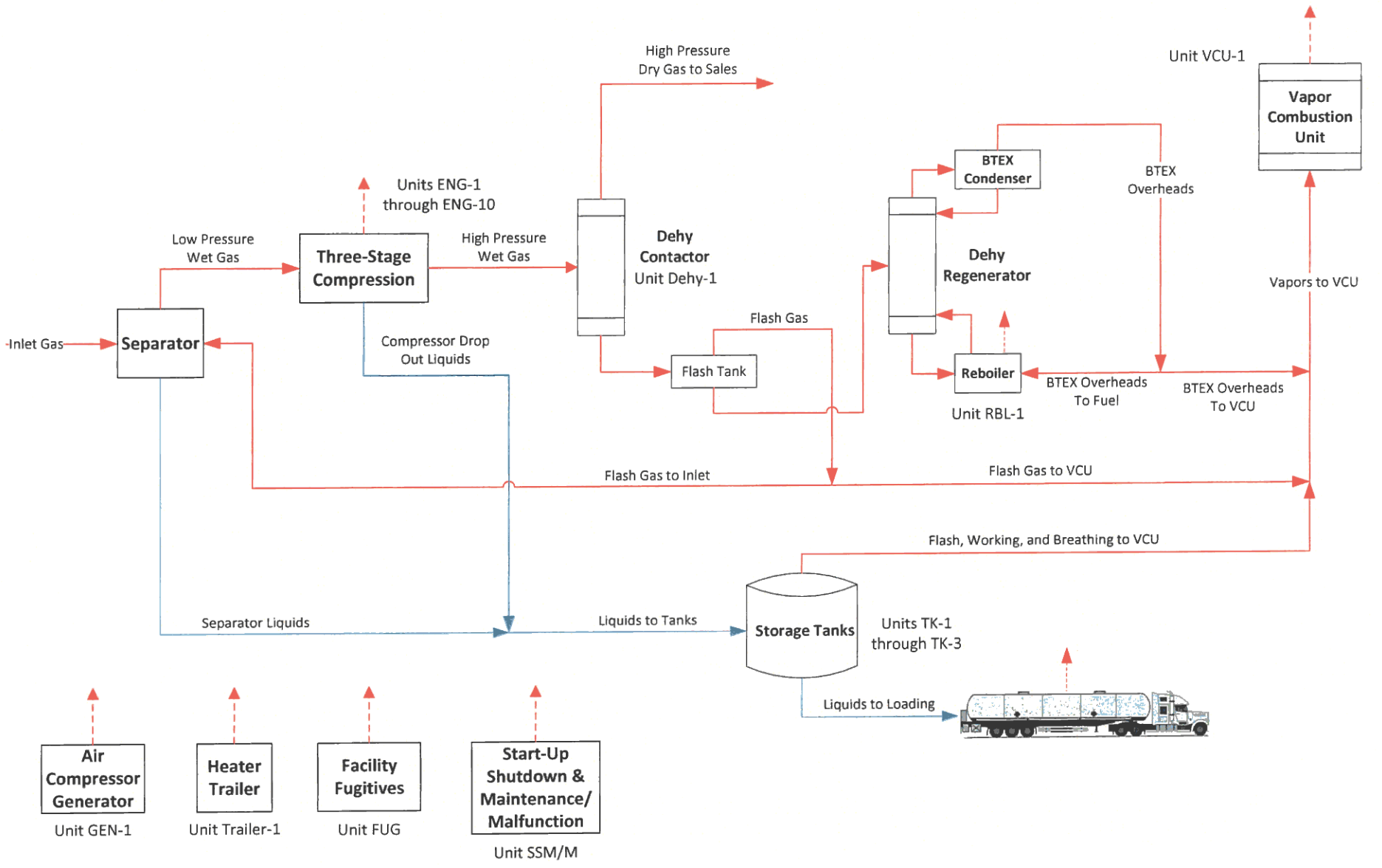
During the winter months, a diesel fired heater trailer (unit Trailer-1) is used to help start up cold engines. A natural gas fired air compressor generator (unit GEN-1) is also used for pneumatics. Startup, shutdown, maintenance /malfunction emissions (SSM/M) include compressor blowdowns, dehydrator blowdowns, filter coalescer blowdowns, scrubber blowdowns, pump blowdowns, reboiler maintenance, pigging, pipeline blowdowns, and tank maintenance. Scrubber blowdowns will not occur at the same time as any other SSM activity. Details regarding the number of events and gas volumes associated with these activities can be found in the provided calculations.

Section 4

Process Flow Sheet

A **process flow sheet** and/or block diagram indicating the individual equipment, all emission points and types of control applied to those points. The unit numbering system should be consistent throughout this application.

Process flow diagram is attached on the following page.



TARGA

Targa Northern Delaware, LLC

Legend:

- Emissions
- Gas
- Liquid

PROCESS FLOW DIAGRAM

Cadillac Compressor Station

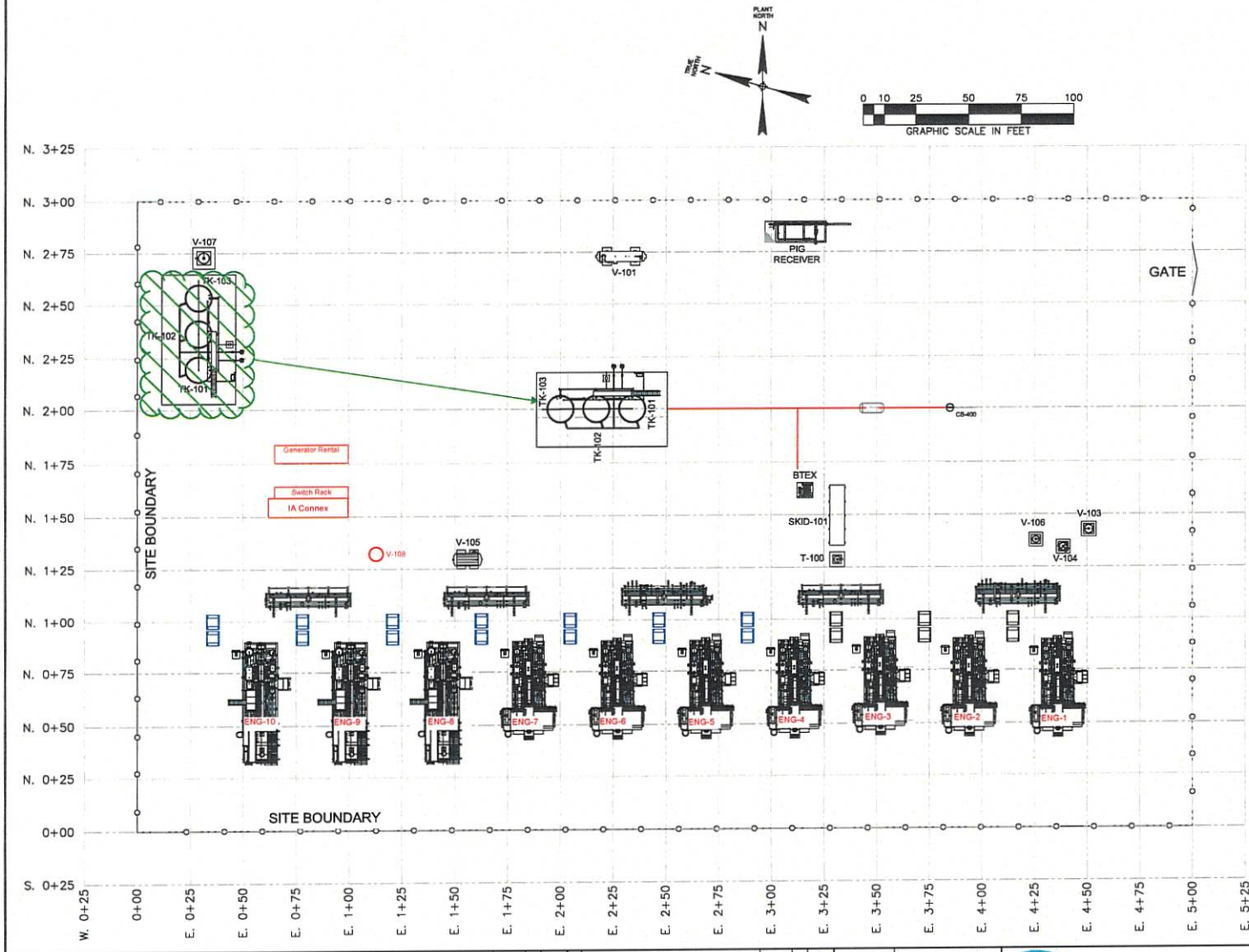
March 2023

Section 5

Plot Plan Drawn to Scale

A **plot plan drawn to scale** showing emissions points, roads, structures, tanks, and fences of property owned, leased, or under direct control of the applicant. This plot plan must clearly designate the restricted area as defined in UA1, Section 1-D.12. The unit numbering system should be consistent throughout this application.

A plot plan is attached on the following page.



EQUIPMENT LIST	
ITEM	DESCRIPTION
ENG-1	3516J COMPRESSOR
ENG-2	3606 COMPRESSOR
ENG-3	3606 COMPRESSOR
ENG-4	3606 COMPRESSOR
ENG-5	3606 COMPRESSOR
ENG-6	3606 COMPRESSOR
ENG-7	3516J COMPRESSOR
ENG-8	3608 COMPRESSOR
ENG-9	3608 COMPRESSOR
ENG-10	3608 COMPRESSOR
V-101	LP INLET SEPARATOR
V-103	3 PHASE SEPARATOR
V-104	BLOWCASE
V-105	3 PHASE SEPARATOR
V-106	FUEL GAS SCRUBBER
V-107	VENT SEPARATOR
T-100	GLYCOL CONTACTOR
SKID-101	GLYCOL REGENERATION UNIT
TK-101	CONDENSATE TANK
TK-102	CONDENSATE TANK
TK-103	CONDENSATE TANK

NOTES:

REV	DESCRIPTION	DATE	BY	APPROVED
E	REVISED – COMPRESSOR NUMBER AND SIZES	11/12/19	SSH	CSS
D	REVISED – REMOVED C-109 THRU C-115 ADD V-105	11/05/19	SSH	NL
C	REVISED – ADDED COMPRESSORS C-109 THRU C-115	09/30/19	SSH	CSS
B	REVISED – ADDED COMPRESSORS C-107/108	09/28/18	SSH	NL
A	PRELIMINARY	09/18/18	SSH	JJ

DRAWING REVISION

DRAWING NUMBER | DESCRIPTION | REFERENCE DRAWINGS

LUCID energy group

DRAWN BY	SSH
DATE	09/2018
CHECKED BY	JJ
DATE	09/2018
ENGINEERED BY	
DATE	
APPROVED BY	
DATE	
APPROVED BY	
DATE	

PLOT PLAN
CADILLAC COMPRESSOR STATION
EDDY COUNTY, NEW MEXICO

CLIENT NUMBER	SCALE	DRAWING NUMBER	REV
AFE #180083	GRAPHIC	1807-450	E

Section 6

All Calculations

Show all calculations used to determine both the hourly and annual controlled and uncontrolled emission rates. All calculations shall be performed keeping a minimum of three significant figures. Document the source of each emission factor used (if an emission rate is carried forward and not revised, then a statement to that effect is required). If identical units are being permitted and will be subject to the same operating conditions, submit calculations for only one unit and a note specifying what other units to which the calculations apply. All formulas and calculations used to calculate emissions must be submitted. The "Calculations" tab in the UA2 has been provided to allow calculations to be linked to the emissions tables. Add additional "Calc" tabs as needed. If the UA2 or other spread sheets are used, all calculation spread sheet(s) shall be submitted electronically in Microsoft Excel compatible format so that formulas and input values can be checked. Format all spread sheets and calculations such that the reviewer can follow the logic and verify the input values. Define all variables. If calculation spread sheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

Tank Flashing Calculations: The information provided to the AQB shall include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., NOI, permit, or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis. If Hysis is used, all relevant input parameters shall be reported, including separator pressure, gas throughput, and all other relevant parameters necessary for flashing calculation.

SSM Calculations: It is the applicant's responsibility to provide an estimate of SSM emissions or to provide justification for not doing so. In this Section, provide emissions calculations for Startup, Shutdown, and Routine Maintenance (SSM) emissions listed in the Section 2 SSM and/or Section 22 GHG Tables and the rational for why the others are reported as zero (or left blank in the SSM/GHG Tables). Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on calculating SSM emissions. If SSM emissions are greater than those reported in the Section 2, Requested Allowables Table, modeling may be required to ensure compliance with the standards whether the application is NSR or Title V. Refer to the Modeling Section of this application for more guidance on modeling requirements.

Glycol Dehydrator Calculations: The information provided to the AQB shall include the manufacturer's maximum design recirculation rate for the glycol pump. If GRI-Glycalc is used, the full input summary report shall be included as well as a copy of the gas analysis that was used.

Road Calculations: Calculate fugitive particulate emissions and enter haul road fugitives in Tables 2-A, 2-D and 2-E for:

1. If you transport raw material, process material and/or product into or out of or within the facility and have PER emissions greater than 0.5 tpy.
2. If you transport raw material, process material and/or product into or out of the facility more frequently than one round trip per day.

Significant Figures:

A. All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.

B. At least 5 significant figures shall be retained in all intermediate calculations.

C. In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

(1) If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;

(2) If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**

(3) If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.

(4) The final result of the calculation shall be expressed in the units of the standard.

Control Devices: In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

Caterpillar Engines (Units ENG-1 through ENG-10)
NO_x, CO, VOC, and formaldehyde emissions are calculated using manufacturer specifications. SO_2 emissions are based on a conservative fuel sulfur content estimated of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Particulate (PM, $PM_{2.5}$, and PM_{10}) and HAP emissions were calculated using AP-42 Table 3.2-2. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Heater Trailer (Unit Trailer-1)
NO_x, CO, VOC, and PM emission are calculated using NSPS IIII Tier IV Final Emission Factors. SO_2 and HAP emissions are calculated using AP-42 Table 3.3-1 and 3.3-2 emission factors. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Air Compressor Generator (Unit GEN-1)
NO_x, CO, and VOC emissions are calculated using a Certification of Conformity with the Clean Air Act dated 2021. SO_2 emissions are based on a conservative fuel sulfur content estimated of 2 gr S/100 scf and 100% conversion of elemental sulfur to SO_2. Particulate (PM, $PM_{2.5}$, and PM_{10}) and HAP emissions were calculated using AP-42 Table 3.2-2. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Glycol Dehydrator (Unit Dehy-1)
Glycol dehydration emissions are calculated using BR&E ProMax and an extended inlet gas analysis. VOC and HAP emissions from the regenerator are controlled with a BTEX condenser. Flash tank emission are normally recycled back to the inlet, however, during periods in which the inlet gas is too high, flash tank emissions are routed to the storage tanks. The BTEX condenser overheads are normally routed to the reboiler for fuel, however, when the reboiler does not call for fuel, the BTEX condenser overheads are routed to the storage tanks. The storage tanks are controlled by the VCU with a 100% capture efficiency and a 98% DRE.

Glycol Reboiler (Unit RBL-1)
NO_x, CO, VOC, PM, and HAPs emissions are calculated using AP-42 Table 1.4-1 through 1.4-3 emission factors. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Atmospheric Storage Tanks (Units TK-1 through TK-3)
Uncontrolled emissions are calculated using BR&E ProMax. Hourly loading emissions are based on the short-term worse case scenario. Annual emissions are based on the daily throughput of the facility. Flash, working, and breathing emissions are routed to the VCU with a 100% capture efficiency and a 98% DRE.

Vapor Combustion Unit (Unit VCU-1)
Emissions for NO_x, CO, and PM are calculated using AP-42 Tables 1.4-1 & 2 emission factors. Pilot SO_2 emissions are based on a conservative fuel sulfur content of 2 gr S/100 scf and a 100% conversion of elemental sulfur to SO_2. SO_2 emissions were calculated based on a 98% DRE, based on the manufacturer specification sheet, and conversion to SO_2. VOC, H_2S, and HAPs are calculated based on BR&E ProMax for the dehydrator flash tank, BTEX condenser overheads, and the flash, working, and breathing emissions from the atmospheric storage tanks. For the H2S, it was assumed 98% was combusted and 100% of the combusted H_2S was converted to SO_2. Greenhouse gas emissions are estimated using emission factors from 40 CFR 98 Subpart C Tables C-1 and C-2.

Loading Emissions (Unit LOAD)
Loading emissions are calculated using AP-42 Section 5.2 methodology. The maximum hourly throughput is based on the assumption that two trucks with a 180 bbl capacity can be loaded in an hour.

Fugitive Emissions (Unit FUG)

Fugitive emission calculations were completed using emission factors from Table 2-4 of EPA Protocol for Equipment Leak Emissions Estimates, 1995. Subcomponent counts for each subcomponent are based on estimated average component counts for each piece of equipment.

Haul Road Emissions (Unit HAUL)

Emissions are calculated using Equation 2 of AP-42 Section 13.2.2. Haul road emissions at this facility are exempt pursuant to 202.2.82.202.B.(5) NMAC. Emissions calculations are included in the application reference.

Startup, Shutdown, Maintenance/Malfunction (Unit SSM/M)

Emissions are based on various activities including, but not limited to, compressor blowdowns, dehydrator blowdowns, filter coalescer blowdowns, scrubber blowdowns, pump blowdowns, reboiler maintenance, pigging, pipeline downs, tank maintenance, surface coating, and abrasive blasting. All blowdowns are conservatively based on the inlet gas. Blowdown volumes were provided by Targa.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Emissions Summary

Uncontrolled Emissions																	
		NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		H_2S		Total HAPs	
Unit		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ENG-1	CAT 3516J 1380 hp Comp Eng	1.52	6.66	9.07	39.71	4.49	19.66	0.045	0.20	0.20	0.87	0.20	0.87	-	-	1.39	6.09
ENG-2	CAT 3606 1875 hp Comp Eng	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73
ENG-3	CAT 3606 1875 hp Comp Eng	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73
ENG-4	CAT 3606 1875 hp Comp Eng	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73
ENG-5	CAT 3606 1875 hp Comp Eng	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73
ENG-6	CAT 3606 1875 hp Comp Eng	2.07	9.05	10.33	45.26	4.68	20.51	0.057	0.25	0.25	1.09	0.25	1.09	-	-	1.08	4.73
ENG-7	CAT 3516J 1380 hp Comp Eng	1.52	6.66	9.07	39.71	4.49	19.66	0.045	0.20	0.20	0.87	0.20	0.87	-	-	1.39	6.09
ENG-8	CAT 3608 2500 hp Comp Eng	2.76	12.07	15.43	67.59	7.01	30.72	0.075	0.33	0.33	1.44	0.33	1.44	-	-	1.60	7.02
ENG-9	CAT 3608 2500 hp Comp Eng	2.76	12.07	15.43	67.59	7.01	30.72	0.075	0.33	0.33	1.44	0.33	1.44	-	-	1.60	7.02
ENG-10	CAT 3608 2500 hp Comp Eng	2.76	12.07	15.43	67.59	7.01	30.72	0.075	0.33	0.33	1.44	0.33	1.44	-	-	1.60	7.02
Trailer-1	Diesel-fired Heater Trailer	0.16	0.71	0.15	0.65	8.52E-03	0.037	2.05E-03	8.98E-03	9.13E-03	0.040	9.13E-03	0.040	-	-	3.79E-03	0.017
GEN-1	Air Compressor Generator	0.80	3.50	1.60	6.99	0.78	3.43	0.013	0.056	0.029	0.13	0.029	0.13	-	-	0.25	1.10
Dehy-1	Glycol Dehydrator	-	-	-	-	82.02	359.27	-	-	-	-	-	-	0.042	0.19	10.95	47.97
RBL-1	2.0 MMBtu/hr Reboiler	0.20	0.86	0.16	0.72	0.011	0.047	8.85E-03	0.039	0.015	0.065	0.015	0.065	-	-	3.69E-03	0.016
TK-1	Atmospheric Storage Tank	-	-	-	-	34.55	0.60	-	-	-	-	-	-	0.035	7.69E-04	1.47	0.022
TK-2	Atmospheric Storage Tank	-	-	-	-	34.55	0.60	-	-	-	-	-	-	0.035	7.69E-04	1.47	0.022
TK-3	Atmospheric Storage Tank	-	-	-	-	34.55	0.60	-	-	-	-	-	-	0.035	7.69E-04	1.47	0.022
VCU-1	Tank Vapor Combustion Unit	3.16E-03	0.014	2.66E-03	0.012	1.74E-04	7.62E-04	1.43E-04	6.26E-04	2.41E-04	1.05E-03	2.41E-04	1.05E-03	-	-	-	-
LOAD	Truck Loading	-	-	-	-	27.16	0.58	-	-	-	-	-	-	0.035	7.41E-06	4.80	0.10
FUG	Facility-wide Fugitive Emissions	-	-	-	-	5.02	21.98	-	-	-	-	-	-	3.64E-04	1.59E-03	0.91	3.97
SSM/M	Startup, Shutdown, Maintenance, and Malfunction	-	-	-	-	1,720.50	7.87	-	-	-	-	-	-	0.16	7.28E-04	68.87	0.37
Total		**22.80**	**99.88**	**118.01**	**516.90**	**1,992.57**	**629.02**	**0.62**	**2.72**	**2.67**	**11.72**	**2.67**	**11.72**	**0.34**	**0.19**	**103.18**	**110.50**

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Emissions Summary

Controlled Emissions																	
		NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		H_2S		Total HAPs	
Unit		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
ENG-1	CAT 3516J 1380 hp Comp Eng	1.52	6.66	1.52	6.66	1.84	8.07	0.045	0.20	0.20	0.87	0.20	0.87	-	-	0.42	1.82
ENG-2	CAT 3606 1875 hp Comp Eng	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38
ENG-3	CAT 3606 1875 hp Comp Eng	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38
ENG-4	CAT 3606 1875 hp Comp Eng	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38
ENG-5	CAT 3606 1875 hp Comp Eng	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38
ENG-6	CAT 3606 1875 hp Comp Eng	2.07	9.05	2.07	9.05	2.49	10.91	0.057	0.25	0.25	1.09	0.25	1.09	-	-	0.54	2.38
ENG-7	CAT 3516J 1380 hp Comp Eng	1.52	6.66	1.52	6.66	1.84	8.07	0.045	0.20	0.20	0.87	0.20	0.87	-	-	0.42	1.82
ENG-8	CAT 3608 2500 hp Comp Eng	2.76	12.07	3.79	16.58	4.29	18.79	0.075	0.33	0.33	1.44	0.33	1.44	-	-	0.59	2.58
ENG-9	CAT 3608 2500 hp Comp Eng	2.76	12.07	3.79	16.58	4.29	18.79	0.075	0.33	0.33	1.44	0.33	1.44	-	-	0.59	2.58
ENG-10	CAT 3608 2500 hp Comp Eng	2.76	12.07	3.79	16.58	4.29	18.79	0.075	0.33	0.33	1.44	0.33	1.44	-	-	0.59	2.58
Trailer-1	Diesel-fired Heater Trailer	0.16	3.24E-03	0.15	2.98E-03	8.52E-03	1.70E-04	0.29	5.80E-03	9.13E-03	1.83E-04	9.13E-03	1.83E-04	-	-	1.15E-04	2.31E-06
GEN-1	Air Compressor Generator	0.80	3.50	1.60	6.99	0.78	3.43	0.013	0.056	0.029	0.13	0.029	0.13	-	-	0.25	1.10
Dehy-1 [1]	Glycol Dehydrator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RBL-1	2.0 MMBtu/hr Reboiler	0.20	0.86	0.16	0.72	0.011	0.047	8.85E-03	0.039	0.015	0.065	0.015	0.065	-	-	3.69E-03	0.016
TK-1 [2]	Atmospheric Storage Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-2 [2]	Atmospheric Storage Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-3 [2]	Atmospheric Storage Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VCU-1	Tank Vapor Combustion Unit	0.51	1.41	0.42	1.18	3.58	7.12	0.079	0.35	0.038	0.11	0.038	0.11	8.55E-04	3.79E-03	0.75	0.96
LOAD	Truck Loading	-	-	-	-	27.16	0.58	-	-	-	-	-	-	0.035	7.41E-06	4.80	0.10
FUG	Facility-wide Fugitive Emissions	-	-	-	-	5.02	21.98	-	-	-	-	-	-	3.64E-04	1.59E-03	0.91	3.97
SSM/M	Startup, Shutdown, Maintenance, and Malfunction	-	-	-	-	1,720.50	7.87	-	-	-	-	-	-	0.16	7.28E-04	68.87	0.37
	Total	**23.31**	**100.56**	**27.07**	**117.22**	**1,786.08**	**168.10**	**0.99**	**3.07**	**2.71**	**11.78**	**2.71**	**11.78**	**0.20**	**6.12E-03**	**80.90**	**29.79**

Controlled HAP and GHG Emissions																			
		Total HAPs		Formaldehyde		Acetaldehyde		Acrolein		Toluene		Benzene		n-Hexane		Xylene		CO_2	N_2O	CH_4	CO_2e
Unit		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy	tpy	tpy	tpy
ENG-1	CAT 3606 1875 hp Comp Eng	0.42	1.82	0.21	0.93	0.11	0.47	0.067	0.29	5.29E-03	0.023	5.70E-03	0.025	0.014	0.063	2.39E-03	0.010	5,246.37	9.89E-03	0.11	5,252.04
ENG-2	CAT 3606 1875 hp Comp Eng	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013	6,546.05	0.012	0.14	6,553.12
ENG-3	CAT 3606 1875 hp Comp Eng	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013	6,546.05	0.012	0.14	6,553.12
ENG-4	CAT 3606 1875 hp Comp Eng	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013	6,546.05	0.012	0.14	6,553.12
ENG-5	CAT 3606 1875 hp Comp Eng	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013	6,546.05	0.012	0.14	6,553.12
ENG-6	CAT 3516J 1380 hp Comp Eng	0.54	2.38	0.29	1.27	0.14	0.59	0.083	0.36	6.60E-03	0.029	7.12E-03	0.031	0.018	0.079	2.98E-03	0.013	6,546.05	0.012	0.14	6,553.12
ENG-7	CAT 3608 2500 hp Comp Eng	0.42	1.82	0.21	0.93	0.11	0.47	0.067	0.29	5.29E-03	0.023	5.70E-03	0.025	0.014	0.063	2.39E-03	0.010	5,246.37	9.89E-03	0.11	5,252.04
ENG-8	CAT 3608 2500 hp Comp Eng	0.59	2.58	0.25	1.11	0.18	0.78	0.11	0.48	8.73E-03	0.038	9.42E-03	0.041	0.024	0.10	3.94E-03	0.017	8,660.18	0.016	0.18	8,669.53
ENG-9	CAT 3608 2500 hp Comp Eng	0.59	2.58	0.25	1.11	0.18	0.78	0.11	0.48	8.73E-03	0.038	9.42E-03	0.041	0.024	0.10	3.94E-03	0.017	8,660.18	0.016	0.18	8,669.53
ENG-10	Diesel-fired Heater Trailer	0.59	2.58	0.25	1.11	0.18	0.78	0.11	0.48	8.73E-03	0.038	9.42E-03	0.041	0.024	0.10	3.94E-03	0.017	8,660.18	0.016	0.18	8,669.53
Trailer-1	Diesel-fired Heater Trailer	1.15E-04	2.31E-06	1.18E-03	2.36E-05	7.67E-04	1.53E-05	9.25E-05	1.85E-06	4.09E-04	8.18E-06	9.33E-04	1.87E-05	-	-	-	-	3.26	2.65E-05	1.32E-04	3.27
GEN-1	Air Compressor Generator	0.25	1.10	0.19	0.85	0.031	0.13	0.019	0.083	1.50E-03	6.55E-03	1.61E-03	7.07E-03	4.03E-03	0.018	6.75E-04	2.95E-03	1,483.80	2.80E-03	0.031	1,485.40
Dehy-1 [1]	Glycol Dehydrator	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RBL-1	2.0 MMBtu/hr Reboiler	3.69E-03	0.016	1.47E-04	6.44E-04	-	-	-	-	6.67E-06	2.92E-05	4.12E-06	1.80E-05	3.53E-03	0.015	-	-	1,024.72	1.93E-03	0.021	1,025.83
TK-1 [2]	Atmospheric Storage Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-2 [2]	Atmospheric Storage Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
TK-3 [2]	Atmospheric Storage Tank	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
VCU-1	Tank Vapor Combustion Unit	0.75	0.96	-	-	-	-	-	-	0.21	0.25	0.38	0.39	0.10	0.23	0.043	0.080	2,642.25	4.98E-03	0.055	2,645.10
LOAD	Truck Loading	4.80	0.10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	9.16E-03	-	6.21E-03	0.16
FUG	Facility-wide Fugitive Emissions	0.91	3.97	-	-	-	-	-	-	0.30	1.33	0.17	0.74	0.13	0.55	0.28	1.23	26.81	-	37.45	963.01
SSM/M	Startup, Shutdown, Maintenance, and Malfunction	68.87	0.37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.15	-	17.65	441.41
	Total	**80.90**	**29.79**	**2.83**	**12.38**	**1.46**	**6.40**	**0.90**	**3.93**	**0.59**	**1.89**	**0.63**	**1.46**	**0.43**	**1.64**	**0.35**	**1.45**	**74,384.54**	**0.14**	**56.65**	**75,842.46**

* Indicates an hourly emission limit is not appropriate for this unit.

"-" Indicates emissions of this pollutant are not expected.

[1] Dehy flash gas and BTEX condenser overheads are represented at the VCU for a worst-case scenario. Emissions are routed with a 100% capture efficiency and a 98% DRE.

[2] Tank flash, working, and breathing emissiosn are routed to the VCU with a 100% capture efficiency and a 98% DRE.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Emissions Summary

Site-Wide		
Description	**Value**	**Unit**
Gas Throughput	100	MMSCFD
Annual Operating Hours	8,760	hr
Daily Operating Hours	24	hr
Site Location	32.149972	-104.048467
Site Elevation	2,944	ft MSL

Fuel Gas			
Parameter	**Value**	**Unit**	**Notes**
Fuel Heat Value	1,291.29	Btu/scf	Inlet Gas Analysis
Fuel Sulfur Content	2.0	gr S / 100 scf	Engineering Estimate

Engine Input Information			
Parameter	**Value**	**Unit**	**Notes**
Unit:	ENG-1 & ENG-7		
Description:	Caterpillar G3516J Compressor Engines		
Rating:	1380	hp	
Fuel Usage:	7929.7	scf/hr	
Unit:	ENG-2 through ENG-6		
Description:	Caterpillar G3606 Compressor Engines		
Rating:	1875	hp	
Fuel Usage:	9894.2	scf/hr	
Unit:	ENG-8 through ENG-10		
Description:	Caterpillar G3608 Compressor Engines		
Rating:	2500	hp	
Fuel Usage:	13089.6	scf/hr	

Atmospheric Storage Tanks			
Parameter	**Value**	**Unit**	**Notes**
Unit ID	TK-1 through TK-3		
Number of Tanks	3	units	Facility Design
Volume	300	bbl	Facility Design
Tank Diameter	12	ft	
Tank Height	15	ft	
Capture Efficiency	100%	%	Routed to VCU
Control Efficiency	N/A	%	
Hourly Throughput	307.79	bbl/hr	
Annual Throughput	8642.42	bbl/yr	

Vapor Combustion Unit			
Parameter	**Value**	**Unit**	**Notes**
Unit ID	VCU		
Controlled Units	TK-1 through TK-3, Dehy-1		
Pilot Flow Rate	25	scf/hr	Mfg. spec sheet
Capacity	0.052	MMscfd	Mfg. spec sheet
DRE	98%		Mfg. spec sheet

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Caterpillar G3516J Compressor Engines

Emission Unit:	ENG-1 & ENG-7
Source Description:	Caterpillar G3516J Compressor Engines
Manufacturer:	Caterpillar
Model:	G3516J
Type:	4SLB

Fuel Consumption

Site horsepower	1380 hp	Manufacturer Rating
Fuel heat value	1291.29 Btu/scf	Inlet Gas Analysis
Heat input	10.24 MMBtu/hr	Fuel consumption * Fuel heat value
Fuel consumption	7.93 Mscf/hr	Heat input / fuel heat value
Hours of Operation	8760 hrs/yr	
Annual fuel usage	69.46 MMscf/yr	8760 hrs/yr operation
Fuel Consumption	7420 Btu/hp-hr	Manufacturer Spec Sheet @ Max Rating

Emission Calculations

Uncontrolled	NO_x	CO	VOC	SO_2[2]	HCHO	PM_{10}[4]	$PM_{2.5}$[4]	Total HAPs[3]	Units	Notes
	0.50	2.98	1.05		0.39				g/hp-hr	Catalyst Data
Emission Factors						1.94E-02	1.94E-02		lb/MMBtu	AP-42 Table 3.2-2
				0.02					gr/scf	Engineering Estimate
	1.52	**9.07**	**4.49**	**0.045**	**1.19**	**0.20**	**0.20**	**1.39**	lb/hr	
	6.66	**39.71**	**19.66**	**0.20**	**5.20**	**0.87**	**0.87**	**6.09**	tpy	

Controlled	NO_x	CO	VOC[1]	SO_2[2]	HCHO	PM_{10}[4]	$PM_{2.5}$[4]	Total HAPs[3]	Units	Notes
	0.50	0.50	0.50		0.07				g/hp-hr	Catalyst Guarantee
Emission Factors	0%	83%	59%		82%					% Reduction
						1.94E-02	1.94E-02		lb/MMBtu	AP-42 Table 3.2-2
	1.52	**1.52**	**1.84**	**0.045**	**0.21**	**0.20**	**0.20**	**0.42**	lb/hr	
	6.66	**6.66**	**8.07**	**0.20**	**0.93**	**0.87**	**0.87**	**1.82**	tpy	

Acetaldehyde[5]	Acrolein[5]	n-Hexane[5]	Benzene[5]	Toluene[5]	E-Benzene[5]	Xylene[5]	Units	Notes
8.36E-03	5.14E-03	1.11E-03	4.40E-04	4.08E-04	3.97E-05	1.84E-04	lb/MMBtu	AP-42 Table 3.2-2
1.06E-02	6.51E-03	1.41E-03	5.57E-04	5.17E-04	5.03E-05	2.33E-04	lb/MMBtu	AP-42 Table 3.2-2 (adjusted)
0.11	**0.067**	**0.014**	**5.70E-03**	**5.29E-03**	**5.15E-04**	**2.39E-03**	lb/hr	
0.47	**0.29**	**0.063**	**0.025**	**0.023**	**2.25E-03**	**0.010**	tpy	

NOTES

[1] VOC emission factor is calculated by adding aldehyde emissions.

[2] SO_2 emissions are based on fuel consumption and fuel sulfur content of 2 grains of sulfur per 100 scf

2 gr S/100 scf * fuel scf/hr * 1 lb/7000 gr * 64 lb-mol SO_2/ 32 lb-mol S = lb/hr SO_2

[3] HAPs emissions factors are referenced from AP-42 Table 3.2-2 (except formaldehyde: provided in mfg spec sheet).

[4] Assumes PM (Filterable + Condensable) = PM_{10} = $PM_{2.5}$

[5] AP-42 Table 3.2-2 & adjusted for 1291.29 Btu/scf

Green House Gas Emissions	CO_2[6]	CH_4[6]	N_2O[6]	CO_2e[6]	Units	Notes
	53.06	1.10E-03	1.00E-04	-	kg/MMBtu	40 CFR 98 Subpart C Tables C-1 & C-2
Emission Factors	1	25	298	-	GWP	40 CFR 98 Subpart A Table A-1
	5246.37	**0.11**	**9.89E-03**	**-**	**tpy**	
	5246.37	**2.72**	**2.95**	**5252.04**	**tpy CO_2e**	

[6] N_2O, CH_4, and CO_2 tpy Emission Rate= EF (kg/MMBtu) * Fuel Usage (MMBtu/hr) * (2.20462 lb/kg) / (2000 lb/ton)

CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor + CH_4 Emission Rate*GWP Factor

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Caterpillar G3606 Compressor Engines

Emission Unit:	ENG-2 through ENG-6
Source Description:	Caterpillar G3606 Compressor Engines
Manufacturer:	Caterpillar
Model:	G3606
Type:	4SLB

Fuel Consumption

Site horsepower	1875 hp	Manufacturer Rating
Fuel heat value	1291.29 Btu/scf	Inlet Gas Analysis
Heat input	12.78 MMBtu/hr	Fuel consumption * Fuel heat value
Fuel consumption	9.89 Mscf/hr	Heat input / fuel heat value
Hours of Operation	8760 hrs/yr	
Annual fuel usage	86.67 MMscf/yr	8760 hrs/yr operation
Fuel Consumption	6814 Btu/hp-hr	Manufacturer Spec Sheet @ Max Rating

Emission Calculations

Uncontrolled	NO_x	CO	VOC	SO_2[2]	HCHO	PM_{10}[4]	$PM_{2.5}$[4]	Total HAPs[3]	Units	Notes
	0.50	2.50	0.90		0.20				g/hp-hr	Catalyst Data
Emission Factors						1.94E-02	1.94E-02		lb/MMBtu	AP-42 Table 3.2-3
				0.02					gr/scf	Engineering Estimate
	2.07	**10.33**	**4.68**	**0.057**	**0.83**	**0.25**	**0.25**	**1.08**	lb/hr	
	9.05	**45.26**	**20.51**	**0.25**	**3.62**	**1.09**	**1.09**	**4.73**	tpy	

Controlled	NO_x	CO	VOC[1]	SO_2[2]	HCHO	PM_{10}[4]	$PM_{2.5}$[4]	Total HAPs[3]	Units	Notes
	0.50	0.50	0.50		0.07				g/hp-hr	Catalyst Guarantee
Emission Factors	0%	80%	47%		65%					% Reduction
						1.94E-02	1.94E-02		lb/MMBtu	AP-42 Table 3.2-3
	2.07	**2.07**	**2.49**	**0.057**	**0.29**	**0.25**	**0.25**	**0.54**	lb/hr	
	9.05	**9.05**	**10.91**	**0.25**	**1.27**	**1.09**	**1.09**	**2.38**	tpy	

Acetaldehyde[5]	Acrolein[5]	n-Hexane[5]	Benzene[5]	Toluene[5]	E-Benzene[5]	Xylene[5]	Units	Notes
8.36E-03	5.14E-03	1.11E-03	4.40E-04	4.08E-04	3.97E-05	1.84E-04	lb/MMBtu	AP-42 Table 3.2-2
1.06E-02	6.51E-03	1.41E-03	5.57E-04	5.17E-04	5.03E-05	2.33E-04	lb/MMBtu	AP-42 Table 3.2-2 (adjusted)
0.14	**0.083**	**0.018**	**7.12E-03**	**6.60E-03**	**6.42E-04**	**2.98E-03**	lb/hr	
0.59	**0.36**	**0.079**	**0.031**	**0.029**	**2.81E-03**	**0.013**	tpy	

NOTES

[1] VOC emission factor is calculated by adding aldehyde emissions.

[2] SO_2 emissions are based on fuel consumption and fuel sulfur content of 2 grains of sulfur per 100 scf

2 gr S/100 scf * fuel scf/hr * 1 lb/7000 gr * 64 lb-mol SO_2/ 32 lb-mol S = lb/hr SO_2

[3] HAPs emissions factors are referenced from AP-42 Table 3.2-2 (except formaldehyde: provided in mfg spec sheet).

[4] Assumes PM (Filterable + Condensable) = PM_{10} = $PM_{2.5}$

[5] AP-42 Table 3.2-2 & adjusted for 1291.29 Btu/scf

Green House Gas Emissions	CO_2[6]	CH_4[6]	N_2O[6]	CO_2e[6]	Units	Notes
	53.06	1.10E-03	1.00E-04	-	kg/MMBtu	40 CFR 98 Subpart C Tables C-1 & C-2
Emission Factors	1	25	298	-	GWP	40 CFR 98 Subpart A Table A-1
	6546.05	**0.14**	**0.012**	**-**	**tpy**	
	6546.05	**3.39**	**3.68**	**6553.12**	**tpy CO_2e**	

[6] N_2O, CH_4, and CO_2 tpy Emission Rate= EF (kg/MMBtu) * Fuel Usage (MMBtu/hr) * (2.20462 lb/kg) / (2000 lb/ton)

CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor + CH_4 Emission Rate*GWP Factor

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Caterpillar G3608 Compressor Engines

Emission Unit:	ENG-8 through ENG-10
Source Description:	Caterpillar G3608 Compressor Engines
Manufacturer:	Caterpillar
Model:	G3608
Type:	4SLB

Fuel Consumption

Site horsepower	2500 hp	Manufacturer Rating
Fuel heat value	1291.29 Btu/scf	Inlet Gas Analysis
Heat input	16.90 MMBtu/hr	Fuel consumption * Fuel heat value
Fuel consumption	13.09 Mscf/hr	Heat input / fuel heat value
Hours of Operation	8760 hrs/yr	
Annual fuel usage	114.66 MMscf/yr	8760 hrs/yr operation
Fuel Consumption	6761 Btu/hp-hr	Manufacturer Spec Sheet @ Max Rating

Emission Calculations

Uncontrolled	NO_x	CO	VOC	SO_2[2]	HCHO	PM_{10}[4]	$PM_{2.5}$[4]	Total HAPs[3]	Units	Notes
Emission Factors	0.50	2.80	1.01		0.23				g/hp-hr	Catalyst Data
						1.94E-02	1.94E-02		lb/MMBtu	AP-42 Table 3.2-2
				0.02					gr/scf	Engineering Estimate
	2.76	**15.43**	**7.01**	**0.075**	**1.27**	**0.33**	**0.33**	**1.60**	lb/hr	
	12.07	**67.59**	**30.72**	**0.33**	**5.55**	**1.44**	**1.44**	**7.02**	tpy	

Controlled	NO_x	CO	VOC[1]	SO_2[2]	HCHO	PM_{10}[4]	$PM_{2.5}$[4]	Total HAPs[3]	Units	Notes
Emission Factors	0.50	0.69	0.70		0.046				g/hp-hr	Catalyst Guarantee
	0%	75%	39%		80%					% Reduction
						1.94E-02	1.94E-02		lb/MMBtu	AP-42 Table 3.2-2
	2.76	**3.79**	**4.29**	**0.075**	**0.25**	**0.33**	**0.33**	**0.59**	lb/hr	
	12.07	**16.58**	**18.79**	**0.33**	**1.11**	**1.44**	**1.44**	**2.58**	tpy	

Acetaldehyde[5]	Acrolein[5]	n-Hexane[5]	Benzene[5]	Toluene[5]	E-Benzene[5]	Xylene[5]	Units	Notes
8.36E-03	5.14E-03	1.11E-03	4.40E-04	4.08E-04	3.97E-05	1.84E-04	lb/MMBtu	AP-42 Table 3.2-2
1.06E-02	6.51E-03	1.41E-03	5.57E-04	5.17E-04	5.03E-05	2.33E-04	lb/MMBtu	AP-42 Table 3.2-2 (adjusted)
0.18	**0.11**	**0.024**	**9.42E-03**	**8.73E-03**	**8.50E-04**	**3.94E-03**	lb/hr	
0.78	**0.48**	**0.10**	**0.041**	**0.038**	**3.72E-03**	**0.017**	tpy	

NOTES

[1] VOC emission factor is calculated by adding aldehyde emissions.

[2] SO_2 emissions are based on fuel consumption and fuel sulfur content of 2 grains of sulfur per 100 scf

2 gr S/100 scf * fuel scf/hr * 1 lb/7000 gr * 64 lb-mol SO_2/ 32 lb-mol S = lb/hr SO_2

[3] HAPs emissions factors are referenced from AP-42 Table 3.2-2 (except formaldehyde: provided in mfg spec sheet).

[4] Assumes PM (Filterable + Condensable) = PM_{10} = $PM_{2.5}$

[5] AP-42 Table 3.2-2 & adjusted for 1291.29 Btu/scf

Green House Gas Emissions	CO_2[6]	CH_4[6]	N_2O[6]	CO_2e[6]	Units	Notes
Emission Factors	53.06	1.10E-03	1.00E-04	-	kg/MMBtu	40 CFR 98 Subpart C Tables C-1 & C-2
	1	25	298	-	GWP	40 CFR 98 Subpart A Table A-1
	8660.18	**0.18**	**0.016**	**-**	**tpy**	
	8660.18	**4.49**	**4.86**	**8669.53**	**tpy CO_2e**	

[6] N_2O, CH_4, and CO_2 tpy Emission Rate= EF (kg/MMBtu) * Fuel Usage (MMBtu/hr) * (2.20462 lb/kg) / (2000 lb/ton)

CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor + CH_4 Emission Rate*GWP Factor

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Heater Trailer Emission

Unit:	Trailer-1		
Description:	Diesel-fired Heater Trailer		
Rating:	10.29	kW	
Horsepower:	13.8	hp	Manufacturer Specs
Operating hours:	40	hrs/year	
Fuel consumption:	3.2	gal/hr	
Fuel consumption:	0.43	scf/hr	
Heating rate:	1.00	MMBtu/hr	Manufacturer Specs

Uncontrolled	NO_x[1]	CO	VOC[1]	SO_2[2]	PM	HAP[1]	Unit	Notes
Emission Factors	5.32	4.9	0.28		0.3		g/bhp-hr	NSPS IIII Tier IV Final Emission Factors
				2.05E-03			lb/hp-hr	AP-42 Table 3.3-1
						3.79E-03	lb/MMBtu	AP-42 Table 3.3-2
Emissions	**0.16**	**0.15**	**8.52E-03**	**2.05E-03**	**9.13E-03**	**3.79E-03**	**lb/hr**	
	0.71	**0.65**	**0.037**	**8.98E-03**	**0.040**	**0.017**	**tpy**	Emissions based on 8760 hr/yr

Controlled	NO_x[1]	CO	VOC[1]	SO_2[2]	PM	HAP[1]	Unit	Notes
Emission Factors	5.32	4.9	0.28		0.3		g/bhp-hr	NSPS IIII Tier IV Final Emission Factors
				0.29			lb/MMBtu	AP-42 Table 3.3-1
						3.79E-03	lb/MMBtu	AP-42 Table 3.3-2
Emissions	**0.16**	**0.15**	**8.52E-03**	**0.29**	**9.13E-03**	**1.15E-04**	**lb/hr**	
	3.24E-03	**2.98E-03**	**1.70E-04**	**5.80E-03**	**1.83E-04**	**2.31E-06**	**lb/hr**	Emissions based on 40 hr/yr

Formaldehyde	Acetaldehyde	Acrolein	Benzene	Toluene	Unit	Notes
1.18E-03	7.67E-04	9.25E-05	9.33E-04	4.09E-04	lb/MMBtu	AP-42 Table 3.3-2
1.18E-03	**7.67E-04**	**9.25E-05**	**9.33E-04**	**4.09E-04**	**lb/hr**	
2.36E-05	**1.53E-05**	**1.85E-06**	**1.87E-05**	**8.18E-06**	**tpy**	

Notes

[1] NSPS IIII Tier IV has a combined NO_x and VOC emission factor of 5.6 g/hp-hr. Per CARB Emission Factors for CI Diesel Engines, when the non-methane hydrocarbon (NMHC) and nitrogen oxide (NO_x) emission factor is combined, assume a breakdown of 5% and 95%, respectivley.

[2] SO_2 and total HAPs were calculated using AP-42 emissions factors for Diesel Industrial Engines (Table 3.3-1 & 3.3-2).

Green House Gas Emissions	CO_2[3]	CH_4[3]	N_2O[3]	CO_2e[3]	Units	Notes
Emission Factors	73.96	3.00E-03	6.00E-04	-	kg/MMBtu	40 CFR 98 Subpart C Tables C-1 & C-2
	1	25	298	-	GWP	40 CFR 98 Subpart A Table A-1
	3.26	**1.32E-04**	**2.65E-05**	**-**	**tpy**	
	3.26	**3.31E-03**	**7.88E-03**	**3.27**	**tpy CO_2e**	

[3] N_2O, CH_4, and CO_2 tpy Emission Rate= EF (kg/MMBtu) * Fuel Usage (MMBtu/hr) * (2.20462 lb/kg) / (2000 lb/ton)

CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor + CH_4 Emission Rate*GWP Factor

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Air Compressor Generator

Emission Unit:	GEN-1
Source Description:	Natural Gas Fired Generator
Manufacturer:	PSI
Model:	14.6LTCAC
Type:	4 Stroke Lean Burn

Fuel Consumption

Site horsepower	362 hp	Maximum horsepower of generator
Fuel heat value	1291.29 Btu/scf	Inlet Gas Analysis
Heat input	2.90 MMBtu/hr	Fuel consumption * Fuel heat value
Fuel consumption	2.24 Mscf/hr	Heat input / fuel heat value
Hours of Operation	8760 hrs/yr	
Annual fuel usage	19.65 MMscf/yr	8760 hrs/yr operation
Fuel Consumption	8000 Btu/hp-hr	Engineering Estimate

Uncontrolled

NO_x[1]	CO[1]	VOC[1]	SO_2[2]	HCHO	PM_{10}[4]	$PM_{2.5}$[4]	Total HAPs[3]		
1.00	2.00	0.70						g/hp-hr	Table 1 to Subpart JJJJ of Part 60, Title 40
				6.68E-02	9.99E-03	9.99E-03		lb/MMBtu	AP-42 Table 3.2-2
0.80	**1.60**	**0.78**	**0.013**	**0.19**	**0.029**	**0.029**	**0.25**	lb/hr	
3.50	**6.99**	**3.43**	**0.056**	**0.85**	**0.13**	**0.13**	**1.10**	tpy	

Acetaldehyde[5]	Acrolein[5]	Benzene[5]	E-Benzene[5]	n-Hexane[5]	Toluene[5]	Xylene[5]	
1.06E-02	6.51E-03	5.57E-04	5.03E-05	1.39E-03	5.17E-04	2.33E-04	lb/MMBtu
0.031	**0.019**	**1.61E-03**	**1.46E-04**	**4.03E-03**	**1.50E-03**	**6.75E-04**	lb/hr
0.13	**0.08**	**7.07E-03**	**6.38E-04**	**0.02**	**6.55E-03**	**2.95E-03**	tpy

Controlled

NO_x[1]	CO[1]	VOC[1]	SO_2[2]	HCHO	PM_{10}[4]	$PM_{2.5}$[4]	Total HAPs[3]		
1.00	2.00	0.70						g/hp-hr	Table 1 to Subpart JJJJ of Part 60, Title 40
0.0%	0%	0%							% Reduction
				6.68E-02	9.99E-03	9.99E-03		lb/MMBtu	AP-42 Table 3.2-2
0.80	**1.60**	**0.78**	**0.013**	**0.19**	**0.029**	**0.029**	**0.25**	lb/hr	
3.50	**6.99**	**3.43**	**0.056**	**0.85**	**0.13**	**0.13**	**1.10**	tpy	

NOTES

[1] NO_x, CO, and VOC emission factors are referenced from Table 1 to Subpart JJJJ of Part 60, Title 40.

[2] SO_2 emissions are based on fuel consumption and fuel sulfur content of 2 grains of sulfur per 100 scf

2 gr S/100 scf * fuel scf/hr * 1 lb/7000 gr * 64 lb-mol SO_2/ 32 lb-mol S = lb/hr SO_2

[3] HAPs emissions factors are referenced from AP-42 Table 3.2-2.

[4] Assumes PM (Filterable + Condensable) = PM_{10} = $PM_{2.5}$

[5] AP-42 Table 3.2-2 & adjusted for 1291.3 Btu/scf

Green House Gas Emissions	CO_2[6]	CH_4[6]	N_2O[6]	CO_2e[6]	Units	Notes
Emission Factors	53.06	1.10E-03	1.00E-04	-	kg/MMBtu	40 CFR 98 Subpart C Tables C-1 & C-2
	1	25	298	-	GWP	40 CFR 98 Subpart A Table A-1
	1,483.80	**0.031**	**2.80E-03**	-	**tpy**	
	1,483.80	**0.77**	**0.83**	**1,485.40**	**tpy CO_2e**	

[6] N_2O, CH_4, and CO_2 tpy Emission Rate= EF (kg/MMBtu) * Fuel Usage (MMBtu/hr) * (2.20462 lb/kg) / (2000 lb/ton)

CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor + CH_4 Emission Rate*GWP Factor

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Glycol Dehydrator

Emission Unit: Dehy-1
Source Description: Glycol Dehydrator
Operating Hours: 8,760 hrs/yr
Throughput: 100 MMSCFD

Uncontrolled [1]	VOC		H_2S		Total HAP		Hexane		Benzene		Toluene		Ethylbenzene		Xylene	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Uncontrolled Flash Tank Overheads	44.83	196.34	0.01	0.06	2.06	9.03	1.27	5.58	0.35	1.53	0.28	1.24	0.015	0.07	0.14	0.62
Uncontrolled Condenser Overheads	37.20	162.92	0.03	0.13	8.89	38.93	1.40	6.13	4.09	17.93	2.57	11.24	0.08	0.35	0.75	3.28
Uncontrolled Emissions Per Unit	**82.02**	**359.27**	**0.04**	**0.19**	**10.95**	**47.97**	**2.67**	**11.70**	**4.44**	**19.47**	**2.85**	**12.48**	**0.10**	**0.42**	**0.89**	**3.90**

Controlled [2]	VOC		H_2S		Total HAP		Hexane		Benzene		Toluene		Ethylbenzene		Xylene	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Controlled Flash Tank Overheads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Controlled Condenser Overheads	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Controlled Emissions Per Unit	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**

[1] Emissions estimated using BR&E ProMax.

[2] Flash tank emissions are normally routed recycled to the inlet, however, if the inlet pressure is too high, the emissions are sent to the tanks. The BTEX condenser overheads are normally routed to the reboiler as fuel, however, when the reboiler doesn't call for fuel, the emission are sent to the tanks. The tanks are controlled by a vapor combustion unit (VCU) with a 100% capture efficiency and a 98% DRE. As a worst case scenario, emissions from the flash tank and the BTEX condenser overheads are represented at the VCU.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Dehy Reboiler

Unit:	RBL-1
Heat Input:	2.0 MMBTU/hr
Fuel Heat Value:	1291.29 BTU/scf
Fuel Sulfur Content:	2 gr/100 scf
Operating Hours:	8,760 hours/yr
Fuel Usage:	1548.84 scf/hr

Criteria Pollutant Emission Rates per Unit							
	NO_x	CO	VOC	SO_2[1]	PM[2]	Units	Notes
Emission Factors	100	84	5.5	-	7.6	lb/MMscf	AP-42 Table 1.4-1 & 2
	126.60	106.34	6.96	-	9.62	lb/MMscf	Adjusted EF, per footnote a in Tables 1.4-1 and 1.4-2
	-	-	-	2	-	gr / 100 scf	
Emissions	0.196	0.165	0.01	8.85E-03	0.01	lb/hr[3]	
	0.86	0.72	0.047	0.04	0.065	tons/year[4]	

HAP Emission Rates per Unit							
	n-Hexane	Benzene	Toluene	HCHO	Total HAPs[5]	Units	Notes
Emission Factors	1.8E+00	2.1E-03	3.4E-03	7.5E-02	-	lb/MMscf	AP-42 Table 1.4-3
	2.28E+00	2.66E-03	4.30E-03	9.49E-02	-	lb/MMscf	Adjusted EF, per footnote a in Table 1.4-3
Emissions	3.53E-03	4.12E-06	6.67E-06	1.47E-04	3.69E-03	lb/hr[3]	
	0.02	1.80E-05	2.92E-05	6.44E-04	0.02	tons/year[4]	

Notes:

[1] SO_2 emissions based on fuel sulfur (gr/100 scf)

[2] Assumes $PM_{10} = PM_{2.5}$

[3] lb/hr emissions calculated using the following methods:
Criteria and HAPs lb/hr = EF (lb/MMscf) * Rating (MMBtu/hr) / Heat value (Btu/scf)

[4] For all pollutant calculations, tons/year = lb/hr * Operating hours * 1ton/2000lb

[5] Total HAP emissions are the sum of all individual HAPs calculated.

Green House Gas Emissions	CO_2[6]	CH_4[6]	N_2O[6]	CO_2e[6]	Units	Notes
Emission Factors	53.06	1.10E-03	1.00E-04	-	kg/MMBtu	40 CFR 98 Subpart C Tables C-1 & C-2
	1	25	298	-	GWP	40 CFR 98 Subpart A Table A-1
	1024.72	**0.02**	**1.93E-03**	-	**tpy**	
	1024.72	**0.53**	**0.58**	**1025.83**	**tpy CO_2e**	

[6] N_2O, CH_4, and CO_2 tpy Emission Rate= EF (kg/MMBtu) * Fuel Usage (MMBtu/hr) * (2.20462 lb/kg) / (2000 lb/ton)
CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor + CH_4 Emission Rate*GWP Factor

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Atmospheric Storage Tanks

Emission unit number(s): TK-1 through TK-3
Source description: 300 bbl Condensate Tanks

Annual Operating Hours: 8,760
Number of Tanks: 3
Capacity of Tanks: 300 bbl 6961.291391
Hourly Throughout: 307.79 bbl/hr
Daily Throughput: 23.68 bbl/d
Annual Throughput: 8,642.42 bbl/yr

Condensate Storage Tank Emissions[1,2]

Component	Uncontrolled Emissions (hourly basis)			Uncontrolled Emissions (annual basis)		
	Flash (lb/hr)	Working and Breathing (lb/hr)	Total per Tank (lb/hr)	Flash (lb/hr)	Working and Breathing (lb/hr)	Total Emissions Per Tank (tpy)
H2S	-	1.04E-01	3.48E-02	-	5.27E-04	7.69E-04
Nitrogen	-	-	-	-	-	-
Carbon Dioxide	-	2.07E+00	6.90E-01	-	6.51E-03	9.51E-03
Methane	-	1.38E+00	4.60E-01	-	4.42E-03	6.45E-03
Ethane	-	1.20E+01	3.99E+00	-	5.90E-02	8.61E-02
Propane	-	1.96E+01	6.53E+00	-	9.53E-02	1.39E-01
i-Butane	-	4.58E+00	1.53E+00	-	2.07E-02	3.03E-02
n-Butane	-	1.78E+01	5.95E+00	-	7.77E-02	1.13E-01
i-Pentane	-	6.56E+00	2.19E+00	-	2.62E-02	3.83E-02
n-Pentane	-	8.69E+00	2.90E+00	-	3.37E-02	4.91E-02
2,2-Dimethylbutane	-	1.48E-01	4.92E-02	-	5.59E-04	8.16E-04
Cyclopentane	-	2.92E+00	9.73E-01	-	1.09E-02	1.59E-02
2-Methylpentane	-	2.47E+00	8.25E-01	-	9.04E-03	1.32E-02
3-Methylpentane	-	1.57E+00	5.24E-01	-	5.67E-03	8.28E-03
n-Hexane	-	3.46E+00	1.15E+00	-	1.21E-02	1.76E-02
Methylcyclopentane	-	4.89E+00	1.63E+00	-	1.74E-02	2.54E-02
Benzene	-	1.05E+01	3.51E+00	-	3.60E-02	5.25E-02
Cyclohexane	-	4.64E+00	1.55E+00	-	1.59E-02	2.32E-02
2-Methylhexane	-	4.74E-01	1.58E-01	-	1.58E-03	2.30E-03
3-Methylhexane	-	7.51E-01	2.50E-01	-	2.45E-03	3.58E-03
1,1-Dimethylcyclopentane	-	6.91E-01	2.30E-01	-	2.31E-03	3.38E-03
Heptane	-	1.20E+00	3.99E-01	-	3.80E-03	5.55E-03
Methylcyclohexane	-	3.50E+00	1.17E+00	-	1.12E-02	1.64E-02
1,1,2-Trimethylcyclopentane	-	-	-	-	-	-
Toluene	-	6.21E+00	2.07E+00	-	1.92E-02	2.80E-02
2-Methylheptane	-	2.20E-01	7.32E-02	-	6.53E-04	9.53E-04
3-Methylheptane	-	-	-	-	-	-
2,5-Dimethylhexane	-	2.16E-02	7.20E-03	-	6.64E-05	9.70E-05
Octane	-	6.52E-01	2.17E-01	-	1.87E-03	2.73E-03
Ethylbenzene	-	1.81E-01	6.03E-02	-	5.01E-04	7.31E-04
p-Xylene	-	1.38E+00	4.60E-01	-	3.86E-03	5.63E-03
o-Xylene	-	3.16E-01	1.05E-01	-	8.74E-04	1.28E-03
Nonane	-	1.24E-01	4.14E-02	-	3.23E-04	4.71E-04
Decane	-	2.61E-02	8.70E-03	-	6.17E-05	9.01E-05
Undecane	-	-	-	-	-	-
Water	-	4.27E+00	1.42E+00	-	1.16E-02	1.69E-02
TEG	-	1.86E-10	6.21E-11	-	9.70E-14	1.42E-13
VOC	**-**	**103.64**	**34.55**	**-**	**0.41**	**0.60**
Total HAPS	**-**	**4.40**	**1.47**	**-**	**0.015**	**0.022**
Total H_2S	**-**	**0.10**	**0.03**	**-**	**5.267E-04**	**7.69E-04**

[1] Uncontrolled emissions are calculated using BR&E ProMax. Hourly loading emissions are based on the short-term worse case scenario. Annual emissions are based on the daily throughput of the facility.
[2] Emissions are sent to the combustor (VCU) with a 100% capture efficiency and a 98% DRE.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Vapor Combustion Unit

Emission Unit: VCU
Source Description: Tank Vapor Combustion Unit
Destruction Efficiency: 98%
Operating Hours (hr/yr): 8760

Input Information				
Activity	Parameters	Value	Unit	Notes:
Pilot	Hourly Volume Flow Rate	25	scf/hr	Manufacturer specificaiton sheet
	Natural Gas Heat Value	1291.29	Btu/scf	Inlet Gas Analysis
	Annual Volume Flow Rate	0.22	MMscf/yr	scf/hr * 8760 hr/yr / 10^6
	Hourly Heat Rate	0.032	MMBtu/hr	scf/hr * Btu/scf / 10^6
	Annual Heat Rate	282.79	MMBtu/yr	MMBtu/hr * 8760 hr/yr
Process Emission Stream	Hourly Tank Flow Rate	903.14	scf/hr	Worst-case flashing losses and Short-term working losses streams from ProMax
	Hourly Dehy Flow Rate	1542.35	scf/hr	Flash gas and Condenser Overhead streams from ProMax.
	Total Hourly Volume Flow Rate	2445.48	scf/hr	
	Annual Tank Flow Rate	0.032	MMscf/yr	Flash, working, and breathing streams from ProMax.
	Annual Dehy Flow Rate	13.51	MMscf/yr	Flash gas and Condenser Overhead streams from ProMax.
	Total Annual Volume Flow Rate	13.54	MMscf/yr	
	Hourly Heating Value	2095.59	Btu/scf	Total Hourly to VCU stream from ProMax
	Annual Heating Value	1867.68	Btu/scf	Total Annual to VCU stream from Promax
	Hourly Heat Rate	5.12	MMBtu/hr	Hourly flow rate (scf/hr) * Hourly weighted heating value (Btu/scf) / (10^6 Btu/MMBtu)
	Annual Heat Rate	25293.48	MMBtu/yr	Annual flow rate (MMscf/yr) * Annual weighted heating value (Btu/scf)
	Hourly VOC	179.21	lb/hr VOC	Total Hourly to VCU stream from ProMax
	Annual VOC	356.05	tpy VOC	Total Annual to VCU stream from Promax
	Hourly HAP	37.34	lb/hr HAP	Total Hourly to VCU stream from ProMax
	Annual HAP	47.83	tpy HAP	Total Annual to VCU stream from Promax
	Hourly H_2S	0.04	lb/hr H_2S	Total Hourly to VCU stream from ProMax
	Annual H_2S	0.19	tpy H_2S	Total Annual to VCU stream from Promax

Emission Calculation

Description	NO_x [1]	CO [1]	VOC [1,2]	SO_2 [1]	PM [1]	H_2S [1,2]	HAPs [1,2]	Units	Notes
Emission Factors	100.0	84.0	5.5	-	7.6	-	-	lb/MMscf	NO_x, CO, and VOC: AP 42 Chapter 1, Table 1.4-1 &1.4-2
	126.6	106.3	6.96	-	9.6	-	-	lb/MMscf	Emission Factor adjusted for pilot gas heat value
	205.5	172.6	-	-	15.6	-	-	lb/MMscf	Emission Factor adjusted for process emission heat value
Fuel Sulfur Content	-	-	-	2.0	-	-	-	gr S/100scf	Fuel sulfur content (gr/100scf)
	-	-	-	0.0029	-	-	-	lb S/ Mscf	gr S/100 scf * (1 lb/7000 gr) * (1000scf/Mscf)
Pilot Emissions	3.16E-03	2.66E-03	1.74E-04	1.43E-04	2.41E-04	-	-	lb/hr	EF (lb/MMscf) * Hourly flow (scf/hr) / (10^6 Btu/MMBtu)
	0.014	0.012	7.62E-04	6.26E-04	1.05E-03	-	-	tpy	Hourly emission rate (lb/hr) / (2000 lb/ton) * (8760 hr/yr)
Process Emissions	0.50	0.42	3.58	0.079	0.038	8.55E-04	0.75	lb/hr	Total Hourly to VCU stream from ProMax
	1.39	1.17	7.12	0.35	0.11	3.79E-03	0.96	tpy	Total Annual to VCU stream from Promax
Total Emissions	0.51	0.42	3.58	0.079	0.038	8.55E-04	0.75	lb/hr	Total emission includes process and pilot emissions.
	1.41	1.18	7.12	0.35	0.11	3.79E-03	0.96	tpy	

Notes:

(1) VCU NO_x, CO, Pilot VOC, and PM emission factors are from AP-42 Table 1.4-1 and 1.4-2. Fuel Gas is conservatively assumed to have 2 gr S/100scf.

Pilot Gas SO_2 Emissions (lb/hr) = Pilot Gas Flow (scf/hr) * Fuel Gas Sulfur Content (lb/ Mscf) * (64 lb/lbmol SO_2 / 32 lb/lbmol S) * (1000 scf/Mscf)

Process SO_2 Emissions (lb/hr) = H_2S Mass Flow Rate (lb/hr) * DRE * (64 lb/lbmol SO_2 / 34 lb/lbmol H_2S)

Process SO_2 Emissions (tpy) = H_2S Mass Flow Rate (tpy) * DRE * (64 lb/lbmol SO_2 / 34 lb/lbmol H_2S)

(2) Process VOC, HAP and H_2S emissions estimated based on event stream routed to combustor and 98% efficiency.

Green House Gas Emission	CO_2 [3]	CH_4 [3]	N_2O [3]	CO_2e [3]	Units	Notes
Emission Factors	53.06	1.10E-03	1.00E-04	-	kg/MMBtu	40 CFR 98 Subpart C Tables C-1 & C-2
	1	25	298	-	GWP	40 CFR 98 Subpart A Table A-1
	2642.25	**0.055**	**4.98E-03**	-	tpy	
	2642.25	**1.37**	**1.48**	**2645.10**	tpy CO_2e	

[3] N_2O, CH_4, and CO_2 tpy Emission Rate= EF (kg/MMBtu) * Fuel Usage (MMBtu/hr) * (2.20462 lb/kg) / (2000 lb/ton)

CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor + CH_4 Emission Rate*GWP Factor

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Truck Loading (Condensate Tanks)

Equation[1]:

$$L_L = \frac{12.46 * SPM}{T}$$

Variables[1]:

L_L - Loading Loss (lbs/1000 gal loaded)
S - Saturation Factor (From Table 5.2-1 of AP-42, Section 5.2)
P - True Vapor Pressure of Loaded Liquid (psia)
M - Molecular Weight of Vapor (lb/lb mol)
T- Temperature of Bulk Liquid (°R = [°F + 460])

															LOAD		
Unit	Material Loaded [2]	Loading Method	S	P_{max} [6] (psia)	M [6] (lb/lbmol)	T_{max} [4] (°R)	L_L (lbs/1000 gal)	Hourly Throughput [5] (gal/hr)	VOC Wt %	HAP Wt %	H_2S Wt % [3]	VOC Vapor Loading Losses (lb/hr)	HAP Vapor Loading Losses (lb/hr)	H_2S Vapor Loading Losses (lb/hr)	Uncontrolled Hourly VOC Emissions (lb/hr)	Uncontrolled Hourly HAP Emissions (lb/hr)	Uncontrolled Hourly H_2S Emissions [3] (lb/hr)
LOAD	Condensate	Submerged	0.6	6.83	45.24	535.45	4.31	7,560	83.33%	14.73%	0.11%	27.16	4.80	0.035	27.16	4.80	0.035
											TOTAL	27.16	4.80	0.035	**27.16**	**4.80**	**0.035**

															LOAD		
Unit	Material Loaded [2]	Loading Method	S	P_{avg} [7] (psia)	M [7] (lb/lbmol)	T_{avg} [4] (°R)	L_L (lbs/1000 gal)	Annual Throughput [7] (gal/yr)	VOC Wt %	HAP Wt %	H_2S Wt % [3]	VOC Vapor Loading Losses (tpy)	HAP Vapor Loading Losses (tpy)	H_2S Vapor Loading Losses (tpy)	Uncontrolled Annual VOC Emissions (tpy)	Uncontrolled Annual HAP Emissions (tpy)	Uncontrolled Annual H_2S Emissions [3] (tpy)
LOAD	Condensate	Submerged	0.6	5.96	45.24	528.56	3.81	362,982	83.33%	14.73%	0.11%	0.58	0.10	7.41E-04	0.58	0.10	7.41E-06
											TOTAL	0.58	0.10	7.41E-04	**0.58**	**0.10**	**7.41E-06**

Notes:

[1] Loading loss equation and variables are from AP-42, Section 5.2, Transportation and Marketing of Petroleum Liquids.
[2] Material loaded is 100% condensate.
[3] H_2S content is conservatively assumed.
[4] Worst case scenario temperature is 95° F and the average temperature is 75.8° F.
[5] The maximum hourly throughput is based on the assumption that two trucks with a 180 bbl capacity can be loaded in an hour.
[6] TVP and MW pulled from Max Hourly promax
[7] TVP, MW, and annual throughput pulled from Annual Average promax

Green House Gas Emissions	CO_2 [6]	CH_4 [6]	N_2O [6]	CO_2e [6]	Units	Notes
	1	25	298	-	GWP	40 CFR 98 Subpart A Table A-1
	9.16E-03	**6.21E-03**	-	-	**tpy**	
	9.16E-03	**0.16**	-	**0.16**	**tpy CO_2e**	

[6] CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor + CH_4 Emission Rate*GWP Factor

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Fugitive Emissions

Emission unit number: FUG
Source description: Facility-wide Fugitive Emissions
Total Operating Hours: 8,760

Component		Emission factor[1] (lb/hr/source)	VOC Content[2] (wt%)	HAP Content[2] (wt%)	H_2S Content[2] (wt%)	Hexane Content[2] (wt%)	Benzene Content[2] (wt%)	Toluene Content[2] (wt%)	Ethylbenzene Content[2] (wt%)	Xylene Content[2] (wt%)	CO_2 Content[2] (wt%)	Methane Content[2] (wt%)	Subcomponent Count[3]
Valves	Inlet Gas	9.92E-03	25.11%	0.94%	0.00%	0.63%	0.10%	0.11%	0.0098%	0.093%	49.691%	57.260%	900
	Residue Gas	9.92E-03	24.49%	0.83%	0.00%	0.60%	0.09%	0.09%	0.0060%	0.055%	0.500%	57.734%	200
	Light Liquid	5.51E-03	26.10%	15.55%	0.00%	0.66%	3.11%	5.82%	0.56%	5.40%	0.00%	0.00%	600
Connectors	Inlet Gas	4.41E-04	25.11%	0.94%	0.00%	0.63%	0.10%	0.11%	0.0098%	0.093%	49.691%	57.260%	2600
	Residue Gas	4.41E-04	24.49%	0.83%	0.00%	0.60%	0.09%	0.09%	0.0060%	0.055%	0.500%	57.734%	800
	Light Liquid	4.63E-04	26.10%	15.55%	0.00%	0.66%	3.11%	5.82%	0.56%	5.40%	0.00%	0.00%	2400
Flanges	Inlet Gas	8.60E-04	25.11%	0.94%	0.00%	0.63%	0.10%	0.11%	0.0098%	0.093%	49.691%	57.260%	1000
	Residue Gas	8.60E-04	24.49%	0.83%	0.00%	0.60%	0.09%	0.09%	0.0060%	0.055%	0.500%	57.734%	100
	Light Liquid	2.43E-04	26.10%	15.55%	0.00%	0.66%	3.11%	5.82%	0.56%	5.40%	0.00%	0.00%	300
Pump Seals	Inlet Gas	5.29E-03	25.11%	0.94%	0.00%	0.63%	0.10%	0.11%	0.0098%	0.093%	49.691%	57.260%	0
	Residue Gas	5.29E-03	24.49%	0.83%	0.00%	0.60%	0.09%	0.09%	0.0060%	0.055%	0.500%	57.734%	0
	Light Liquid	2.87E-02	26.10%	15.55%	0.00%	0.66%	3.11%	5.82%	0.56%	5.40%	0.00%	0.00%	10
Other	Inlet Gas	1.94E-02	25.11%	0.94%	0.00%	0.63%	0.10%	0.11%	0.0098%	0.093%	49.691%	57.260%	70
	Residue Gas	1.94E-02	24.49%	0.83%	0.00%	0.60%	0.09%	0.09%	0.0060%	0.055%	0.500%	57.734%	10
	Light Liquid	1.65E-02	26.10%	15.55%	0.00%	0.66%	3.11%	5.82%	0.56%	5.40%	0.00%	0.00%	10
		Total (lb/hr):	**5.02**	**0.91**	**3.64E-04**	**0.125**	**0.17**	**0.30**	**0.029**	**0.280**	**6.12**	**8.55**	
		Total (tpy):	**21.98**	**3.97**	**1.59E-03**	**0.55**	**0.74**	**1.33**	**0.13**	**1.23**	**26.81**	**37.45**	

[1] Emission factors from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates, 1995.
[2] Weight percent of gas and liquid components from site specific liquids and gas analyses.
[3] Component counts are based on facility design.
[4] Hourly Emissions [lb/hr] = Emissions Factor [lb/hr/component] * Weight Content of Chemical Component [%] * Subcomponent Count.
[5] Annual Emissions [ton/yr] = Hourly Emissions [lb/hr] * Operating Hours [hr/yr] * 1/2000 [ton/lb].

Green House Gas Emissions	CO_2[6]	CH_4[6]	N_2O[6]	CO_2e[6]	Units	Notes
	1	25	298	-	GWP	40 CFR 98 Subpart A Table A-1
	26.81	**37.45**	**-**	**-**	**tpy**	
	26.81	**936.20**	**-**	**963.01**	**tpy CO_2e**	

[6] CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor + CH_4 Emission Rate*GWP Factor

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Analysis Summary

Inlet Gas Analysis

Component	Mol %	Wt.%
H2S	0.0015	0.0024
Nitrogen	0.9472	1.2226
Carbon Dioxide	0.2451	0.4969
Methane	77.4690	57.2605
Ethane	11.4828	15.9083
Propane	5.4273	11.0265
i-Butane	0.7652	2.0491
n-Butane	1.7544	4.6982
i-Pentane	0.4401	1.4630
n-Pentane	0.4961	1.6492
2,2-Dimethylbutane	0.0070	0.0278
Cyclopentane	0.0340	0.1099
2-Methylpentane	0.1110	0.4408
3-Methylpentane	0.0590	0.2343
n-Hexane	0.1580	0.6275
Methylcyclopentane	0.0660	0.2560
Benzene	0.0280	0.1008
Cyclohexane	0.0780	0.3025
2-Methylhexane	0.0250	0.1154
3-Methylhexane	0.0350	0.1616
1,1-Dimethylcyclopentane	0.0110	0.0498
Heptane	0.0690	0.3186
Methylcyclohexane	0.0890	0.4027
1,1,2-Trimethylcyclopentane	0.0000	0.0000
Toluene	0.0260	0.1104
2-Methylheptane	0.0200	0.1053
3-Methylheptane	0.0000	0.0000
2,5-Dimethylhexane	0.0020	0.0105
Octane	0.0750	0.3948
Ethylbenzene	0.0020	0.0098
p-Xylene	0.0160	0.0783
o-Xylene	0.0030	0.0147
Nonane	0.0340	0.2010
Decane	0.0230	0.1508
Undecane	0.0000	0.0000
Water	0.0000	0.0000
TEG	0.0000	0.0000
Total	**100.0000**	**100.0000**
Total VOC	**9.8544**	**25.1094**
Total HAP	**0.2331**	**0.9414**
Total H2S	**0.0015**	**0.0024**

H_2S Concentration: 1500 ppm

Residue Gas Analysis (Dry Gas from Dehy)

Component	Mol %	Wt.%
H2S	0.0015	0.0024
Nitrogen	0.9492	1.2329
Carbon Dioxide	0.2451	0.5001
Methane	77.6137	57.7343
Ethane	11.4950	16.0271
Propane	5.4226	11.0874
i-Butane	0.7622	2.0543
n-Butane	1.7430	4.6975
i-Pentane	0.4331	1.4491
n-Pentane	0.4860	1.6257
2,2-Dimethylbutane	0.0068	0.0271
Cyclopentane	0.0327	0.1064
2-Methylpentane	0.1062	0.4243
3-Methylpentane	0.0561	0.2243
n-Hexane	0.1490	0.5954
Methylcyclopentane	0.0617	0.2407
Benzene	0.0248	0.0898
Cyclohexane	0.0715	0.2791
2-Methylhexane	0.0225	0.1045
3-Methylhexane	0.0312	0.1450
1,1-Dimethylcyclopentane	0.0099	0.0451
Heptane	0.0600	0.2787
Methylcyclohexane	0.0767	0.3491
1,1,2-Trimethylcyclopentane	0.0000	0.0000
Toluene	0.0201	0.0859
2-Methylheptane	0.0155	0.0823
3-Methylheptane	0.0000	0.0000
2,5-Dimethylhexane	0.0017	0.0088
Octane	0.0540	0.2862
Ethylbenzene	0.0012	0.0060
p-Xylene	0.0096	0.0472
o-Xylene	0.0016	0.0081
Nonane	0.0169	0.1006
Decane	0.0066	0.0434
Undecane	0.0000	0.0000
Water	0.0120	0.0101
TEG	0.0002	0.0012
Total	**100.0000**	**100.0000**
Total VOC	**9.6833**	**24.4920**
Total HAP	**0.2064**	**0.8324**
Total H2S	**0.0015**	**0.0024**

Liquid Analysis

Component	Mol %	Wt.%
H2S	0.0002	0.0003
Nitrogen	0.0000	0.0000
Carbon Dioxide	0.0005	0.0011
Methane	0.0002	0.0001
Ethane	0.0003	0.0004
Propane	0.0346	0.0669
i-Butane	0.0169	0.0432
n-Butane	0.1102	0.2807
i-Pentane	0.0937	0.2964
n-Pentane	0.1666	0.5268
2,2-Dimethylbutane	0.0037	0.0138
Cyclopentane	0.1026	0.3154
2-Methylpentane	0.0886	0.3348
3-Methylpentane	0.0644	0.2434
n-Hexane	0.1744	0.6586
Methylcyclopentane	0.2788	1.0284
Benzene	0.9085	3.1107
Cyclohexane	0.3777	1.3935
2-Methylhexane	0.0410	0.1801
3-Methylhexane	0.0740	0.3248
1,1-Dimethylcyclopentane	0.0615	0.2649
Heptane	0.1544	0.6783
Methylcyclohexane	0.4874	2.0979
1,1,2-Trimethylcyclopentane	0.0000	0.0000
Toluene	1.4401	5.8162
2-Methylheptane	0.0538	0.2695
3-Methylheptane	0.0000	0.0000
2,5-Dimethylhexane	0.0036	0.0179
Octane	0.2323	1.1634
Ethylbenzene	0.1208	0.5622
p-Xylene	0.9289	4.3230
o-Xylene	0.2311	1.0755
Nonane	0.1112	0.6250
Decane	0.0626	0.3903
Undecane	0.0000	0.0000
Water	93.5754	73.8964
TEG	0.0000	0.0002
Total	**100.0000**	**100.0000**
Total VOC	**6.4234**	**26.1017**
Total HAP	**3.8038**	**15.5463**
Total H2S	**0.0002**	**0.0003**

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Haul Road

Unit: HAUL
Description: Haul Road Emissions
Control Equipment: N/A

Input Data

Empty vehicle weight[1]	16	tons	
Load weight[2]	29.5	tons	
Loaded vehicle[3]	45.5	tons	
Mean vehicle weight[4]	30.7	tons	
Daily Oil Throughput	23.7	bbls	
Vehicle frequency	0.5	trips/hour	
Round-trip distance	0.10	mile/trip	
Round-trip distance	4.80	miles/yr	
Operating hours	8760	hours/yr	
Surface silt content[5]	4.8	%	
Annual wet days[6]	70	days/yr	
Vehicle miles traveled[7]	0.05	mile/hr	
Control percentage	0%	nominal, base course chemical treatment	

Emission Factors and Constants

Parameter	PM_{30}	PM_{10}	$PM_{2.5}$
k, lb/VMT[8]	4.9	1.5	0.15
a, lb/VMT[8]	0.70	0.90	0.90
b, lb/VMT[8]	0.45	0.45	0.45
Hourly EF, lb/VMT[9]	7.35	1.87	0.19
Annual EF, lb/VMT[10]	5.94	1.51	0.15

Uncontrolled Emissions

PM_{30}	PM_{10}	$PM_{2.5}$	
0.37	0.094	9.37E-03	lb/hr[11]
0.014	3.64E-03	3.64E-04	ton/yr[12]

Notes

[1] Empty vehicle weight includes driver and occupants and full fuel load.
[2] Cargo, transported materials, etc. (Liquid density (lb/ft^3) / 7.481 gal/ft^3 * lb/gal RVP5 * 7560 gal truck/ 2000lb/ton)
[3] Loaded vehicle weight = Empty + Load Size
[4] Mean Vehicle weight = (Loaded Weight + Empty Weight) / 2
[5] AP-42 Table 13.2.2-1, Sand and gravel processing
[6] AP-42 Figure 13.2.2-1
[7] VMT/hr = Vehicle Miles Traveled per hour = Trips per hour * Segment Length
[8] Table 13.2.2-2, Industrial Roads
[9] AP-42 13.2.2, Equation 1a
[10] AP-42 13.2.2, Equation 2
[11] lb/hr = Hourly EF (lb/VMT) * VMT (mile/hr)
[12] ton/yr = Annual EF (lb/VMT) * Truck/day * Mile/truck * 365day/yr * 1ton/2000lb
[13] Uncontrolled emissions * (1 - Control%)

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Emission Calculation Inputs

Compressor Blowdowns

Compressor Name	Quantity of Compressors (#)	Quantity of Compressors Simultaneously (#)	Total Volume (scf/event)[1]	Hours / Blowdown (hr/event)	Number of Events/yr
RC-1 and RC-7 (CAT 3516)	2	1	4285.9	1	12
RC-2 through RC-6 (CAT 3606)	5	1	4272.7	1	12
RC-8 through RC-10 (CAT 3608)	3	1	6184.9	1	12

[1] Blowdown volumes provided by Targa.

Dehydrator Blowdowns

Dehydrator/Amine	Volume of Gas per Blowdown (scf/event)	# Blowdowns / year (# /year)	Hours / Blowdown (hr/event)	Number of Units (#)
60"x30' Contactor	39,821	1	1	1

Filter Coalescer Blowdowns

Input Data	Value	Units
Volume of gas per blowdown	6900	scf/event
Number of Filter Coalescers	1	Units
Number of Blowdowns per unit per year	1	events/yr
Duration of Event	1	hr/event

Scrubbers

Input Data	Value	Units
Volume of Gas Per Blowdown	33800	scf/event
Number of Scrubbers	5	Units
Number of Blowdowns per unit per year	1	events/yr
Duration of Event	1	hr/event
Simultaneous unit blowdowns	5	

Pump Blowdowns

Input Data	Value	Units
Volume of gas per blowdown	16	scf/event
Number of pumps	2	Units
Number of blowdowns per unit per year	1	events/yr
Hours per event	1	hr/event
Simultaneous unit blowdowns	2	Units

Reboiler Maintenance

Input Data	Value	Units
Volume of Gas Released during Reboiler Maintenance	65	scf/event
Number of Reboilers	1	-
Duration of Event	1	hr/event
Maintenance Events per year	1	event/ year
Actual Pressure	15.2	psia
Maximum Temperature	100	°F
Annual Temperature	80	°F
Simultaneous Events	1	events

Pigging

Input Data	Value	Units
Unit #1 Volume Vented - Southern Comfort	87	scf/event
Unit #2 Volume Vented - Illustrated Man Fee	87	scf/event
Unit #3 Volume Vented - Oxy Bow Lateral Extension Phase 2	212	scf/event
Unit #4 Volume Vented - Rick Deckard Flow	87	scf/event
Unit #5 Volume Vented - Corral Canyon Lateral	346	scf/event
Unit #6 Volume Vented - Cadillac Discharge	2336	scf/event
Maximum hourly number of pigging events	1	events/hr
Unit #1 Annual Number of Events	12	events/yr
Unit #2 Annual Number of Events	12	events/yr
Unit #3 Annual Number of Events	12	events/yr
Unit #4 Annual Number of Events	12	events/yr
Unit #5 Annual Number of Events	12	events/yr
Unit #6 Annual Number of Events	12	events/yr
Actual Pressure	30	psig
Maximum Temperatue	100	°F
Annual Temperature	80	°F

Pipeline Blowdown - Only if pipeline is opened and a segment is vented

Input Data	Value	Units
Pipeline Diameter - Southern Comfort	8	inches
Pipeline Length - Southern Comfort	14051	ft
Pipeline Diameter - Illustrated Man Fee	8	inches
Pipeline Length - Illustrated Man Fee	15500	ft
Pipeline Diameter - Oxy Bow Lateral Extension Phase 2	12	inches
Pipeline Length - Oxy Bow Lateral Extension Phase 2	8398.96	ft
Pipeline Diameter - Rick Deckard Flow	8	inches
Pipeline Length - Rick Deckard Flow	13040.26	ft
Pipeline Diameter - Corral Canyon Lateral	16	inches
Pipeline Length - Corral Canyon Lateral	11985	ft
Pipeline Diameter - Cadillac Discharge	12	inches
Pipeline Length - Cadillac Discharge	27456	ft
Total Pipleline Volume	59761.79	ft^3
Duration of Event	0.25	hr/event
Maintenance events per year	1	events/yr
Actual Pressure	100	psia
Maximum Temperature	100	°F
Annual Temperature	80	°F
Pipeline volume vented	377590	scf/event

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Emission Calculation Inputs

Tank Maintenance

Input Data	Value	Units
Number of tanks	3	Units
Molecular Weight of Vapors	70.00	lb/lb-mol
Duration of tank purging/degassing	24	hr/event
Volume of gas released during degassing event	1696.50	scf/event
Tank Height	15	ft
Tank Diameter	12	ft
Number of tank purging/degassing events per tank per year	1	event/yr

Surface Coating

Input Data	Value	Units
Maximum amount of paint used in an hour	25	gal/hr
Maximum amount of paint used in a year	100	gal/yr
Source Painted	Tank	-

Abrasive Blasting

Input Data	Value	Units
Blasting Material	Sand	-
Usage per Event	3100	lb/event
Events per year	1	-
Duration of event	6	hr/event

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

SSM Summary

Description	NO_x		CO		VOC		PM		PM_{10}		$PM_{2.5}$		SO_2		H_2S		Total HAPs		CO_2	CH_4	N_2O	CO_2e
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
Compressor Blowdowns	-	-	-	-	211.72	4.18	-	-	-	-	-	-	-	-	0.020	<0.01	7.94	0.16	0.083	9.53	-	238.28
Dehydrator Blowdowns	-	-	-	-	571.85	0.29	-	-	-	-	-	-	-	-	0.054	<0.01	21.44	0.011	<0.011	0.65	-	16.31
Filter Coalescer Blowdowns	-	-	-	-	99.09	0.050	-	-	-	-	-	-	-	-	<0.01	<0.01	3.72	<0.01	<0.01	0.11	-	2.83
Scrubber Blowdowns	-	-	-	-	485.38	0.24	-	-	-	-	-	-	-	-	0.046	<0.01	18.20	<0.01	<0.001	0.55	-	13.84
Pump Blowdowns	-	-	-	-	0.46	<0.01	-	-	-	-	-	-	-	-	<0.01	<0.01	0.017	<0.01	<0.01	<0.01	-	<0.01
Reboiler Maintenance	-	-	-	-	0.93	<0.01	-	-	-	-	-	-	-	-	<0.01	<0.01	0.035	<0.01	<0.01	<0.01	-	0.03
Pigging	-	-	-	-	33.55	0.27	-	-	-	-	-	-	-	-	<0.01	<0.01	1.26	0.010	<0.01	0.62	-	15.50
Pipeline Blowdowns	-	-	-	-	309.67	2.71	-	-	-	-	-	-	-	-	0.029	<0.01	11.61	0.10	0.054	6.18	-	154.62
Tank Maintenance	-	-	-	-	7.85	0.13	-	-	-	-	-	-	-	-	<0.01	<0.01	4.66	0.08	<0.01	<0.01	-	<0.01
Total	**-**	**-**	**-**	**-**	**1,720.50**	**7.87**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.16**	**<0.01**	**68.87**	**0.37**	**0.15**	**17.65**	**-**	**441.41**

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Emission Calculation Inputs

Compressor Blowdowns

Compressor Name	Quantity of Compressors (#)	Quantity of Compressors Simultaneously (#)	Total Volume (scf/event)[1]	Hours / Blowdown (hr/event)	Number of Events/yr
RC-1 and RC-7 (CAT 3516)	2	1	4285.9	1	12
RC-2 through RC-6 (CAT 3606)	5	1	4272.7	1	12
RC-8 through RC-10 (CAT 3608)	3	1	6184.9	1	12

[1] Blowdown volumes provided by Targa.

Dehydrator Blowdowns

Dehydrator/Amine	Volume of Gas per Blowdown (scf/event)	# Blowdowns / year (# /year)	Hours / Blowdown (hr/event)	Number of Units (#)
60"x30' Contactor	39,821	1	1	1

Filter Coalescer Blowdowns

Input Data	Value	Units
Volume of gas per blowdown	6900	scf/event
Number of Filter Coalescers	1	Units
Number of Blowdowns per unit per year	1	events/yr
Duration of Event	1	hr/event

Scrubbers

Input Data	Value	Units
Volume of Gas Per Blowdown	33800	scf/event
Number of Scrubbers	5	Units
Number of Blowdowns per unit per year	1	events/yr
Duration of Event	1	hr/event
Simultaneous unit blowdowns	5	

Pump Blowdowns

Input Data	Value	Units
Volume of gas per blowdown	16	scf/event
Number of pumps	2	Units
Number of blowdowns per unit per year	1	events/yr
Hours per event	1	hr/event
Simultaneous unit blowdowns	2	Units

Reboiler Maintenance

Input Data	Value	Units
Volume of Gas Released during Reboiler Maintenance	65	scf/event
Number of Reboilers	1	-
Duration of Event	1	hr/event
Maintenance Events per year	1	event/ year
Actual Pressure	15.2	psia
Maximum Temperature	100	°F
Annual Temperature	80	°F
Simultaneous Events	1	events

Pigging

Input Data	Value	Units
Unit #1 Volume Vented - Southern Comfort	87	scf/event
Unit #2 Volume Vented - Illustrated Man Fee	87	scf/event
Unit #3 Volume Vented - Oxy Bow Lateral Extension Phase 2	212	scf/event
Unit #4 Volume Vented - Rick Deckard Flow	87	scf/event
Unit #5 Volume Vented - Corral Canyon Lateral	346	scf/event
Unit #6 Volume Vented - Cadillac Discharge	2336	scf/event
Maximum hourly number of pigging events	1	events/hr
Unit #1 Annual Number of Events	12	events/yr
Unit #2 Annual Number of Events	12	events/yr
Unit #3 Annual Number of Events	12	events/yr
Unit #4 Annual Number of Events	12	events/yr
Unit #5 Annual Number of Events	12	events/yr
Unit #6 Annual Number of Events	12	events/yr
Actual Pressure	30	psig
Maximum Temperatue	100	°F
Annual Temperature	80	°F

Pipeline Blowdown - Only if pipeline is opened and a segment is vented

Input Data	Value	Units
Pipeline Diameter - Southern Comfort	8	inches
Pipeline Length - Southern Comfort	14051	ft
Pipeline Diameter - Illustrated Man Fee	8	inches
Pipeline Length - Illustrated Man Fee	15500	ft
Pipeline Diameter - Oxy Bow Lateral Extension Phase 2	12	inches
Pipeline Length - Oxy Bow Lateral Extension Phase 2	8398.96	ft
Pipeline Diameter - Rick Deckard Flow	8	inches
Pipeline Length - Rick Deckard Flow	13040.26	ft
Pipeline Diameter - Corral Canyon Lateral	16	inches
Pipeline Length - Corral Canyon Lateral	11985	ft
Pipeline Diameter - Cadillac Discharge	12	inches
Pipeline Length - Cadillac Discharge	27456	ft
Total Pipleline Volume	59761.79	ft^3
Duration of Event	0.25	hr/event
Maintenance events per year	1	events/yr
Actual Pressure	100	psia
Maximum Temperature	100	°F
Annual Temperature	80	°F
Pipeline volume vented	377590	scf/event

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Emission Calculation Inputs

Tank Maintenance

Input Data	Value	Units
Number of tanks	3	Units
Molecular Weight of Vapors	70.00	lb/lb-mol
Duration of tank purging/degassing	24	hr/event
Volume of gas released during degassing event	1696.50	scf/event
Tank Height	15	ft
Tank Diameter	12	ft
Number of tank purging/degassing events per tank per year	1	event/yr

Surface Coating

Input Data	Value	Units
Maximum amount of paint used in an hour	25	gal/hr
Maximum amount of paint used in a year	100	gal/yr
Source Painted	Tank	-

Abrasive Blasting

Input Data	Value	Units
Blasting Material	Sand	-
Usage per Event	3100	lb/event
Events per year	1	-
Duration of event	6	hr/event

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

SSM Summary

Description	NO_x		CO		VOC		PM		PM_{10}		$PM_{2.5}$		SO_2		H_2S		Total HAPs		CO_2	CH_4	N_2O	CO_2e
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(tpy)	(tpy)	(tpy)	(tpy)
Compressor Blowdowns	-	-	-	-	211.72	4.18	-	-	-	-	-	-	-	-	0.020	<0.01	7.94	0.16	0.083	9.53	-	238.28
Dehydrator Blowdowns	-	-	-	-	571.85	0.29	-	-	-	-	-	-	-	-	0.054	<0.01	21.44	0.011	<0.011	0.65	-	16.31
Filter Coalescer Blowdowns	-	-	-	-	99.09	0.050	-	-	-	-	-	-	-	-	<0.01	<0.01	3.72	<0.01	<0.01	0.11	-	2.83
Scrubber Blowdowns	-	-	-	-	485.38	0.24	-	-	-	-	-	-	-	-	0.046	<0.01	18.20	<0.01	<0.001	0.55	-	13.84
Pump Blowdowns	-	-	-	-	0.46	<0.01	-	-	-	-	-	-	-	-	<0.01	<0.01	0.017	<0.01	<0.01	<0.01	-	<0.01
Reboiler Maintenance	-	-	-	-	0.93	<0.01	-	-	-	-	-	-	-	-	<0.01	<0.01	0.035	<0.01	<0.01	<0.01	-	0.03
Pigging	-	-	-	-	33.55	0.27	-	-	-	-	-	-	-	-	<0.01	<0.01	1.26	0.010	<0.01	0.62	-	15.50
Pipeline Blowdowns	-	-	-	-	309.67	2.71	-	-	-	-	-	-	-	-	0.029	<0.01	11.61	0.10	0.054	6.18	-	154.62
Tank Maintenance	-	-	-	-	7.85	0.13	-	-	-	-	-	-	-	-	<0.01	<0.01	4.66	0.08	<0.01	<0.01	-	<0.01
Total	**-**	**-**	**-**	**-**	**1,720.50**	**7.87**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.16**	**<0.01**	**68.87**	**0.37**	**0.15**	**17.65**	**-**	**441.41**

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

RC-1 and RC-7 (CAT 3615) Blowdowns

Basis of Calculation:
Emissions from blowdowns are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions (lb/hr) = [Volume of blowdown (scf/event/unit)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# compressors blowndown simultaneously (units)] / [event duration (hr/event)] / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions (tpy) = [Volume of blowdown (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# compressors blowndown at site (units)] x [frequency of events (events/yr/unit)] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)]

Compressor BlowDown Emissions

Estimated Gas Vented per BlowDown Event [1] =	4,286	scf/event
Compressors at Site =	2	units
Compressors Blowndown Simultaneously =	1	units
Assumed BlowDown Duration =	1	hrs/event
Compressor BlowDowns in One Year =	12	events/yr
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	0.0024	5.77E-03	6.93E-05	--	--	--
Nitrogen	1.2226	3.00E+00	3.60E-02	--	--	--
Carbon Dioxide	0.4969	1.22E+00	1.46E-02	--	--	--
Methane	57.2605	1.40E+02	1.68E+00	--	--	--
Ethane	15.9083	3.90E+01	4.68E-01	--	--	--
Propane	11.0265	2.70E+01	3.24E-01	--	--	--
i-Butane	2.0491	5.02E+00	6.03E-02	--	--	--
n-Butane	4.6982	1.15E+01	0.14	--	--	--
i-Pentane	1.4630	3.59E+00	4.30E-02	--	--	--
n-Pentane	1.6492	4.04E+00	4.85E-02	--	--	--
2,2-Dimethylbutane	0.0278	6.81E-02	8.18E-04	--	--	--
Cyclopentane	0.1099	2.69E-01	3.23E-03	--	--	--
2-Methylpentane	0.4408	1.08E+00	1.30E-02	--	--	--
3-Methylpentane	0.2343	5.74E-01	6.89E-03	--	--	--
n-Hexane	0.6275	1.54E+00	1.85E-02	--	--	--
Methylcyclopentane	0.2560	6.27E-01	7.53E-03	--	--	--
Benzene	0.1008	2.47E-01	2.96E-03	--	--	--
Cyclohexane	0.3025	7.42E-01	8.90E-03	--	--	--
2-Methylhexane	0.1154	2.83E-01	3.40E-03	--	--	--
3-Methylhexane	0.1616	3.96E-01	4.75E-03	--	--	--
1,1-Dimethylcyclopentane	0.0498	1.22E-01	1.46E-03	--	--	--
Heptane	0.3186	7.81E-01	9.37E-03	--	--	--
Methylcyclohexane	0.4027	9.87E-01	1.18E-02	--	--	--
1,1,2-Trimethylcyclopentan	0.0000	0.00E+00	0.00E+00	--	--	--
Toluene	0.1104	2.71E-01	3.25E-03	--	--	--
2-Methylheptane	0.1053	2.58E-01	3.10E-03	--	--	--
3-Methylheptane	0.0000	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	0.0105	2.58E-02	3.10E-04	--	--	--
Octane	0.3948	9.68E-01	1.16E-02	--	--	--
Ethylbenzene	0.0098	2.40E-02	2.88E-04	--	--	--
p-Xylene	0.0783	1.92E-01	2.30E-03	--	--	--
o-Xylene	0.0147	3.60E-02	4.32E-04	--	--	--
Nonane	0.2010	4.93E-01	5.91E-03	--	--	--
Decane	0.1508	3.70E-01	4.44E-03	--	--	--
Undecane	0.0000	0.00E+00	0.00E+00	--	--	--
Water	0.0000	0.00E+00	0.00E+00	--	--	--
TEG	0.0000	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**61.55**	**0.74**	--	--	--
H_2S	**2.36E-03**	**5.77E-03**	**6.93E-05**	--	--	--
Total HAP	**0.70**	**2.31**	**0.028**	--	--	--
Total CO_2	**0.50**	**1.22**	**0.015**	--	--	--
Total CH_4	**57.26**	**140.36**	**1.68**	--	--	--

[1] This is a representative estimate of the amount of gas vented per blow down event.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

RC-2 through RC-6 (CAT 3606) Blowdowns

Basis of Calculation:
Emissions from blowdowns are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions (lb/hr) = [Volume of blowdown (scf/event/unit)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# compressors blowndown simultaneously (units)] / [event duration (hr/event)] / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions (tpy) = [Volume of blowdown (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# compressors blowndown at site (units)] x [frequency of events (events/yr/unit)] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)]

Compressor BlowDown Emissions

Estimated Gas Vented per BlowDown Event [1] =	4,273	scf/event
Compressors at Site =	5	units
Compressors Blowndown Simultaneously =	1	units
Assumed BlowDown Duration =	1	hrs/event
Compressor BlowDowns in One Year =	12	events/yr
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	0.00	5.76E-03	1.73E-04	--	--	--
Nitrogen	1.22	2.99E+00	8.96E-02	--	--	--
Carbon Dioxide	0.50	1.21E+00	3.64E-02	--	--	--
Methane	57.26	1.40E+02	4.20E+00	--	--	--
Ethane	15.91	3.89E+01	1.17E+00	--	--	--
Propane	11.03	2.69E+01	8.08E-01	--	--	--
i-Butane	2.05	5.01E+00	1.50E-01	--	--	--
n-Butane	4.70	1.15E+01	0.34	--	--	--
i-Pentane	1.46	3.58E+00	1.07E-01	--	--	--
n-Pentane	1.65	4.03E+00	1.21E-01	--	--	--
2,2-Dimethylbutane	0.03	6.79E-02	2.04E-03	--	--	--
Cyclopentane	0.11	2.69E-01	8.06E-03	--	--	--
2-Methylpentane	0.44	1.08E+00	3.23E-02	--	--	--
3-Methylpentane	0.23	5.73E-01	1.72E-02	--	--	--
n-Hexane	0.63	1.53E+00	4.60E-02	--	--	--
Methylcyclopentane	0.26	6.26E-01	1.88E-02	--	--	--
Benzene	0.10	2.46E-01	7.39E-03	--	--	--
Cyclohexane	0.30	7.39E-01	2.22E-02	--	--	--
2-Methylhexane	0.12	2.82E-01	8.46E-03	--	--	--
3-Methylhexane	0.16	3.95E-01	1.18E-02	--	--	--
1,1-Dimethylcyclopentane	0.05	1.22E-01	3.65E-03	--	--	--
Heptane	0.32	7.79E-01	2.34E-02	--	--	--
Methylcyclohexane	0.40	9.84E-01	2.95E-02	--	--	--
1,1,2-Trimethylcyclopentane	0.00	0.00E+00	0.00E+00	--	--	--
Toluene	0.11	2.70E-01	8.09E-03	--	--	--
2-Methylheptane	0.11	2.57E-01	7.72E-03	--	--	--
3-Methylheptane	0.00	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	0.01	2.57E-02	7.72E-04	--	--	--
Octane	0.39	9.65E-01	2.89E-02	--	--	--
Ethylbenzene	0.01	2.39E-02	7.17E-04	--	--	--
p-Xylene	0.08	1.91E-01	5.74E-03	--	--	--
o-Xylene	0.01	3.59E-02	1.08E-03	--	--	--
Nonane	0.20	4.91E-01	1.47E-02	--	--	--
Decane	0.15	3.69E-01	1.11E-02	--	--	--
Undecane	0.00	0.00E+00	0.00E+00	--	--	--
Water	0.00	0.00E+00	0.00E+00	--	--	--
TEG	0.00	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**61.36**	**1.84**	--	--	--
H_2S	**2.36E-03**	**5.76E-03**	**1.73E-04**	--	--	--
Total HAP	**0.70**	**2.30**	**0.069**	--	--	--
Total CO_2	**0.50**	**1.21**	**0.036**	--	--	--
Total CH_4	**57.26**	**139.92**	**4.20**	--	--	--

[1] This is a representative estimate of the amount of gas vented per blow down event.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

RC-8 through RC-10 (CAT 3608) Blowdowns

Basis of Calculation:
Emissions from blowdowns are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions (lb/hr) = [Volume of blowdown (scf/event/unit)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# compressors blowndown simultaneously (units)] / [event duration (hr/event)] / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions (tpy) = [Volume of blowdown (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# compressors blowndown at site (units)] x [frequency of events (events/yr/unit)] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)]

Compressor BlowDown Emissions

Estimated Gas Vented per BlowDown Event [1] =	6,185	scf/event
Compressors at Site =	3	units
Compressors Blowndown Simultaneously =	1	units
Assumed BlowDown Duration =	1	hrs/event
Compressor BlowDowns in One Year =	12	events/yr
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	0.0024	8.33E-03	1.50E-04	--	--	--
Nitrogen	1.2226	4.32E+00	7.78E-02	--	--	--
Carbon Dioxide	0.4969	1.76E+00	3.16E-02	--	--	--
Methane	57.2605	2.03E+02	3.65E+00	--	--	--
Ethane	15.9083	5.63E+01	1.01E+00	--	--	--
Propane	11.0265	3.90E+01	7.02E-01	--	--	--
i-Butane	2.0491	7.25E+00	1.30E-01	--	--	--
n-Butane	4.6982	1.66E+01	0.30	--	--	--
i-Pentane	1.4630	5.17E+00	9.31E-02	--	--	--
n-Pentane	1.6492	5.83E+00	1.05E-01	--	--	--
2,2-Dimethylbutane	0.0278	9.83E-02	1.77E-03	--	--	--
Cyclopentane	0.1099	3.89E-01	7.00E-03	--	--	--
2-Methylpentane	0.4408	1.56E+00	2.81E-02	--	--	--
3-Methylpentane	0.2343	8.29E-01	1.49E-02	--	--	--
n-Hexane	0.6275	2.22E+00	4.00E-02	--	--	--
Methylcyclopentane	0.2560	9.05E-01	1.63E-02	--	--	--
Benzene	0.1008	3.57E-01	6.42E-03	--	--	--
Cyclohexane	0.3025	1.07E+00	1.93E-02	--	--	--
2-Methylhexane	0.1154	4.08E-01	7.35E-03	--	--	--
3-Methylhexane	0.1616	5.72E-01	1.03E-02	--	--	--
1,1-Dimethylcyclopentane	0.0498	1.76E-01	3.17E-03	--	--	--
Heptane	0.3186	1.13E+00	2.03E-02	--	--	--
Methylcyclohexane	0.4027	1.42E+00	2.56E-02	--	--	--
1,1,2-Trimethylcyclopentane	0.0000	0.00E+00	0.00E+00	--	--	--
Toluene	0.1104	3.91E-01	7.03E-03	--	--	--
2-Methylheptane	0.1053	3.72E-01	6.70E-03	--	--	--
3-Methylheptane	0.0000	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	0.0105	3.72E-02	6.70E-04	--	--	--
Octane	0.3948	1.40E+00	2.51E-02	--	--	--
Ethylbenzene	0.0098	3.46E-02	6.23E-04	--	--	--
p-Xylene	0.0783	2.77E-01	4.98E-03	--	--	--
o-Xylene	0.0147	5.19E-02	9.35E-04	--	--	--
Nonane	0.2010	7.11E-01	1.28E-02	--	--	--
Decane	0.1508	5.33E-01	9.60E-03	--	--	--
Undecane	0.0000	0.00E+00	0.00E+00	--	--	--
Water	0.0000	0.00E+00	0.00E+00	--	--	--
TEG	0.0000	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**88.82**	**1.60**	--	--	--
H_2S	**2.36E-03**	**8.33E-03**	**1.50E-04**	--	--	--
Total HAP	**0.70**	**3.33**	**0.060**	--	--	--
Total CO_2	**0.50**	**1.76**	**0.032**	--	--	--
Total CH_4	**57.26**	**202.54**	**3.65**	--	--	--

[1] This is a representative estimate of the amount of gas vented per blow down event.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Compressor Blowdowns

Hours per event: 1

Compressor	Number of Compressors	Volume per Compressor Event (scf/event)	Annual events per Compressor	Annual Release (scf/yr)	Hourly Volume (scf/hr)	Molecular Weight (lb/lb-mol)
RC-1 & RC-7 (CAT 3516)	2	4285.9	12	102861.6	8571.8	22
RC-2 through RC-6 (CAT 3606)	5	4272.7	12	256362	21363.5	22
RC-8 through RC-10 (CAT 3608)	3	6184.9	12	222656.4	18554.7	22

Uncontrolled Emissions	VOC		H_2S		Total HAP		CO_2	CH_4
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	(tpy)	(tpy)
RC-1 & RC-7 (CAT 3516)	61.55	0.74	5.77E-03	6.93E-05	2.31	0.028	0.015	1.68
RC-2 through RC-6 (CAT 3606)	61.36	1.84	5.76E-03	1.73E-04	2.30	0.069	0.036	4.20
RC-8 through RC-10 (CAT 3608)	88.82	1.60	8.33E-03	1.50E-04	3.33	0.060	0.032	3.65
TOTAL	211.72	4.18	0.020	3.92E-04	7.94	0.16	0.083	9.53

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Dehydrator Blowdowns

Basis of Calculation:
Emissions from blowdowns are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions (lb/hr) = [Estimated blowdown volume (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] / [hour/event] / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions (tpy) = [Estimated blowdown volume (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] * [event/yr] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)]

The hourly volume is calculated from the sum of the blowdown volumes from each component of the dehydrator (i.e. the contactor, scrubber, flash tank, and filters).

Dehydrator Blowdown Emissions

Estimated Hourly Blowdown Volume [1] =	39,821	scf/event
Number of Units =	1	units
Assumed Blowdown Duration =	1	hr/event
Blowdowns Per Year =	1	event/yr
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	2.36E-03	5.37E-02	2.68E-05	--	--	--
Nitrogen	1.22E+00	2.78E+01	1.39E-02	--	--	--
Carbon Dioxide	4.97E-01	1.13E+01	5.66E-03	--	--	--
Methane	5.73E+01	1.30E+03	6.52E-01	--	--	--
Ethane	1.59E+01	3.62E+02	1.81E-01	--	--	--
Propane	1.10E+01	2.51E+02	1.26E-01	--	--	--
I-Butane	2.05E+00	4.67E+01	2.33E-02	--	--	--
n-Butane	4.70E+00	1.07E+02	5.35E-02	--	--	--
i-Pentane	1.46E+00	3.33E+01	1.67E-02	--	--	--
n-Pentane	1.65E+00	3.76E+01	1.88E-02	--	--	--
2,2-Dimethylbutane	2.78E-02	6.33E-01	3.17E-04	--	--	--
Cyclopentane	1.10E-01	2.50E+00	1.25E-03	--	--	--
2-Methylpentane	4.41E-01	1.00E+01	5.02E-03	--	--	--
3-Methylpentane	2.34E-01	5.34E+00	2.67E-03	--	--	--
n-Hexane	6.27E-01	1.43E+01	7.15E-03	--	--	--
Methylcyclopentane	2.56E-01	5.83E+00	2.91E-03	--	--	--
Benzene	1.01E-01	2.30E+00	1.15E-03	--	--	--
Cyclohexane	3.03E-01	6.89E+00	3.44E-03	--	--	--
2-Methylhexane	1.15E-01	2.63E+00	1.31E-03	--	--	--
3-Methylhexane	1.62E-01	3.68E+00	1.84E-03	--	--	--
1,1-Dimethylcyclopentan	4.98E-02	1.13E+00	5.67E-04	--	--	--
Heptane	3.19E-01	7.26E+00	3.63E-03	--	--	--
Methylcyclohexane	4.03E-01	9.17E+00	4.59E-03	--	--	--
1,1,2-Trimethylcyclopent	0.00E+00	0.00E+00	0.00E+00	--	--	--
Toluene	1.10E-01	2.51E+00	1.26E-03	--	--	--
2-Methylheptane	1.05E-01	2.40E+00	1.20E-03	--	--	--
3-Methylheptane	0.00E+00	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	1.05E-02	2.40E-01	1.20E-04	--	--	--
Octane	3.95E-01	8.99E+00	4.50E-03	--	--	--
Ethylbenzene	9.79E-03	2.23E-01	1.11E-04	--	--	--
p-Xylene	7.83E-02	1.78E+00	8.91E-04	--	--	--
o-Xylene	1.47E-02	3.34E-01	1.67E-04	--	--	--
Nonane	2.01E-01	4.58E+00	2.29E-03	--	--	--
Decane	1.51E-01	3.43E+00	1.72E-03	--	--	--
Undecane	0.00E+00	0.00E+00	0.00E+00	--	--	--
Water	0.00E+00	0.00E+00	0.00E+00	--	--	--
TEG	0.00E+00	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**571.85**	**0.29**	--	--	--
H_2S	**2.36E-03**	**0.054**	**2.68E-05**	--	--	--
Total HAP	**0.70**	**21.44**	**0.011**	--	--	--
Total CO_2	**0.50**	**11.32**	**5.66E-03**	--	--	--
Total CH_4	**57.26**	**1304.06**	**0.65**	--	--	--

[1] This is a representative estimate of the amount of gas vented per blowdown event.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Filter Coalescer Blowdowns

Basis of Calculation:
Emissions from blowdowns are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions (lb/hr) = [Volume of blowdown (scf/event/unit)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# units blowndown simultaneously (units)] / [event duration (hr/event)] / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions (tpy) = [Volume of blowdown (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# units blowndown at site (units)] x [frequency of events (events/yr/unit)] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)]

Filter Coalescer BlowDown Emissions

Estimated Gas Vented per BlowDown Event [1] =	6,900	scf/event
Units at Site =	1	units
Units Blowndown Simultaneously =	1	units
BlowDown Duration =	1	hrs/event
Unit BlowDowns in One Year =	1	events/yr
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	0.0024	9.30E-03	4.65E-06	--	--	--
Nitrogen	1.2226	4.82E+00	2.41E-03	--	--	--
Carbon Dioxide	0.4969	1.96E+00	9.80E-04	--	--	--
Methane	57.2605	2.26E+02	1.13E-01	--	--	--
Ethane	15.9083	6.28E+01	3.14E-02	--	--	--
Propane	11.0265	4.35E+01	2.18E-02	--	--	--
i-Butane	2.0491	8.09E+00	4.04E-03	--	--	--
n-Butane	4.6982	1.85E+01	9.27E-03	--	--	--
i-Pentane	1.4630	5.77E+00	0.00	--	--	--
n-Pentane	1.6492	6.51E+00	3.25E-03	--	--	--
2,2-Dimethylbutane	0.0278	1.10E-01	5.49E-05	--	--	--
Cyclopentane	0.1099	4.34E-01	2.17E-04	--	--	--
2-Methylpentane	0.4408	1.74E+00	8.70E-04	--	--	--
3-Methylpentane	0.2343	9.25E-01	4.62E-04	--	--	--
n-Hexane	0.6275	2.48E+00	1.24E-03	--	--	--
Methylcyclopentane	0.2560	1.01E+00	5.05E-04	--	--	--
Benzene	0.1008	3.98E-01	1.99E-04	--	--	--
Cyclohexane	0.3025	1.19E+00	5.97E-04	--	--	--
2-Methylhexane	0.1154	4.56E-01	2.28E-04	--	--	--
3-Methylhexane	0.1616	6.38E-01	3.19E-04	--	--	--
1,1-Dimethylcyclopentane	0.0498	1.96E-01	9.82E-05	--	--	--
Heptane	0.3186	1.26E+00	6.29E-04	--	--	--
Methylcyclohexane	0.4027	1.59E+00	7.95E-04	--	--	--
1,1,2-Trimethylcyclopentar	0.0000	0.00E+00	0.00E+00	--	--	--
Toluene	0.1104	4.36E-01	2.18E-04	--	--	--
2-Methylheptane	0.1053	4.15E-01	2.08E-04	--	--	--
3-Methylheptane	0.0000	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	0.0105	4.15E-02	2.08E-05	--	--	--
Octane	0.3948	1.56E+00	7.79E-04	--	--	--
Ethylbenzene	0.0098	3.86E-02	1.93E-05	--	--	--
p-Xylene	0.0783	3.09E-01	1.54E-04	--	--	--
o-Xylene	0.0147	5.79E-02	2.90E-05	--	--	--
Nonane	0.2010	7.93E-01	3.97E-04	--	--	--
Decane	0.1508	5.95E-01	2.98E-04	--	--	--
Undecane	0.0000	0.00E+00	0.00E+00	--	--	--
Water	0.0000	0.00E+00	0.00E+00	--	--	--
TEG	0.0000	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**99.09**	**0.050**	**--**	**--**	**--**
H_2S	**2.36E-03**	**9.30E-03**	**4.65E-06**	**--**	**--**	**--**
Total HAP	**0.70**	**3.72**	**1.86E-03**	**--**	**--**	**--**
Total CO_2	**0.50**	**1.96**	**9.80E-04**	**--**	**--**	**--**
Total CH_4	**57.26**	**225.96**	**0.11**	**--**	**--**	**--**

[1] This is a representative estimate of the amount of gas vented per blow down event.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Scrubber Blowdown

Basis of Calculation:
Emissions from blowdowns are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions (lb/hr) = [Volume of blowdown (scf/event/unit)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# units blowndown simultaneously (units)] / [event duration (hr/event)] / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions (tpy) = [Volume of blowdown (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# units blowndown at site (units)] x [frequency of events (events/yr/unit)] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)]

Scrubber BlowDown Emissions

Estimated Gas Vented per BlowDown Event [1] =	33,800	scf/event
Units at Site =	5	units
Units Blowndown Simultaneously =	1	units
BlowDown Duration =	1	hrs/event
Unit BlowDowns in One Year =	1	events/yr
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	0.0024	4.55E-02	2.28E-05	--	--	--
Nitrogen	1.2226	2.36E+01	1.18E-02	--	--	--
Carbon Dioxide	0.4969	9.61E+00	4.80E-03	--	--	--
Methane	57.2605	1.11E+03	5.53E-01	--	--	--
Ethane	15.9083	3.08E+02	1.54E-01	--	--	--
Propane	11.0265	2.13E+02	1.07E-01	--	--	--
i-Butane	2.0491	3.96E+01	1.98E-02	--	--	--
n-Butane	4.6982	9.08E+01	4.54E-02	--	--	--
i-Pentane	1.4630	2.83E+01	0.01	--	--	--
n-Pentane	1.6492	3.19E+01	1.59E-02	--	--	--
2,2-Dimethylbutane	0.0278	5.37E-01	2.69E-04	--	--	--
Cyclopentane	0.1099	2.12E+00	1.06E-03	--	--	--
2-Methylpentane	0.4408	8.52E+00	4.26E-03	--	--	--
3-Methylpentane	0.2343	4.53E+00	2.26E-03	--	--	--
n-Hexane	0.6275	1.21E+01	6.06E-03	--	--	--
Methylcyclopentane	0.2560	4.95E+00	2.47E-03	--	--	--
Benzene	0.1008	1.95E+00	9.74E-04	--	--	--
Cyclohexane	0.3025	5.85E+00	2.92E-03	--	--	--
2-Methylhexane	0.1154	2.23E+00	1.12E-03	--	--	--
3-Methylhexane	0.1616	3.12E+00	1.56E-03	--	--	--
1,1-Dimethylcyclopentar	0.0498	9.62E-01	4.81E-04	--	--	--
Heptane	0.3186	6.16E+00	3.08E-03	--	--	--
Methylcyclohexane	0.4027	7.78E+00	3.89E-03	--	--	--
1,1,2-Trimethylcyclopen	0.0000	0.00E+00	0.00E+00	--	--	--
Toluene	0.1104	2.13E+00	1.07E-03	--	--	--
2-Methylheptane	0.1053	2.04E+00	1.02E-03	--	--	--
3-Methylheptane	0.0000	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	0.0105	2.04E-01	1.02E-04	--	--	--
Octane	0.3948	7.63E+00	3.82E-03	--	--	--
Ethylbenzene	0.0098	1.89E-01	9.46E-05	--	--	--
p-Xylene	0.0783	1.51E+00	7.57E-04	--	--	--
o-Xylene	0.0147	2.84E-01	1.42E-04	--	--	--
Nonane	0.2010	3.88E+00	1.94E-03	--	--	--
Decane	0.1508	2.92E+00	1.46E-03	--	--	--
Undecane	0.0000	0.00E+00	0.00E+00	--	--	--
Water	0.0000	0.00E+00	0.00E+00	--	--	--
TEG	0.0000	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**485.38**	**0.24**	**--**	**--**	**--**
H_2S	**2.36E-03**	**0.046**	**2.28E-05**	**--**	**--**	**--**
Total HAP	**0.70**	**18.20**	**9.10E-03**	**--**	**--**	**--**
Total CO_2	**0.50**	**9.61**	**4.80E-03**	**--**	**--**	**--**
Total CH_4	**57.26**	**1106.89**	**0.55**	**--**	**--**	**--**

[1] This is a representative estimate of the amount of gas vented per blow down event.

[2] Due to the hourly emissions of H_2S, scrubber blowdowns will not occur at the same time as any other SSM activity.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Pump Blowdowns

Basis of Calculation:
Emissions from blowdowns are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions (lb/hr) = [Volume of blowdown (scf/event/unit)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# units blowndown simultaneously (units)] / [event duration (hr/event)] / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions (tpy) = [Volume of blowdown (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# units blowndown at site (units)] x [frequency of events (events/yr/unit)] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)]

Pump BlowDown Emissions

Estimated Gas Vented per BlowDown Event [1] =	16	scf/event
Units at Site =	2	units
Units Blowndown Simultaneously =	2	units
Assumed BlowDown Duration =	1	hrs/event
Unit BlowDowns in One Year =	1	events/yr
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	2.36E-03	4.31E-05	1.08E-08	--	--	--
Nitrogen	1.22E+00	2.24E-02	5.59E-06	--	--	--
Carbon Dioxide	4.97E-01	9.09E-03	2.27E-06	--	--	--
Methane	5.73E+01	1.05E+00	2.62E-04	--	--	--
Ethane	1.59E+01	2.91E-01	7.28E-05	--	--	--
Propane	1.10E+01	2.02E-01	5.04E-05	--	--	--
i-Butane	2.05E+00	3.75E-02	9.38E-06	--	--	--
n-Butane	4.70E+00	8.60E-02	2.15E-05	--	--	--
i-Pentane	1.46E+00	2.68E-02	6.69E-06	--	--	--
n-Pentane	1.65E+00	3.02E-02	7.55E-06	--	--	--
2,2-Dimethylbutane	2.78E-02	5.09E-04	1.27E-07	--	--	--
Cyclopentane	1.10E-01	2.01E-03	5.03E-07	--	--	--
2-Methylpentane	4.41E-01	8.07E-03	2.02E-06	--	--	--
3-Methylpentane	2.34E-01	4.29E-03	1.07E-06	--	--	--
n-Hexane	6.27E-01	1.15E-02	2.87E-06	--	--	--
Methylcyclopentane	2.56E-01	4.68E-03	1.17E-06	--	--	--
Benzene	1.01E-01	1.84E-03	4.61E-07	--	--	--
Cyclohexane	3.03E-01	5.54E-03	1.38E-06	--	--	--
2-Methylhexane	1.15E-01	2.11E-03	5.28E-07	--	--	--
3-Methylhexane	1.62E-01	2.96E-03	7.39E-07	--	--	--
1,1-Dimethylcyclopentar	4.98E-02	9.11E-04	2.28E-07	--	--	--
Heptane	3.19E-01	5.83E-03	1.46E-06	--	--	--
Methylcyclohexane	4.03E-01	7.37E-03	1.84E-06	--	--	--
1,1,2-Trimethylcyclopen	0.00E+00	0.00E+00	0.00E+00	--	--	--
Toluene	1.10E-01	2.02E-03	5.05E-07	--	--	--
2-Methylheptane	1.05E-01	1.93E-03	4.82E-07	--	--	--
3-Methylheptane	0.00E+00	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	1.05E-02	1.93E-04	4.82E-08	--	--	--
Octane	3.95E-01	7.23E-03	1.81E-06	--	--	--
Ethylbenzene	9.79E-03	1.79E-04	4.48E-08	--	--	--
p-Xylene	7.83E-02	1.43E-03	3.58E-07	--	--	--
o-Xylene	1.47E-02	2.69E-04	6.72E-08	--	--	--
Nonane	2.01E-01	3.68E-03	9.19E-07	--	--	--
Decane	1.51E-01	2.76E-03	6.90E-07	--	--	--
Undecane	0.00E+00	0.00E+00	0.00E+00	--	--	--
Water	0.00E+00	0.00E+00	0.00E+00	--	--	--
TEG	0.00E+00	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**0.46**	**1.15E-04**	**--**	**--**	**--**
H_2S	**2.36E-03**	**4.31E-05**	**1.08E-08**	**--**	**--**	**--**
Total HAP	**0.70**	**0.017**	**4.31E-06**	**--**	**--**	**--**
Total CO_2	**0.50**	**9.09E-03**	**2.27E-06**	**--**	**--**	**--**
Total CH_4	**57.26**	**1.05**	**2.62E-04**	**--**	**--**	**--**

[1] This is a representative estimate of the amount of gas vented per blow down event.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Reboiler Maintenance

Basis of Calculation:
Emissions from reboiler maintenance activities are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions (lb/hr) = [Volume of Gas Vented (scf/event/unit)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# Reboilers worked on simultaneously (units)] / [event duration (hr/event)] / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions (tpy) = [Volume of Gas Vented (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# Reboilers at site (units)] x [frequency of events

Reboiler Maintenance Emissions

Estimated Gas Vented per Event [1] =	65	scf/event
Reboilers at Site =	1	units
Reboilers Maintenance Events Occurring Simultaneously =	1	events
Assumed Reboiler Maintenance Duration =	1	hrs/event
Reboiler Maintenance Activities in One Year =	1	events/yr
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	2.36E-03	8.76E-05	4.38E-08	--	--	--
Nitrogen	1.22E+00	4.54E-02	2.27E-05	--	--	--
Carbon Dioxide	4.97E-01	1.85E-02	9.24E-06	--	--	--
Methane	5.73E+01	2.13E+00	1.06E-03	--	--	--
Ethane	1.59E+01	5.91E-01	2.96E-04	--	--	--
Propane	1.10E+01	4.10E-01	2.05E-04	--	--	--
I-Butane	2.05E+00	7.62E-02	3.81E-05	--	--	--
n-Butane	4.70E+00	1.75E-01	8.73E-05	--	--	--
I-Pentane	1.46E+00	5.44E-02	2.72E-05	--	--	--
n-Pentane	1.65E+00	6.13E-02	3.07E-05	--	--	--
2,2-Dimethylbutane	2.78E-02	1.03E-03	5.17E-07	--	--	--
Cyclopentane	1.10E-01	4.09E-03	2.04E-06	--	--	--
2-Methylpentane	4.41E-01	1.64E-02	8.19E-06	--	--	--
3-Methylpentane	2.34E-01	8.71E-03	4.36E-06	--	--	--
n-Hexane	6.27E-01	2.33E-02	1.17E-05	--	--	--
Methylcyclopentane	2.56E-01	9.52E-03	4.76E-06	--	--	--
Benzene	1.01E-01	3.75E-03	1.87E-06	--	--	--
Cyclohexane	3.03E-01	1.12E-02	5.62E-06	--	--	--
2-Methylhexane	1.15E-01	4.29E-03	2.15E-06	--	--	--
3-Methylhexane	1.62E-01	6.01E-03	3.00E-06	--	--	--
1,1-Dimethylcyclopentane	4.98E-02	1.85E-03	9.25E-07	--	--	--
Heptane	3.19E-01	1.18E-02	5.92E-06	--	--	--
Methylcyclohexane	4.03E-01	1.50E-02	7.49E-06	--	--	--
1,1,2-Trimethylcyclopentan	0.00E+00	0.00E+00	0.00E+00	--	--	--
Toluene	1.10E-01	4.10E-03	2.05E-06	--	--	--
2-Methylheptane	1.05E-01	3.91E-03	1.96E-06	--	--	--
3-Methylheptane	0.00E+00	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	1.05E-02	3.91E-04	1.96E-07	--	--	--
Octane	3.95E-01	1.47E-02	7.34E-06	--	--	--
Ethylbenzene	9.79E-03	3.64E-04	1.82E-07	--	--	--
p-Xylene	7.83E-02	2.91E-03	1.46E-06	--	--	--
o-Xylene	1.47E-02	5.46E-04	2.73E-07	--	--	--
Nonane	2.01E-01	7.47E-03	3.74E-06	--	--	--
Decane	1.51E-01	5.61E-03	2.80E-06	--	--	--
Undecane	0.00E+00	0.00E+00	0.00E+00	--	--	--
Water	0.00E+00	0.00E+00	0.00E+00	--	--	--
TEG	0.00E+00	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**0.93**	**4.67E-04**	--	--	--
H_2S	**2.36E-03**	**8.76E-05**	**4.38E-08**	--	--	--
Total HAP	**0.70**	**0.035**	**1.75E-05**	--	--	--
Total CO_2	**0.50**	**0.018**	**9.24E-06**	--	--	--
Total CH_4	**57.26**	**2.13**	**1.06E-03**	--	--	--

[1] This is a representative estimate of the amount of gas vented per reboiler maintenance event.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Pigging Emissions

Basis of Calculation:
Emissions from pigging operations are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions for each Unit (lb/hr) = [Volume of gas in pipe (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] * [events per hour (event/hr) / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions for each Unit (tpy) = [Volume of gas in pipe (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [frequency of events (events/yr)] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)]

For sites with multiple units, the total annual emissions are calculated by summing emissions for all units. It is assumed only one unit can be pigged/purged in one hour; therefore, the maximum volume of the units is used for the hourly calculations.

Pigging and Purging Emissions

Unit #1 - Volume Vented =	87	scf/event
Unit #2 - Volume Vented =	87	scf/event
Unit #3 - Volume Vented =	212	scf/event
Unit #4 - Volume Vented =	87	scf/event
Unit #5 - Volume Vented =	346	scf/event
Unit #6 - Volume Vented =	2336	scf/event
Maximum Number of Hourly Pigging/Purging Events =	1	events/hr
Unit #1 - Annual Number of Events =	12	events/yr
Unit #2 - Annual Number of Events =	12	events/yr
Unit #3 - Annual Number of Events =	12	events/yr
Unit #4 - Annual Number of Events =	12	events/yr
Unit #5 - Annual Number of Events =	12	events/yr
Unit #6 - Annual Number of Events =	12	events/yr
Pipelines Purged Simultaneously =	1	lines
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	2.36E-03	3.15E-03	2.55E-05	--	--	--
Nitrogen	1.22E+00	1.63E+00	1.32E-02	--	--	--
Carbon Dioxide	4.97E-01	6.64E-01	5.38E-03	--	--	--
Methane	5.73E+01	7.65E+01	6.20E-01	--	--	--
Ethane	1.59E+01	2.13E+01	1.72E-01	--	--	--
Propane	1.10E+01	1.47E+01	1.19E-01	--	--	--
i-Butane	2.05E+00	2.74E+00	2.22E-02	--	--	--
n-Butane	4.70E+00	6.28E+00	5.09E-02	--	--	--
i-Pentane	1.46E+00	1.95E+00	1.58E-02	--	--	--
n-Pentane	1.65E+00	2.20E+00	1.79E-02	--	--	--
2,2-Dimethylbutane	2.78E-02	3.71E-02	3.01E-04	--	--	--
Cyclopentane	1.10E-01	1.47E-01	1.19E-03	--	--	--
2-Methylpentane	4.41E-01	5.89E-01	4.77E-03	--	--	--
3-Methylpentane	2.34E-01	3.13E-01	2.54E-03	--	--	--
n-Hexane	6.27E-01	8.38E-01	6.79E-03	--	--	--
Methylcyclopentane	2.56E-01	3.42E-01	2.77E-03	--	--	--
Benzene	1.01E-01	1.35E-01	1.09E-03	--	--	--
Cyclohexane	3.03E-01	4.04E-01	3.28E-03	--	--	--
2-Methylhexane	1.15E-01	1.54E-01	1.25E-03	--	--	--
3-Methylhexane	1.62E-01	2.16E-01	1.75E-03	--	--	--
1,1-Dimethylcyclopentane	4.98E-02	6.65E-02	5.39E-04	--	--	--
Heptane	3.19E-01	4.26E-01	3.45E-03	--	--	--
Methylcyclohexane	4.03E-01	5.38E-01	4.36E-03	--	--	--
1,1,2-Trimethylcyclopentar	0.00E+00	0.00E+00	0.00E+00	--	--	--
Toluene	1.10E-01	1.47E-01	1.20E-03	--	--	--
2-Methylheptane	1.05E-01	1.41E-01	1.14E-03	--	--	--
3-Methylheptane	0.00E+00	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	1.05E-02	1.41E-02	1.14E-04	--	--	--
Octane	3.95E-01	5.27E-01	4.27E-03	--	--	--
Ethylbenzene	9.79E-03	1.31E-02	1.06E-04	--	--	--
p-Xylene	7.83E-02	1.05E-01	8.48E-04	--	--	--
o-Xylene	1.47E-02	1.96E-02	1.59E-04	--	--	--
Nonane	2.01E-01	2.68E-01	2.18E-03	--	--	--
Decane	1.51E-01	2.01E-01	1.63E-03	--	--	--
Undecane	0.00E+00	0.00E+00	0.00E+00	--	--	--
Water	0.00E+00	0.00E+00	0.00E+00	--	--	--
TEG	0.00E+00	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**33.55**	**0.27**	--	--	--
H_2S	**2.36E-03**	**3.15E-03**	**2.55E-05**	--	--	--
Total HAP	**0.70**	**1.26**	**0.010**	--	--	--
Total CO_2	**0.50**	**0.66**	**5.38E-03**	--	--	--
Total CH_4	**57.26**	**76.50**	**0.62**	--	--	--

[1] This is a representative estimate of the amount of gas vented per blowdown event.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Pipeline Blowdown

Basis of Calculation:
Emissions from pipeline maintenance operations are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions for each Unit (lb/hr) = [Volume of gas in pipe (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] * [events per hour (event/hr) / [379.5 (scf/lb-mol)]

Maximum Uncontrolled Annual Emissions for each Unit (tpy) = [Volume of gas in pipe (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [frequency of events (events/yr)] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)]

Pipeline Blowdown Emissions

Max Hourly Pipeline Volume Vented =	21563.89	scf/hr
Pipeline Volume Vented =	377589.65	scf/yr
Molecular Weight of Stream =	22	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Control Efficiency (%)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
H2S	2.36E-03	2.91E-02	2.54E-04	--	--	--
Nitrogen	1.22E+00	1.51E+01	1.32E-01	--	--	--
Carbon Dioxide	4.97E-01	6.13E+00	5.37E-02	--	--	--
Methane	5.73E+01	7.06E+02	6.18E+00	--	--	--
Ethane	1.59E+01	1.96E+02	1.72E+00	--	--	--
Propane	1.10E+01	1.36E+02	1.19E+00	--	--	--
i-Butane	2.05E+00	2.53E+01	2.21E-01	--	--	--
n-Butane	4.70E+00	5.79E+01	5.07E-01	--	--	--
i-Pentane	1.46E+00	1.80E+01	1.58E-01	--	--	--
n-Pentane	1.65E+00	2.03E+01	1.78E-01	--	--	--
2,2-Dimethylbutane	2.78E-02	3.43E-01	3.00E-03	--	--	--
Cyclopentane	1.10E-01	1.36E+00	1.19E-02	--	--	--
2-Methylpentane	4.41E-01	5.44E+00	4.76E-02	--	--	--
3-Methylpentane	2.34E-01	2.89E+00	2.53E-02	--	--	--
n-Hexane	6.27E-01	7.74E+00	6.78E-02	--	--	--
Methylcyclopentane	2.56E-01	3.16E+00	0.03	--	--	--
Benzene	1.01E-01	1.24E+00	1.09E-02	--	--	--
Cyclohexane	3.03E-01	3.73E+00	3.27E-02	--	--	--
2-Methylhexane	1.15E-01	1.42E+00	1.25E-02	--	--	--
3-Methylhexane	1.62E-01	1.99E+00	1.75E-02	--	--	--
1,1-Dimethylcyclopentane	4.98E-02	6.14E-01	5.37E-03	--	--	--
Heptane	3.19E-01	3.93E+00	3.44E-02	--	--	--
Methylcyclohexane	4.03E-01	4.97E+00	4.35E-02	--	--	--
1,1,2-Trimethylcyclopentar	0.00E+00	0.00E+00	0.00E+00	--	--	--
Toluene	1.10E-01	1.36E+00	1.19E-02	--	--	--
2-Methylheptane	1.05E-01	1.30E+00	1.14E-02	--	--	--
3-Methylheptane	0.00E+00	0.00E+00	0.00E+00	--	--	--
2,5-Dimethylhexane	1.05E-02	1.30E-01	1.14E-03	--	--	--
Octane	3.95E-01	4.87E+00	4.26E-02	--	--	--
Ethylbenzene	9.79E-03	1.21E-01	1.06E-03	--	--	--
p-Xylene	7.83E-02	9.65E-01	8.45E-03	--	--	--
o-Xylene	1.47E-02	1.81E-01	1.58E-03	--	--	--
Nonane	2.01E-01	2.48E+00	2.17E-02	--	--	--
Decane	1.51E-01	1.86E+00	1.63E-02	--	--	--
Undecane	0.00E+00	0.00E+00	0.00E+00	--	--	--
Water	0.00E+00	0.00E+00	0.00E+00	--	--	--
TEG	0.00E+00	0.00E+00	0.00E+00	--	--	--
Total VOC	**14.08**	**309.67**	**2.71**	--	--	--
H_2S	**2.36E-03**	**0.029**	**2.54E-04**	--	--	--
Total HAP	**0.70**	**11.61**	**0.10**	--	--	--
Total CO_2	**0.50**	**6.13**	**0.054**	--	--	--
Total CH_4	**57.26**	**706.18**	**6.18**	--	--	--

[1] This is a representative estimate of the amount of gas vented per blowdown event. The calculation assumes that maximum segment is vented in an hour and only one occurs at a time.

TARGA

Targa Northern Delaware, LLC - Cadillac Compressor Station

Tank Degassing

Basis of Calculation:
Emissions from tank degassing are calculated based on a mass balance as follows:

Maximum Uncontrolled Hourly Emissions (lb/hr) = [Volume of gas vented (scf/event/unit)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# tank degassing activities occurring simultaneously (units)] / [event duration (hr/event)] / [379.5 (scf/lb-mol)] + Clingage volume (scf/event) x Liquid density (lb/scf) / event duration (hr/event) x [# tank degassing activities occurring simultaneously (units)]

Maximum Uncontrolled Annual Emissions (tpy) = [Volume of gas vented (scf/event)] x [MW of stream (lb/lb-mol)] x [wt % VOC or speciated constituent] x [# tanks at site (units)] x [frequency of events (events/yr/unit)] / [379.5 (scf/lb-mol)] / [2,000 (lb/ton)] + Clingage volume (scf/event) x Liquid density (lb/scf) / Frequency of event (events/yr/unit) / 2,000 (lb/ton) x [# tanks at site (units)]

Tank Degassing Emissions - Non-Forced Ventilation

Estimated Gas Vented per Degassing Event =	1,697	scf/event
Number of Tanks =	3	units
Tank Degassing Events Occurring Simultaneously =	1	units
Degassing Event Duration =	24	hrs/event
Tank Degassing Events in One Year =	1	events/yr
Molecular Weight of Stream =	70	lb/lb-mol
Is Forced Ventilation used?	No	
Control Type =	None	

Clingage-to-vessel Volume		
Clingage volume [1] =	0.27	scf
Clingage thickness [2] =	0.0004	ft
Diameter =	12	ft
Height =	15	ft
Liquid Density [1] =	62.40	lb/scf

[1] The roof of the tank is not included in the clingage volume since no liquid will reach the roof. Liquid density for water is used as a surrogate since the density of each condensate sample is not available and will vary over time.

[2] Clingage thickness per TCEQ Maintenance, Startup and Shutdown (MSS) Guidance Document for terminals and chemical plants. http://www.tceq.texas.gov/assets/public/permitting/air/Guidance/NewSourceReview/mss/mss-guidance.pdf

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)
Total VOC	**26**	**7.85**	**0.13**
Total HAP	**16**	**4.66**	**0.08**
Total H_2S	**4.15E-04**	**1.24E-04**	**2.05E-06**
Total CO_2	**3.06E-03**	**9.17E-04**	**1.51E-05**
Total CH_4	**1.49E-03**	**4.46E-04**	**7.35E-06**

[1] HAP content is conservatively assumed to be 25% of the vented liquid vapor analysis.

Section 6.a

Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

Title V (20.2.70 NMAC), Minor NSR (20.2.72 NMAC), and PSD (20.2.74 NMAC) applicants must estimate and report greenhouse gas (GHG) emissions to verify the emission rates reported in the public notice, determine applicability to 40 CFR 60 Subparts, and to evaluate Prevention of Significant Deterioration (PSD) applicability. GHG emissions that are subject to air permit regulations consist of the sum of an aggregate group of these six greenhouse gases: carbon dioxide (CO_2), nitrous oxide (N_2O), methane (CH_4), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6).

Calculating GHG Emissions:

1. Calculate the ton per year (tpy) GHG mass emissions and GHG CO_2e emissions from your facility.
2. GHG mass emissions are the sum of the total annual tons of greenhouse gases without adjusting with the global warming potentials (GWPs). GHG CO_2e emissions are the sum of the mass emissions of each individual GHG multiplied by its GWP found in Table A-1 in 40 CFR 98 Mandatory Greenhouse Gas Reporting.
3. Emissions from routine or predictable start up, shut down, and maintenance must be included.
4. Report GHG mass and GHG CO_2e emissions in Table 2-P of this application. Emissions are reported in **short** tons per year and represent each emission unit's Potential to Emit (PTE).
5. All Title V major sources, PSD major sources, and all power plants, whether major or not, must calculate and report GHG mass and CO2e emissions for each unit in Table 2-P.
6. For minor source facilities that are not power plants, are not Title V, and are not PSD there are three options for reporting GHGs in Table 2-P: 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHGs as a second separate unit; 3) or check the following ☐ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

Sources for Calculating GHG Emissions:

- Manufacturer's Data
- AP-42 Compilation of Air Pollutant Emission Factors at http://www.epa.gov/ttn/chief/ap42/index.html
- EPA's Internet emission factor database WebFIRE at http://cfpub.epa.gov/webfire/
- 40 CFR 98 Mandatory Green House Gas Reporting except that tons should be reported in short tons rather than in metric tons for the purpose of PSD applicability.
- API Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Natural Gas Industry. August 2009 or most recent version.
- Sources listed on EPA's NSR Resources for Estimating GHG Emissions at http://www.epa.gov/nsr/clean-air-act-permitting-greenhouse-gases:

Global Warming Potentials (GWP):
Applicants must use the Global Warming Potentials codified in Table A-1 of the most recent version of 40 CFR 98 Mandatory Greenhouse Gas Reporting. The GWP for a particular GHG is the ratio of heat trapped by one unit mass of the GHG to that of one unit mass of CO_2 over a specified time period.

"Greenhouse gas" for the purpose of air permit regulations is defined as the aggregate group of the following six gases: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. **(20.2.70.7 NMAC, 20.2.74.7 NMAC).** You may also find GHGs defined in 40 CFR 86.1818-12(a).

Metric to Short Ton Conversion:
Short tons for GHGs and other regulated pollutants are the standard unit of measure for PSD and title V permitting programs. 40 CFR 98 Mandatory Greenhouse Reporting requires metric tons.
1 metric ton = 1.10231 short tons (per Table A-2 to Subpart A of Part 98 – Units of Measure Conversions)

Section 7

Information Used to Determine Emissions

Information Used to Determine Emissions shall include the following:

- ☒ If manufacturer data are used, include specifications for emissions units and control equipment, including control efficiencies specifications and sufficient engineering data for verification of control equipment operation, including design drawings, test reports, and design parameters that affect normal operation.
- ☐ If test data are used, include a copy of the complete test report. If the test data are for an emissions unit other than the one being permitted, the emission units must be identical. Test data may not be used if any difference in operating conditions of the unit being permitted and the unit represented in the test report significantly effect emission rates.
- ☒ If the most current copy of AP-42 is used, reference the section and date located at the bottom of the page. Include a copy of the page containing the emissions factors, and clearly mark the factors used in the calculations.
- ☐ If an older version of AP-42 is used, include a complete copy of the section.
- ☒ If an EPA document or other material is referenced, include a complete copy.
- ☐ Fuel specifications sheet.
- ☒ If computer models are used to estimate emissions, include an input summary (if available) and a detailed report, and a disk containing the input file(s) used to run the model. For tank-flashing emissions, include a discussion of the method used to estimate tank-flashing emissions, relative thresholds (i.e., permit or major source (NSPS, PSD or Title V)), accuracy of the model, the input and output from simulation models and software, all calculations, documentation of any assumptions used, descriptions of sampling methods and conditions, copies of any lab sample analysis.

This section contains the following references or actual document to support the emissions in the required forms and calculations in Section 6:

Documentation used to support calculations in this permit revision:

- Compressor manufacturer and catalyst specification sheets (for ENG-1 through ENG-10)
- Engine manufacturer specification sheet (for Trailer-1)
- Certification of Conformity with the Clean Air Act (for GEN-1)
- Generator manufacturer specification sheets (for GEN-1)
- Vapor combustion unit manufacturer specification sheet (for VCU-1)
- ProMax report
- Inlet gas analysis (June 26, 2023)
- Current version of AP-42 located online at: EPA AP-42 Compilation Air Emissions Factors
- Specific sections used in this application:
  - Section 1.3 – Natural Gas external Combustion Sources-Natural Gas (Table 1.4-1 through 1.4-3)
  - Section 3.2 – Natural Gas-fired Reciprocating Engines (Table 3.2-2)
  - Section 3.3 – Gasoline and Diesel Industrial Engines (Tables 3.3-1 & 2)
  - Section 5.2 – Transportation And Marketing Of Petroleum Liquids
  - Section 13.2-2 - Unpaved Haul Roads
- EPA Protocol for Equipment Leak Emissions Estimates, 1995 Table 2-4
- 40 CFR 98 Subpart C Tables C-1 and C-2

G3516J

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1400	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	8	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	CAT WIDE RANGE WITH AIR FUEL RATIO CONTROL
AFTERCOOLER - STAGE 2 INLET (°F):	130		
AFTERCOOLER - STAGE 1 INLET (°F):	201	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	210	FUEL:	Gas Analysis
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig): (See note 1)	7.0-40.0
COOLING SYSTEM:	JW+OC+1AC, 2AC	FUEL METHANE NUMBER:	53.6
CONTROL SYSTEM:	ADEM3	FUEL LHV (Btu/scf):	1133
EXHAUST MANIFOLD:	ASWC	ALTITUDE(ft):	500
COMBUSTION:	LOW EMISSION	MAXIMUM INLET AIR TEMPERATURE(°F):	77
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	STANDARD RATED POWER:	1380 bhp@1400rpm
SET POINT TIMING:	28		

RATING	NOTES	LOAD	MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
			100%	100%	75%	50%
ENGINE POWER (WITHOUT FAN)	(2)	bhp	1380	1380	1035	690
INLET AIR TEMPERATURE		°F	77	77	77	77
ENGINE DATA						
FUEL CONSUMPTION (LHV)	(3)	Btu/bhp-hr	7420	7420	7947	8535
FUEL CONSUMPTION (HHV)	(3)	Btu/bhp-hr	8180	8180	8761	9410
AIR FLOW (@inlet air temp, 14.7 psia) (WET)	(4)(5)	ft3/min	3132	3132	2393	1643
AIR FLOW (WET)	(4)(5)	lb/hr	13885	13885	10611	7286
FUEL FLOW (60°F, 14.7 psia)		scfm	151	151	121	87
INLET MANIFOLD PRESSURE	(6)	in Hg(abs)	88.2	88.2	70.2	48.3
EXHAUST TEMPERATURE - ENGINE OUTLET	(7)	°F	847	847	865	922
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia) (WET)	(8)(5)	ft3/min	8182	8182	6353	4562
EXHAUST GAS MASS FLOW (WET)	(8)(5)	lb/hr	14386	14386	11014	7574
EMISSIONS DATA - ENGINE OUT						
NOx (as NO2)	(9)(10)	g/bhp-hr	0.50	0.50	0.50	0.50
CO	(9)(10)	g/bhp-hr	2.98	2.98	3.20	3.13
THC (mol. wt. of 15.84)	(9)(10)	g/bhp-hr	4.40	4.40	4.72	4.79
NMHC (mol. wt. of 15.84)	(9)(10)	g/bhp-hr	1.79	1.79	1.92	1.95
NMNEHC (VOCs) (mol. wt. of 15.84)	(9)(10)(11)	g/bhp-hr	1.05	1.05	1.13	1.15
HCHO (Formaldehyde)	(9)(10)	g/bhp-hr	0.39	0.39	0.37	0.36
CO2	(9)(10)	g/bhp-hr	507	507	526	561
EXHAUST OXYGEN	(9)(12)	% DRY	9.1	9.1	8.8	8.4
HEAT REJECTION						
HEAT REJ. TO JACKET WATER (JW)	(13)	Btu/min	36501	36501	32695	26964
HEAT REJ. TO ATMOSPHERE	(13)	Btu/min	5313	5313	4428	3543
HEAT REJ. TO LUBE OIL (OC)	(13)	Btu/min	4347	4347	3894	3211
HEAT REJ. TO A/C - STAGE 1 (1AC)	(13)(14)	Btu/min	7661	7661	5688	1140
HEAT REJ. TO A/C - STAGE 2 (2AC)	(13)(14)	Btu/min	5048	5048	4389	2764
COOLING SYSTEM SIZING CRITERIA						
TOTAL JACKET WATER CIRCUIT (JW+OC+1AC)	(14)(15)	Btu/min	53412			
TOTAL AFTERCOOLER CIRCUIT (2AC)	(14)(15)	Btu/min	5300			
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.						

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY:
Data generated by Gas Engine Rating Pro Version 6.06.00
Ref. Data Set EM1495-04-001, Printed 10Aug2018

POWERTHERM

ICE Catalyst Sizing Program

ENGINE INPUT (Manufacturer, Model, Type) - Caterpillar G3516J Caterpillar G3516J 1380bhp 1400rpm - EXPERT MODE

Input Mass Flow Rate

	lbs/hr	"scfm"	"scfh"	"acfm"	"acfh"
lb/hr(Estimated):	14,407	3,255	195,316	8182	490,920
Brake Horse Power:	1380				
			Maximum Pressure Drop (in)		
Molecular weight:	28.50		0.029	Exhaust Density (lbs/ft3)	

Estimated Exhaust Gas Composition

N2	74.5	vol%
O2	10	vol%
H2O	10	vol%
CO2	6	vol%

Inlet Temperature

Process Temperature (F): 847

Enter permitted grams per brake horse power hour (g/bhp-hr)

NOx**	CO**	VOC(NMNE)**	H2CO**
0.5	0.5	0.5	0.07

Catalyst Type

NG/Diesel (Lean)

Catalyst Module Details

Module Shape		Module/Layer	2	Layers	1
Square				cpsi	300
	X&Y (inch)	15	24	Depth	3.5

Open area for gas flow (ft2):	4.47				
Linear Velocity(ft/min):	1,830	Calculated Space Velocity:	149,737	Safety Value	2
Foil thickness (inches):	0.002				

Pressure Drop

300	3.04

Inlet Pollutants

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.50	1.52	6.66	64.27	38.65
CO	2.98	9.07	39.71	383.07	230.39
VOC	1.05	3.19	13.99	134.97	81.17
H2CO	0.39	1.19	5.20	50.13	30.15

Target Conversions

NOx	0.0%
CO	83.2%
VOC(NMNE)	52.4%
H2CO	82.1%

Required Output Pollutants

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.5	1.52	6.66	64.27	38.65
CO	0.5	1.52	6.66	64.27	38.66
VOC	0.5	1.52	6.66	64.27	38.65
H2CO	0.07	0.21	0.93	9.00	5.41

Conversions Catalyst Design

NOx	0.0%
CO	83.2%
VOC(NMNE)	52.4%
H2CO	82.1%

Output Pollutants with Catalyst Sizing

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.5	1.52	6.66	64.27	38.65
CO	0.5	1.52	6.66	64.27	38.66
VOC	0.5	1.52	6.66	64.27	38.65
H2CO	0.07	0.21	0.93	9.00	5.41

Customer: Pegasus
Sales Person: KW
Date: 8/10/2018
Project: Lucid - G3516J Trojan Horse
Contact: Justin Watson

Notes: (2) Standard Element
Expected Emissions:
> 90% CO
> 60% VOC
> 80% HCHO
Trojan Horse

G3606

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1000	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	7.6	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	GAV WITH AIR FUEL RATIO CONTROL
AFTERCOOLER - STAGE 2 INLET (°F):	130		
AFTERCOOLER - STAGE 1 INLET (°F):	174	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	190	FUEL:	Gas Analysis
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig): (See note 1)	58.0-70.3
COOLING SYSTEM:	JW+1AC, OC+2AC	FUEL METHANE NUMBER:	53.6
CONTROL SYSTEM:	ADEM4	FUEL LHV (Btu/scf):	1133
EXHAUST MANIFOLD:	DRY	ALTITUDE(ft):	500
COMBUSTION:	LOW EMISSION	MAXIMUM INLET AIR TEMPERATURE(°F):	77
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	STANDARD RATED POWER:	1875 bhp@1000rpm
SET POINT TIMING:	16		

			MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING	**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER (WITHOUT FAN)	(2)	bhp	1875	1875	1406	938
INLET AIR TEMPERATURE		°F	77	77	77	77
ENGINE DATA						
FUEL CONSUMPTION (LHV)	(3)	Btu/bhp-hr	6814	6814	7092	7671
FUEL CONSUMPTION (HHV)	(3)	Btu/bhp-hr	7512	7512	7818	8457
AIR FLOW (@inlet air temp, 14.7 psia) (WET)	(4)(5)	ft3/min	4696	4696	3557	2446
AIR FLOW (WET)	(4)(5)	lb/hr	20823	20823	15773	10848
FUEL FLOW (60°F, 14.7 psia)		scfm	188	188	147	106
INLET MANIFOLD PRESSURE	(6)	In Hg(abs)	101.4	101.4	77.7	55.7
EXHAUST TEMPERATURE - ENGINE OUTLET	(7)	°F	814	814	885	966
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia) (WET)	(8)(5)	ft3/min	11840	11840	9481	6930
EXHAUST GAS MASS FLOW (WET)	(8)(5)	lb/hr	21449	21449	16262	11200
EMISSIONS DATA - ENGINE OUT						
NOx (as NO2)	(9)(10)	g/bhp-hr	0.50	0.50	0.50	0.50
CO	(9)(10)	g/bhp-hr	2.50	2.50	2.50	2.50
THC (mol. wt. of 15.84)	(9)(10)	g/bhp-hr	3.94	3.94	4.12	4.35
NMHC (mol. wt. of 15.84)	(9)(10)	g/bhp-hr	1.61	1.61	1.68	1.77
NMNEHC (VOCs) (mol. wt. of 15.84)	(9)(10)(11)	g/bhp-hr	0.94	0.94	0.99	1.04
HCHO (Formaldehyde)	(9)(10)	g/bhp-hr	0.20	0.20	0.22	0.25
CO2	(9)(10)	g/bhp-hr	458	458	473	513
EXHAUST OXYGEN	(9)(12)	% DRY	11.2	11.2	11.0	10.6
HEAT REJECTION						
HEAT REJ. TO JACKET WATER (JW)	(13)	Btu/min	22805	22805	18555	15087
HEAT REJ. TO ATMOSPHERE	(13)	Btu/min	5421	5421	5501	5360
HEAT REJ. TO LUBE OIL (OC)	(13)	Btu/min	11714	11714	10805	9351
HEAT REJ. TO A/C - STAGE 1 (1AC)	(13)(14)	Btu/min	13588	13588	6609	1880
HEAT REJ. TO A/C - STAGE 2 (2AC)	(13)(14)	Btu/min	6734	6734	4160	2124

COOLING SYSTEM SIZING CRITERIA			
TOTAL JACKET WATER CIRCUIT (JW+1AC)	(14)(15)	Btu/min	39353
TOTAL STAGE 2 AFTERCOOLER CIRCUIT (OC+2AC)	(14)(15)	Btu/min	21128
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.			

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY:
Data generated by Gas Engine Rating Pro Version 6.08.00
Ref. Data Set EM0555-07-001, Printed 10Aug2018

POWERTHERM

ICE Catalyst Sizing Program

ENGINE INPUT (Manufacturer, Model, Type) - Caterpillar G3606 1875 BHP @ 1000 RPM Caterpillar G3606 - EXPERT MODE

Input Mass Flow Rate

	lbs/hr	"scfm"	"scfh"	"acfm"	"acfh"
lb/hr(Estimated):	21,388	4,833	289,959	11840	710,400
Brake Horse Power:	1875				
			Maximum Pressure Drop (in)		
Molecular weight:	28.50		0.030	Exhaust Density (lbs/ft3)	

Estimated Exhaust Gas Composition

N2	74.5	vol%
O2	10	vol%
H2O	10	vol%
CO2	6	vol%

Inlet Temperature

Process Temperature (F): 814

Enter permitted grams per brake horse power hour (g/bhp-hr)

NOx**	CO**	VOC(NMNE)**	H2CO**
0.5	0.5	0.5	0.07

Catalyst Type

NG/Diesel (Lean)

Catalyst Module Details

Module Shape: Square

Module/Layer	2	Layers	1		
		cpsi	300		
X&Y (inch)	15	36	Depth	3.5	

Open area for gas flow (ft2):	6.81
Linear Velocity(ft/min):	1,740
Foil thickness (inches):	0.002

Calculated Space Velocity: 146,079

Safety Value: 2

Pressure Drop

300	2.89

Inlet Pollutants

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.50	2.07	9.05	58.82	35.38
CO	2.50	10.33	45.26	294.12	176.89
VOC	0.94	3.89	17.02	110.59	66.51
H2CO	0.20	0.83	3.62	23.53	14.15

Target Conversions

NOx	0.0%
CO	80.0%
VOC(NMNE)	46.8%
H2CO	65.0%

Required Output Pollutants

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.5	2.07	9.05	58.82	35.38
CO	0.5	2.07	9.05	58.82	35.38
VOC	0.5	2.07	9.05	58.82	35.38
H2CO	0.07	0.29	1.27	8.24	4.95

Conversions Catalyst Design

NOx	0.0%
CO	80.0%
VOC(NMNE)	46.8%
H2CO	65.0%

Output Pollutants with Catalyst Sizing

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.5	2.07	9.05	58.82	35.38
CO	0.5	2.07	9.05	58.82	35.38
VOC	0.5	2.07	9.05	58.82	35.38
H2CO	0.07	0.29	1.27	8.24	4.95

Customer: Pegasus
Sales Person: KW
Date: 8/10/2018
Project: Lucid - G3606A4 Trojan Horse
Contact: Justin Watson

Notes: (2) High Activity Elements
Expected Emissions:
> 90% CO
> 60% VOC
> 80% HCHO
Trojan Horse
Exhaust Piping to be Insulated

G3608

GAS COMPRESSION APPLICATION

GAS ENGINE SITE SPECIFIC TECHNICAL DATA

CATERPILLAR®

ENGINE SPEED (rpm):	1000	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	7.6	RATING LEVEL:	CONTINUOUS
AFTERCOOLER TYPE:	SCAC	FUEL SYSTEM:	GAV WITH AIR FUEL RATIO CONTROL
AFTERCOOLER - STAGE 2 INLET (°F):	130		
AFTERCOOLER - STAGE 1 INLET (°F):	174	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	190	FUEL:	Salt Draw (Cadillac)
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig): (See note 1)	58.0-70.3
COOLING SYSTEM:	JW+1AC, OC+2AC	FUEL METHANE NUMBER:	56.8
CONTROL SYSTEM:	ADEM4	FUEL LHV (Btu/scf):	1118
EXHAUST MANIFOLD:	DRY	ALTITUDE(ft):	3000
COMBUSTION:	LOW EMISSION	INLET AIR TEMPERATURE(°F):	110
NOx EMISSION LEVEL (g/bhp-hr NOx):	0.5	STANDARD RATED POWER:	2500 bhp@1000rpm
SET POINT TIMING:	17		

			MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING	**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER (WITHOUT FAN)	(2)	bhp	2500	2500	1875	1250
INLET AIR TEMPERATURE		°F	110	110	110	110
ENGINE DATA						
FUEL CONSUMPTION (LHV)	(3)	Btu/bhp-hr	6761	6761	7007	7512
FUEL CONSUMPTION (HHV)	(3)	Btu/bhp-hr	7452	7452	7723	8280
AIR FLOW (@inlet air temp, 14.7 psia) (WET)	(4)(5)	ft3/min	6614	6614	5006	3421
AIR FLOW (WET)	(4)(5)	lb/hr	27627	27627	20912	14289
FUEL FLOW (60°F, 14.7 psia)		scfm	252	252	196	140
INLET MANIFOLD PRESSURE	(6)	In Hg(abs)	99.0	99.0	75.2	52.9
EXHAUST TEMPERATURE - ENGINE OUTLET	(7)	°F	835	835	882	937
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia) (WET)	(8)(5)	ft3/min	15994	15994	12558	8950
EXHAUST GAS MASS FLOW (WET)	(8)(5)	lb/hr	28480	28480	21575	14763
EMISSIONS DATA - ENGINE OUT						
NOx (as NO2)	(9)(10)	g/bhp-hr	0.50	0.50	0.50	0.50
CO	(9)(10)	g/bhp-hr	2.80	2.80	2.80	2.80
THC (mol. wt. of 15.84)	(9)(10)	g/bhp-hr	3.99	3.99	4.19	4.21
NMHC (mol. wt. of 15.84)	(9)(10)	g/bhp-hr	1.66	1.66	1.74	1.75
NMNEHC (VOCs) (mol. wt. of 15.84)	(9)(10)(11)	g/bhp-hr	1.01	1.01	1.06	1.06
HCHO (Formaldehyde)	(9)(10)	g/bhp-hr	0.23	0.23	0.24	0.24
CO2	(9)(10)	g/bhp-hr	454	454	467	500
EXHAUST OXYGEN	(9)(12)	% DRY	11.6	11.6	11.3	10.8
HEAT REJECTION						
HEAT REJ. TO JACKET WATER (JW)	(13)	Btu/min	26677	26677	23010	19384
HEAT REJ. TO ATMOSPHERE	(13)	Btu/min	9106	9106	9529	9540
HEAT REJ. TO LUBE OIL (OC)	(13)	Btu/min	13036	13036	12159	10943
HEAT REJ. TO A/C - STAGE 1 (1AC)	(13)(14)	Btu/min	26905	26905	13289	3479
HEAT REJ. TO A/C - STAGE 2 (2AC)	(13)(14)	Btu/min	8911	8911	5506	2724
COOLING SYSTEM SIZING CRITERIA						
TOTAL JACKET WATER CIRCUIT (JW+1AC)	(14)(15)	Btu/min	57595			
TOTAL STAGE 2 AFTERCOOLER CIRCUIT (OC+2AC)	(14)(15)	Btu/min	24999			
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.						

CONDITIONS AND DEFINITIONS

Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Lowest load point is the lowest continuous duty operating load allowed. No overload permitted at rating shown.

For notes information consult page three.

PREPARED BY:
Data generated by Gas Engine Rating Pro Version 6.09.04
Ref. Data Set EM0655-06-001, Printed 19Aug2019

POWERTHERM

ICE Catalyst Sizing Program

ENGINE INPUT (Manufacturer, Model, Type) - Caterpillar G3608 2500 BHP @ 1000 RPM Caterpillar G3608 A4 - EXPERT MODE

Input Mass Flow Rate

	lbs/hr	"scfm"	"scfh"	"acfm"	"acfh"
lb/hr(Estimated):	29,402	6,422	385,338	15994	959,640
Brake Horse Power:	2500				
Molecular weight:	28.50		Maximum Pressure Drop (in) 0.031	Exhaust Density (lbs/ft3)	
			mol% propane in fuel gas:	6.8412	

Estimated Exhaust Gas Composition

N2	74.5	vol%
O2	10	vol%
H2O	10	vol%
CO2	6	vol%

Inlet Temperature

Process Temperature (F): 835

Enter permitted grams per brake horse power hour (g/bhp-hr)

NOx**	CO**	VOC(NMNE)**	H2CO**
0.5	0.6868	0.7	0.046

Catalyst Type

Bi-metallic Propane Catalyst

Catalyst Module Details

Module Shape: Square
Guard Bed - No
Module/Layer: 3
Layers: 1
cpsi: 400
X&Y (inch): 15 x 36
Depth: 3.5
Part Number ERH-1536-2

Open area for gas flow (ft2):	10.21
Linear Velocity(ft/min):	1,567
Foil thickness (inches):	0.002

Calculated Space Velocity: 129,420

Safety Value: 2

Pressure Drop

400	3.29

Inlet Pollutants

	g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.50	2.76	12.07	58.92	35.44
CO	2.80	15.43	67.59	542.09	326.03
VOC	1.01	5.57	24.38	124.15	74.67
H2CO	0.23	1.27	5.55	41.56	25.00

Target Conversions

Required Output Pollutants

		g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.0%	NOx	<0.5	2.76	12.07	58.92	35.44
CO	75.5%	CO	<0.6868	3.78	16.58	132.97	79.97
VOC(NMNE)	30.7%	VOC	<0.7	3.86	16.90	86.04	51.75
H2CO	80.0%	H2CO	<0.046	0.25	1.11	8.31	5.00

Conversions Catalyst Design

Output Pollutants with Catalyst Sizing

		g/bhp-hr	lb/hr	tons/year	ppmv	ppmvd%O2*
NOx	0.0%	NOx	0.5	2.76	12.07	58.92	35.44
CO	75.5%	CO	0.6868	3.78	16.58	132.97	79.97
VOC(NMNE)	30.7%	VOC	0.7	3.86	16.90	86.04	51.75
VOC(NMNE) w/bimetallic	42.20%	VOC	0.58	3.22	14.09	71.75	43.16
H2CO	80.0%	H2CO	0.046	0.25	1.11	8.31	5.00

Notes:

Customer:	Pegasus	Project:	G3608A4 Cadillac
Sales Person:	KW	Date: 8/19/2019	Contact: Kolten Kelley
Housing:		Element: ERH-1536-2	Description: Element, Catalyst, Oxidation, 15 x 36

Allmand®

MAXI-HEAT® 1MBTU

The **Maxi-Heat®** line includes a robustly designed towable indirect fired heater, with 1M BTU. This Unit provides heat for different applications including severe harsh conditions. The 1M includes two independently operating burners providing up to a combined 1,000,000 BTUs of heat. For ease of operation the **Maxi-Heat®** comes fully equipped with the iQ system, which automatically calibrates each burner providing reliable trouble free operation, eliminating the tedious trial and error combustion measurements and adjustments. Recirculation is standard on all **Maxi-Heat®** products resulting in increased efficiency of the heater and less fuel consumed. The **Maxi-Heat®** can go from warming equipment to curing concrete, the heat you can rely on when you need it most.

BRIGGS&STRATTON

KEY FEATURES

Allmand® MAXI-HEAT®

External Control Panel Provides the operator with the necessary operating parameters needed during operation eliminating the need to open the heater door.

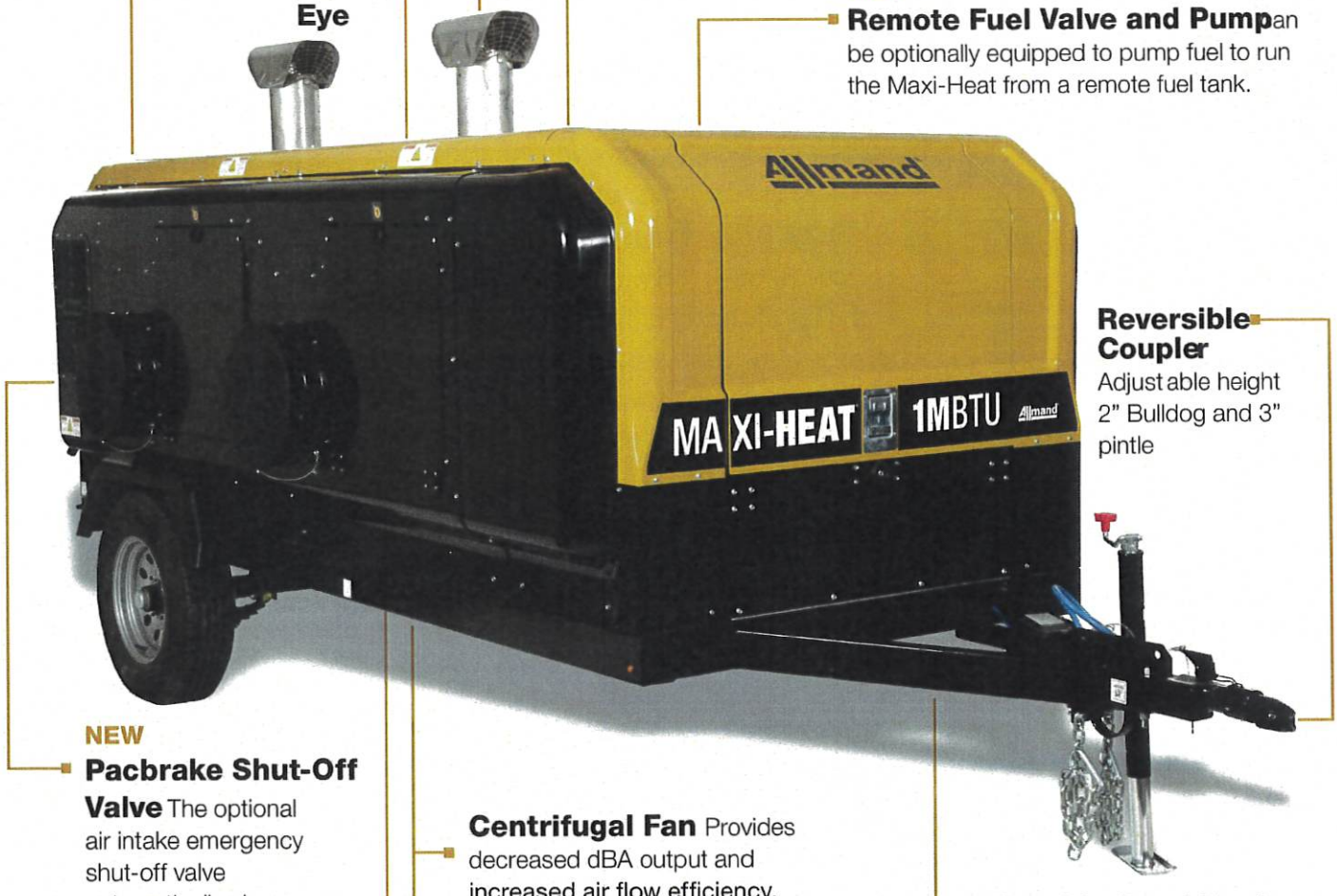
Flexible Applications Twin Heater units on the 1M BTU model providing flexibility of heat needed for the jobsite.

iQ System Automatically calibrates burner for temperature, humidity and barometric pressure. Provides damper setting on color display, and information on efficiency, target and actual outlet temperatures.

Lifting Eye

NEW

Remote Fuel Valve and Pump can be optionally equipped to pump fuel to run the Maxi-Heat from a remote fuel tank.



Reversible Coupler Adjustable height 2" Bulldog and 3" pintle

NEW

Pacbrake Shut-Off Valve The optional air intake emergency shut-off valve automatically closes the valve and shuts down the engine when an overspeed runaway condition occurs.

Centrifugal Fan Provides decreased dBA output and increased air flow efficiency.

Air Recirculation Inlet Air inlet comes standard and results in increased efficiency of the heater and less fuel consumed.

Durable Steel Enclosure is built to last through the toughest environments and conditions.

Sleek Design allowing for ease of transport and maneuverability.

16", 20" or Dual 12" Duct Flange Outlets

NEW

Adjustable Air Recirculation Inlet The optional adjustable air recirculation inlet connection changes size to fit either 16" or 20" ducting.

NEW

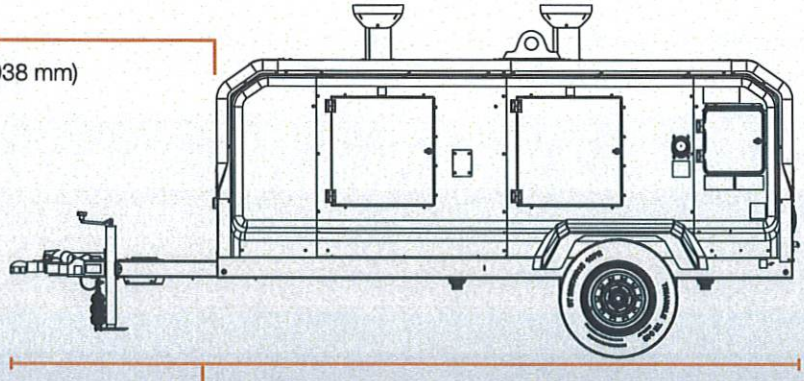
CSA Approved Steel Fuel Tank The optional 175 gallon steel double wall (UN-31A rated) fuel tank meets CSA and Transport Canada standards.

Fluid Containment System (FCS) Provides 130%+ fluid containment for all on-board fluids.

Allmand® MAXI-HEAT®

TECHNICAL SPECS

Model	Maxi-Heat® 1MBTU	Maxi-Heat® 1MBTU
Engine Brand	Kubota D1005	CAT or Perkins 1.1
Engine Model	D1005	1.1
Frequency	60 Hz	60 Hz
Ducting Length - Continuous Heating	3,354 cfm with 96°F rise over ambient @125 ft	3,354 cfm with 96°F rise over ambient @125 ft
Sound Level @ 23ft (FULL LOAD) dBA	67.1 dBA	65.7 dBA
Sound Level @ 23ft (NO LOAD) dBA	62.9 dBA	62.4 dBA
Phase	1-phase	1-phase
Prime Power (kW)*	7	8
BTU per Hour	1,000,000	1,000,000
Heated Air Output Maximum (cfm)	7,060	7,060
Horsepower (@ 1,800 RPM) ****	11.6	13.8
Oil Change Interval (hr)	500	1,000
Engine Tier	Tier 4 Final	Tier 4 Final
Fuel Tank - Single (Poly - Standard)		
Fuel Capacity gal (L)	210 (794.9)	210 (794.9)
Operating Time - 1 Heater @ Full Load (hrs)	67.5	67.8
Operating Time - 2 Heater @ Full Load (hrs)	35.1	34.6
Fuel Tank - Single (Steel - Optional)		
Fuel Capacity gal (L)	175 (662.4)	175 (662.4)
Operating Time - 1 Heater @ Full Load (hrs)	56.5	56.4
Operating Time - 2 Heater @ Full Load (hrs)	29.2	28.8
Fuel Tank - Multi (Poly - Optional)		
Heater Fuel Tank - 1 Capacity gal (L)	116 (439.1)	116 (439.1)
Heater Fuel Tank - 2 Capacity gal (L)	116 (439.1)	116 (439.1)
Engine Fuel Tank Capacity gal (L)	50 (189.2)	50 (189.2)
Total Fuel Tank Capacity gal (L)	281.6 (1,065.9)	281.6 (1,065.9)
Operating Time - 1 Heater @ Full Load (hrs)	42.1	42.1
Operating Time - 2 Heater @ Full Load (hrs)	42.1	42.1
Weights & Shipping		
Net Dry Weight (lbs†)	4,633	
Operating Wet Weight NO Fuel (lbs†)	4,654	
Operating Wet Weight FULL Fuel (lbs†)	5,869	
Number of Units on 48' Flatbed	4	
Number of Units on 53' Flatbed	4	



Width
80.2 in (2,038 mm)

Height
Transport Position
83.9 in (2,130 mm)

Length
183.4 in (4,657 mm)

* Prime generator electrical output per Allmand® testing. ** Based on one hour run test full fuel tank consumption. *** All power levels are stated gross horsepower as rated by each engine's manufacturer. † Dry and wet weights vary by model. Allmand® has a policy of continuous product improvement and reserves the right to modify its specifications at any time and without prior notice. See operator's manual or www.allmand.com website for complete warranty details.

OPTIONS

Maxi-Heat®

Thermostat Package

- Remote Thermostat
- Lead extension

2 5/16" Bulldog Hitch

Lockable Battery Disconnect

16", 20" or Dual 12" Duct Flange Outlets (ducting sold separately)

Adjustable Air Recirculation Inlet

Air Shut off Valve

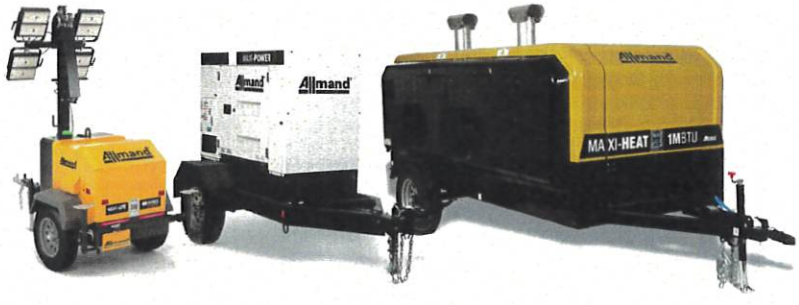
Remote Fuel Valve and Pump

Single Steel Fuel Tank or Multi Poly Fuel Tanks

Custom Paint

Telematics (Customer supplied – consult factory)

Emergency Stop



COMPROMISE NOTHING.

At Allmand, our sole focus is providing jobsite support equipment to help your customers get the job done. Whenever they need it. Wherever they are. And whatever it takes. What's more, our genuine commitment to you — the highest standard of service and lowest total cost of ownership — is simply unmatched. Choose the equipment that comes with complete confidence that jobsite productivity won't go dark at 2 a.m. **Allmand. Above All.**

Allmand

BRIGGS & STRATTON

Briggs & Stratton LLC
P.O. Box 888, Holdrege, NE 68949

GILLETTE GENERATORS

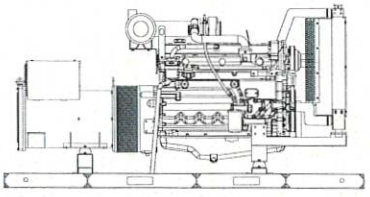
LIQUID COOLED NAT. GAS ENGINE GENERATOR SET

PRIME MODEL

PR-2400

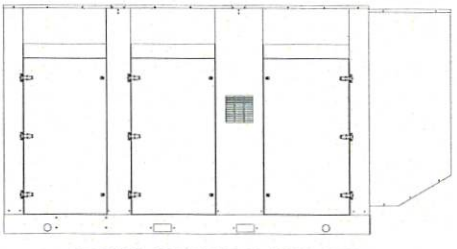
60 HERTZ

Model	HZ	PRIME 105°C RISE NATURAL GAS
PR-2400-60 HERTZ	60	240



"OPEN" GEN-SET

There is no enclosure, so gen-set must be placed within a weather protected area, un-inhabited by humans or animals, with proper ventilation. Silencer not supplied, as installation requirements are not known. However, this item is available as optional equipment.



"LEVEL 2" HOUSED GEN-SET

Full aluminum weather protection and superior sound attenuation for specific low noise applications. Critical grade muffler is standard.

All generator sets are USA prototype built and thoroughly tested. Production models are USA factory built and 100% load tested.

UL1446, UL508, UL142, UL498

NFPA 110, 99, 70, 37
All generator sets meet NFPA-110 Level 1, when equipped with the necessary accessories and installed per NFPA standards.

NEC 700, 701, 702, 708

NEMA ICS10, MG1, ICS6, AB1

ANSI C62.41, 27, 59, 32, 480, 40Q, 81U, 360-05

ASCE 7-05 & 7-10
All generator sets meet 180 MPH rating.

EPA 40CFR Part 60, 1048, 1065, 1068

GENERATOR RATINGS					NATURAL GAS FUEL		POWER LEAD CONNECTIONS
GENERATOR MODEL	VOLTAGE		PH	HZ	105°C RISE PRIME RATING		
	L-N	L-L			KW/KVA	AMP	
PR-2400-3-2	120	208	3	60	240/300	834	12 LEAD LOW WYE
PR-2400-3-3	120	240	3	60	240/300	723	12 LEAD HIGH DELTA
PR-2400-3-4	277	480	3	60	240/300	361	12 LEAD HIGH WYE
PR-2400-3-5	127	220	3	60	240/300	788	12 LEAD LOW WYE
PR-2400-3-16	346	600	3	60	240/300	289	4 LEAD WYE 3PH

RATINGS: All single phase gen-sets are dedicated 4 lead windings, rated at unity (1.0) power factor. All three phase gen-sets are 12 lead windings, rated at (.8) power factor. 105°C "PRIME RATINGS" are strictly for gen-sets provide the prime source of electric power, where normal utility power is unavailable or unreliable. A 10% overload is allowed for a total of 1 hour, within every 12 hours of operation of PRIME RATED systems. All gen-set power ratings are based on temperature rise measured by resistance method as defined by MIL-STD 705C and IEEE STD 115, METHOD 6.4.4. All generators have class H (180°C) insulation system on both rotor and stator windings. All factory tests and KW/KVA charts shown above are based on 105°C (prime) R/R winding temperature, within a maximum 40°C ambient condition. Specifications & ratings are subject to change without prior notice.

APPLICATION AND ENGINEERING DATA FOR MODEL PR-2400-60 HZ

GENERATOR SPECIFICATIONS

Manufacturer ..... Stamford Electric Generators
Model & Type ..... S4L1DD-311, 4 Pole, 12 Lead, Three Phase
..... S4L1SD-17, 4 Pole, 12 Lead, 600V, Three Phase
Exciter ..... Brushless, shunt excited
Voltage Regulator ..... Solid State, HZ/Volts
Voltage Regulation ..... ½%, No load to full load
Frequency ..... Field convertible, 60 HZ to 50 HZ
Frequency Regulation ..... ½% (½ cycle, no load to full load)
Unbalanced Load Capability ..... 100% of prime amps
Total Stator and Load Insulation ..... Class H, 180°C
Temperature Rise ..... 105°C R/R, prime rating @ 40°C amb.
3 Ø Motor Starting @ 30% Voltage Dip (208-240V) .... 550 kVA
3 Ø Motor Starting @ 30% Voltage Dip (480V) ..... 750 kVA
Bearing ..... 1, Pre-lubed and sealed
Coupling ..... Direct flexible disc
Total Harmonic Distortion ..... Max 3 % (MIL-STD705B)
Telephone Interference Factor ..... Max 50 (NEMA MG1-22)
Deviation Factor ..... Max 5% (MIL-STD 405B)
Ltd. Warranty Period ..... 24 Months from date of start-up or
..... 1000 hours use, first to occur.

GENERATOR FEATURES

- World Renown Stamford Electric Generator having UL-1446 certification.
- Full generator protection with **Deep Sea 7420** controller, having UL-508 certification.
- Automatic voltage regulator with over-excitation, under-frequency compensation, under-speed protection, and EMI filtering. Entire solid-state board is encapsulated for moisture protection.
- Generator power ratings are based on temperature rise, measured by resistance method, as defined in MIL-STD 705C and IEEE STD 115, Method 6.4.4.
- Power ratings will not exceed temperature rise limitation for class H insulation as per NEMA MG1-22.40.
- Insulation resistance to ground, exceeds 1.5 meg-ohm.
- Stator receives 2000 V. hi-potential test on main windings, and rotor windings receive a 1500 V. hi-potential test, as per MIL-STD 705B.
- Full amortisseur windings with UL-1446 certification.
- Complete engine-generator torsional acceptance, confirmed during initial prototype testing.
- Full load testing on all engine-generator sets, before shipping.
- Self ventilating and drip-proof & revolving field design

ENGINE SPECIFICATIONS AND APPLICATIONS DATA

ENGINE

Manufacturer ..... Power Solutions Inc. (PSI)
Model and Type ..... Heavy Duty, 14.6LTCAC, 4 cycle
Aspiration ..... Turbocharged & Charge Air Cooled
Cylinder Arrangement ..... 8 Cylinders, Vee
Displacement Cu. In. (Liters) 892 (14.6)
Bore & Stroke In. (Cm.) ..... 5.04 x 5.59 (12.8 x 14.2)
Compression Ratio 10.5:1
Main Bearings & Style ..... 10, Precision Half-Shell
Cylinder Head ..... Cast Iron
Pistons ..... Cast Aluminum
Crankshaft ..... Forged Steel
Exhaust Valve ..... Inconel, A193
Governor ..... Electronic
Frequency Reg. (no load-full load) ..... Isochronous
Frequency Reg. (steady state) ..... ± 1/4%
Air Cleaner ..... Dry, Replaceable Cartridge
Engine Speed 1800
Piston Speed, ft/min (m./min) 1677 (511)
Max Power, bhp (kwm) Prime/NG 362 (270)
Ltd. Warranty Period ..... 12 Months or 2000 hrs., first to occur

FUEL SYSTEM

Type ..... NAT. GAS, Vapor Withdrawal
Fuel Pressure (kpa), in. H_2O ..... (1.74), 7"
Secondary Fuel Regulator ..... NG Vapor System
Auto Fuel Lock-Off Solenoid ..... Standard on all sets
Fuel Supply Inlet Line ..... (2) 2" NPTF

FUEL CONSUMPTION

NAT. GAS: FT^3/HR (M^3/HR)	PRIME
100% LOAD	2760 (78.2)
75% LOAD	2050 (58.0)
50% LOAD	1440 (40.8)
NG = 1000 BTU X FT^3/HR = Total BTU/HR	

OIL SYSTEM

Type ..... Full Pressure
Oil Pan Capacity qt. (L) 42.3 (40.0)
Oil Pan Cap. W/ filter qt. (L) 49.7 (47.1)
Oil Filter ..... 2, Replaceable Spin-On

ELECTRICAL SYSTEM

Ignition System ..... Electronic
Eng. Alternator/Starter: 24 VDC, negative ground, 45 amp/hr.

Recommended battery to -18°C (0° F): ...(2) 12 VDC, BCI# 31, Max. Dimensions: 14"lg x 6 3/4" wi x 10" hi, with standard round posts. Min output 1000 CCA. Battery tray (max. dim. at 15"lg x 7"wi). This model has (2) battery trays, (2) hold down straps, (2) sets of battery cables, and (1) battery charger. Installation of (2) 12VDC starting batteries connected in series for 24VDC output is required, with possible higher AMP/HR rating, as described above, if the normal environment temperature averages -13° F (-25°C) or cooler.

APPLICATION AND ENGINEERING DATA FOR MODEL PR-2400-60 HZ

COOLING SYSTEM

Type of System ..... Pressurized, closed recovery
Coolant Pump ..... Pre-lubricated, self-sealing
Cooling Fan Type (no. of blades) .....Pusher (12)
Fan Diameter inches (mm) .....45" (1143)
Ambient Capacity of Radiator °F (°C) 125 (51.6)
Engine Jacket Coolant Capacity Gal (L) 9.5 (43.2)
Radiator Coolant Capacity Gal. (L)..... 50.0 (227.3)
Maximum Restriction of Cooling Air Intake
and discharge side of radiator in. H_20 (kpa) ..... 0.5 (.125)
Water Pump Capacity gpm (L/min) 180 (680)
Heat Reject Coolant: Btu/min (kw) 16,189 (284)
Low Radiator Coolant Level Shutdown.....Standard
Note: Coolant temp. shut-down switch setting at 230°F (110°C) with 50/50 (water/antifreeze) mix.

AIR REQUIREMENTS

Combustion Air, cfm (kg/hr) 532 (1064)
Radiator Air Flow cfm (m^3/min)..... .....30,000 (849)
Heat Rejected to Ambient:
Engine: kw (btu/min)..... ..... 66.0 (3765)
Alternator: kw (btu/min)..... ..... 23 (1309)

EXHAUST SYSTEM

Exhaust Outlet Size.....(2) 4"
Max. Back Pressure, in. hg (KPA). 3.0 (10.2)
Exhaust Flow, at rated kw: cfm (m^3/min)..... ....2521 (71.3)
Exhaust Temp., at rated kw: °F (°C) 1382 (750)
Engines are EPA certified for Natural Gas.

SOUND LEVELS MEASURED IN dB(A)

	Open Set	Level 2 Encl.
Level 2, Critical Silencer	92	80
Level 3, Hospital Silencer	87	75

Note: Open sets (no enclosure) has (2) optional silencer system choices due to unknown job-site applications. Level 2 enclosure has installed critical silencer with upgrade to hospital silencer. Sound tests are averaged from several test points and taken at 23 ft. (7 m) from source of noise at normal operation.

DERATE GENERATOR FOR ALTITUDE

3% per 1000 ft.(305m) above 3000 ft. (914m) from sea level

DERATE GENERATOR FOR TEMPERATURE

2% per 10°F(5.6°C) above 85°F (29.4°C)

DIMENSIONS AND WEIGHTS

	Open Set	Level 2 Enclosure
Length in (cm)	152 (368)	186 (473)
Width in (cm)	72 (183)	72 (183)
Height in (cm)	80 (203)	94 (239)
3 Ø Net Weight lbs (kg)	8475 (3844)	10975 (4978)
3 Ø Ship Weight lbs (kg)	8825 (4003)	11325 (5137)

DEEP SEA 7420 DIGITAL MICROPROCESSOR CONTROLLER

Deep Sea 7420

The "**7420**" controller is an auto start mains (utility) failure module for single gen-set applications. This controller includes a backlit LCD display which continuously displays the status of the engine and generator at all times.

The "**7420**" controller will also monitor speed, frequency, voltage, current, oil pressure, coolant temp., and fuel levels. These modules have been designed to display warning and shut down status. It also includes: (11) configurable inputs • (8) configurable outputs • voltage monitoring • mains (utility) failure detection. • (250) event logs • configurable timers • automatic shutdown or warning during fault detection • remote start (on load) • engine preheat • advanced metering capability • hour meter • text LCD displays • protected solid state outputs • test buttons for: stop/reset • manual mode • auto mode • lamp test • start button • power monitoring (kWh, kVAr, kVAh, kVArh) This controller includes expansion features including RS232, RS484 (using MODBUS-RTU/TCP), direct USB connection with PC, expansion optioned using DSENet for remote annunciation and remote relay interfacing for a distance of up to 3300FT. The controller software is freely downloadable from the internet and allows monitoring with direct USB cable, LAN, or by internet via the built in web interface.

LOW LOAD CONDITIONS: Operation of PSI HD engines at low-load conditions should be limited to no more than one (1) hour per twenty-four (24) hour period. If the application requires extended time at light loads, it is recommended that the engine load be increased to at least 70% of mechanical rating for a minimum of two (2) hours per fifty (50) hours of low-load operation. Piston sealing rings rely on adequate cylinder firing pressure and temperature to seal the combustion chamber and prevent excessive engine oil from entering the power cylinder. Under low loads these rings will not seal properly, resulting in oil being burned in the combustion chamber and carbon deposits on pistons and valves. This mechanism is well-documented in reciprocating engines of all fuel types and is often referred to as "wet-stacking."

STANDARD FEATURES FOR MODEL PR-2400-60 HZ

CONTROL PANEL:

Deep Sea 7420 digital microprocessor with logic allows programming in the field. Controller has:

- STOP-MANUAL-AUTO modes and automatic engine shutdowns, signaled by full text LCD indicators:
- Low oil pressure
- High engine temp
- Low Radiator Level
- Three auxiliary alarms
- Battery fail alarm
- Engine fail to start
- Engine over speed
- Engine under speed
- Over & under voltage

Also included is tamper-proof engine hour meter

ENGINE:

Full flow oil filter • Air filter • Oil pump • Solenoid type starter motor • Hi-temp radiator • Jacket water pump • Thermostat • Pusher fan and guard • Exhaust manifold • 24 VDC battery charging alternator • Flexible exhaust connector • "Isochronous" duty, electronic governor • Secondary dry fuel regulator • Dry fuel lock-off solenoid • Vibration isolators • Closed coolant recovery system with 50/50 water to anti-freeze mixture • flexible oil & radiator drain hose.

AC GENERATOR SYSTEM:

AC generator • Shunt excited • Brushless design • Circuit Breaker installed and wired to gen-set • Direct connection to engine with flex disc • Class H, 180°C insulation • Self ventilated • Drip proof construction • UL Certified

VOLTAGE REGULATOR:

½% Voltage regulation • EMI filter • Under-speed protection • Over-excitation protection • total encapsulation

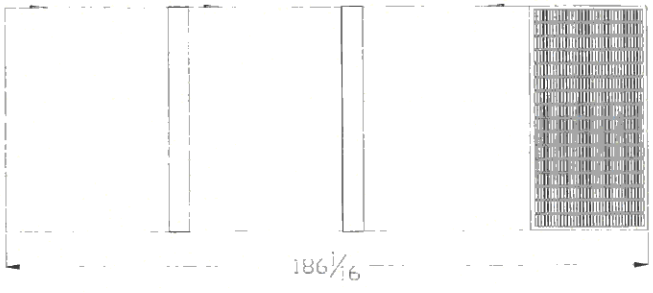
DC ELECTRICAL SYSTEM:

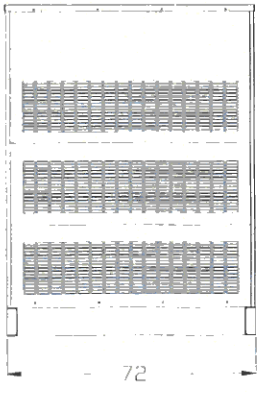
Battery tray • Battery cables • Battery hold down straps • 2-stage battery float charger with maintaining & recharging automatic charge stages

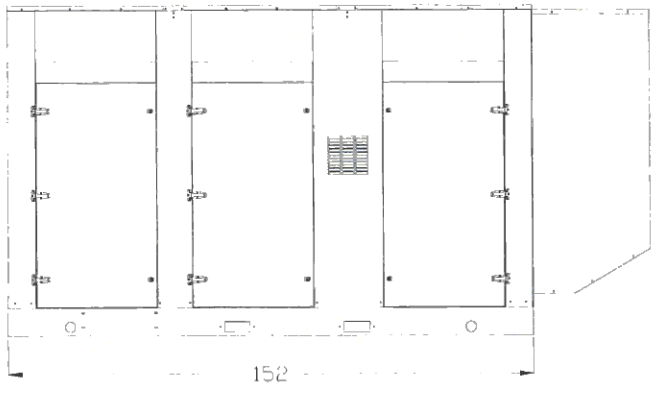
WEATHER/SOUND PROOF ALUMINUM HOUSING CORROSION RESISTANT PROTECTION CONSISTING OF:

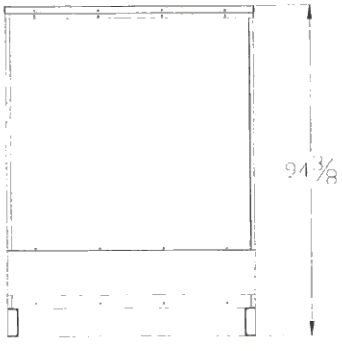
- 9 Heated And Agitated Wash Stages
- Zinc Phosphate Etching-coating Stage
- Final Baked On Enamel Powder Coat
- 18/8 Stainless Steel Hardware

Design & specifications subject to change without prior notice. Dimensions shown are approximate. Contact Gillette for certified drawings. DO NOT USE DIMENSIONS FOR INSTALLATION PURPOSES.









GILLETTE GENERATORS

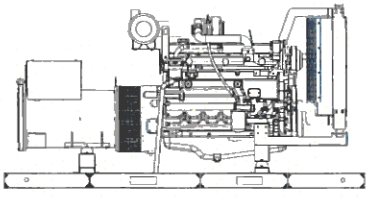
LIQUID COOLED NAT. GAS ENGINE GENERATOR SET

PRIME MODEL

PR-1800

60 HERTZ

Model	HZ	PRIME 105°C RISE NATURAL GAS
PR-1800-60 HERTZ	60	180



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UL1446, UL508, UL142, UL498

NFPA 110, 99, 70, 37
All generator sets meet NFPA-110 Level 1, when equipped with the necessary accessories and installed per NFPA standards.

NEC 700, 701, 702, 708

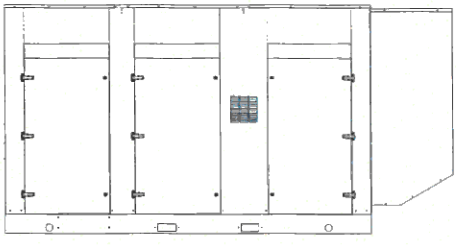
NEMA ICS10, MG1, ICS6, AB1

ANSI C62.41, 27, 59, 32, 480, 40Q, 81U, 360-05

ASCE 7-05 & 7-10
All generator sets meet 180 MPH rating.

EPA 40CFR Part 60, 1048, 1065, 1068

"OPEN" GEN-SET
There is no enclosure, so gen-set must be placed within a weather protected area, un-inhabited by humans or animals, with proper ventilation. Silencer not supplied, as installation requirements are not known. However, this item is available as optional equipment.



"LEVEL 2" HOUSED GEN-SET
Full aluminum weather protection and superior sound attenuation for specific low noise applications. Critical grade muffler is standard.

GENERATOR RATINGS

GENERATOR MODEL	VOLTAGE		PH	HZ	NATURAL GAS FUEL 105°C RISE PRIME RATING		POWER LEAD CONNECTIONS
	L-N	L-L			KW/KVA	AMP	
PR-1800-1-1	120	240	1	60	180/180	750	4 LEAD DEDICATED 1 PH.
PR-1800-3-2	120	208	3	60	180/225	625	12 LEAD LOW WYE
PR-1800-3-3	120	240	3	60	180/225	542	12 LEAD HIGH DELTA
PR-1800-3-4	277	480	3	60	180/225	271	12 LEAD HIGH WYE
PR-1800-3-5	127	220	3	60	180/225	591	12 LEAD LOW WYE
PR-1800-3-16	346	600	3	60	180/225	217	4 LEAD DEDICATED 3 PH.

RATINGS: All single phase gen-sets are dedicated 4 lead windings, rated at unity (1.0) power factor. All three phase gen-sets are 12 lead windings, rated at (.8) power factor. 105°C "PRIME RATINGS" are strictly for gen-sets provide the prime source of electric power, where normal utility power is unavailable or unreliable. A 10% overload is allowed for a total of 1 hour, within every 12 hours of operation of PRIME RATED systems. All gen-set power ratings are based on temperature rise measured by resistance method as defined by MIL-STD 705C and IEEE STD 115, METHOD 6.4.4. All generators have class H (180°C) insulation system on both rotor and stator windings. All factory tests and KW/KVA charts shown above are based on 105°C (prime) R/R winding temperature, within a maximum 40°C ambient condition. Specifications & ratings are subject to change without prior notice.

APPLICATION AND ENGINEERING DATA FOR MODEL PR-1800-60 HZ

GENERATOR SPECIFICATIONS

Manufacturer ..... Stamford Electric Generators
Model & Type ..... S4L1DD-311, 4 Pole, 12 Lead, Single Phase
..... UCID274J-311, 4 Pole, 12 Lead, Three Phase
..... UCI274H-17, 4 Pole, 12 Lead, 600V, Three Phase
Exciter ..... Brushless, shunt excited
Voltage Regulator ..... Solid State, HZ/Volts
Voltage Regulation ..... ½%, No load to full load
Frequency ..... Field convertible, 60 HZ to 50 HZ
Frequency Regulation ..... ½% (½ cycle, no load to full load)
Unbalanced Load Capability ..... 100% of prime amps
Total Stator and Load Insulation ..... Class H, 180°C
Temperature Rise ..... 105°C R/R, prime rating @ 40°C amb.
1 Ø Motor Starting @ 30% Voltage Dip (240V) ..... 490 kVA
3 Ø Motor Starting @ 30% Voltage Dip (208-240V) ..... 510 kVA
3 Ø Motor Starting @ 30% Voltage Dip (480V) ..... 675 kVA
Bearing ..... 1, Pre-lubed and sealed
Coupling ..... Direct flexible disc
Total Harmonic Distortion ..... Max 3½% (MIL-STD705B)
Telephone Interference Factor ..... Max 50 (NEMA MG1-22)
Deviation Factor ..... Max 5% (MIL-STD 405B)
Ltd. Warranty Period ..... 24 Months from date of start-up or
..... 1000 hours use, first to occur.

GENERATOR FEATURES

- World Renown Stamford Electric Generator having UL-1446 certification.
- Full generator protection with **Deep Sea 7420** controller, having UL-508 certification.
- Automatic voltage regulator with over-excitation, under-frequency compensation, under-speed protection, and EMI filtering. Entire solid-state board is encapsulated for moisture protection.
- Generator power ratings are based on temperature rise, measured by resistance method, as defined in MIL-STD 705C and IEEE STD 115, Method 6.4.4.
- Power ratings will not exceed temperature rise limitation for class H insulation as per NEMA MG1-22.40.
- Insulation resistance to ground, exceeds 1.5 meg-ohm.
- Stator receives 2000 V. hi-potential test on main windings, and rotor windings receive a 1500 V. hi-potential test, as per MIL-STD 705B.
- Full amortisseur windings with UL-1446 certification.
- Complete engine-generator torsional acceptance, confirmed during initial prototype testing.
- Full load testing on all engine-generator sets, before shipping.
- Self ventilating and drip-proof & revolving field design

ENGINE SPECIFICATIONS AND APPLICATIONS DATA

ENGINE

Manufacturer ..... Power Solutions Inc. (PSI)
Model and Type ..... Heavy Duty 11.1LTCAC, 4 cycle
Aspiration ..... Turbocharged & Charge Air Cooled
Cylinder Arrangement ..... 6 Cylinders, Inline
Displacement Cu. In. (Liters) 674 (11.1)
Bore & Stroke In. (Cm.) ..... 4.84 x 6.1 (12.3 x 15.5)
Compression Ratio 10.5:1
Main Bearings & Style ..... 7, Precision Half-Shell
Cylinder Head ..... Cast Iron
Pistons ..... Cast Aluminum
Crankshaft ..... Forged Steel
Exhaust Valve ..... Inconel, A193
Governor ..... Electronic
Frequency Reg. (no load-full load) ..... Isochronous
Frequency Reg. (steady state) ..... ± 1/4%
Air Cleaner ..... Dry, Replaceable Cartridge
Engine Speed 1800
Piston Speed, ft/min (m./min) 18310 (558)
Max Power, bhp (kwm) Prime/NG 272 (203)
Ltd. Warranty Period ..... 12 Months or 2000 hrs., first to occur

FUEL SYSTEM

Type ..... NAT. GAS, Vapor Withdrawal
Fuel Pressure (kpa), in. H_2O ..... (1.74), 7"
Secondary Fuel Regulator ..... NG Vapor System
Auto Fuel Lock-Off Solenoid ..... Standard on all sets
Fuel Supply Inlet Line ..... 2" NPTF

FUEL CONSUMPTION

NAT. GAS: FT^3/HR (M^3/HR)	PRIME
100% LOAD	1980 (56.1)
75% LOAD	1500 (42.5)
50% LOAD	1075 (30.4)
NG = 1000 BTU X FT^3/HR = Total BTU/HR	

OIL SYSTEM

Type ..... Full Pressure
Oil Pan Capacity qt. (L) 26.4 (25.0)
Oil Pan Cap. W/ filter qt. (L) 28.8 (27.0)
Oil Filter ..... 1, Replaceable Spin-On

ELECTRICAL SYSTEM

Ignition System ..... Electronic
Eng. Alternator/Starter: 24 VDC, negative ground, 45 amp/hr.

Recommended battery to -18°C (0° F): ....(2) 12 VDC, BCI# 27, Max. Dimensions: 12"lg x 6 3/4" wi x 9" hi, with standard round posts. Min output 700 CCA. Battery tray (max. dim. at 12"lg x 7"wi). This model has (2) battery trays, (2) hold down straps, (2) sets of battery cables, and (1) battery charger. Installation of (2) 12VDC starting batteries connected in series for 24VDC output is required, with possible higher AMP/HR rating, as described above, if the normal environment temperature averages -13° F (-25°C) or cooler.

APPLICATION AND ENGINEERING DATA FOR MODEL PR-1800-60 HZ

COOLING SYSTEM

Type of System ..... Pressurized, closed recovery
Coolant Pump ..... Pre-lubricated, self-sealing
Cooling Fan Type (no. of blades) ..... Pusher (12)
Fan Diameter inches (mm) ..... 38" (965)
Ambient Capacity of Radiator °F (°C) 125 (51.6)
Engine Jacket Coolant Capacity Gal (L) 5.5 (21.0)
Radiator Coolant Capacity Gal. (L) 30.6 (116)
Maximum Restriction of Cooling Air Intake
and discharge side of radiator in. H_20 (kpa) ..... 0.5 (.125)
Water Pump Capacity gpm (L/min) 75 (284)
Heat Reject Coolant: Btu/min (kw) 8100 (142)
Low Radiator Coolant Level Shutdown ..... Standard
Note: Coolant temp. shut-down switch setting at 230°F (110°C) with 50/50 (water/antifreeze) mix.

AIR REQUIREMENTS

Combustion Air, cfm (m^3/min) 448 (12.7)
Radiator Air Flow cfm (m^3/min) 18,000 (510)
Heat Rejected to Ambient:
Engine: kw (btu/min) 60.3 (3430)
Alternator: kw (btu/min) 16 (910)

EXHAUST SYSTEM

Exhaust Outlet Size ..... 5"
Max. Back Pressure, in. hg (KPA) 3.0 (10.2)
Exhaust Flow, at rated kw: cfm (m^3/min) 1425 (40.3)
Exhaust Temp., at rated kw: °F (°C) 1382 (750)
Engines are EPA certified for Natural Gas.

SOUND LEVELS MEASURED IN dB(A)

	Open Set	Level 2 Encl.
Level 2, Critical Silencer	90	75

Note: Open sets (no enclosure) has (2) optional silencer system choices due to unknown job-site applications. Level 2 enclosure has installed critical silencer with upgrade to hospital silencer. Sound tests are averaged from several test points and taken at 23 ft. (7 m) from source of noise at normal operation.

DERATE GENERATOR FOR ALTITUDE

3% per 1000 ft.(305m) above 3000 ft. (914m) from sea level

DERATE GENERATOR FOR TEMPERATURE

2% per 10°F(5.6°C) above 85°F (29.4°C)

DIMENSIONS AND WEIGHTS

	Open Set	Level 2 Enclosure
Length in (cm)	132 (335)	204 (518)
Width in (cm)	52 (132)	72 (183)
Height in (cm)	80 (203)	94 (239)
3 Ø Net Weight lbs (kg)	6375 (2891)	8975 (4071)
3 Ø Ship Weight lbs (kg)	6725 (3050)	9325 (4230)

DEEP SEA 7420MKII DIGITAL MICROPROCESSOR CONTROLLER

Deep Sea 7420MKII

The "**7420MKII**" controller is an auto start mains (utility) failure module for single gen-set applications. This controller includes a backlit LCD display which continuously displays the status of the engine and generator at all times.

The "**7420**" controller will also monitor speed, frequency, voltage, current, oil pressure, coolant temp., and fuel levels. These modules have been designed to display warning and shut down status. It also includes: (11) configurable inputs • (8) configurable outputs • voltage monitoring • mains (utility) failure detection.

• (250) event logs • configurable timers • automatic shutdown or warning during fault detection • remote start (on load) • engine preheat • advanced metering capability • hour meter • text LCD displays • protected solid state outputs • test buttons for: stop/reset • manual mode • auto mode • lamp test • start button • power monitoring (kWh, kVAr, kVAh, kVArh) This controller includes expansion features including RS232, RS484 (using MODBUS-RTU/TCP), direct USB connection with PC, expansion optioned using DSENet for remote annunciation and remote relay interfacing for a distance of up to 3300FT. The controller software is freely downloadable from the internet and allows monitoring with direct USB cable, LAN, or by internet via the built in web interface.

LOW LOAD CONDITIONS: Operation of PSI HD engines at low-load conditions should be limited to no more than one (1) hour per twenty-four (24) hour period. If the application requires extended time at light loads, it is recommended that the engine load be increased to at least 70% of mechanical rating for a minimum of two (2) hours per fifty (50) hours of low-load operation. Piston sealing rings rely on adequate cylinder firing pressure and temperature to seal the combustion chamber and prevent excessive engine oil from entering the power cylinder. Under low loads these rings will not seal properly, resulting in oil being burned in the combustion chamber and carbon deposits on pistons and valves. This mechanism is well-documented in reciprocating engines of all fuel types and is often referred to as "wet-stacking."

STANDARD FEATURES FOR MODEL PR-1800-60 HZ

STANDARD FEATURES

CONTROL PANEL:

Deep Sea 7420 digital microprocessor with logic allows programming in the field. *Controller has:*

- STOP-MANUAL-AUTO modes and automatic engine shutdowns, signaled by full text LCD indicators:
- Low oil pressure
- High engine temp
- Low Radiator Level
- Three auxiliary alarms
- Battery fail alarm
- Engine fail to start
- Engine over speed
- Engine under speed
- Over & under voltage

Also included is tamper-proof engine hour meter

ENGINE:

Full flow oil filter • Air filter • Oil pump • Solenoid type starter motor • Hi-temp radiator • Jacket water pump • Thermostat • Pusher fan and guard • Exhaust manifold • 24 VDC battery charging alternator • Flexible exhaust connector • "Isochronous" duty, electronic governor • Secondary dry fuel regulator • Dry fuel lock-off solenoid • Vibration isolators • Closed coolant recovery system with 50/50 water to anti-freeze mixture • flexible oil & radiator drain hose.

Design & specifications subject to change without prior notice. Dimensions shown are approximate. Contact Gillette for certified drawings. DO NOT USE DIMENSIONS FOR INSTALLATION PURPOSES.

AC GENERATOR SYSTEM:

AC generator • Shunt excited • Brushless design • Circuit Breaker installed and wired to gen-set • Direct connection to engine with flex disc • Class H, 180°C insulation • Self ventilated • Drip proof construction • UL Certified

VOLTAGE REGULATOR:

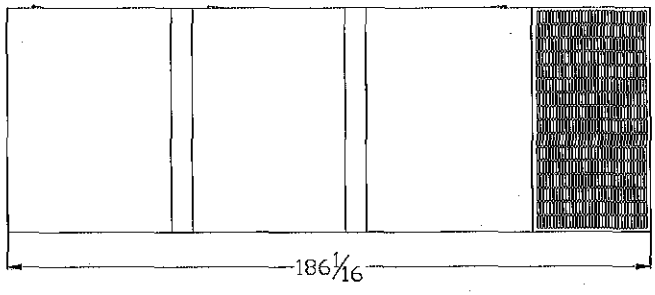
½% Voltage regulation • EMI filter • Under-speed protection • Over-excitation protection • total encapsulation

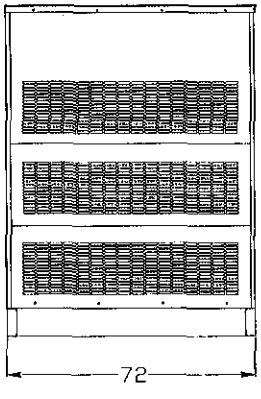
DC ELECTRICAL SYSTEM:

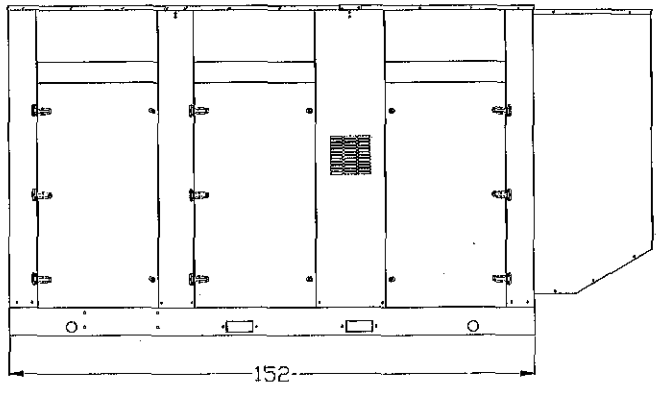
Battery tray • Battery cables • Battery hold down straps • 2-stage battery float charger with maintaining & recharging automatic charge stages

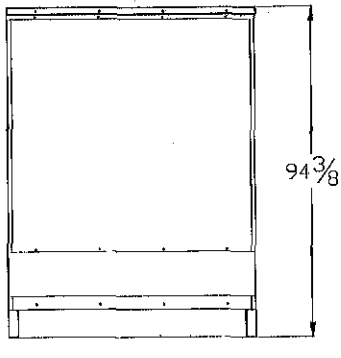
WEATHER/SOUND PROOF ALUMINUM HOUSING CORROSION RESISTANT PROTECTION CONSISTING OF:

- 9 Heated And Agitated Wash Stages
- Zinc Phosphate Etching-coating Stage
- Final Baked On Enamel Powder Coat
- 18/8 Stainless Steel Hardware









UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
2021 MODEL YEAR
CERTIFICATE OF CONFORMITY
WITH THE CLEAN AIR ACT

OFFICE OF TRANSPORTATION AND AIR QUALITY
ANN ARBOR, MICHIGAN 48105

Certificate Issued To: **Power Solutions International, Inc.**
(U.S. Manufacturer or Importer)

Certificate Number: **MPSIB14.6NGP-019**

Effective Date: 07/15/2020

Expiration Date: 12/31/2021

Byron J. Bunker, Division Director
Compliance Division

Issue Date: 07/15/2020

Revision Date: N/A

Manufacturer: Power Solutions International, Inc.
Engine Family: MPSIB14.6NGP
Mobile/Stationary Certification Type: Mobile and Stationary
Fuel : LPG/Propane
Natural Gas (CNG/LNG)
Emission Standards :
Part 60 Subpart JJJ Table 1
CO (g/Hp-hr) : 2.0
VOC (g/Hp-hr) : 0.7
NOx (g/Hp-hr) : 1.0
Mobile Part 1048
HC + NOx (g/kW-hr) : 2.7
CO (g/kW-hr) : 4.4
NMHC + NOx (g/kW-hr) : 2.7
Stationary Part 1048
CO (g/kW-hr) : 4.4
HC + NOx (g/kW-hr) : 2.7
NMHC + NOx (g/kW-hr) : 2.7
Emergency Use Only : N

Pursuant to Section 213 of the Clean Air Act (42 U.S.C. section 7547) and 40 CFR Part 1048, 40 CFR Part 60, 1065, 1068, and 60 (stationary only and combined stationary and mobile) and subject to the terms and conditions prescribed in those provisions, this certificate of conformity is hereby issued with respect to the test engines which have been found to conform to applicable requirements and which represent the following nonroad engines, by engine family, more fully described in the documentation required by 40 CFR Part 1048, 40 CFR Part 60 and produced in the stated model year.

This certificate of conformity covers only those new nonroad spark-ignition engines which conform in all material respects to the design specifications that applied to those engines described in the documentation required by 40 CFR Part 1048, 40 CFR Part 60 and which are produced during the model year stated on this certificate of the said manufacturer, as defined in 40 CFR Part 1048, 40 CFR Part 60. This certificate of conformity does not cover nonroad engines imported prior to the effective date of the certificate.

It is a term of this certificate that the manufacturer shall consent to all inspections described in 40 CFR 1068.20 and authorized in a warrant or court order. Failure to comply with the requirements of such a warrant or court order may lead to revocation or suspension of this certificate for reasons specified in 40 CFR Part 1048, 40 CFR Part 60. It is also a term of this certificate that this certificate may be revoked or suspended or rendered void *ab initio* for other reasons specified in 40 CFR Part 1048, 40 CFR Part 60.

This certificate does not cover large nonroad engines sold, offered for sale, or introduced, or delivered for introduction, into commerce in the U.S. prior to the effective date of the certificate.

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Quality flares that work every time.

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Targa Resources

Rev 0: 02/02/24

Reference: Cadillac VCU

Combustor Model: HCD48

Hero Flare is pleased to provide a proposal for a combustor system that is fully compliant with 40 CFR 60.18 subpart OOOO EPA regulatory standards. The system being offered has been fully tested by the manufacturer in-house and has been approved by the EPA.

There are many advantages to our combustor systems:

- Guaranteed destruction efficiency greater than 98% or greater
- Quad O EPA Certified
- Battery / Solar powered OR 120VAC BMS systems available.
- Automated pilot ignition system with continuous pilot flame monitoring.
- No minimum operating pressure requirements.

We look forward to working with you as this project progresses.

Best regards,

Craig Rosencutter
Office: (918) 941-2166 Ext. 101
Cell: (918) 344-4335
Email: craig.rosencutter@heroflare.com

Garrett Consedine
Office: (918) 941-2166 Ext. 114
Cell: (918) 948-4647
Email: garrett.consedine@heroflare.com

Matt Schrum
Cell: (402) 637-1588
Email: matt.schrum@heroflare.com

Visit us at www.heroflare.com

Hero Flare offers more Quad O approved combustors than any other supplier! We are committed to providing safe, reliable, and environmentally friendly combustor solutions!

Design Data Sheet

Design Flow Rate

Flow Rate Case	Flow Rate (SCFD)	Molecular Weight	Lower Heating Value (Btu/SCF)	Pressure	Temp. (°F)
Smokeless Rate	0 to 52,000	30 to 40	1,600	6 oz/in^2	Amb.

See Flow Curve on Last Sheet of Proposal

Site Conditions

Wind	120 MPH	Temperature	0 to 120 °F	Elevation	14.5 Psi

Site Utilities Required

Pilot Gas (per pilot)	Natural Gas: 25 scfh @ 5 psig (Clean, dry gas)	
Plant Air	No Plant Air Required	
Pilot Panel Electricity	115VAC or Battery / Solar Powered (Specify at time of order)	
Blower Motor Electricity	No blower included with this offer	Blower Size: N/A

Emission / Flare Performance

Destruction	A 98% or greater hydrocarbon destruction efficiency will be achieved
Smokeless Rate	100% Smokeless
Max Radiation	Shell temperature < 150 °F
Tip Velocity	N/A

Pilot Construction

Electrical Area	Non-classified area
Control Panel Type	Nema 4 (Painted)
Pilot(s)	One (1) Gas Pilot
Pilot Construction	Stainless Steel
Pilot Monitoring	Ionization Rod
Pilot Gas Connection	¼" FNPT Located at Base of Flare

Flare Construction

Component	Dimension	Material
Stack Height x Diameter	12'-6" x 4'	A53B
Internal Insulation	2" Thick	8# Ceramic Fiber
Inlet Connection	3" FNPT	Carbon

HCD48 Equipment Description

Combustor

- Over 98% mass destruction rate efficiency
- 12'-6" overall height (including skid)
- Multi-jet burner manifold
- Flame Arrestor at the bottom air intake (Bottom of stack)
- 2" Ceramic internal insulation
- 3" SCD inlet connection
- The combustor shell upper section is shipped lose and requires minimum field installation.

Skid – *Optional Item*

- Combustor base is shop mounted on a 4'-4" Wide x 11'-0" long skid.
- Optional items (i.e. scrubber) are shop mounted to reduce field assembly time.

Flashback Protection

- In-Line Flame Arrestor

Burner Management System

- BMS Enclosure shop mounted to skid *(battery / solar powered or 120VAC powered)*
- Remote Start / Stop Capabilities
- Automated Pilot Ignition *(Includes pilot gas solenoid valve, regulator, gauge)*
- Automated main waste gas butterfly valve

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575.397.3713 2609 W MARLAND HOBBS, NEW MEXICO 88240

EXTENDED GAS REPORT
SUMMARY OF CHROMATOGRAPHIC ANALYSIS

Sample Name:	Lucid Cadillac Gas	**For:**	16380G
Sample Date:	07/26/2023	**Cyl. Ident.:**	2023072618
Sampled By:	DG	**Company:**	Targa Midstream
Time Sampled:	09:30	**Analysis Date:**	07/28/2023
Sample Temp:	103.3 F	**Analysis By:**	BH
Sample Press:	1084.6 **H2S (PPM) = 2.0**	**Data File:**	LS_8793.D

Component	Mole%	GPM REAL	GPM IDEAL
H2S	0.000		
Nitrogen	0.947		
Methane	77.450		
CO2	0.245		
Ethane	11.480	3.069	3.062
Propane	5.426	1.494	1.491
Isobutane	0.765	0.250	0.250
N-Butane	1.754	0.553	0.552
Isopentane	0.440	0.161	0.161
N-Pentane	0.496	0.180	0.179
Hexanes+	0.997	0.427	0.425
Total	100.000	6.134	6.120

CALCULATED PARAMETERS

TOTAL ANALYSIS SUMMARY

MOLE WT:	21.735
VAPOR PRESS PSIA:	3976.2
SPECIFIC GRAVITY	
AIR = 1 (REAL):	0.7526
AIR = 1 (IDEAL):	0.7501
H2O = 1 (IDEAL):	0.355
REPORTED BASIS:	14.73
Unnormalized Total:	107.624

HEATING VALUE

BTU/CUFT (DRY)	1301.2
BTU/CUFT (WET)	1279.1

BTEX SUMMARY

WT% BENZENE	3.415
WT% TOLUENE	2.775
WT% E BENZENE	0.224
WT% XYLENES	2.123

LAB MANAGER

LABORATORY SERVICES
Natural Gas Analysis

575.397.3713 2609 W MARLAND HOBBS, NEW MEXICO 88240

Sample Name: Lucid Cadillac Gas
Company: Targa Midstream

Data File: LS_8793.D

*ANALYSIS OF HEXANES PLUS

Component	MOLE%	WT%
2,2 DIMETHYL BUTANE	0.007	0.027
CYCLOPENTANE	0.034	0.122
2-METHYLPENTANE	0.111	0.439
3-METHYLPENTANE	0.059	0.236
HEXANE (C6)	0.158	0.599
DIMETHYLPENTANES	0.009	0.042
METHYLCYCLOPENTANE	0.066	0.256
2,2,3 TRIMETHYLBUTANE	0.000	0.002
BENZENE	0.020	0.073
CYCLOHEXANE	0.078	0.301
2-METHYLHEXANE	0.025	0.114
3-METHYLHEXANE	0.035	0.163
DIMETHYCYCLOPENTANES	0.011	0.052
HEPTANE (C7)	0.060	0.275
METHYLCYCLOHEXANE	0.089	0.404
2,5 DIMETHYLHEXANE	0.002	0.009
TOLUENE	0.026	0.112
2-METHYLHEPTANE	0.020	0.105
OTHER OCTANES	0.046	0.243
OCTANE (C8)	0.022	0.116
ETHYLCYCLOHEXANE	0.007	0.036
ETHYL BENZENE	0.002	0.008
M,P-XYLENE	0.016	0.078
O-XYLENE	0.003	0.017
OTHER NONANES	0.022	0.134
NONANE (C-9)	0.012	0.071
IC3 BENZENE	0.003	0.015
CYCLOOCTANE	0.000	0.000
NC3 BENZENE	0.000	0.000
TM BENZENE(S)	0.004	0.021
IC4 BENZENE	0.000	0.001
NC4 BENZENE	0.001	0.005
DECANES + (C10+)	0.023	0.175

*HEXANES PLUS SUMMARY

AVG MOLE WT	95.576
VAPOR PRESS PSIA	9.860
API GRAVITY @ 60F	65.9
SPECIFIC GRAVITY	
AIR = 1 (IDEAL):	2.975
H2O = 1 (IDEAL):	0.717

COMPONENT RATIOS

HEXANES (C6) MOLE%	36.335
HEPTANES (C7) MOLE%	33.260
OCTANES (C8) MOLE%	20.666
NONANES (C9) MOLE%	6.311
DECANES+ (C10+) MOLE%	3.428

HEXANES (C6) WT%	32.474
HEPTANES (C7) WT%	32.168
OCTANES (C8) WT%	22.578
NONANES (C9) WT%	7.817
DECANES+ (C10+) WT%	4.963

Remarks: On: 6/26/23 spot

* Hexane+ portion calculated by Allocation Process

Table 1.4-1. EMISSION FACTORS FOR NITROGEN OXIDES (NO_x) AND CARBON MONOXIDE (CO) FROM NATURAL GAS COMBUSTION[a]

Combustor Type (MMBtu/hr Heat Input) [SCC]	NO_x[b]		CO	
	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
Large Wall-Fired Boilers (>100) [1-01-006-01, 1-02-006-01, 1-03-006-01]				
Uncontrolled (Pre-NSPS)[c]	280	A	84	B
Uncontrolled (Post-NSPS)[c]	190	A	84	B
Controlled - Low NO_x burners	140	A	84	B
Controlled - Flue gas recirculation	100	D	84	B
Small Boilers (<100) [1-01-006-02, 1-02-006-02, 1-03-006-02, 1-03-006-03]				
Uncontrolled	100	B	84	B
Controlled - Low NO_x burners	50	D	84	B
Controlled - Low NO_x burners/Flue gas recirculation	32	C	84	B
Tangential-Fired Boilers (All Sizes) [1-01-006-04]				
Uncontrolled	170	A	24	C
Controlled - Flue gas recirculation	76	D	98	D
Residential Furnaces (<0.3) [No SCC]				
Uncontrolled	94	B	40	B

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. Emission factors are based on an average natural gas higher heating value of 1,020 Btu/scf. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. SCC = Source Classification Code. ND = no data. NA = not applicable.

[b] Expressed as NO_2. For large and small wall fired boilers with SNCR control, apply a 24 percent reduction to the appropriate NO_x emission factor. For tangential-fired boilers with SNCR control, apply a 13 percent reduction to the appropriate NO_x emission factor.

[c] NSPS=New Source Performance Standard as defined in 40 CFR 60 Subparts D and Db. Post-NSPS units are boilers with greater than 250 MMBtu/hr of heat input that commenced construction modification, or reconstruction after August 17, 1971, and units with heat input capacities between 100 and 250 MMBtu/hr that commenced construction modification, or reconstruction after June 19, 1984.

TABLE 1.4-2. EMISSION FACTORS FOR CRITERIA POLLUTANTS AND GREENHOUSE GASES FROM NATURAL GAS COMBUSTION[a]

Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
CO_2[b]	120,000	A
Lead	0.0005	D
N_2O (Uncontrolled)	2.2	E
N_2O (Controlled-low-NO_X burner)	0.64	E
PM (Total)[c]	7.6	D
PM (Condensable)[c]	5.7	D
PM (Filterable)[c]	1.9	B
SO_2[d]	0.6	A
TOC	11	B
Methane	2.3	B
VOC	5.5	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020. The emission factors in this table may be converted to other natural gas heating values by multiplying the given emission factor by the ratio of the specified heating value to this average heating value. TOC = Total Organic Compounds. VOC = Volatile Organic Compounds.

[b] Based on approximately 100% conversion of fuel carbon to CO_2. $CO_2[lb/10^6 scf] = (3.67)(CON)(C)(D)$, where CON = fractional conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.76), and D = density of fuel, $4.2x10^4$ $lb/10^6$ scf.

[c] All PM (total, condensible, and filterable) is assumed to be less than 1.0 micrometer in diameter. Therefore, the PM emission factors presented here may be used to estimate PM_{10}, $PM_{2.5}$ or PM_1 emissions. Total PM is the sum of the filterable PM and condensible PM. Condensible PM is the particulate matter collected using EPA Method 202 (or equivalent). Filterable PM is the particulate matter collected on, or prior to, the filter of an EPA Method 5 (or equivalent) sampling train.

[d] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content is natural gas of 2,000 grains/10^6 scf. The SO_2 emission factor in this table can be converted to other natural gas sulfur contents by multiplying the SO_2 emission factor by the ratio of the site-specific sulfur content (grains/10^6 scf) to 2,000 grains/10^6 scf.

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION[a]

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
91-57-6	2-Methylnaphthalene[b, c]	2.4E-05	D
56-49-5	3-Methylcholanthrene[b, c]	<1.8E-06	E
	7,12-Dimethylbenz(a)anthracene[b,c]	<1.6E-05	E
83-32-9	Acenaphthene[b,c]	<1.8E-06	E
203-96-8	Acenaphthylene[b,c]	<1.8E-06	E
120-12-7	Anthracene[b,c]	<2.4E-06	E
56-55-3	Benz(a)anthracene[b,c]	<1.8E-06	E
71-43-2	Benzene[b]	2.1E-03	B
50-32-8	Benzo(a)pyrene[b,c]	<1.2E-06	E
205-99-2	Benzo(b)fluoranthene[b,c]	<1.8E-06	E
191-24-2	Benzo(g,h,i)perylene[b,c]	<1.2E-06	E
207-08-9	Benzo(k)fluoranthene[b,c]	<1.8E-06	E
106-97-8	Butane	2.1E+00	E
218-01-9	Chrysene[b,c]	<1.8E-06	E
53-70-3	Dibenzo(a,h)anthracene[b,c]	<1.2E-06	E
25321-22-6	Dichlorobenzene[b]	1.2E-03	E
74-84-0	Ethane	3.1E+00	E
206-44-0	Fluoranthene[b,c]	3.0E-06	E
86-73-7	Fluorene[b,c]	2.8E-06	E
50-00-0	Formaldehyde[b]	7.5E-02	B
110-54-3	Hexane[b]	1.8E+00	E
193-39-5	Indeno(1,2,3-cd)pyrene[b,c]	<1.8E-06	E
91-20-3	Naphthalene[b]	6.1E-04	E
109-66-0	Pentane	2.6E+00	E
85-01-8	Phenanathrene[b,c]	1.7E-05	D
74-98-6	Propane	1.6E+00	E

TABLE 1.4-3. EMISSION FACTORS FOR SPECIATED ORGANIC COMPOUNDS FROM NATURAL GAS COMBUSTION (Continued)

CAS No.	Pollutant	Emission Factor ($lb/10^6$ scf)	Emission Factor Rating
129-00-0	Pyrene[b, c]	5.0E-06	E
108-88-3	Toluene[b]	3.4E-03	C

[a] Reference 11. Units are in pounds of pollutant per million standard cubic feet of natural gas fired. Data are for all natural gas combustion sources. To convert from $lb/10^6$ scf to $kg/10^6$ m^3, multiply by 16. To convert from $lb/10^6$ scf to lb/MMBtu, divide by 1,020. Emission Factors preceeded with a less-than symbol are based on method detection limits.

[b] Hazardous Air Pollutant (HAP) as defined by Section 112(b) of the Clean Air Act.

[c] HAP because it is Polycyclic Organic Matter (POM). POM is a HAP as defined by Section 112(b) of the Clean Air Act.

[d] The sum of individual organic compounds may exceed the VOC and TOC emission factors due to differences in test methods and the availability of test data for each pollutant.

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES[a]
(SCC 2-02-002-54)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Criteria Pollutants and Greenhouse Gases		
NO_x[c] 90 - 105% Load	4.08 E+00	B
NO_x[c] <90% Load	8.47 E-01	B
CO[c] 90 - 105% Load	3.17 E-01	C
CO[c] <90% Load	5.57 E-01	B
CO_2[d]	1.10 E+02	A
SO_2[e]	5.88 E-04	A
TOC[f]	1.47 E+00	A
Methane[g]	1.25 E+00	C
VOC[h]	1.18 E-01	C
PM10 (filterable)[i]	7.71 E-05	D
PM2.5 (filterable)[i]	7.71 E-05	D
PM Condensable[i]	9.91 E-03	D
Trace Organic Compounds		
1,1,2,2-Tetrachloroethane[k]	<4.00 E-05	E
1,1,2-Trichloroethane[k]	<3.18 E-05	E
1,1-Dichloroethane	<2.36 E-05	E
1,2,3-Trimethylbenzene	2.30 E-05	D
1,2,4-Trimethylbenzene	1.43 E-05	C
1,2-Dichloroethane	<2.36 E-05	E
1,2-Dichloropropane	<2.69 E-05	E
1,3,5-Trimethylbenzene	3.38 E-05	D
1,3-Butadiene[k]	2.67E-04	D
1,3-Dichloropropene[k]	<2.64 E-05	E
2-Methylnaphthalene[k]	3.32 E-05	C
2,2,4-Trimethylpentane[k]	2.50 E-04	C
Acenaphthene[k]	1.25 E-06	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
Acenaphthylene[k]	5.53 E-06	C
Acetaldehyde[k,l]	8.36 E-03	A
Acrolein[k,l]	5.14 E-03	A
Benzene[k]	4.40 E-04	A
Benzo(b)fluoranthene[k]	1.66 E-07	D
Benzo(e)pyrene[k]	4.15 E-07	D
Benzo(g,h,i)perylene[k]	4.14 E-07	D
Biphenyl[k]	2.12 E-04	D
Butane	5.41 E-04	D
Butyr/Isobutyraldehyde	1.01 E-04	C
Carbon Tetrachloride[k]	<3.67 E-05	E
Chlorobenzene[k]	<3.04 E-05	E
Chloroethane	1.87 E-06	D
Chloroform[k]	<2.85 E-05	E
Chrysene[k]	6.93 E-07	C
Cyclopentane	2.27 E-04	C
Ethane	1.05 E-01	C
Ethylbenzene[k]	3.97 E-05	B
Ethylene Dibromide[k]	<4.43 E-05	E
Fluoranthene[k]	1.11 E-06	C
Fluorene[k]	5.67 E-06	C
Formaldehyde[k,l]	5.28 E-02	A
Methanol[k]	2.50 E-03	B
Methylcyclohexane	1.23 E-03	C
Methylene Chloride[k]	2.00 E-05	C
n-Hexane[k]	1.11 E-03	C
n-Nonane	1.10 E-04	C

Table 3.2-2. UNCONTROLLED EMISSION FACTORS FOR 4-STROKE LEAN-BURN ENGINES
(Continued)

Pollutant	Emission Factor (lb/MMBtu)[b] (fuel input)	Emission Factor Rating
n-Octane	3.51 E-04	C
n-Pentane	2.60 E-03	C
Naphthalene[k]	7.44 E-05	C
PAH[k]	2.69 E-05	D
Phenanthrene[k]	1.04 E-05	D
Phenol[k]	2.40 E-05	D
Propane	4.19 E-02	C
Pyrene[k]	1.36 E-06	C
Styrene[k]	<2.36 E-05	E
Tetrachloroethane[k]	2.48 E-06	D
Toluene[k]	4.08 E-04	B
Vinyl Chloride[k]	1.49 E-05	C
Xylene[k]	1.84 E-04	B

[a] Reference 7. Factors represent uncontrolled levels. For NO_x, CO, and PM10, "uncontrolled" means no combustion or add-on controls; however, the factor may include turbocharged units. For all other pollutants, "uncontrolled" means no oxidation control; the data set may include units with control techniques used for NOx control, such as PCC and SCR for lean burn engines, and PSC for rich burn engines. Factors are based on large population of engines. Factors are for engines at all loads, except as indicated. SCC = Source Classification Code. TOC = Total Organic Compounds. PM-10 = Particulate Matter ≤ 10 microns (μm) aerodynamic diameter. A "<" sign in front of a factor means that the corresponding emission factor is based on one-half of the method detection limit.

[b] Emission factors were calculated in units of (lb/MMBtu) based on procedures in EPA Method 19. To convert from (lb/MMBtu) to (lb/10^6 scf), multiply by the heat content of the fuel. If the heat content is not available, use 1020 Btu/scf. To convert from (lb/MMBtu) to (lb/hp-hr) use the following equation:

$$\text{lb/hp-hr} = (\text{lb/MMBtu})\ (\text{heat input, MMBtu/hr})\ (1/\text{operating HP, 1/hp})$$

[c] Emission tests with unreported load conditions were not included in the data set.

[d] Based on 99.5% conversion of the fuel carbon to CO_2. CO_2 [lb/MMBtu] = (3.67)(%CON)(C)(D)(1/h), where %CON = percent conversion of fuel carbon to CO_2, C = carbon content of fuel by weight (0.75), D = density of fuel, 4.1 E+04 lb/10^6 scf, and

h = heating value of natural gas (assume 1020 Btu/scf at 60°F).

[e] Based on 100% conversion of fuel sulfur to SO_2. Assumes sulfur content in natural gas of 2,000 gr/10^6 scf.

[f] Emission factor for TOC is based on measured emission levels from 22 source tests.

[g] Emission factor for methane is determined by subtracting the VOC and ethane emission factors from the TOC emission factor. Measured emission factor for methane compares well with the calculated emission factor, 1.31 lb/MMBtu vs. 1.25 lb/MMBtu, respectively.

[h] VOC emission factor is based on the sum of the emission factors for all speciated organic compounds less ethane and methane.

[i] Considered ≤ 1 μm in aerodynamic diameter. Therefore, for filterable PM emissions, PM10(filterable) = PM2.5(filterable).

[j] PM Condensable = PM Condensable Inorganic + PM-Condensable Organic

[k] Hazardous Air Pollutant as defined by Section 112(b) of the Clean Air Act.

[l] For lean burn engines, aldehyde emissions quantification using CARB 430 may reflect interference with the sampling compounds due to the nitrogen concentration in the stack. The presented emission factor is based on FTIR measurements. Emissions data based on CARB 430 are available in the background report.

Table 3.3-1. EMISSION FACTORS FOR UNCONTROLLED GASOLINE AND DIESEL INDUSTRIAL ENGINES[a]

Pollutant	Gasoline Fuel (SCC 2-02-003-01, 2-03-003-01)		Diesel Fuel (SCC 2-02-001-02, 2-03-001-01)		EMISSION FACTOR RATING
	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	Emission Factor (lb/hp-hr) (power output)	Emission Factor (lb/MMBtu) (fuel input)	
NO_x	0.011	1.63	0.031	4.41	D
CO	6.96 E-03[d]	0.99[d]	6.68 E-03	0.95	D
SO_x	5.91 E-04	0.084	2.05 E-03	0.29	D
PM-10[b]	7.21 E-04	0.10	2.20 E-03	0.31	D
CO_2[c]	1.08	154	1.15	164	B
Aldehydes	4.85 E-04	0.07	4.63 E-04	0.07	D
TOC					
Exhaust	0.015	2.10	2.47 E-03	0.35	D
Evaporative	6.61 E-04	0.09	0.00	0.00	E
Crankcase	4.85 E-03	0.69	4.41 E-05	0.01	E
Refueling	1.08 E-03	0.15	0.00	0.00	E

[a] References 2,5-6,9-14. When necessary, an average brake-specific fuel consumption (BSFC) of 7,000 Btu/hp-hr was used to convert from lb/MMBtu to lb/hp-hr. To convert from lb/hp-hr to kg/kw-hr, multiply by 0.608. To convert from lb/MMBtu to ng/J, multiply by 430. SCC = Source Classification Code. TOC = total organic compounds.

[b] PM-10 = particulate matter less than or equal to 10 μm aerodynamic diameter. All particulate is assumed to be ≤ 1 μm in size.

[c] Assumes 99% conversion of carbon in fuel to CO_2 with 87 weight % carbon in diesel, 86 weight % carbon in gasoline, average BSFC of 7,000 Btu/hp-hr, diesel heating value of 19,300 Btu/lb, and gasoline heating value of 20,300 Btu/lb.

[d] Instead of 0.439 lb/hp-hr (power output) and 62.7 lb/mmBtu (fuel input), the correct emissions factors values are 6.96 E-03 lb/hp-hr (power output) and 0.99 lb/mmBtu (fuel input), respectively. This is an editorial correction. March 24, 2009

Table 3.3-2. SPECIATED ORGANIC COMPOUND EMISSION FACTORS FOR UNCONTROLLED DIESEL ENGINES[a]

EMISSION FACTOR RATING: E

Pollutant	Emission Factor (Fuel Input) (lb/MMBtu)
Benzene[b]	9.33 E-04
Toluene[b]	4.09 E-04
Xylenes[b]	2.85 E-04
Propylene	2.58 E-03
1,3-Butadiene[b,c]	<3.91 E-05
Formaldehyde[b]	1.18 E-03
Acetaldehyde[b]	7.67 E-04
Acrolein[b]	<9.25 E-05
Polycyclic aromatic hydrocarbons (PAH)	
Naphthalene[b]	8.48 E-05
Acenaphthylene	<5.06 E-06
Acenaphthene	<1.42 E-06
Fluorene	2.92 E-05
Phenanthrene	2.94 E-05
Anthracene	1.87 E-06
Fluoranthene	7.61 E-06
Pyrene	4.78 E-06
Benzo(a)anthracene	1.68 E-06
Chrysene	3.53 E-07
Benzo(b)fluoranthene	<9.91 E-08
Benzo(k)fluoranthene	<1.55 E-07
Benzo(a)pyrene	<1.88 E-07
Indeno(1,2,3-cd)pyrene	<3.75 E-07
Dibenz(a,h)anthracene	<5.83 E-07
Benzo(g,h,l)perylene	<4.89 E-07
TOTAL PAH	1.68 E-04

[a] Based on the uncontrolled levels of 2 diesel engines from References 6-7. Source Classification Codes 2-02-001-02, 2-03-001-01. To convert from lb/MMBtu to ng/J, multiply by 430.
[b] Hazardous air pollutant listed in the *Clean Air Act*.
[c] Based on data from 1 engine.

5.2 Transportation And Marketing Of Petroleum Liquids[1-3]

5.2.1 General

The transportation and marketing of petroleum liquids involve many distinct operations, each of which represents a potential source of evaporation loss. Crude oil is transported from production operations to a refinery by tankers, barges, rail tank cars, tank trucks, and pipelines. Refined petroleum products are conveyed to fuel marketing terminals and petrochemical industries by these same modes. From the fuel marketing terminals, the fuels are delivered by tank trucks to service stations, commercial accounts, and local bulk storage plants. The final destination for gasoline is usually a motor vehicle gasoline tank. Similar distribution paths exist for fuel oils and other petroleum products. A general depiction of these activities is shown in Figure 5.2-1.

5.2.2 Emissions And Controls

Evaporative emissions from the transportation and marketing of petroleum liquids may be considered, by storage equipment and mode of transportation used, in four categories:

1. Rail tank cars, tank trucks, and marine vessels: loading, transit, and ballasting losses.
2. Service stations: bulk fuel drop losses and underground tank breathing losses.
3. Motor vehicle tanks: refueling losses.
4. Large storage tanks: breathing, working, and standing storage losses. (See Chapter 7, "Liquid Storage Tanks".)

Evaporative and exhaust emissions are also associated with motor vehicle operation, and these topics are discussed in AP-42 *Volume II: Mobile Sources*.

5.2.2.1 Rail Tank Cars, Tank Trucks, And Marine Vessels -

Emissions from these sources are from loading losses, ballasting losses, and transit losses.

5.2.2.1.1 Loading Losses -

Loading losses are the primary source of evaporative emissions from rail tank car, tank truck, and marine vessel operations. Loading losses occur as organic vapors in "empty" cargo tanks are displaced to the atmosphere by the liquid being loaded into the tanks. These vapors are a composite of (1) vapors formed in the empty tank by evaporation of residual product from previous loads, (2) vapors transferred to the tank in vapor balance systems as product is being unloaded, and (3) vapors generated in the tank as the new product is being loaded. The quantity of evaporative losses from loading operations is, therefore, a function of the following parameters:

- Physical and chemical characteristics of the previous cargo;
- Method of unloading the previous cargo;
- Operations to transport the empty carrier to a loading terminal;
- Method of loading the new cargo; and
- Physical and chemical characteristics of the new cargo.

The principal methods of cargo carrier loading are illustrated in Figure 5.2-2, Figure 5.2-3, and Figure 5.2-4. In the splash loading method, the fill pipe dispensing the cargo is lowered only part way into the cargo tank. Significant turbulence and vapor/liquid contact occur during the splash

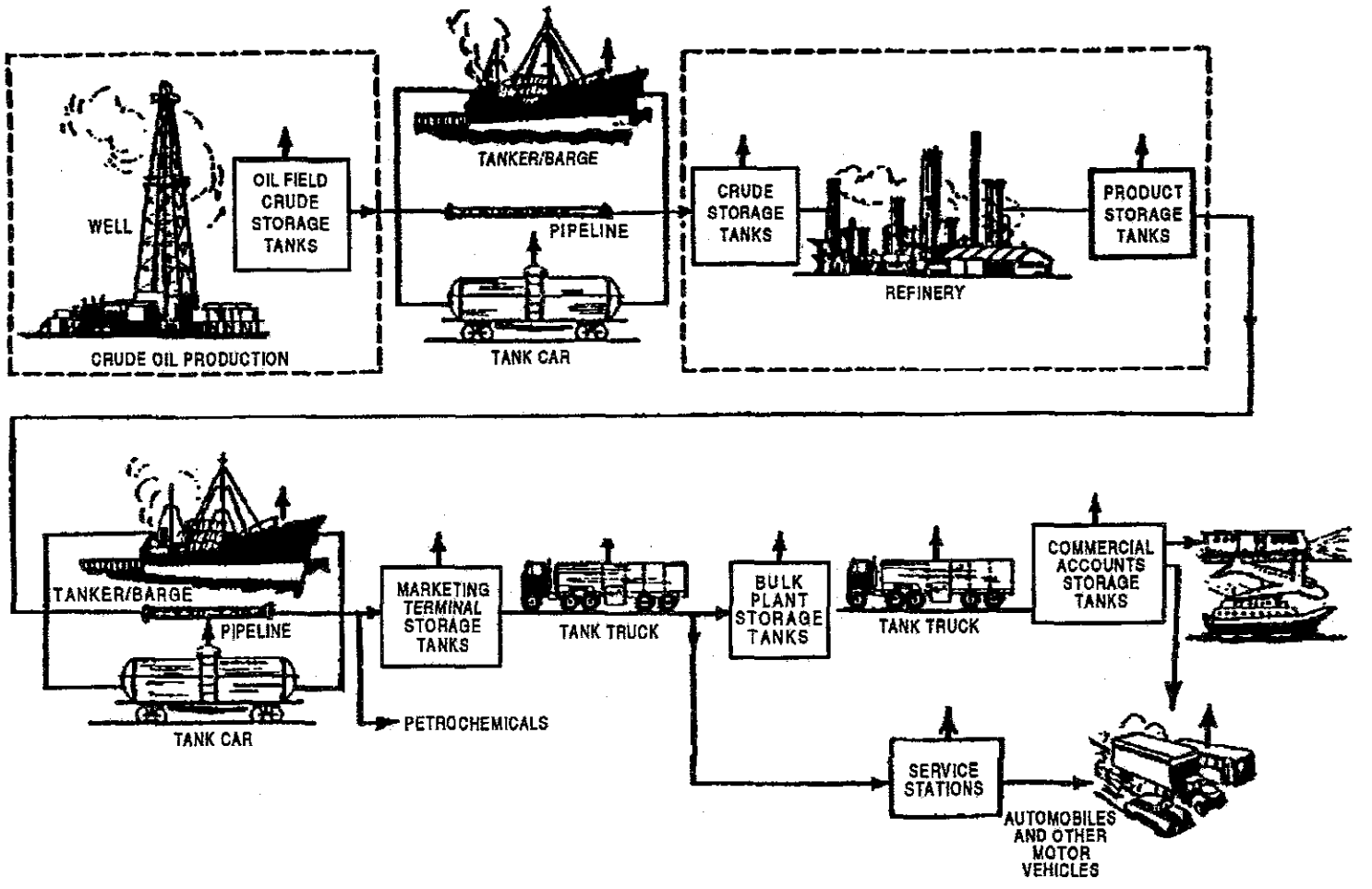

Figure 5.2-1. Flow sheet of petroleum production, refining, and distribution systems.
(Points of organic emissions are indicated by vertical arrows.)

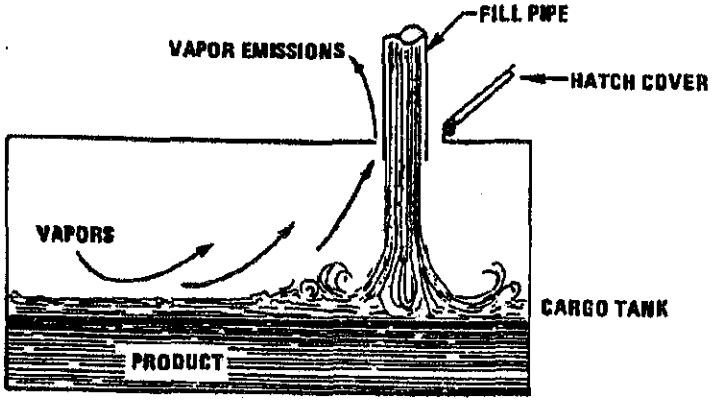

Figure 5.2-2. Splash loading method.

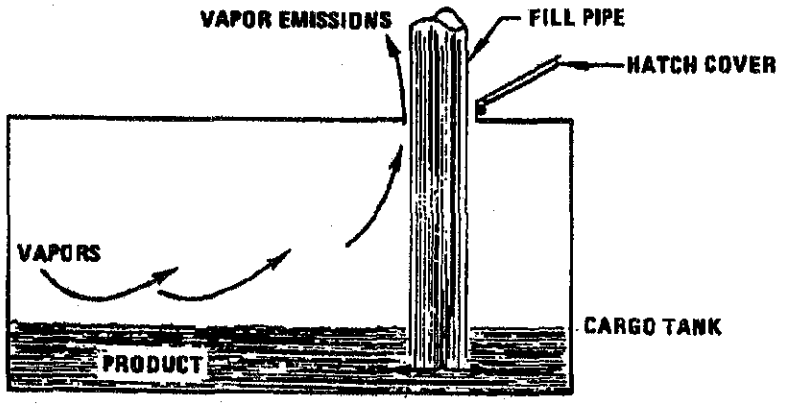

Figure 5.2-3. Submerged fill pipe.

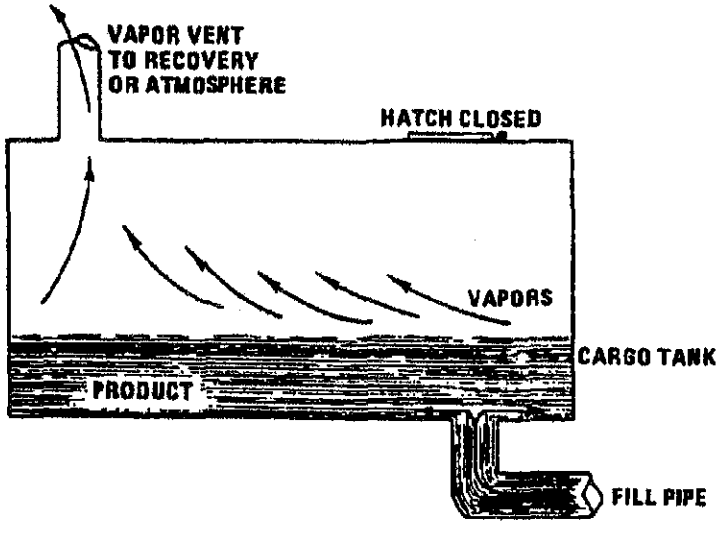

Figure 5.2-4. Bottom loading.

loading operation, resulting in high levels of vapor generation and loss. If the turbulence is great enough, liquid droplets will be entrained in the vented vapors.

A second method of loading is submerged loading. Two types are the submerged fill pipe method and the bottom loading method. In the submerged fill pipe method, the fill pipe extends almost to the bottom of the cargo tank. In the bottom loading method, a permanent fill pipe is attached to the cargo tank bottom. During most of submerged loading by both methods, the fill pipe opening is below the liquid surface level. Liquid turbulence is controlled significantly during submerged loading, resulting in much lower vapor generation than encountered during splash loading.

The recent loading history of a cargo carrier is just as important a factor in loading losses as the method of loading. If the carrier has carried a nonvolatile liquid such as fuel oil, or has just been cleaned, it will contain vapor-free air. If it has just carried gasoline and has not been vented, the air in the carrier tank will contain volatile organic vapors, which will be expelled during the loading operation along with newly generated vapors.

Cargo carriers are sometimes designated to transport only one product, and in such cases are practicing "dedicated service". Dedicated gasoline cargo tanks return to a loading terminal containing air fully or partially saturated with vapor from the previous load. Cargo tanks may also be "switch loaded" with various products, so that a nonvolatile product being loaded may expel the vapors remaining from a previous load of a volatile product such as gasoline. These circumstances vary with the type of cargo tank and with the ownership of the carrier, the petroleum liquids being transported, geographic location, and season of the year.

One control measure for vapors displaced during liquid loading is called "vapor balance service", in which the cargo tank retrieves the vapors displaced during product unloading at bulk plants or service stations and transports the vapors back to the loading terminal. Figure 5.2-5 shows a tank truck in vapor balance service filling a service station underground tank and taking on displaced gasoline vapors for return to the terminal. A cargo tank returning to a bulk terminal in vapor balance service normally is saturated with organic vapors, and the presence of these vapors at the start of submerged loading of the tanker truck results in greater loading losses than encountered during nonvapor balance, or "normal", service. Vapor balance service is usually not practiced with marine vessels, although some vessels practice emission control by means of vapor transfer within their own cargo tanks during ballasting operations, discussed below.

Emissions from loading petroleum liquid can be estimated (with a probable error of ±30 percent)[4] using the following expression:

$$L_L = 12.46 \frac{SPM}{T} \quad (1)$$

where:

L_L = loading loss, pounds per 1000 gallons (lb/10^3 gal) of liquid loaded

S = a saturation factor (see Table 5.2-1)
P = true vapor pressure of liquid loaded, pounds per square inch absolute (psia) (see Section 7.1, "Organic Liquid Storage Tanks")
M = molecular weight of vapors, pounds per pound-mole (lb/lb-mole) (see Section 7.1, "Organic Liquid Storage Tanks")
T = temperature of bulk liquid loaded, °R (°F + 460)

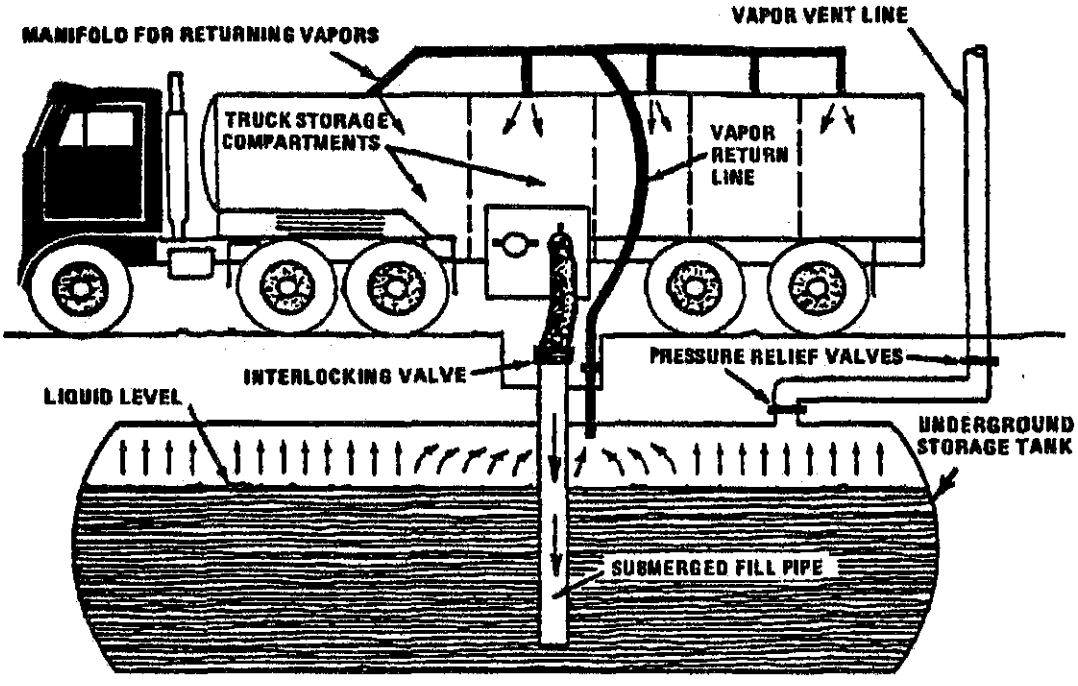

Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

Table 5.2-1. SATURATION (S) FACTORS FOR CALCULATING PETROLEUM LIQUID LOADING LOSSES

Cargo Carrier	Mode Of Operation	S Factor
Tank trucks and rail tank cars	Submerged loading of a clean cargo tank	0.50
	Submerged loading: dedicated normal service	0.60
	Submerged loading: dedicated vapor balance service	1.00
	Splash loading of a clean cargo tank	1.45
	Splash loading: dedicated normal service	1.45
	Splash loading: dedicated vapor balance service	1.00
Marine vessels[a]	Submerged loading: ships	0.2
	Submerged loading: barges	0.5

[a] For products other than gasoline and crude oil. For marine loading of gasoline, use factors from Table 5.2-2. For marine loading of crude oil, use Equations 2 and 3 and Table 5.2-3.

The saturation factor, S, represents the expelled vapor's fractional approach to saturation, and it accounts for the variations observed in emission rates from the different unloading and loading methods. Table 5.2-1 lists suggested saturation factors.

Emissions from controlled loading operations can be calculated by multiplying the uncontrolled emission rate calculated in Equation 1 by an overall reduction efficiency term:

$$\left(1 - \frac{\text{eff}}{100}\right)$$

The overall reduction efficiency should account for the capture efficiency of the collection system as well as both the control efficiency and any downtime of the control device. Measures to reduce loading emissions include selection of alternate loading methods and application of vapor recovery equipment. The latter captures organic vapors displaced during loading operations and recovers the vapors by the use of refrigeration, absorption, adsorption, and/or compression. The recovered product is piped back to storage. Vapors can also be controlled through combustion in a thermal oxidation unit, with no product recovery. Figure 5.2-6 demonstrates the recovery of gasoline vapors from tank trucks during loading operations at bulk terminals. Control efficiencies for the recovery units range from 90 to over 99 percent, depending on both the nature of the vapors and the type of control equipment used.[5-6] However, not all of the displaced vapors reach the control device, because of leakage from both the tank truck and collection system. The collection efficiency should be assumed to be 99.2 percent for tanker trucks passing the MACT-level annual leak test (not more than 1 inch water column pressure change in 5 minutes after pressurizing to 18 inches water followed by pulling a vacuum of 6 inches water).[7] A collection efficiency of 98.7 percent (a 1.3 percent leakage rate) should be assumed for trucks passing the NSPS-level annual test (3 inches pressure change) A collection efficiency of 70 percent should be assumed for trucks not passing one of these annual leak tests[6].

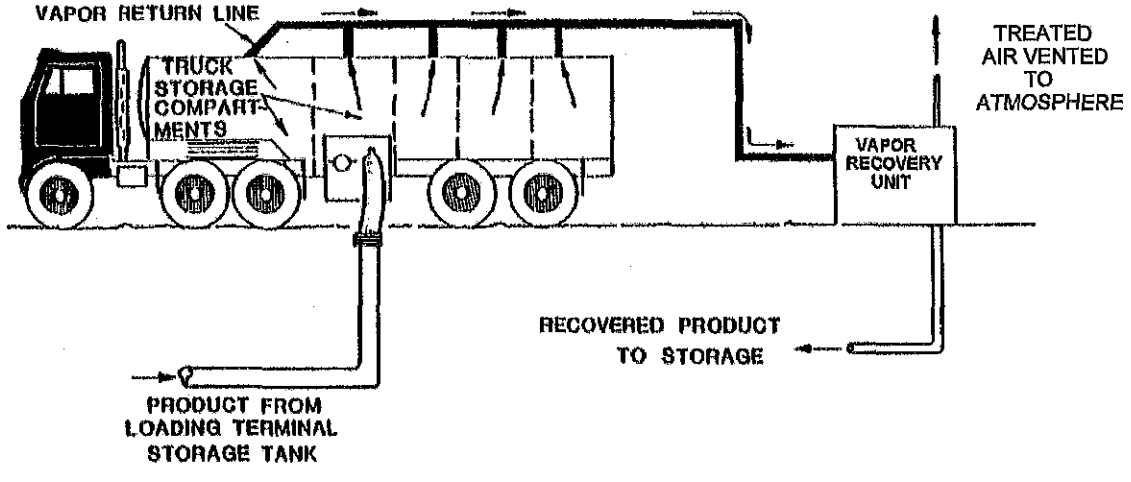

Figure 5.2-6. Tank truck loading with vapor recovery.

Sample Calculation -

Loading losses (L_L) from a gasoline tank truck in dedicated vapor balance service and practicing vapor recovery would be calculated as follows, using Equation 1:

Design basis -

Cargo tank volume is 8000 gal
Gasoline Reid vapor pressure (RVP) is 9 psia
Product temperature is 80°F
Vapor recovery efficiency is 95 percent
Vapor collection efficiency is 98.7 percent (NSPS-level annual leak test)

Loading loss equation -

$$L_L = 12.46 \frac{SPM}{T}\left(1 - \frac{eff}{100}\right)$$

where:

S = saturation factor (see Table 5.2-1) - 1.00
P = true vapor pressure of gasoline = 6.6 psia
M = molecular weight of gasoline vapors = 66
T = temperature of gasoline = 540°R
eff = overall reduction efficiency (95 percent control x 98.7 percent collection) = 94 percent

$$L_L = 12.46 \frac{(1.00)(6.6)(66)}{540}\left(1 - \frac{94}{100}\right)$$

$$= 0.60 \text{ lb}/10^3 \text{ gal}$$

Total loading losses are:

$$(0.60 \text{ lb}/10^3 \text{ gal})(8.0 \times 10^3 \text{ gal}) = 4.8 \text{ pounds (lb)}$$

Measurements of gasoline loading losses from ships and barges have led to the development of emission factors for these specific loading operations.[8] These factors are presented in Table 5.2-2 and should be used instead of Equation 1 for gasoline loading operations at marine terminals. Factors are expressed in units of milligrams per liter (mg/L) and pounds per 1000 gallons (lb/10^3 gal).

Table 5.2-2 (Metric And English Units). VOLATILE ORGANIC COMPOUND (VOC) EMISSION FACTORS FOR GASOLINE LOADING OPERATIONS AT MARINE TERMINALS[a]

Vessel Tank Condition	Previous Cargo	Ships/Ocean Barges[b]		Barges[b]	
		mg/L Transferred	lb/10^3 gal Transferred	mg/L Transferred	lb/10^3 gal Transferred
Uncleaned	Volatile[c]	315	2.6	465	3.9
Ballasted	Volatile	205	1.7	—[d]	—[d]
Cleaned	Volatile	180	1.5	ND	ND
Gas-freed	Volatile	85	0.7	ND	ND
Any condition	Nonvolatile	85	0.7	ND	ND
Gas-freed	Any cargo	ND	ND	245	2.0
Typical overall situation[e]	Any cargo	215	1.8	410	3.4

[a] References 2,9. Factors are for both VOC emissions (which excludes methane and ethane) and total organic emissions, because methane and ethane have been found to constitute a negligible weight fraction of the evaporative emissions from gasoline. ND = no data.
[b] Ocean barges (tank compartment depth about 12.2 m [40 ft]) exhibit emission levels similar to tank ships. Shallow draft barges (compartment depth 3.0 to 3.7 m [10 to 12 ft]) exhibit higher emission levels.
[c] Volatile cargoes are those with a true vapor pressure greater than 10 kilopascals (kPa) (1.5 psia).
[d] Barges are usually not ballasted.
[e] Based on observation that 41% of tested ship compartments were uncleaned, 11% ballasted, 24% cleaned, and 24% gas-freed. For barges, 76% were uncleaned.

In addition to Equation 1, which estimates emissions from the loading of petroleum liquids, Equation 2 has been developed specifically for estimating emissions from the loading of crude oil into ships and ocean barges:

$$C_L = C_A + C_G \quad (2)$$

where:

C_L = total loading loss, lb/10^3 gal of crude oil loaded
C_A = arrival emission factor, contributed by vapors in the empty tank compartment before loading, lb/10^3 gal loaded (see Note below)
C_G = generated emission factor, contributed by evaporation during loading, lb/10^3 gal loaded

Note: Values of C_A for various cargo tank conditions are listed in Table 5.2-3.

5.2-3 (English Units). AVERAGE ARRIVAL EMISSION FACTORS, C_A, FOR CRUDE OIL LOADING EMISSION EQUATION[a]

Ship/Ocean Barge Tank Condition	Previous Cargo	Arrival Emission Factor, lb/10^3 gal
Uncleaned	Volatile[b]	0.86
Ballasted	Volatile	0.46
Cleaned or gas-freed	Volatile	0.33
Any condition	Nonvolatile	0.33

[a] Arrival emission factors (C_A) to be added to generated emission factors (C_G) calculated in Equation 3 to produce total crude oil loading loss (C_L). Factors are for total organic compounds; VOC emission factors average about 15% lower, because VOC does not include methane or ethane.
[b] Volatile cargoes are those with a true vapor pressure greater than 10 kPa (1.5 psia).

This equation was developed empirically from test measurements of several vessel compartments.[8] The quantity C_G can be calculated using Equation 3:

$$C_G = 1.84\ (0.44\ P - 0.42)\ \frac{M\ G}{T} \qquad (3)$$

where:

P = true vapor pressure of loaded crude oil, psia
M = molecular weight of vapors, lb/lb-mole
G = vapor growth factor = 1.02 (dimensionless)
T = temperature of vapors, °R (°F + 460)

Emission factors derived from Equation 3 and Table 5.2-3 represent total organic compounds. Volatile organic compound (VOC) emission factors (which exclude methane and ethane because they are exempted from the regulatory definition of "VOC") for crude oil vapors have been found to range from approximately 55 to 100 weight percent of these total organic factors. When specific vapor composition information is not available, the VOC emission factor can be estimated by taking 85 percent of the total organic factor.[3]

5.2.2.1.2 Ballasting Losses -

Ballasting operations are a major source of evaporative emissions associated with the unloading of petroleum liquids at marine terminals. It is common practice to load several cargo tank compartments with sea water after the cargo has been unloaded. This water, termed "ballast", improves the stability of the empty tanker during the subsequent voyage. Although ballasting practices vary, individual cargo tanks are ballasted typically about 80 percent, and the total vessel 15 to 40 percent, of capacity. Ballasting emissions occur as vapor-laden air in the "empty" cargo tank is displaced to the atmosphere by ballast water being pumped into the tank. Upon arrival at a loading port, the ballast water is pumped from the cargo tanks before the new cargo is loaded. The ballasting of cargo tanks reduces the quantity of vapors returning in the empty tank, thereby reducing the quantity of vapors emitted during subsequent tanker loading. Regulations administered by the U. S. Coast Guard require that, at marine terminals located in ozone nonattainment areas, large tankers with crude oil washing systems contain the organic vapors from ballasting.[10] This is accomplished principally by displacing the vapors during ballasting into a cargo tank being simultaneously unloaded. In other areas, marine vessels emit organic vapors directly to the atmosphere.

Equation 4 has been developed from test data to calculate the ballasting emissions from crude oil ships and ocean barges[8]:

$$L_B = 0.31 + 0.20\ P + 0.01\ PU_A \qquad (4)$$

where:

L_B = ballasting emission factor, lb/10^3 gal of ballast water
P = true vapor pressure of discharged crude oil, psia
U_A = arrival cargo true ullage, before dockside discharge, measured from the deck, feet; (the term "ullage" here refers to the distance between the cargo surface level and the deck level)

Table 5.2-4 lists average total organic emission factors for ballasting into uncleaned crude oil cargo compartments. The first category applies to "full" compartments wherein the crude oil true ullage just before cargo discharge is less than 1.5 meters (m) (5 ft). The second category applies to lightered, or short-loaded, compartments (part of cargo previously discharged, or original load a partial fill), with an arrival true ullage greater than 1.5 m (5 ft). It should be remembered that these tabulated emission factors are examples only, based on average conditions, to be used when crude oil vapor pressure is unknown. Equation 4 should be used when information about crude oil vapor pressure and cargo compartment condition is available. The following sample calculation illustrates the use of Equation 4.

5.2-4 (Metric And English Units). TOTAL ORGANIC EMISSION FACTORS FOR CRUDE OIL BALLASTING[a]

Compartment Condition Before Cargo Discharge	Average Emission Factors			
	By Category		Typical Overall[b]	
	mg/L Ballast Water	lb/10^3 gal Ballast Water	mg/L Ballast Water	lb/10^3 gal Ballast Water
Fully loaded[c]	111	0.9	129	1.1
Lightered or previously short loaded[d]	171	1.4 ••		

[a] Assumes crude oil temperature of 16°C (60°F) and RVP of 34 kPa (5 psia). VOC emission factors average about 85% of these total organic factors, because VOCs do not include methane or ethane.
[b] Based on observation that 70% of tested compartments had been fully loaded before ballasting. May not represent average vessel practices.
[c] Assumed typical arrival ullage of 0.6 m (2 ft).
[d] Assumed typical arrival ullage of 6.1 m (20 ft).

Sample Calculation -

Ballasting emissions from a crude oil cargo ship would be calculated as follows, using Equation 4:

Design basis -

Vessel and cargo description: 80,000 dead-weight-ton tanker, crude oil capacity 500,000 barrels (bbl); 20 percent of the cargo capacity is filled with ballast water after cargo discharge. The crude oil has an RVP of 6 psia and is discharged at 75°F.

Compartment conditions: 70 percent of the ballast water is loaded into compartments that had been fully loaded to 2 ft ullage, and 30 percent is loaded into compartments that had been lightered to 15 ft ullage before arrival at dockside.

Ballasting emission equation -

$$L_B = 0.31 + 0.20\ P + 0.01\ PU_A$$

where:

P = true vapor pressure of crude oil
= 4.6 psia
U_A = true cargo ullage for the full compartments = 2 ft, and true cargo ullage for the lightered compartments = 15 ft

$$L_B = 0.70\ [0.31 + (0.20)\ (4.6) + (0.01)\ (4.6)\ (2)] + 0.30\ [0.31 + (0.20)\ (4.6) + (0.01)\ (4.6)\ (15)]$$

$$= 1.5\ lb/10^3\ gal$$

Total ballasting emissions are:

$$(1.5\ lb/10^3\ gal)\ (0.20)\ (500{,}000\ bbl)\ (42\ gal/bbl) = 6{,}300\ lb$$

Since VOC emissions average about 85 percent of these total organic emissions, emissions of VOCs are about: (0.85)(6,300 lb) = 5,360 lb

5.2.2.1.3 Transit Losses -

In addition to loading and ballasting losses, losses occur while the cargo is in transit. Transit losses are similar in many ways to breathing losses associated with petroleum storage (see Section 7.1, "Organic Liquid Storage Tanks"). Experimental tests on ships and barges[4] have indicated that transit losses can be calculated using Equation 5:

$$L_T = 0.1\ PW \qquad (5)$$

where:

L_T = transit loss from ships and barges, lb/week-10^3 gal transported
P = true vapor pressure of the transported liquid, psia
W = density of the condensed vapors, lb/gal

Emissions from gasoline truck cargo tanks during transit have been studied by a combination of theoretical and experimental techniques, and typical emission values are presented in Table 5.2-5.[11-12] Emissions depend on the extent of venting from the cargo tank during transit, which in turn depends on the vapor tightness of the tank, the pressure relief valve settings, the pressure in the tank at the start of the trip, the vapor pressure of the fuel being transported, and the degree of fuel vapor saturation of the space in the tank. The emissions are not directly proportional to the time spent in transit. If the vapor leakage rate of the tank increases, emissions increase up to a point, and then the rate changes as other determining factors take over. Truck tanks in dedicated vapor balance service usually contain saturated vapors, and this leads to lower emissions during transit because no additional fuel evaporates to raise the pressure in the tank to cause venting. Table 5.2-5 lists "typical" values for transit emissions and "extreme" values that could occur in the unlikely event that all determining factors combined to cause maximum emissions.

Table 5.2-5 (Metric And English Units). TOTAL UNCONTROLLED ORGANIC EMISSION FACTORS FOR PETROLEUM LIQUID RAIL TANK CARS AND TANK TRUCKS

Emission Source	Gasoline[a]	Crude Oil[b]	Jet Naphtha (JP-4)	Jet Kerosene	Distillate Oil No. 2	Residual Oil No. 6
Loading operations[c]						
Submerged loading - Dedicated normal service[d]						
mg/L transferred	590	240	180	1.9	1.7	0.01
lb/10^3 gal transferred	5	2	1.5	0.016	0.014	0.0001
Submerged loading - Vapor balance service[d]						
mg/L transferred	980	400	300	—[e]	—[e]	—[e]
lb/10^3 gal transferred	8	3	2.5	—[e]	—[e]	—[e]
Splash loading - Dedicated normal service						
mg/L transferred	1,430	580	430	5	4	0.03
lb/10^3 gal transferred	12	5	4	0.04	0.03	0.0003
Splash loading - Vapor balance service						
mg/L transferred	980	400	300	—[e]	—[e]	—[e]
lb/10^3 gal transferred	8	3	2.5	—[e]	—[e]	—[e]

Table 5.2-5 (cont.).

Emission Source	Gasoline[a]	Crude Oil[b]	Jet Naphtha (JP-4)	Jet Kerosene	Distillate Oil No. 2	Residual Oil No. 6
Transit losses						
Loaded with product						
mg/L transported						
Typical	0 - 1.0	ND	ND	ND	ND	ND
Extreme	0 - 9.0	ND	ND	ND	ND	ND
lb/10^3 gal transported						
Typical	0 - 0.01	ND	ND	ND	ND	ND
Extreme	0 - 0.08	ND	ND	ND	ND	ND
Return with vapor						
mg/L transported						
Typical	0 - 13.0	ND	ND	ND	ND	ND
Extreme	0 - 44.0	ND	ND	ND	ND	ND
lb/10^3 gal transported						
Typical	0 - 0.11	ND	ND	ND	ND	ND
Extreme	0 - 0.37	ND	ND	ND	ND	ND

[a] Reference 2. Gasoline factors represent emissions of VOC as well as total organics, because methane and ethane constitute a negligible weight fraction of the evaporative emissions from gasoline. VOC factors for crude oil can be assumed to be 15% lower than the total organic factors, to account for the methane and ethane content of crude oil evaporative emissions. All other products should be assumed to have VOC factors equal to total organics. The example gasoline has an RVP of 69 kPa (10 psia). ND = no data.
[b] The example crude oil has an RVP of 34 kPa (5 psia).
[c] Loading emission factors are calculated using Equation 1 for a dispensed product temperature of 16°C (60°F).
[d] Reference 2.
[e] Not normally used.

In the absence of specific inputs for Equations 1 through 5, the typical evaporative emission factors presented in Tables 5.2-5 and 5.2-6 should be used. It should be noted that, although the crude oil used to calculate the emission values presented in these tables has an RVP of 5, the RVP of crude oils can range from less than 1 up to 10. Similarly, the RVP of gasolines ranges from 7 to 13. In areas where loading and transportation sources are major factors affecting air quality, it is advisable to obtain the necessary parameters and to calculate emission estimates using Equations 1 through 5.

5.2.2.2 Service Stations -

Another major source of evaporative emissions is the filling of underground gasoline storage tanks at service stations. Gasoline is usually delivered to service stations in 30,000-liter (8,000-gal) tank trucks or smaller account trucks. Emissions are generated when gasoline vapors in the underground storage tank are displaced to the atmosphere by the gasoline being loaded into the tank. As with other loading losses, the quantity of loss in service station tank filling depends on several variables, including the method and rate of filling, the tank configuration, and the gasoline temperature, vapor pressure and composition. An average emission rate for submerged filling is 880 mg/L (7.3 lb/1000 gal) of transferred gasoline, and the rate for splash filling is 1380 mg/L (11.5 lb/1000 gal) transferred gasoline (see Table 5.2-7).[5]

Table 5.2-6 (Metric And English Units). TOTAL ORGANIC EMISSION FACTORS FOR PETROLEUM MARINE VESSEL SOURCES[a]

Emission Source	Gasoline[b]	Crude Oil[c]	Jet Naphtha (JP-4)	Jet Kerosene	Distillate Oil No. 2	Residual Oil No. 6
Loading operations						
Ships/ocean barges						
mg/L transferred	—[d]	73	60	0.63	0.55	0.004
lb/10^3 gal transferred	—[d]	0.61	0.50	0.005	0.005	0.00004
Barges						
mg/L transferred	—[d]	120	150	1.60	1.40	0.011
lb/10^3 gal transferred	—[d]	1.0	1.2	0.013	0.012	0.00009
Tanker ballasting						
mg/L ballast water	100	—[e]	ND	ND	ND	ND
lb/10^3 gal ballast water	0.8	—[e]	ND	ND	ND	ND
Transit						
mg/week-L transported	320	150	84	0.60	0.54	0.003
lb/week-10^3 gal transported	2.7	1.3	0.7	0.005	0.005	0.00003

[a] Factors are for a dispensed product of 16°C (60°F). ND = no data.
[b] Factors represent VOC as well as total organic emissions, because methane and ethane constitute a negligible fraction of gasoline evaporative emissions. All products other than crude oil can be assumed to have VOC factors equal to total organic factors. The example gasoline has an RVP of 69 kPa (10 psia).
[c] VOC emission factors for a typical crude oil are 15% lower than the total organic factors shown, in order to account for methane and ethane. The example crude oil has an RVP of 34 kPa (5 psia).
[d] See Table 5.2-2 for these factors.
[e] See Table 5.2-4 for these factors.

Emissions from underground tank filling operations at service stations can be reduced by the use of a vapor balance system such as in Figure 5.2-5 (termed Stage I vapor control). The vapor balance system employs a hose that returns gasoline vapors displaced from the underground tank to the tank truck cargo compartments being emptied. The control efficiency of the balance system ranges from 93 to 100 percent. Organic emissions from underground tank filling operations at a service station employing a vapor balance system and submerged filling are not expected to exceed 40 mg/L (0.3 lb/1000 gal) of transferred gasoline.

Table 5.2-7 (Metric And English Units). EVAPORATIVE EMISSIONS FROM GASOLINE SERVICE STATION OPERATIONS[a]

Emission Source	Emission Rate	
	mg/L Throughput	lb/10^3 gal Throughput
Filling underground tank (Stage I)		
Submerged filling	880	7.3
Splash filling	1,380	11.5
Balanced submerged filling	40	0.3
Underground tank breathing and emptying[b]	120	1.0
Vehicle refueling operations (Stage II)		
Displacement losses (uncontrolled)[c]	1,320	11.0
Displacement losses (controlled)	132	1.1
Spillage	80	0.7

[a] Factors are for VOC as well as total organic emissions, because of the methane and ethane content of gasoline evaporative emissions is negligible.
[b] Includes any vapor loss between underground tank and gas pump.
[c] Based on Equation 6, using average conditions.

A second source of vapor emissions from service stations is underground tank breathing. Breathing losses occur daily and are attributable to gasoline evaporation and barometric pressure changes. The frequency with which gasoline is withdrawn from the tank, allowing fresh air to enter to enhance evaporation, also has a major effect on the quantity of these emissions. An average breathing emission rate is 120 mg/L (1.0 lb/1000 gal) of throughput.

5.2.2.3 Motor Vehicle Refueling -

Service station vehicle refueling activity also produces evaporative emissions. Vehicle refueling emissions come from vapors displaced from the automobile tank by dispensed gasoline and from spillage. The quantity of displaced vapors depends on gasoline temperature, auto tank temperature, gasoline RVP, and dispensing rate. Equation 6 can be used to estimate uncontrolled displacement losses from vehicle refueling for a particular set of conditions.[14]

$$E_R = 264.2\ [(-5.909) - 0.0949\ (\Delta T) + 0.0884\ (T_D) + 0.485\ (RVP)] \quad (6)$$

where:

E_R = refueling emissions, mg/L
ΔT = difference between temperature of fuel in vehicle tank and temperature of dispensed fuel, °F
T_D = temperature of dispensed fuel, °F
RVP = Reid vapor pressure, psia

Note that this equation and the spillage loss factor are incorporated into the *MOBILE* model. The *MOBILE* model allows for disabling of this calculation if it is desired to include these emissions in the stationary area source portion of an inventory rather than in the mobile source portion. It is estimated that the uncontrolled emissions from vapors displaced during vehicle refueling average 1320 mg/L (11.0 lb/1000 gal) of dispensed gasoline.[5,13]

Spillage loss is made up of contributions from prefill and postfill nozzle drip and from spit-back and

overflow from the vehicles's fuel tank filler pipe during filling. The amount of spillage loss can depend on several variables, including service station business characteristics, tank configuration, and operator techniques. An average spillage loss is 80 mg/L (0.7 lb/1000 gal) of dispensed gasoline.[5,13]

Control methods for vehicle refueling emissions are based on conveying the vapors displaced from the vehicle fuel tank to the underground storage tank vapor space through the use of a special hose and nozzle, as depicted in Figure 5.2-7 (termed Stage II vapor control). In "balance" vapor control systems, the vapors are conveyed by natural pressure differentials established during refueling. In "vacuum assist" systems, the conveyance of vapors from the auto fuel tank to the underground storage tank is assisted by a vacuum pump. Tests on a few systems have indicated overall systems control efficiencies in the range of 88 to 92 percent.[5,13] When inventorying these emissions as an area source, rule penetration and rule effectiveness should also be taken into account. *Procedures For Emission Inventory Preparation, Volume IV: Mobile Sources*, EPA-450/4-81-026d, provides more detail on this.

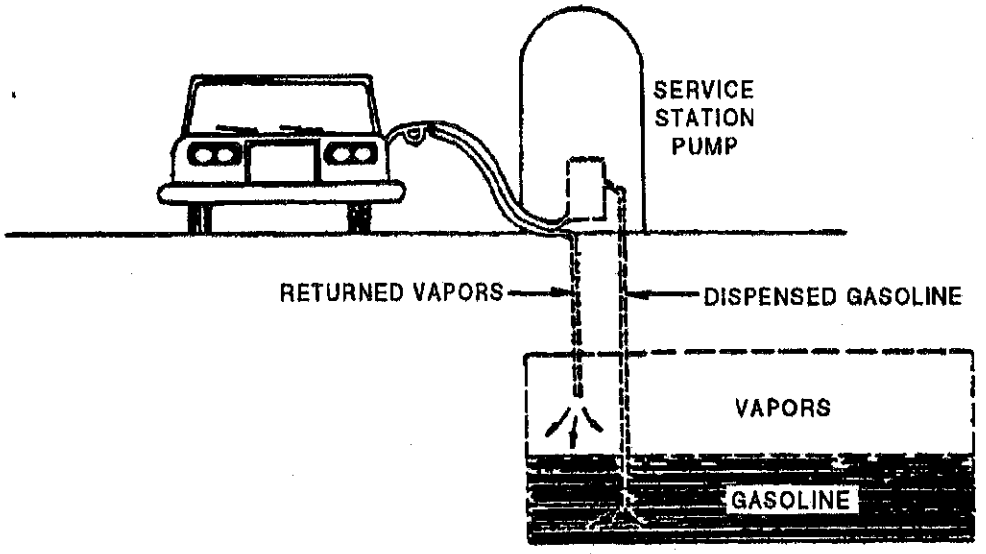

Figure 5.2-7. Automobile refueling vapor recovery system.

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13.2.2 Unpaved Roads

13.2.2.1 General

When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.

The particulate emission factors presented in the previous draft version of this section of AP-42, dated October 2001, implicitly included the emissions from vehicles in the form of exhaust, brake wear, and tire wear as well as resuspended road surface material[25]. EPA included these sources in the emission factor equation for unpaved public roads (equation 1b in this section) since the field testing data used to develop the equation included both the direct emissions from vehicles and emissions from resuspension of road dust.

This version of the unpaved public road emission factor equation only estimates particulate emissions from resuspended road surface material [23,26]. The particulate emissions from vehicle exhaust, brake wear, and tire wear are now estimated separately using EPA's MOBILE6.2 [24]. This approach eliminates the possibility of double counting emissions. Double counting results when employing the previous version of the emission factor equation in this section and MOBILE6.2 to estimate particulate emissions from vehicle traffic on unpaved public roads. It also incorporates the decrease in exhaust emissions that has occurred since the unpaved public road emission factor equation was developed. The previous version of the unpaved public road emission factor equation includes estimates of emissions from exhaust, brake wear, and tire wear based on emission rates for vehicles in the 1980 calendar year fleet. The amount of PM released from vehicle exhaust has decreased since 1980 due to lower new vehicle emission standards and changes in fuel characteristics.

13.2.2.2 Emissions Calculation And Correction Parameters[1-6]

The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. Field investigations also have shown that emissions depend on source parameters that characterize the condition of a particular road and the associated vehicle traffic. Characterization of these source parameters allow for "correction" of emission estimates to specific road and traffic conditions present on public and industrial roadways.

Dust emissions from unpaved roads have been found to vary directly with the fraction of silt (particles smaller than 75 micrometers [μm] in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200-mesh screen, using the ASTM-C-136 method. A summary of this method is contained in Appendix C of AP-42. Table 13.2.2-1 summarizes measured silt values for industrial unpaved roads. Table 13.2.2-2 summarizes measured silt values for public unpaved roads. It should be noted that the ranges of silt content vary over two orders of magnitude. Therefore, the use of data from this table can potentially introduce considerable error. Use of this data is strongly discouraged when it is feasible to obtain locally gathered data.

Since the silt content of a rural dirt road will vary with geographic location, it should be measured for use in projecting emissions. As a conservative approximation, the silt content of the parent soil in the area can be used. Tests, however, show that road silt content is normally lower than in the surrounding parent soil, because the fines are continually removed by the vehicle traffic, leaving a higher percentage of coarse particles.

Other variables are important in addition to the silt content of the road surface material. For example, at industrial sites, where haul trucks and other heavy equipment are common, emissions are highly correlated with vehicle weight. On the other hand, there is far less variability in the weights of cars and pickup trucks that commonly travel publicly accessible unpaved roads throughout the United States. For those roads, the moisture content of the road surface material may be more dominant in determining differences in emission levels between, for example a hot, desert environment and a cool, moist location.

The PM-10 and TSP emission factors presented below are the outcomes from stepwise linear regressions of field emission test results of vehicles traveling over unpaved surfaces. Due to a limited amount of information available for PM-2.5, the expression for that particle size range has been scaled against the result for PM-10. Consequently, the quality rating for the PM-2.5 factor is lower than that for the PM-10 expression.

Table 13.2.2-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIAL ON INDUSTRIAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	No. Of Samples	Silt Content (%)	
				Range	Mean
Copper smelting	Plant road	1	3	16 - 19	17
Iron and steel production	Plant road	19	135	0.2 - 19	6.0
Sand and gravel processing	Plant road	1	3	4.1 - 6.0	4.8
	Material storage area	1	1	-	7.1
Stone quarrying and processing	Plant road	2	10	2.4 - 16	10
	Haul road to/from pit	4	20	5.0-15	8.3
Taconite mining and processing	Service road	1	8	2.4 - 7.1	4.3
	Haul road to/from pit	1	12	3.9 - 9.7	5.8
Western surface coal mining	Haul road to/from pit	3	21	2.8 - 18	8.4
	Plant road	2	2	4.9 - 5.3	5.1
	Scraper route	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Construction sites	Scraper routes	7	20	0.56-23	8.5
Lumber sawmills	Log yards	2	2	4.8-12	8.4
Municipal solid waste landfills	Disposal routes	4	20	2.2 - 21	6.4

[a]References 1,5-15.

The following empirical expressions may be used to estimate the quantity in pounds (lb) of size-specific particulate emissions from an unpaved road, per vehicle mile traveled (VMT):

For vehicles traveling on unpaved surfaces at industrial sites, emissions are estimated from the following equation:

$$E = k\,(s/12)^a(W/3)^b \qquad (1a)$$

and, for vehicles traveling on publicly accessible roads, dominated by light duty vehicles, emissions may be estimated from the following:

$$E = \frac{k\,(s/12)^a(S/30)^d}{(M/0.5)^c} - C \qquad (1b)$$

where k, a, b, c and d are empirical constants (Reference 6) given below and

E = size-specific emission factor (lb/VMT)
s = surface material silt content (%)
W = mean vehicle weight (tons)
M = surface material moisture content (%)
S = mean vehicle speed (mph)
C = emission factor for 1980's vehicle fleet exhaust, brake wear and tire wear.

The source characteristics s, W and M are referred to as correction parameters for adjusting the emission estimates to local conditions. The metric conversion from lb/VMT to grams (g) per vehicle kilometer traveled (VKT) is as follows:

1 lb/VMT = 281.9 g/VKT

The constants for Equations 1a and 1b based on the stated aerodynamic particle sizes are shown in Tables 13.2.2-2 and 13.2.2-4. The PM-2.5 particle size multipliers (k-factors) are taken from Reference 27.

Table 13.2.2-2. CONSTANTS FOR EQUATIONS 1a AND 1b

Constant	Industrial Roads (Equation 1a)			Public Roads (Equation 1b)		
	PM-2.5	PM-10	PM-30*	PM-2.5	PM-10	PM-30*
k (lb/VMT)	0.15	1.5	4.9	0.18	1.8	6.0
a	0.9	0.9	0.7	1	1	1
b	0.45	0.45	0.45	-	-	-
c	-	-	-	0.2	0.2	0.3
d	-	-	-	0.5	0.5	0.3
Quality Rating	B	B	B	B	B	B

*Assumed equivalent to total suspended particulate matter (TSP)
"-" = not used in the emission factor equation

Table 13.2.2-2 also contains the quality ratings for the various size-specific versions of Equation 1a and 1b. The equation retains the assigned quality rating, if applied within the ranges of source conditions, shown in Table 13.2.2-3, that were tested in developing the equation:

Table 13.2.2-3. RANGE OF SOURCE CONDITIONS USED IN DEVELOPING EQUATION 1a AND 1b

Emission Factor	Surface Silt Content, %	Mean Vehicle Weight		Mean Vehicle Speed		Mean No. of Wheels	Surface Moisture Content, %
		Mg	ton	km/hr	mph		
Industrial Roads (Equation 1a)	1.8-25.2	1.8-260	2-290	8-69	5-43	4-17[a]	0.03-13
Public Roads (Equation 1b)	1.8-35	1.4-2.7	1.5-3	16-88	10-55	4-4.8	0.03-13

[a] See discussion in text.

As noted earlier, the models presented as Equations 1a and 1b were developed from tests of traffic on unpaved surfaces. Unpaved roads have a hard, generally nonporous surface that usually dries quickly after a rainfall or watering, because of traffic-enhanced natural evaporation. (Factors influencing how fast a road dries are discussed in Section 13.2.2.3, below.) The quality ratings given above pertain to the mid-range of the measured source conditions for the equation. A higher mean vehicle weight and a higher than normal traffic rate may be justified when performing a worst-case analysis of emissions from unpaved roads.

The emission factors for the exhaust, brake wear and tire wear of a 1980's vehicle fleet (*C*) was obtained from EPA's MOBILE6.2 model [23]. The emission factor also varies with aerodynamic size range

as shown in Table 13.2.2-4

Table 13.2.2-4. EMISSION FACTOR FOR 1980'S VEHICLE FLEET EXHAUST, BRAKE WEAR AND TIRE WEAR

Particle Size Range[a]	*C*, Emission Factor for Exhaust, Brake Wear and Tire Wear[b] lb/VMT
$PM_{2.5}$	0.00036
PM_{10}	0.00047
PM_{30}[c]	0.00047

[a] Refers to airborne particulate matter (PM-x) with an aerodynamic diameter equal to or less than x micrometers.
[b] Units shown are pounds per vehicle mile traveled (lb/VMT).
[c] PM-30 is sometimes termed "suspendable particulate" (SP) and is often used as a surrogate for TSP.

It is important to note that the vehicle-related source conditions refer to the average weight, speed, and number of wheels for all vehicles traveling the road. For example, if 98 percent of traffic on the road are 2-ton cars and trucks while the remaining 2 percent consists of 20-ton trucks, then the mean weight is 2.4 tons. More specifically, Equations 1a and 1b are *not* intended to be used to calculate a separate emission factor for each vehicle class within a mix of traffic on a given unpaved road. That is, in the example, one should *not* determine one factor for the 2-ton vehicles and a second factor for the 20-ton trucks. Instead, only one emission factor should be calculated that represents the "fleet" average of 2.4 tons for all vehicles traveling the road.

Moreover, to retain the quality ratings when addressing a group of unpaved roads, it is necessary that reliable correction parameter values be determined for the road in question. The field and laboratory procedures for determining road surface silt and moisture contents are given in AP-42 Appendices C.1 and C.2. Vehicle-related parameters should be developed by recording visual observations of traffic. In some cases, vehicle parameters for industrial unpaved roads can be determined by reviewing maintenance records or other information sources at the facility.

In the event that site-specific values for correction parameters cannot be obtained, then default values may be used.In the absence of site-specific silt content information, an appropriate mean value from Table 13.2.2-1 may be used as a default value, but the quality rating of the equation is reduced by two letters. Because of significant differences found between different types of road surfaces and between different areas of the country, use of the default moisture content value of 0.5 percent in Equation 1b is discouraged. The quality rating should be downgraded two letters when the default moisture content value is used. (It is assumed that readers addressing industrial roads have access to the information needed to develop average vehicle information in Equation 1a for their facility.)

The effect of routine watering to control emissions from unpaved roads is discussed below in Section 13.2.2.3, "Controls". However, all roads are subject to some natural mitigation because of rainfall and other precipitation. The Equation 1a and 1b emission factors can be extrapolated to annual

average uncontrolled conditions (but including natural mitigation) under the simplifying assumption that annual average emissions are inversely proportional to the number of days with measurable (more than 0.254 mm [0.01 inch]) precipitation:

$$E_{ext} = E\ [(365 - P)/365] \quad (2)$$

where:

E_{ext} = annual size-specific emission factor extrapolated for natural mitigation, lb/VMT

E = emission factor from Equation 1a or 1b

P = number of days in a year with at least 0.254 mm (0.01 in) of precipitation (see below)

Figure 13.2.2-1 gives the geographical distribution for the mean annual number of "wet" days for the United States.

Equation 2 provides an estimate that accounts for precipitation on an annual average basis for the purpose of inventorying emissions. It should be noted that Equation 2 does not account for differences in the temporal distributions of the rain events, the quantity of rain during any event, or the potential for the rain to evaporate from the road surface. In the event that a finer temporal and spatial resolution is desired for inventories of public unpaved roads, estimates can be based on a more complex set of assumptions. These assumptions include:

1. The moisture content of the road surface material is increased in proportion to the quantity of water added;
2. The moisture content of the road surface material is reduced in proportion to the Class A pan evaporation rate;
3. The moisture content of the road surface material is reduced in proportion to the traffic volume; and
4. The moisture content of the road surface material varies between the extremes observed in the area. The CHIEF Web site (http://www.epa.gov/ttn/chief/ap42/ch13/related/c13s02-2.html) has a file which contains a spreadsheet program for calculating emission factors which are temporally and spatially resolved. Information required for use of the spreadsheet program includes monthly Class A pan evaporation values, hourly meteorological data for precipitation, humidity and snow cover, vehicle traffic information, and road surface material information.

It is emphasized that the simple assumption underlying Equation 2 and the more complex set of assumptions underlying the use of the procedure which produces a finer temporal and spatial resolution have not been verified in any rigorous manner. For this reason, the quality ratings for either approach should be downgraded one letter from the rating that would be applied to Equation 1.

13.2.2.3 Controls[18-22]

A wide variety of options exist to control emissions from unpaved roads. Options fall into the following three groupings:

1. Vehicle restrictions that limit the speed, weight or number of vehicles on the road;

2. Surface improvement, by measures such as (a) paving or (b) adding gravel or slag to a dirt road; and

3. Surface treatment, such as watering or treatment with chemical dust suppressants.

Available control options span broad ranges in terms of cost, efficiency, and applicability. For example, traffic controls provide moderate emission reductions (often at little cost) but are difficult to enforce. Although paving is highly effective, its high initial cost is often prohibitive. Furthermore, paving is not feasible for industrial roads subject to very heavy vehicles and/or spillage of material in transport. Watering and chemical suppressants, on the other hand, are potentially applicable to most industrial roads at moderate to low costs. However, these require frequent reapplication to maintain an acceptable level of control. Chemical suppressants are generally more cost-effective than water but not in cases of temporary roads (which are common at mines, landfills, and construction sites). In summary, then, one needs to consider not only the type and volume of traffic on the road but also how long the road will be in service when developing control plans.

Vehicle restrictions. These measures seek to limit the amount and type of traffic present on the road or to lower the mean vehicle speed. For example, many industrial plants have restricted employees from driving on plant property and have instead instituted bussing programs. This eliminates emissions due to employees traveling to/from their worksites. Although the heavier average vehicle weight of the busses increases the base emission factor, the decrease in vehicle-miles-traveled results in a lower overall emission rate.

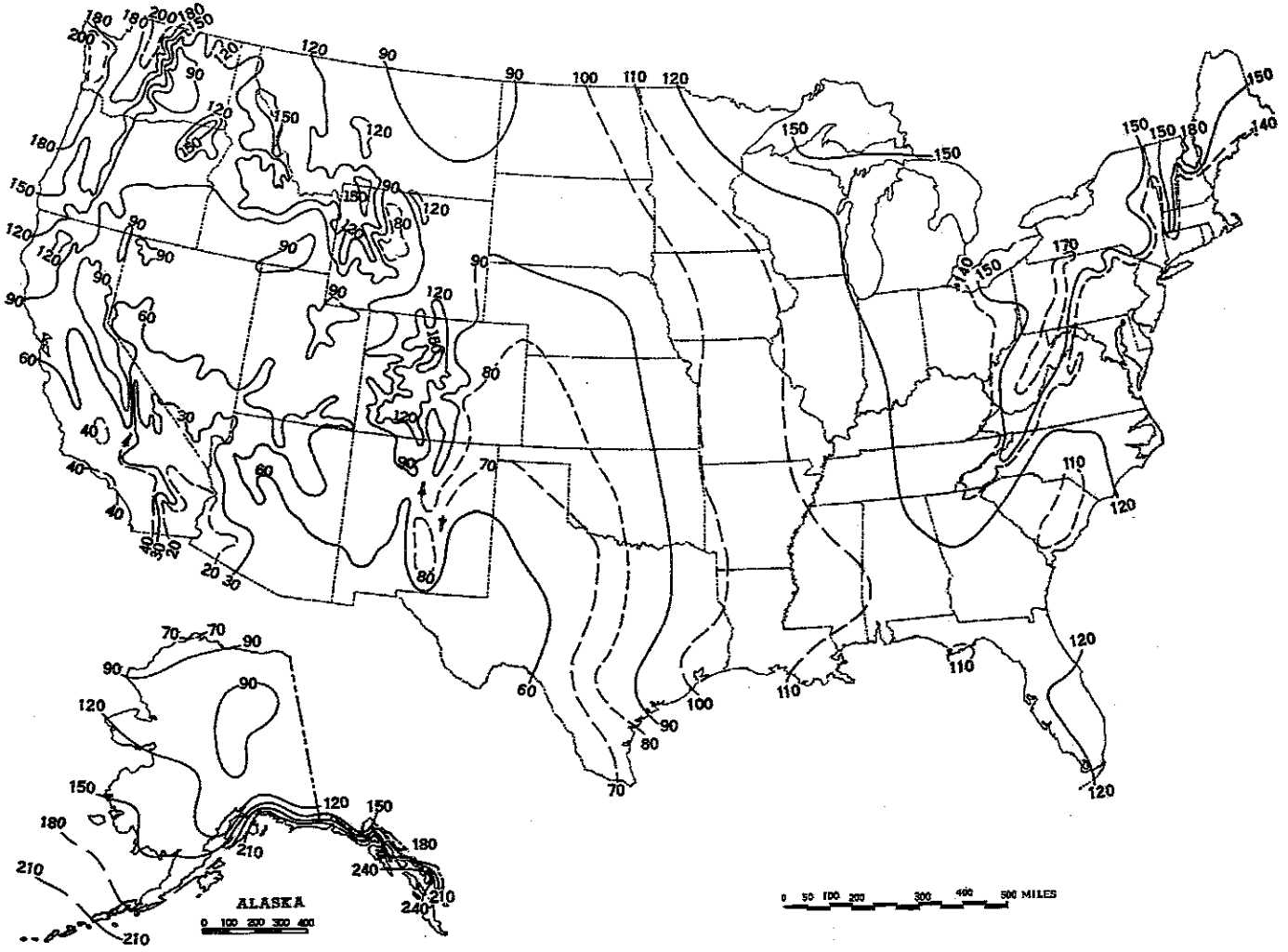

Figure 13.2.2-1. Mean number of days with 0.01 inch or more of precipitation in United States.

Surface improvements. Control options in this category alter the road surface. As opposed to the "surface treatments" discussed below, improvements are relatively "permanent" and do not require periodic retreatment.

The most obvious surface improvement is paving an unpaved road. This option is quite expensive and is probably most applicable to relatively short stretches of unpaved road with at least several hundred vehicle passes per day. Furthermore, if the newly paved road is located near unpaved areas or is used to transport material, it is essential that the control plan address routine cleaning of the newly paved road surface.

The control efficiencies achievable by paving can be estimated by comparing emission factors for unpaved and paved road conditions. The predictive emission factor equation for paved roads, given in Section 13.2.1, requires estimation of the silt loading on the traveled portion of the paved surface, which in turn depends on whether the pavement is periodically cleaned. Unless curbing is to be installed, the effects of vehicle excursion onto unpaved shoulders (berms) also must be taken into account in estimating the control efficiency of paving.

Other improvement methods cover the road surface with another material that has a lower silt content. Examples include placing gravel or slag on a dirt road. Control efficiency can be estimated by comparing the emission factors obtained using the silt contents before and after improvement. The silt content of the road surface should be determined after 3 to 6 months rather than immediately following placement. Control plans should address regular maintenance practices, such as grading, to retain larger aggregate on the traveled portion of the road.

Surface treatments refer to control options which require periodic reapplication. Treatments fall into the two main categories of (a) "wet suppression" (i. e., watering, possibly with surfactants or other additives), which keeps the road surface wet to control emissions and (b) "chemical stabilization/ treatment", which attempts to change the physical characteristics of the surface. The necessary reapplication frequency varies from several minutes for plain water under summertime conditions to several weeks or months for chemical dust suppressants.

Watering increases the moisture content, which conglomerates particles and reduces their likelihood to become suspended when vehicles pass over the surface. The control efficiency depends on how fast the road dries after water is added. This in turn depends on (a) the amount (per unit road surface area) of water added during each application; (b) the period of time between applications; (c) the weight, speed and number of vehicles traveling over the watered road during the period between applications; and (d) meteorological conditions (temperature, wind speed, cloud cover, etc.) that affect evaporation during the period.

Figure 13.2.2-2 presents a simple bilinear relationship between the instantaneous control efficiency due to watering and the resulting increase in surface moisture. The moisture ratio "M" (i.e., the x-axis in Figure 13.2.2-2) is found by dividing the surface moisture content of the watered road by the surface moisture content of the uncontrolled road. As the watered road surface dries, both the ratio M and the predicted instantaneous control efficiency (i.e., the y-axis in the figure) decrease. The figure shows that between the uncontrolled moisture content and a value twice as large, a small increase in moisture content results in a large increase in control efficiency. Beyond that, control efficiency grows slowly with increased moisture content.

Given the complicated nature of how the road dries, characterization of emissions from watered roadways is best done by collecting road surface material samples at various times between water truck passes. (Appendices C.1 and C.2 present the sampling and analysis procedures.) The moisture content measured can then be associated with a control efficiency by use of Figure 13.2.2-2. Samples that reflect average conditions during the watering cycle can take the form of either a series of samples between water applications or a single sample at the midpoint. It is essential that samples be collected during periods with active traffic on the road. Finally, because of different evaporation rates, it is recommended that samples be collected at various times during the year. If only one set of samples is to be collected, these must be collected during hot, summertime conditions.

When developing watering control plans for roads that do not yet exist, it is strongly recommended that the moisture cycle be established by sampling similar roads in the same geographic area. If the moisture cycle cannot be established by similar roads using established watering control plans, the more complex methodology used to estimate the mitigation of rainfall and other precipitation can be used to estimate the control provided by routine watering. An estimate of the maximum daytime Class A pan evaporation (based upon daily evaporation data published in the monthly Climatological Data for the state by the National Climatic Data Center) should be used to insure that adequate watering capability is available during periods of highest evaporation. The hourly precipitation values in the spreadsheet should be replaced with the equivalent inches of precipitation (where the equivalent of 1 inch of precipitation is provided by an application of 5.6 gallons of water per square yard of road). Information on the long term average annual evaporation and on the percentage that occurs between May and October was published in the Climatic Atlas (Reference 16). Figure 13.2.2-3 presents the geographical distribution for "Class A pan evaporation" throughout the United States. Figure 13.2.2-4 presents the geographical distribution of the percentage of this evaporation that occurs between May and October. The U. S. Weather Bureau Class A evaporation pan is a cylindrical metal container with a depth of 10 inches and a diameter of 48 inches. Periodic measurements are made of the changes of the water level.

The above methodology should be used only for prospective analyses and for designing watering programs for existing roadways. The quality rating of an emission factor for a watered road that is based on this methodology should be downgraded two letters. Periodic road surface samples should be collected and analyzed to verify the efficiency of the watering program.

As opposed to watering, chemical dust suppressants have much less frequent reapplication requirements. These materials suppress emissions by changing the physical characteristics of the existing road surface material. Many chemical unpaved road dust suppressants form a hardened surface that binds particles together. After several applications, a treated road often resembles a paved road except that the surface is not uniformly flat. Because the improved surface results in more grinding of small particles, the silt content of loose material on a highly controlled surface may be substantially higher than when the surface was uncontrolled. For this reason, the models presented as Equations 1a and 1b cannot be used to estimate emissions from chemically stabilized roads. Should the road be allowed to return to an

uncontrolled state with no visible signs of large-scale cementing of material, the Equation 1a and 1b emission factors could then be used to obtain conservatively high emission estimates.

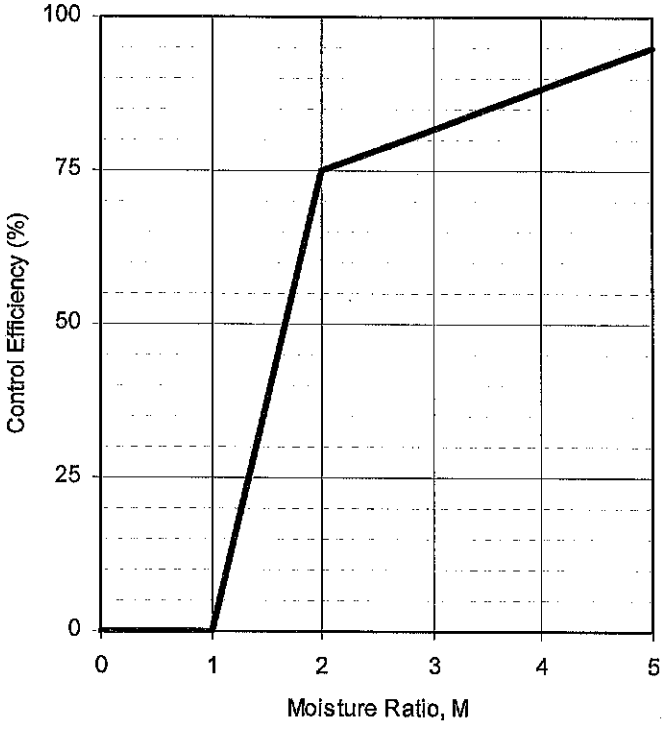

Figure 13.2.2-2. Watering control effectiveness for unpaved travel surfaces

The control effectiveness of chemical dust suppressants appears to depend on (a) the dilution rate used in the mixture; (b) the application rate (volume of solution per unit road surface area); (c) the time between applications; (d) the size, speed and amount of traffic during the period between applications; and (e) meteorological conditions (rainfall, freeze/thaw cycles, etc.) during the period. Other factors that affect the performance of dust suppressants include other traffic characteristics (e. g., cornering, track-on from unpaved areas) and road characteristics (e. g., bearing strength, grade). The variabilities in the above factors and differences between individual dust control products make the control efficiencies of chemical dust suppressants difficult to estimate. Past field testing of emissions from controlled unpaved roads has shown that chemical dust suppressants provide a PM-10 control efficiency of about 80 percent when applied at regular intervals of 2 weeks to 1 month.

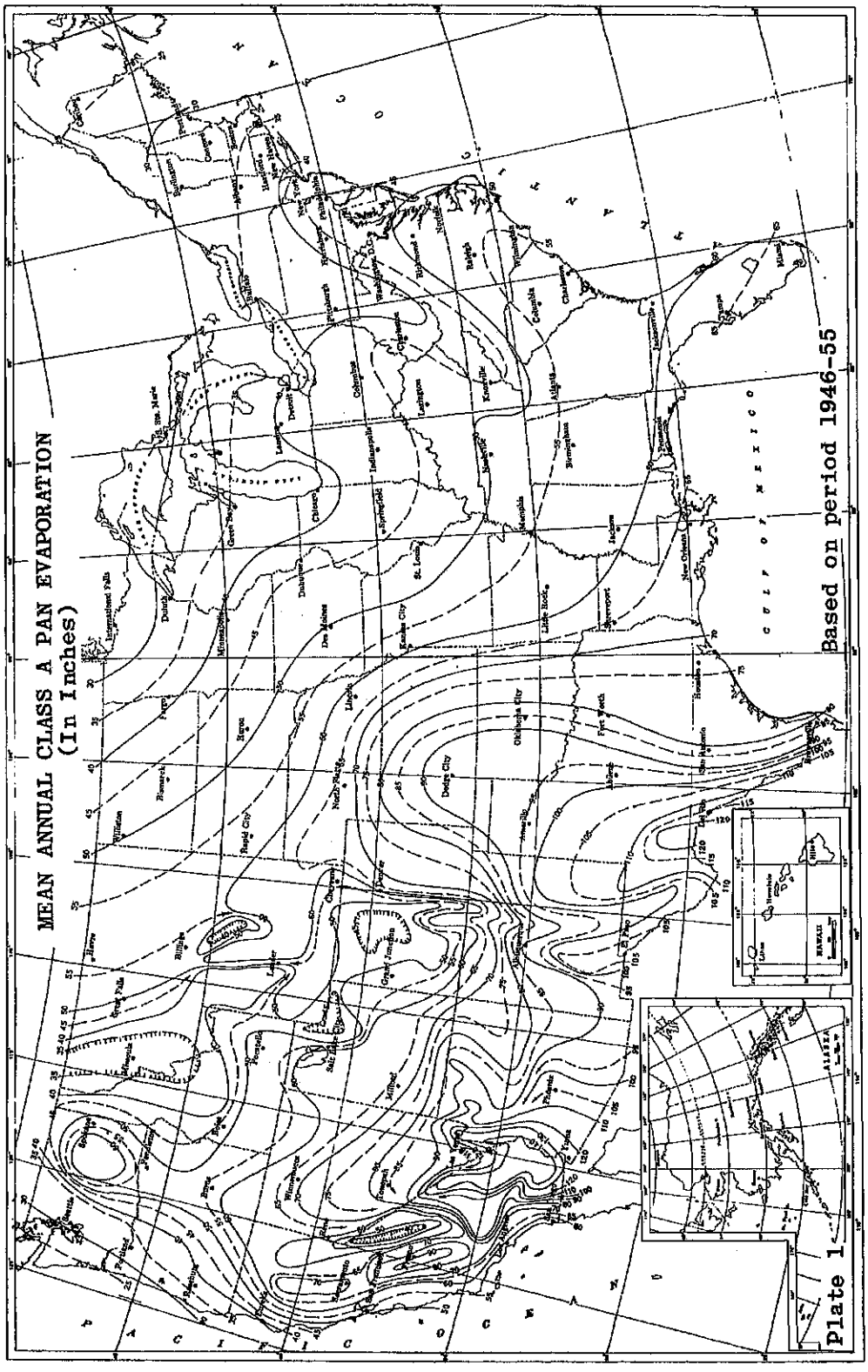

Figure 13.2.2-3. Annual evaporation data.

Figure 13.2.2-4. Geographical distribution of the percentage of evaporation occurring between May and October.

Petroleum resin products historically have been the dust suppressants (besides water) most widely used on industrial unpaved roads. Figure 13.2.2-5 presents a method to estimate average control efficiencies associated with petroleum resins applied to unpaved roads.[20] Several items should be noted:

1. The term "ground inventory" represents the total volume (per unit area) of petroleum resin concentrate (*not solution*) applied since the start of the dust control season.

2. Because petroleum resin products must be periodically reapplied to unpaved roads, the use of a time-averaged control efficiency value is appropriate. Figure 13.2.2-5 presents control efficiency values averaged over two common application intervals, 2 weeks and 1 month. Other application intervals will require interpolation.

3. Note that zero efficiency is assigned until the ground inventory reaches 0.05 gallon per square yard (gal/yd^2). Requiring a minimum ground inventory ensures that one must apply a reasonable amount of chemical dust suppressant to a road before claiming credit for emission control. Recall that the ground inventory refers to the amount of petroleum resin concentrate rather than the total solution.

As an example of the application of Figure 13.2.2-5, suppose that Equation 1a was used to estimate an emission factor of 7.1 lb/VMT for PM-10 from a particular road. Also, suppose that, starting on May 1, the road is treated with 0.221 gal/yd^2 of a solution (1 part petroleum resin to 5 parts water) on the first of each month through September. Then, the average controlled emission factors, shown in Table 13.2.2-5, are found.

Table 13.2-2-5. EXAMPLE OF AVERAGE CONTROLLED EMISSION FACTORS FOR SPECIFIC CONDITIONS

Period	Ground Inventory, gal/yd^2	Average Control Efficiency, %[a]	Average Controlled Emission Factor, lb/VMT
May	0.037	0	7.1
June	0.073	62	2.7
July	0.11	68	2.3
August	0.15	74	1.8
September	0.18	80	1.4

[a] From Figure 13.2.2-5, ≤10 μm. Zero efficiency assigned if ground inventory is less than 0.05 gal/yd^2. 1 lb/VMT = 281.9 g/VKT. 1 gal/yd^2 = 4.531 L/m^2.

Besides petroleum resins, other newer dust suppressants have also been successful in controlling emissions from unpaved roads. Specific test results for those chemicals, as well as for petroleum resins and watering, are provided in References 18 through 21.

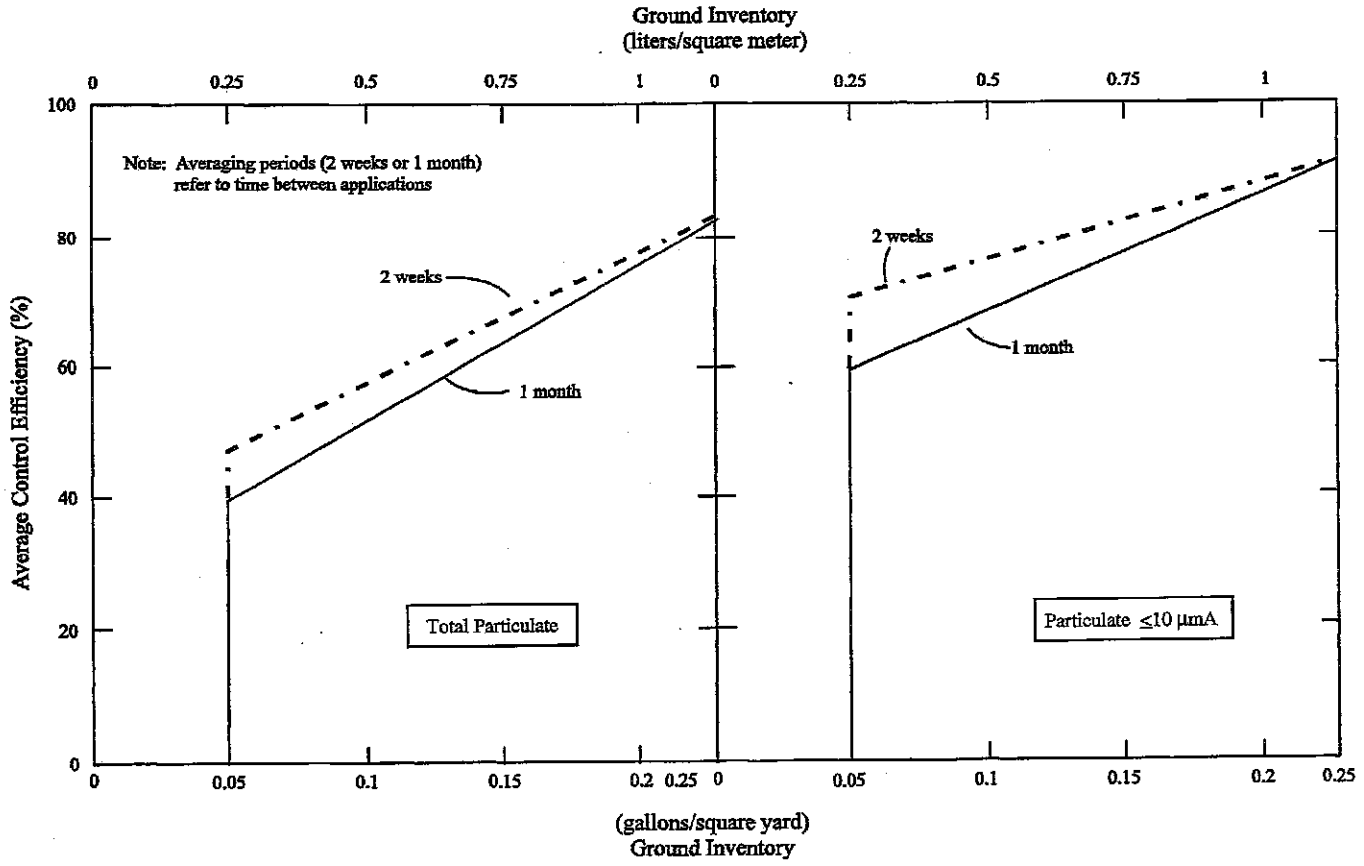

Figure 13.2.2-5. Average control efficiencies over common application intervals.

13.2.2.4 Updates Since The Fifth Edition

The Fifth Edition was released in January 1995. Revisions to this section since that date are summarized below. For further detail, consult the background report for this section (Reference 6).

October 1998 (Supplement E)– This was a major revision of this section. Significant changes to the text and the emission factor equations were made.

October 2001 – Separate emission factors for unpaved surfaces at industrial sites and publicly accessible roads were introduced. Figure 13.2.2-2 was included to provide control effectiveness estimates for watered roads.

December 2003 – The public road emission factor equation (equation 1b) was adjusted to remove the component of particulate emissions from exhaust, brake wear, and tire wear. The parameter C in the new equation varies with aerodynamic size range of the particulate matter. Table 13.2.2-4 was added to present the new coefficients.

January 2006 – The PM-2.5 particle size multipliers (i.e., factors) in Table 13.2.2-2 were modified and the quality ratings were upgraded from C to B based on the wind tunnel studies of a variety of dust emitting surface materials.

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United States
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Planning and Standards
Research Triangle Park NC 27711

EPA-453/R-95-017
November 1995

Air

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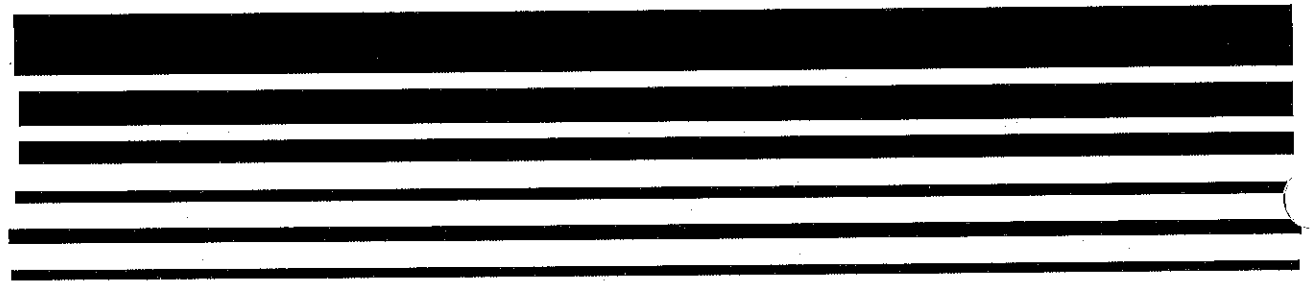
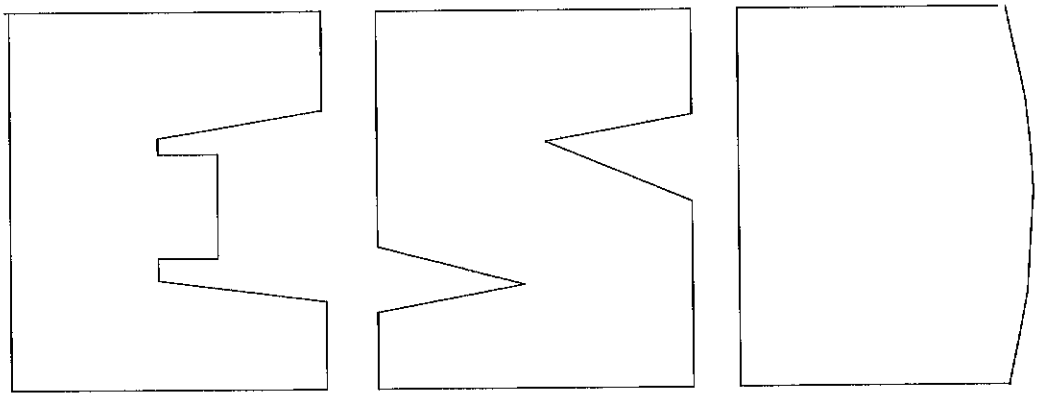
Protocol for Equipment Leak Emission Estimates





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1995 Protocol for Equipment Leak Emission Estimates

Emission Standards Division

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air and Radiation
Office of Air Quality Planning and Standards
Research Triangle Park, North Carolina 27711

November 1995

TABLE 2-4. OIL AND GAS PRODUCTION OPERATIONS AVERAGE EMISSION FACTORS (kg/hr/source)

Equipment Type	Service[a]	Emission Factor (kg/hr/source)[b]
Valves	Gas	4.5E-03
	Heavy Oil	8.4E-06
	Light Oil	2.5E-03
	Water/Oil	9.8E-05
Pump seals	Gas	2.4E-03
	Heavy Oil	NA
	Light Oil	1.3E-02
	Water/Oil	2.4E-05
Others[c]	Gas	8.8E-03
	Heavy Oil	3.2E-05
	Light Oil	7.5E-03
	Water/Oil	1.4E-02
Connectors	Gas	2.0E-04
	Heavy Oil	7.5E-06
	Light Oil	2.1E-04
	Water/Oil	1.1E-04
Flanges	Gas	3.9E-04
	Heavy Oil	3.9E-07
	Light Oil	1.1E-04
	Water/Oil	2.9E-06
Open-ended lines	Gas	2.0E-03
	Heavy Oil	1.4E-04
	Light Oil	1.4E-03
	Water/Oil	2.5E-04

[a]Water/Oil emission factors apply to water streams in oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.

[b]These factors are for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities. "NA" indicates that not enough data were available to develop the indicated emission factor.

[c]The "other" equipment type was derived from compressors, diaphrams, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents. This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps, or valves.

Title 40 —Protection of Environment
Chapter I —Environmental Protection Agency
Subchapter C —Air Programs
Part 98 —Mandatory Greenhouse Gas Reporting
Subpart C —General Stationary Fuel Combustion Sources

Table C-1 to Subpart C of Part 98—Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Fuel type	Default high heat value	Default CO_2 emission factor
Coal and coke	mmBtu/short ton	kg CO_2/mmBtu
Anthracite	25.09	103.69
Bituminous	24.93	93.28
Subbituminous	17.25	97.17
Lignite	14.21	97.72
Coal Coke	24.80	113.67
Mixed (Commercial sector)	21.39	94.27
Mixed (Industrial coking)	26.28	93.90
Mixed (Industrial sector)	22.35	94.67
Mixed (Electric Power sector)	19.73	95.52
Natural gas	mmBtu/scf	kg CO_2/mmBtu
(Weighted U.S. Average)	1.026×10^{-3}	53.06
Petroleum products—liquid	mmBtu/gallon	kg CO_2/mmBtu
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.138	74.00

Title 40 —Protection of Environment
Chapter I —Environmental Protection Agency
Subchapter C —Air Programs
Part 98 —Mandatory Greenhouse Gas Reporting
Subpart C —General Stationary Fuel Combustion Sources

Table C-2 to Subpart C of Part 98—Default CH_4 and N_2O Emission Factors for Various Types of Fuel

Fuel type	Default CH_4 emission factor (kg CH_4/mmBtu)	Default N_2O emission factor (kg N_2O/mmBtu)
Coal and Coke (All fuel types in Table C–1)	1.1×10^{-02}	1.6×10^{-03}
Natural Gas	1.0×10^{-03}	1.0×10^{-04}
Petroleum Products (All fuel types in Table C–1)	3.0×10^{-03}	6.0×10^{-04}
Fuel Gas	3.0×10^{-03}	6.0×10^{-04}
Other Fuels—Solid	3.2×10^{-02}	4.2×10^{-03}
Blast Furnace Gas	2.2×10^{-05}	1.0×10^{-04}
Coke Oven Gas	4.8×10^{-04}	1.0×10^{-04}
Biomass Fuels—Solid (All fuel types in Table C–1, except wood and wood residuals)	3.2×10^{-02}	4.2×10^{-03}
Wood and wood residuals	7.2×10^{-03}	3.6×10^{-03}
Biomass Fuels—Gaseous (All fuel types in Table C–1)	3.2×10^{-03}	6.3×10^{-04}
Biomass Fuels—Liquid (All fuel types in Table C–1)	1.1×10^{-03}	1.1×10^{-04}

Note: Those employing this table are assumed to fall under the IPCC definitions of the "Energy Industry" or "Manufacturing Industries and Construction". In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC "Energy Industry" category may employ a value of 1g of CH_4/mmBtu.

[78 FR 71952, Nov. 29, 2013, as amended at 81 FR 89252, Dec. 9, 2016]

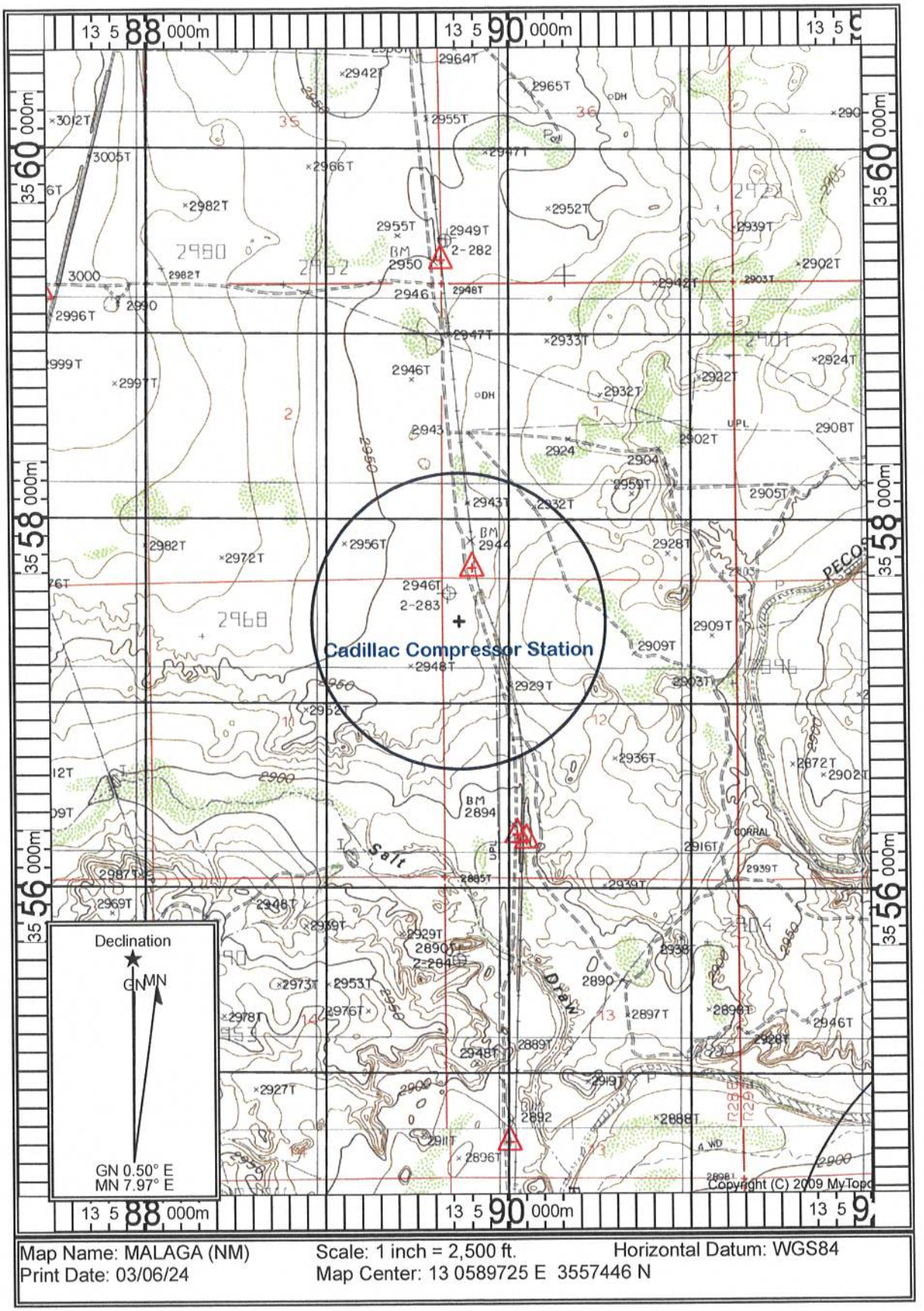
Section 8

Map(s)

A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

The UTM or Longitudinal coordinate system on both axes	An indicator showing which direction is north
A minimum radius around the plant of 0.8km (0.5 miles)	Access and haul roads
Topographic features of the area	Facility property boundaries
The name of the map	The area which will be restricted to public access
A graphical scale	

A map of the facility has been attached on the following page.



Map Name: MALAGA (NM)
Print Date: 03/06/24

Scale: 1 inch = 2,500 ft.
Map Center: 13 0589725 E 3557446 N

Horizontal Datum: WGS84

Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)
(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

☑ **I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**
This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

New Permit and **Significant Permit Revision** public notices must include all items in this list.

Technical Revision public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

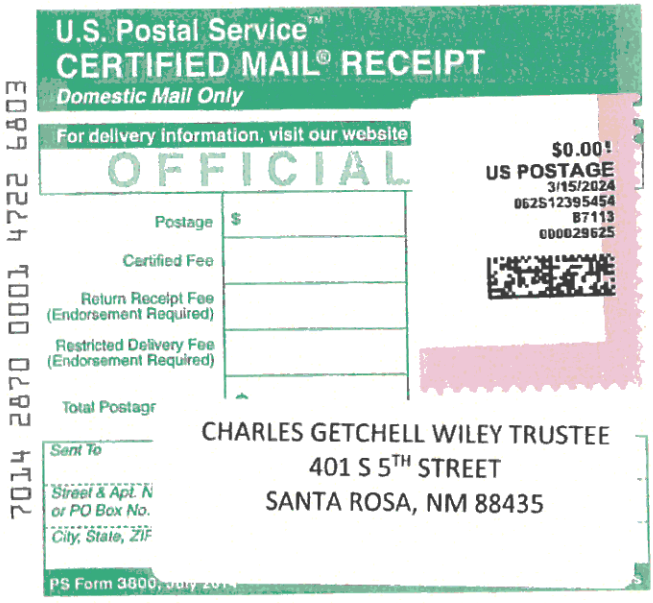
1. ☑ A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC)
2. ☑ A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.)
3. ☑ A copy of the property tax record (20.2.72.203.B NMAC).
4. ☑ A sample of the letters sent to the owners of record.
5. ☑ A sample of the letters sent to counties, municipalities, and Indian tribes.
6. ☑ A sample of the public notice posted and a verification of the local postings.
7. ☑ A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. ☑ A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. ☑ A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. ☑ A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. ☑ A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our website
OFFICIAL
Postage
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
$0.00
US POSTAGE
3/15/2024
062S12395454
87113
000029624
7014 2870 0001 4722 6797
Sent To
CHARLES G WILEY TRUST
401 S 5TH STREET
SANTA ROSA, NM 88435
PS Form 380


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our website
OFFICIAL
Postage
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
$0.00
US POSTAGE
3/15/2024
062S12395454
87113
000029623
7014 2870 0001 4719 1033
Sent To
JOY ELIZABETH COKSEY
PO BOX 85
TEAGUE, TX 75860
PS Form 3800


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our website
OFFICIAL
Postage
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
$0.00
US POSTAGE
3/15/2024
062S12395454
87113
000029622
7014 2870 0001 4719 1026
Sent To
STATE OF NEW MEXICO
310 OLD SANTA FE TRAIL
SANTA FE, NM 87504
PS Form 380


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our website
OFFICIAL
Postage
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
$0.00
US POSTAGE
3/15/2024
062S12395454
87113
000029621
7014 2870 0001 4722 6810
Sent To
EDDY COUNTY – COUNTY MANAGER
101 W GREENE STREET, SUITE 110
CARLSBAD, NM 88220
PS Form 3800


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our website
OFFICIAL
Postage $
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Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
Total Postage
$0.00
US POSTAGE
3/15/2024
062S12395454
87113
000029625
Sent To
Street & Apt. N
or PO Box No.
City, State, ZIF
PS Form 3800,
7014 2870 0001 4722 6803
CHARLES GETCHELL WILEY TRUSTEE
401 S 5TH STREET
SANTA ROSA, NM 88435


U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our webs
OFFICIA
Postage $
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
Total Postage & Fees $
$0.00
US POSTAGE
3/15/2024
062S12395454
87113
000029626
Sent To
Street & Ap
or PO Box
City, State,
PS Form 3
7014 2870 0001 4722 6827
SALT DRAW RANCH, LLC
3201 BOYD DR
CARLSBAD, NM 88220

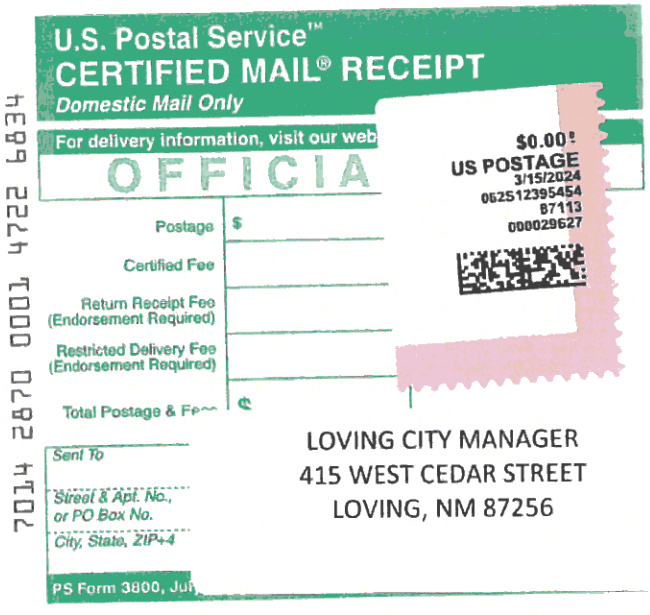

U.S. Postal Service™
CERTIFIED MAIL® RECEIPT
Domestic Mail Only
For delivery information, visit our web
OFFICIA
Postage $
Certified Fee
Return Receipt Fee (Endorsement Required)
Restricted Delivery Fee (Endorsement Required)
Total Postage & Fe
$0.00
US POSTAGE
3/15/2024
062S12395454
87113
000029627
Sent To
Street & Apt. No.,
or PO Box No.
City, State, ZIP+4
PS Form 3800, Ju
7014 2870 0001 4722 6834
LOVING CITY MANAGER
415 WEST CEDAR STREET
LOVING, NM 87256

Table of Posted Public Notice Locations

Name	Address	City	State	Zip Code
Facility Entrance				
Carlsbad Public Library	101 S Halagueno St.	Carlsbad	NM	88220
Carlsbad Municipal Building	101 N Halagueno St.	Carlsbad	NM	88220
Carlsbad United States Postal Service	301 N. Canyon St.	Carlsbad	NM	88220

- Account Search
- View Created Report(s)
- Help?
- Eddy County Website
- County Treasurer
- County Assessor
- County Clerk
- Logout Public

Account: R091350 *Mill Levy does not include Special District Rates such as Penasco, Carlsbad Soil & Water, Central Valley, Eagle Draw, PVC, Cottonwood, and Hackberry

Location

Account Number R091350

Situs Address E OF 1102 PECOS HIGHWAY

Tax Area CO_NR - CARLSBAD-OUT (Nonresidential)

Parcel Number 4-168-146-133-066

Legal Summary Quarter: NW S: 12 T: 25S R: 28E N2NW

Map Number 383-12

Parcel Size 80 AC

Owner Information

Owner Name SALT DRAW RANCH LLC

Owner Address 3201 BOYD DR
CARLSBAD, NM 88220

Assessment History

Actual Value (2024) $144

Primary Taxable $48

Tax Area: CO_NR **Mill Levy:** 22.561000

Type	Actual	Assessed	Acres
Agriculture Land	$144	$48	80.000

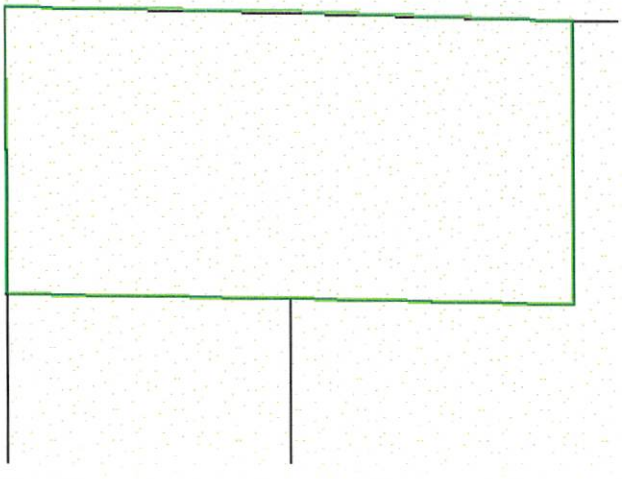
Tax History

Tax Year	Taxes
*2025	$1.12
2024	No Tax Values

* Estimated

Images

- GIS



March 15, 2024

CERTIFIED MAIL 7014 2870 0001 4719 1026
RETURN RECEIPT REQUESTED *(certified mail is required, **return receipt is optional**)*

Dear **Neighbor,**
Targa Northern Delaware, LLC announces its application submittal to the New Mexico Environment Department for an air quality permit for the **modification** of its **compressor station** facility. The expected date of application submittal to the Air Quality Bureau is **March 15, 2023.**

The exact location for the proposed facility known as, **Cadillac Compressor Station**, is at **32.149885°, -104.048548°.** The approximate location of this facility is **5.0** miles **south-southeast** of **Malaga, NM** in **Eddy** county.

The proposed **modification** consists of replacing various compressor engines with like-kind replacements, adding a heater trailer, air compressor generator, and vapor combustion unit, removing select compressor engines and one storage tank, and to modify all other units based on a recent inlet gas analysis.

The estimated maximum quantities of any regulated air contaminant will be as follows in pound per hour (pph) and tons per year (tpy) and may change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
PM_{10}	4	15
$PM_{2.5}$	4	15
Sulfur Dioxide (SO_2)	2	4
Nitrogen Oxides (NO_x)	30	126
Carbon Monoxide (CO)	34	147
Volatile Organic Compounds (VOC)	2,274	212
Hydrogen Sulfide (H_2S)	1	1
Total sum of all Hazardous Air Pollutants (HAPs)	104	38
Toxic Air Pollutant (TAP)	N/A	N/A
Green House Gas Emissions as Total CO_2e	N/A	93,048

The standard operating schedule of the facility will be 24 hours a day, 7 days a week, and 52 weeks per year.

Owners and operators of the facility include:
Targa Northern Delaware, LLC
811 Lousianna St, Ste 2100
Houston, TX 77002

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the

application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Attención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Sincerely,
Targa Northern Delaware, LLC
811 Lousianna St, Ste 2100
Houston, TX 77002

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

March 15, 2024

CERTIFIED MAIL 7014 2870 0001 4722 6834
RETURN RECEIPT REQUESTED *(certified mail is required, **return receipt is optional**)*

Dear **Municipal Official,**
Targa Northern Delaware, LLC announces its application submittal to the New Mexico Environment Department for an air quality permit for the **modification** of its **compressor station** facility. The expected date of application submittal to the Air Quality Bureau is **March 15, 2023.**

The exact location for the proposed facility known as, **Cadillac Compressor Station**, is at **32.149885°, -104.048548°.** The approximate location of this facility is **5.0** miles **south-southeast** of **Malaga, NM** in **Eddy** county.

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Pollutant:	Pounds per hour	Tons per year
PM_{10}	4	15
$PM_{2.5}$	4	15
Sulfur Dioxide (SO_2)	2	4
Nitrogen Oxides (NO_x)	30	126
Carbon Monoxide (CO)	34	147
Volatile Organic Compounds (VOC)	2,274	212
Hydrogen Sulfide (H_2S)	1	1
Total sum of all Hazardous Air Pollutants (HAPs)	104	38
Toxic Air Pollutant (TAP)	N/A	N/A
Green House Gas Emissions as Total CO_2e	N/A	93,048

The standard operating schedule of the facility will be 24 hours a day, 7 days a week, and 52 weeks per year.

Owners and operators of the facility include:
Targa Northern Delaware, LLC
811 Lousianna St, Ste 2100
Houston, TX 77002

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the

application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Attención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Sincerely,
Targa Northern Delaware, LLC
811 Lousianna St, Ste 2100
Houston, TX 77002

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.

General Posting of Notices – Certification

I, __Kim Hamlet_____, the undersigned, certify that on 3-15-2024, posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in the **Town** of **Carlsbad, Eddy** County, State of New Mexico on the following dates:

1. Facility entrance {DATE}
2. Carlsbad Public Library, 101 S Halagueno St. Carlsbad, NM 88220 {DATE}
3. Carlsbad Municipal Building, 101 N Halagueno St, Carlsbad, NM 88220 {DATE}
4. Carlsbad United States Postal Service 301 N. Canyon Street Carlsbad, NM 88220 3-15-2024

Signed this __15___ day of __March_____, __2024___,

Kim Hamlet
Signature

___3-15-2024_____
Date

_Kim Hamlet_____
Printed Name

ES&H Coordinator
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}


UNITED STATES POST OFFICE
CARLSBAD, NEW MEXICO
88220
03/15/2024 9:35 AM

NOTICE

Targa Northern Delaware, LLC announces its application submittal to the New Mexico Environment Department for an air quality permit for the **modification** of its **compressor station** facility. The expected date of application submittal to the Air Quality Bureau is **March 15, 2023.**

The exact location for the proposed facility known as, **Cadillac Compressor Station**, is at **32.149845°, -104.048548°**. The approximate location of this facility is **5.0 miles south-southeast** of **Malaga, NM** in **Eddy** county.

The proposed **modification** consists of replacing various compressor engines with like kind replacements, adding a heater stabler, air compressor generator, and vapor combustion unit, removing select compressor engines and one storage tank, and to modify all other units based on a recent inlet gas analysis.

The estimated maximum quantities of any regulated air contaminant will be as follows in pound per hour (pph) and tons per year (tpy) and could change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
PM	4	15
PM$_{10}$	4	15
PM$_{2.5}$	2	4
Sulfur Dioxide (SO_2)	50	229
Nitrogen Dioxide (NO_2)	34	147
Carbon Monoxide (CO)	2,274	212
Volatile Organic Compounds (VOC)	1	1
Hydrogen Sulfide (H_2S)	104	58
Total sum of all Hazardous Air Pollutants (HAPs)	5.3	n/a
Toxic Air Pollutant (TAP)	n/a	91,068
Green House Gas Emissions as Total CO$_2$e		

The standard operating schedule of the facility will be 24 hours a day, 7 days a week, and 52 weeks per year.

The owner and/or operator of the Facility is:
Targa Northern Delaware, LLC
811 Louisiana St, Ste 2100
Houston, TX 77002

If you have any comments about the construction or operation of this facility, and you want your comments to be made a part of the permit review process, you must submit your comments in writing to the address: Permit Program Manager, New Mexico Environment Department, Air Quality Bureau, 525 Camino de los Marquez, Suite 1, Santa Fe, New Mexico 87505, (505) 476-4300, 1-800-224-7009.

With your comments, please refer to the company name and facility name or send a copy of this notice along with your comments. This information can usually solve the Department may have not yet received the permit application. Please include a request for future hearing with this. Once the Department has completed its preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Atención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones propuestas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con la oficina al teléfono 505-476-4303.

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nmedcivilrights@state.nm.us. If you prefer to file your complaint with EPA, you may do so through the EPA Form Processing Center, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20460, (202) 564-7272. Complaints must be filed within 180 days of the alleged occurrence.

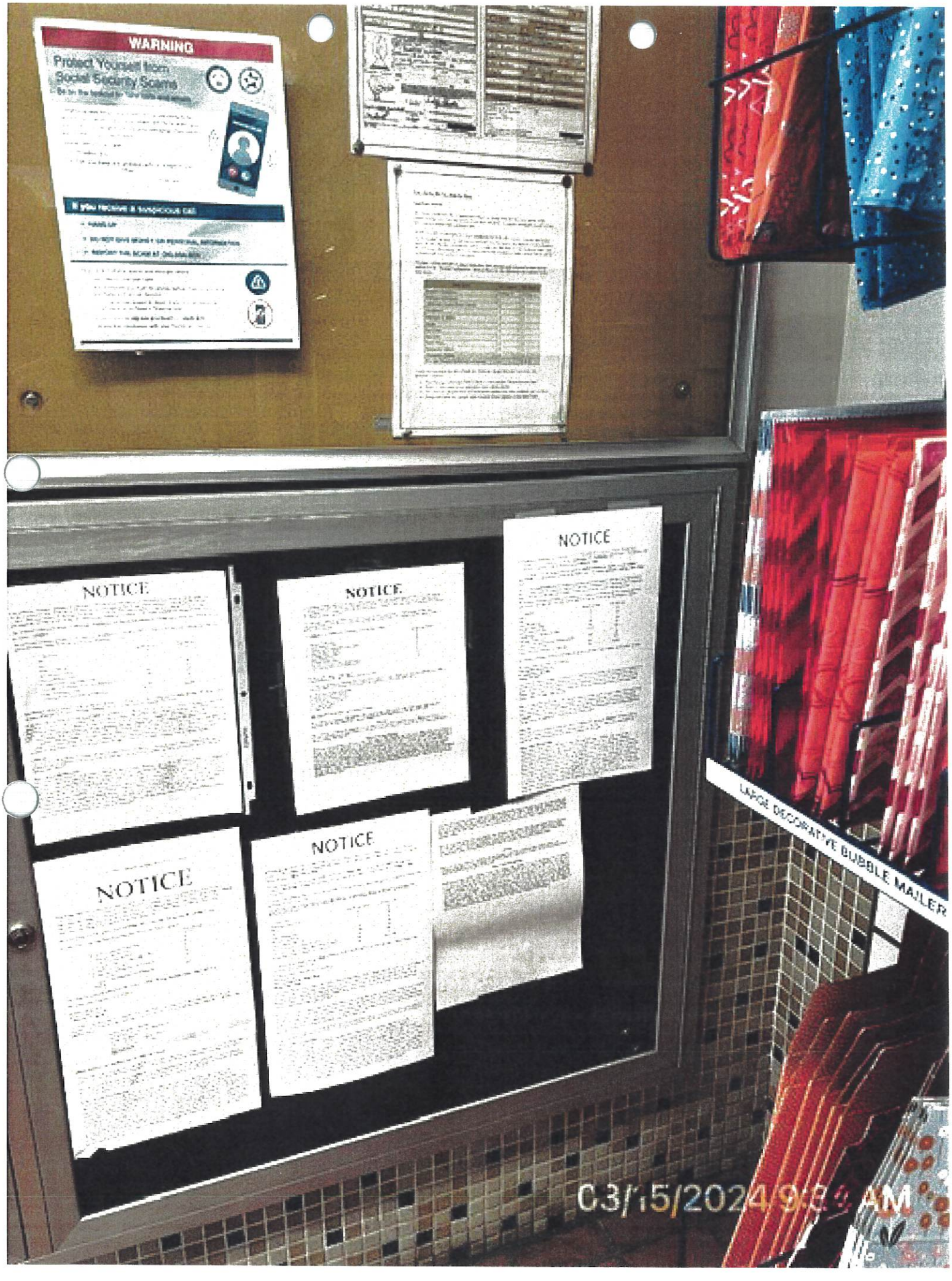
WARNING
Protect Yourself from Social Security Scams
NOTICE
NOTICE
NOTICE
NOTICE
NOTICE
LARGE DECORATIVE BUBBLE MAILER
03/15/2024 9:

Table of Noticed Citizens

Name	Address	City	State	Zip Code
STATE OF NEW MEXICO	310 OLD SANTA FE TRAIL	SANTA FE	NM	87504
JOY ELIZABETH COOKSEY	PO BOX 85	TEAGUE	TX	75860
CHARLES G WILEY TRUST	401 S 5TH STREET	SANTA ROSA	NM	88435
CHARLES GETCHELL WILEY TRUSTEE	401 S 5TH STREET	SANTA ROSA	NM	88435
SALT DRAW RANCH LLC	3201 BOYD DR	CARLSBAD	NM	88220

Table of Noticed Municipalities

Name	Address	City	State	Zip Code
LOVING CITY MANAGER	415 WEST CEDAR STREET	LOVING	NM	87256

Table of Noticed Counties

Name	Address	City	State	Zip Code
EDDY COUNTY - COUNTY MANAGER	101 W GREENE STREET, SUITE 110	CARLSBAD	NM	88220

Table of Noticed Tribes

Name	Address	City	State	Zip Code
N/A				

Submittal of Public Service Announcement – Certification

I, Daniel Dolce, the undersigned, certify that on **March 15, 2024**, submitted a public service announcement to **Carlsbad Radio** that serves the City of **Carlsbad, Eddy** County, New Mexico, in which the source is or is proposed to be located and that **Carlsbad Radio DID NOT RESPOND.**

Signed this 15 day of March, 2024,

Daniel Dolce
Signature

3/15/2024
Date

Daniel Dolce
Printed Name

Associate Consultant - Trinity Consultants
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

Daniel Dolce

From: Daniel Dolce
Sent: Friday, March 15, 2024 1:10 PM
To: don@carlsbadradio.com
Subject: Cadillac Compressor Station Public Service Announcement

Dear Radio 92.1 KATK-FM,

Per New Mexico Administrative Code 20.2.72.203.B NMAC and according to the Guidance for Public Notice for Air Quality Permit Applications – **(5) Notifications: Submittal of Public Service Announcement (PSA):** A public service announcement required for permits and significant permit revisions must be submitted to at least one radio or television station, which services the municipality, or county which the facility is or will be located. **Therefore, based on the above, we respectfully ask you to air the information shown below as a Public Service Announcement.**

The public service announcement request must contain the following information about the facility or proposed facility (20.2.72.203.D NMAC).

a. The name: **Cadillac Compressor Station,** location: **32.149885°, -104.048548°**. and type of business: **Compressor Station.**
b. The name and principal owner or operator: **Targa Northern Delaware, LLC** – owner and operator.
c. The type of process or change for which the permit is sought: **NSR Significant Revision – replacing various compressor engines with like-kind replacements; adding a heater trailer, air compressor generator, and vapor combustion unit; removing select compressor engines and one storage tank; and to modify all other units based on a recent inlet gas analysis.**
d. Locations where the notices have been posted in Loving, NM 88256: **(1) Cadillac Station Facility Entrance, (2) Carlsbad Public Library, 101 S Halagueno St. Carlsbad, NM 88220, (3) Carlsbad Municipal Building, 101 N Halagueno St, Carlsbad, NM 88220, and (4) Carlsbad United States Postal Service, 301 N. Canyon Street Carlsbad, NM 88220.**
e. The Department's address or telephone number to which comments may be directed: **Permit Programs manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1, Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 (800) 224-7009.**

Thank you and regards,
Daniel Dolce

Daniel Dolce
Associate Consultant

P 505.266.6611 M 505.818.8761
Email: daniel.dolce@trinityconsultants.com
9400 Holly Avenue NE, Building 3, Suite B, Albuquerque, NM 87122

Affidavit of Publication

No.

State of New Mexico

County of Eddy:

Danny Scott Danny Scott

being duly sworn, sayes that he is the **Publisher**

of the Artesia Daily Press, a daily newspaper of General circulation, published in English at Artesia, said county and state, and that the hereto attached

Display Ad

was published in a regular and entire issue of the said Artesia Daily Press, a daily newspaper duly qualified for that purpose within the meaning of Chapter 167 of the 1937 Session Laws of the state of New Mexico for

1 Consecutive weeks/day on the same day as follows:

First Publication March 14, 2024

Second Publication

Third Publication

Fourth Publication

Fifth Publication

Sixth Publication

Subscribed ans sworn before me this

th day of March 2024

LATISHA ROMINE
Notary Public, State of New Mexico
Commission No. 1076338
My Commission Expires
05-12-2027

Latisha Romine

Latisha Romine

Notary Public, Eddy County, New Mexico

Copy of Publication:

NOTICE OF AIR QUALITY PERMIT APPLICATION

Targa Northern Delaware, LLC announces its application submittal to tl Mexico Environment Department for an air quality permit for the **modif** of its **compressor station** facility. The expected date of application subm the Air Quality Bureau is **March 15, 2023**.

The exact location for the proposed facility known as, **Cadillac Compress tion,** is at **32.149885°, - 104.048548°.** The approximate location of this fa **5.0 miles south-southeast of Malaga, NM in Eddy County.**

The proposed **modification** consists of replacing various compressor e with like-kind replacements, adding a heater trailer, air compressor ger and vapor combustion unit, removing select compressor engines and one tank, and to modify all other units based on a recent inlet gas analysis.

The estimated maximum quantities of any regulated air contaminant wil follows in pound per hour (pph) and tons per year (tpy) and could change during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
PM_{10}	4	15
$PM_{2.5}$	4	15
Sulfur Dioxide (SO2)	2	4
Nitrogen Oxides (NO_x)	30	126
Carbon Monoxide (CO)	34	147
Volatile Organic Compounds (VOC)	2,274	212
Hydrogen Sulfide (H2S)	1	1
Total sum of all Hazardous Air Pollutants (HAPs)	104	38
Toxic Air Pollutant (TAP)	N/A	N/A
Green House Gas Emissions as Total CO_2e	N/A	93,048

The standard operating schedule of the facility will be 24 hours a day, 7 da week, and 52 weeks per year.

The owner and/or operator of the Facility is:
Targa Northern Delaware, LLC
811 Lousianna St, Ste 2100
Houston, TX 77002

If you have any comments about the construction or operation of this facili you want your comments to be made as part of the permit review proce must submit your comments in writing to this address: Permit Programs M er; New Mexico Environment Department; Air Quality Bureau; 525 Cam los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other commen questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and site name, or send a copy of this along with your comments, since the Department may have not yet receiv permit application. Please include a legible return mailing address witl comments. Once the Department has performed a preliminary review of application and its air quality impacts, the Department's notice will be pub in the legal section of a newspaper circulated near the facility location. G information about air quality and the permitting process, and links to the r tions can be found at the Air Quality Bureau's website: www.env.nm.gov/air ity/permitting-section-home-page/. The regulation dealing with public par tion in the permit review process is 20.2.72.206 NMAC.

Attención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Me Ambiente de Nuevo México, acerca de las emisiones producidas por un est lecimiento en esta área. Si usted desea información en español, por favor c muníquese con esa oficina al teléfono 505-629-3395.

Affidavit of Publication

No. 26796

State of New Mexico

County of Eddy:

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Legal Ad

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First Publication	March 14, 2024
Second Publication	
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Sixth Publication	

Subscribed ans sworn before me this

14th day of March 2024

LATISHA ROMINE
Notary Public, State of New Mexico
Commission No. 1076338
My Commission Expires
05-12-2027

Latisha Romine

Latisha Romine

Notary Public, Eddy County, New Mexico

Copy of Publication:

Legal Notice

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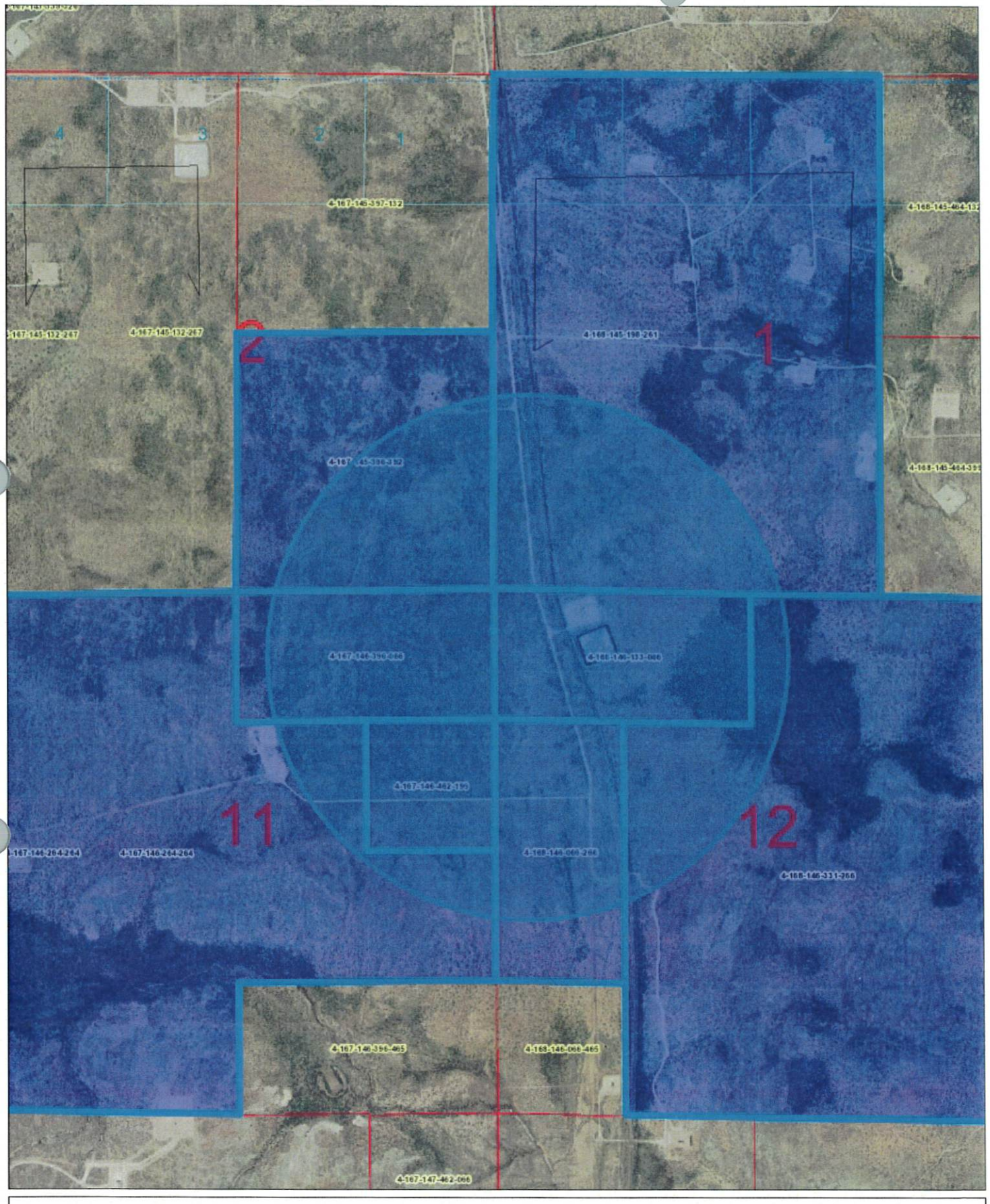

Cadillac Compressor Station

Web Print: 03/14/2024

0 1,505 Feet

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.

Section 10

Written Description of the Routine Operations of the Facility

A written description of the routine operations of the facility. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

Low pressure field gas is gathered from various wells in the area and sent to an inlet separator. The gas from the separator is compressed by ten (10) natural gas driven compressor engines (units ENG-1 through ENG-10). Once the gas is compressed, it is treated using a glycol dehydration system (unit Dehy-1) to remove entrained water. The dry gas is then sent off site via pipeline for further processing.

The glycol dehydration unit incorporates three distinct sources of air emissions: (1) flash tank, (2) BTEX condenser still vent, and a (3) natural gas fired reboiler (unit RBL-1). Flash tank emissions are recycled to the inlet, however, during periods where the inlet pressure is too high, the emissions are routed to the storage tanks (units TK-1 through TK-3). The BTEX condenser still vent emissions are routed to the reboiler as fuel, however, during periods in which the reboiler does not call for fuel, the emission are routed to the tanks.

Liquids from the inlet separator, as well as from compressor interstage knockout are sent to three (3) atmospheric storage tanks (units TK-1 though TK-3). Flash, working ,and breathing emissions as well as dehy flash gas (during high inlet pressure periods) and BTEX condenser still vent (during periods in which the reboiler does not call for fuel) are controlled with a vapor combustion unit (unit VCU) with a 100% capture efficiency and a 98% DRE. While liquids may be transported offsite via pipeline, loading emissions (unit LOAD) are represented for the entire facility throughput for liquids along with associated haul road emissions (unit HAUL), the latter of which is exempt pursuant to 20.2.72.202.B.(5) NMAC.

During the winter months, a diesel fired heater trailer (unit Trailer-1) is used to help start up cold engines. A natural gas fired air compressor generator (unit GEN-1) is also used for pneumatics. Startup, shutdown, maintenance /malfunction emissions (SSM/M) include compressor blowdowns, dehydrator blowdowns, filter coalescer blowdowns, scrubber blowdowns, pump blowdowns, reboiler maintenance, pigging, pipeline blowdowns, and tank maintenance. Details regarding the number of events and gas volumes associated with these activities can be found in the provided calculations.

Section 11

Source Determination

Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe):
Please refer to Table 2-A of this application.

B. Apply the 3 criteria for determining a single source:

SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

☑ **Yes** ☐ **No**

Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.

☑ **Yes** ☐ **No**

Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

☑ **Yes** ☐ **No**

C. Make a determination:

☑ The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

Section 12

Section 12.A

PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

A PSD applicability determination for all sources. For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

A. This facility is:

- ☑ **a minor PSD source before and after this modification (if so, delete C and D below).**
- ☐ **a major PSD source before this modification. This modification will make this a PSD minor source.**
- ☐ **an existing PSD Major Source that has never had a major modification requiring a BACT analysis.**
- ☐ **an existing PSD Major Source that has had a major modification requiring a BACT analysis**
- ☐ **a new PSD Major Source after this modification.**

This application is for an NSR Significant modification.

Section 13

Determination of State & Federal Air Quality Regulations

This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

Required Information for Specific Equipment:
For regulations that apply to specific source types, in the 'Justification' column **provide any information needed to determine if the regulation does or does not apply**. **For example**, to determine if emissions standards at 40 CFR 60, Subpart IIII apply to your three identical stationary engines, we need to know the construction date as defined in that regulation; the manufacturer date; the date of reconstruction or modification, if any; if they are or are not fire pump engines; if they are or are not emergency engines as defined in that regulation; their site ratings; and the cylinder displacement.

Required Information for Regulations that Apply to the Entire Facility:
See instructions in the 'Justification' column for the information that is needed to determine if an 'Entire Facility' type of regulation applies (e.g. 20.2.70 or 20.2.73 NMAC).

Regulatory Citations for Regulations That Do Not, but Could Apply:
If there is a state or federal air quality regulation that does not apply, but you have a piece of equipment in a source category for which a regulation has been promulgated, you must **provide the low level regulatory citation showing why your piece of equipment is not subject to or exempt from the regulation. For example** if you have a stationary internal combustion engine that is not subject to 40 CFR 63, Subpart ZZZZ because it is an existing 2 stroke lean burn stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, your citation would be 40 CFR 63.6590(b)(3)(i). **We don't want a discussion of every non-applicable regulation, but if it is possible a regulation could apply, explain why it does not. For example,** if your facility is a power plant, you do not need to include a citation to show that 40 CFR 60, Subpart OOO does not apply to your non-existent rock crusher.

Regulatory Citations for Emission Standards:
For each unit that is subject to an emission standard in a source specific regulation, such as 40 CFR 60, Subpart OOO or 40 CFR 63, Subpart HH, include the low level regulatory citation of that emission standard. Emission standards can be numerical emission limits, work practice standards, or other requirements such as maintenance. **Here are examples:** a glycol dehydrator is subject to the general standards at 63.764C(1)(i) through (iii); an engine is subject to 63.6601, Tables 2a and 2b; a crusher is subject to 60.672(b), Table 3 and all transfer points are subject to 60.672(e)(1)

Federally Enforceable Conditions:
All federal regulations are federally enforceable. All Air Quality Bureau State regulations are federally enforceable except for the following: affirmative defense portions at 20.2.7.6.B, 20.2.7.110(B)(15), 20.2.7.11 through 20.2.7.113, 20.2.7.115, and 20.2.7.116; 20.2.37; 20.2.42; 20.2.43; 20.2.62; 20.2.63; 20.2.86; 20.2.89; and 20.2.90 NMAC. Federally enforceable means that EPA can enforce the regulation as well as the Air Quality Bureau and federally enforceable regulations can count toward determining a facility's potential to emit (PTE) for the Title V, PSD, and nonattainment permit regulations.

INCLUDE ANY OTHER INFORMATION NEEDED TO COMPLETE AN APPLICABILITY DETERMINATION OR THAT IS RELEVENT TO YOUR FACILITY'S NOTICE OF INTENT OR PERMIT.

EPA Applicability Determination Index for 40 CFR 60, 61, 63, etc: http://cfpub.epa.gov/adi/

Table for State Regulations:

State Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.1 NMAC	General Provisions	Yes	Facility	General Provisions apply to Notice of Intent, Construction, and Title V permit applications.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	20.2.3 NMAC is a State Implementation Plan (SIP) approved regulation that limits the maximum allowable concentration of, Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide
20.2.7 NMAC	Excess Emissions	Yes	Facility	This regulation establishes requirements for the facility if operations at the facility result in any excess emissions. The owner or operator will operate the source at the facility having an excess emission, to the extent practicable, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions. The facility will also notify the NMED of any excess emissions per 20.2.7.110 NMAC.
20.2.23 NMAC	Fugitive Dust Control	No	Facility	This regulation does not apply because this application is not for a Notice of Intent.
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide	Yes	RBL-1	This facility has existing gas burning equipment having a heat input of greater than 1,000,000 million British Thermal Units per year per unit.
20.2.34 NMAC	Oil Burning Equipment: NO_2	No	N/A	This facility does not have oil burning equipment having a heat input of greater than 1,000,000 million British Thermal Units per year per unit.
20.2.35 NMAC	Natural Gas Processing Plant – Sulfur	No	N/A	This regulation establishes sulfur emission standards for natural gas processing plants. This facility is a compressor station and not a natural gas process plant. Therefore, this regulation does not apply.
20.2.37 and 20.2.36 NMAC	Petroleum Processing Facilities and Petroleum Refineries	No	N/A	These regulations were repealed by the Environmental Improvement Board. If you had equipment subject to 20.2.37 NMAC before the repeal, your combustion emission sources are now subject to 20.2.61 NMAC.
20.2.38 NMAC	Hydrocarbon Storage Facility	No	N/A	This facility does not have any containers with a capacity of 20,000 gallons or a throughput of 30,000 gallons/week.
20.2.39 NMAC	Sulfur Recovery Plant - Sulfur	No	N/A	This facility is not a sulfur recovery plant; therefore, this regulation does not apply.
20.2.50 NMAC	Oil and Gas Sector – Ozone Precursor Pollutants			This regulation establishes emission standards for volatile organic compounds (VOC) and oxides of nitrogen (NOx) for oil and gas production, processing, compression, and transmission sources. 20.2.50 NMAC subparts below: Check the box for the subparts that are applicable: ☒113 – Engines and Turbines ☒114 – Compressor Seals ☐115 – Control Devices and Closed Vent Systems ☒116 – Equipment Leaks and Fugitive Emissions ☐ 117 – Natural Gas Well Liquid Unloading ☐ 118 – Glycol Dehydrators ☐ 119 – Heaters ☒ 120 – Hydrocarbon Liquid Transfers ☐121 – Pig Launching and Receiving ☐122 – Pneumatic Controllers and Pumps ☐ 123 – Storage Vessels ☐124 – Well Workovers ☐ 125 – Small Business Facilities ☐126 – Produced Water Management Unit ☐127 – Flowback Vessels and Preproduction Operations 113 – Units ENG-1 through ENG-10 are existing natural gas-fired spark ignition engines rated >1000 hp and are therefore subject to the requirements of this

State Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
				subpart. GEN-1 is a new natural gas-fired spark ignition engine rated <500 hp. Trailer-1 is a diesel fired engine. Therefore, GEN-1 and Trailer-1 are not subject to the requirements of this subpart. 114 – ENG-1 through ENG-10 are reciprocating compressors located at a gathering and boosting station and are therefore subject to the requirements of this subpart. Trailer-1 and GEN-1 are not compressor engines and are therefore not subject to the requirements of this subpart. 115 – N/A – The control devices used at this facility are not used to comply with the requirements of Part 50; therefore, this subpart does not apply. 116 – This facility is a gathering and boosting station and is therefore subject to the requirements of this subpart. 117 – N/A – There are no natural gas wells located at this facility; therefore, this subpart does not apply. 118 – N/A – Dehy-1 does not have a PTE > 2 tpy VOC; therefore, this subpart does not apply. 119 – N/A – RBL-1 does not have a rated heat input >20 MMBtu/hr; therefore, this subpart does not apply. 120 – This facility is a gathering and boosting station with one or more controlled storage vessels and performs hydrocarbon liquid transfers and is therefore subject to the requirements of this subpart. 121 – N/A – The pipeline pigging operations at this facility have a PTE < 1 tpy; therefore, this subpart does not apply. 122 – N/A – The facility will not have natural gas driven pneumatics after this modification; therefore, this subpart does not apply. 123 – N/A – TK-1 through TK-3 are existing storage tanks located at a multi-tank battery, but do not have a PTE > 3 tpy VOC; therefore ,this subpart does not apply. 124 – N/A – There are no oil or natural gas wells located at this facility; therefore, this subpart does not apply. 125 – N/A – This facility does not qualify as a small business; therefore, this subpart does not apply. 126 – N/A – There are no produced water managements units located at this facility; therefore, this subpart does not apply. 127 – N/A – There are no wells located at this facility; therefore, this subpart does not apply.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	ENG-1 through ENG-10, Trailer-1, GEN-1, RBL-1, VCU-1	This regulation establishes controls on smoke and visible emissions from certain sources, including stationary combustion equipment such as engines, boilers, and flares. The compressor engines (ENG-1 through ENG-10), engines (Trailer-1 & GEN-1), glycol reboiler (RBL-1), and vapor combustion unit (VCU-1) are subject to this regulation.
20.2.70 NMAC	Operating Permits	Yes	Facility	This regulation establishes requirements for obtaining an operating permit. This facility is a major source with respect to Title V. The facility will comply with all operating permit conditions as applicable.
20.2.71 NMAC	Operating Permit Fees	Yes	Facility	This regulation establishes a schedule of operating permit emission fees. The facility is subject to 20.2.70 NMAC and is therefore subject to requirements of this regulation.
20.2.72 NMAC	Construction Permits	Yes	Facility	This regulation establishes a schedule of operating permit emission fees. The facility is subject to 20.2.70 NMAC and is therefore subject to requirements of this regulation.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	This regulation establishes emission inventory requirements. The facility meets the applicability requirements of 20.2.73.300 NMAC. The facility will meet all applicable reporting requirements under 20.2.73.300.B.1 NMAC.

State Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	No	N/A	This regulation establishes requirements for obtaining a prevention of significant deterioration permit. This facility is not a PSD major source. Therefore, this regulation does not apply.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	This regulation establishes a schedule of operating permit emission fees. This facility is subject to 20.2.72 NMAC and in turn subject to 20.2.75 NMAC. The facility is exempt from annual fees under this part (20.2.75.11.E NMAC) as it is subject to fees pursuant to 20.2.71 NMAC.
20.2.77 NMAC	New Source Performance	Yes	ENG-1 through ENG-10, GEN-1	This is a stationary source which is subject to the requirements of 40 CFR Part 60.
20.2.78 NMAC	Emission Standards for HAPS	No	N/A	This facility emits hazardous air pollutants which are subject to the requirements of 40 CFR Part 61. However, there are no units subject to 40 CFR Part 61; therefore, this regulation does not apply.
20.2.79 NMAC	Permits – Nonattainment Areas	No	N/A	This regulation establishes the requirements for obtaining a nonattainment area permit. The facility is not located in a non-attainment area and therefore is not subject to this regulation.
20.2.80 NMAC	Stack Heights	No	N/A	This regulation establishes requirements for the evaluation of stack heights and other dispersion techniques. This regulation does not apply, as all stacks at the facility will follow good engineering practice.
20.2.82 NMAC	MACT Standards for source categories of HAPS	Yes	ENG-1 through ENG-10, GEN-1, Dehy-1	This regulation applies to all sources emitting hazardous air pollutants, which are subject to the requirements of 40 CFR Part 63.

Table for Applicable Federal Regulations (Note: This is not an exhaustive list):

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
40 CFR 50	NAAQS	No	Facility	The modeling and conditions developed from the modeling are the applicable requirements to demonstration compliance with the NAAQS.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	ENG-1 through ENG-10, GEN-1	The compressor engines and generator are subject to NSPS JJJJ, compressors are subject to NSPS OOOOa or OOOOb. Applicability is dependent upon manufacture dates of equipment, which are TBD. Facility fugitives will be subject to NSPS OOOOa. TK-1 through TK-3 are not subject to OOOOa.
NSPS 40 CFR60.40a, Subpart Da	Subpart Da, Performance Standards for **Electric Utility Steam Generating Units**	No	N/A	This regulation establishes standards of performance for fossil-fuel-fired stream generators. This regulation does not apply as the facility does not have any fossil fuel-fired steam generating units with a heat input rate of 250 MMBtu/hr [60.40(a)(1)].
NSPS 40 CFR60.40b Subpart Db	**Electric Utility Steam Generating Units**	No	N/A	This regulation establishes standards of performance for electric utility steam generating units. This regulation does not apply because the facility does not operate any electric utility steam generating units.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
40 CFR 60.40c, Subpart Dc	Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units	No	N/A	This regulation does not apply as there are no small industrial commercial instructional steam generating units at this facility.
NSPS 40 CFR 60, Subpart Ka	Standards of Performance for **Storage Vessels for Petroleum Liquids** for which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and **Prior** to July 23, 1984	No	N/A	This facility does not operate storage vessels constructed between May 18, 1978 and July 23, 1984. Therefore this subpart does not apply.
NSPS 40 CFR 60, Subpart Kb	Standards of Performance for **Volatile Organic Liquid Storage Vessels** (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced **After** July 23, 1984	No	N/A	This facility does not have storage vessels with design capacities > $75m^3$.
NSPS 40 CFR 60.330 Subpart GG	**Stationary Gas Turbines**	No	N/A	This Facility does not operate stationary gas turbines with a heat input equal to or greater than 10 million Btu per hour. Therefore this regulation does not apply.
NSPS 40 CFR 60, Subpart KKK	Leaks of VOC from **Onshore Gas Plants**	No	N/A	The facility was constructed after the applicability date of 40 CFR 60 Subpart KKK (August 23, 2011).
NSPS 40 CFR Part 60 Subpart LLL	Standards of Performance for **Onshore Natural Gas Processing**: SO_2 Emissions	No	N/A	The facility was constructed after the applicability date of 40 CFR 60 Subpart LLL (August 23, 2011).
NSPS 40 CFR Part 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which construction, modification or reconstruction	No	N/A	This regulation is applicable to onshore affected facilities listed in paragraphs (a) through (g) of this section constructed after August 23, 2011, and on or before September 18, 2015. The facility is not subject to this regulation.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
	commenced after August 23, 2011 and before September 18, 2015			
NSPS 40 CFR Part 60 Subpart OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced **After** September 18, 2015 and before December 6, 2022	No	N/A	This regulation is applicable to onshore affected facilities listed in paragraphs (a) through (g) of this section constructed after September 18, 2015, and on or before December 6, 2022. The facility is not subject to this regulation.
NSPS 40 CFR Part 60 Subpart OOOOb	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced **After** December 6, 2022	Yes	ENG-1 through ENG-10, FUG	This regulation establishes standards of performance for crude oil and natural gas production, transmission, and distribution. The compressors associated with ENG-1 through ENG-10 are subject to this regulation. Fugitive emissions (FUG) are subject to the leak detection requirements of this regulation. Facility wide LDAR monitoring will be conducted by using optical gas imaging for the compressor station. Storage tanks TK-1 through TK-3 have a PTE of less than 6 tpy of VOC and are therefore not subject to this regulation.
NSPS 40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition Internal Combustion Engines	No	N/A	This regulation establishes standards of performance for stationary compression ignition internal combustion engines. This rule applies to IC engines (diesel engines) that commenced construction after July 11, 2005. Trailer-1 is a diesel fired compression ignition engine, however, Trailer-1 will not be stationary for more than 12 months; therefore, this regulation does not apply.
NSPS 40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	Yes	ENG-1 through ENG-10, GEN-1	ENG-1 through ENG-10 and GEN-1 are stationary spark ignition engines and are subject to NSPS JJJJ pursuant to 40 CFR 60.4233(e).
NSPS 40 CFR 60 Subpart TTTT	Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units	No	N/A	This facility does not have any steam generating units; therefore, the facility is not subject to this regulation.
NSPS 40 CFR 60 Subpart UUUU	Emissions Guidelines for Greenhouse Gas Emissions and Compliance Times for Electric Utility Generating Units	No	N/A	This facility does not generate electricity; therefore, this regulation does not apply.
NSPS 40 CFR 60, Subparts	Standards of performance for Municipal Solid			This facility is not a landfill; therefore, this regulation does not apply.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
WWW, XXX, Cc, and Cf	Waste (MSW) Landfills			
NESHAP 40 CFR 61 Subpart A	General Provisions	No	N/A	NSPS 40 CFR 61 does not apply to the facility because the facility does not emit or have the triggering substances on site and/or the facility is not involved in the triggering activity. The facility is not subject to this regulation. None of the subparts of Part 61 apply to the facility.
NESHAP 40 CFR 61 Subpart E	National Emission Standards for **Mercury**	No	N/A	The provisions of this subpart are applicable to those stationary sources which process mercury ore to recover mercury, use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide, and incinerate or dry wastewater treatment plant sludge. Therefore, this subpart does not apply.
NESHAP 40 CFR 61 Subpart V	National Emission Standards for **Equipment Leaks** (Fugitive Emission Sources)	No	N/A	Not applicable as the facility equipment does not operate in VHAP service. VHAP service is a piece of equipment, which contains or encounters a fluid that is at least 10% weight of VHAP. VHAP is a substance regulated under this subpart for which a standard for equipment leaks of VHAPs has been promulgated.
MACT 40 CFR 63, Subpart A	General Provisions	Yes	ENG-1 through ENG-10, GEN-1, Dehy-1	Applies if any other Subpart in 40 CFR 63 applies.
MACT 40 CFR 63.760 Subpart HH	**Oil and Natural Gas Production Facilities**	Yes	Dehy-1	This regulation establishes national emission standards for hazardous air pollutants from oil and natural gas production facilities. The facility is a major source of HAPs and meets the definition of a natural gas processing plant. The dehydrator will have a natural gas flow rate equal to or greater than 85 thousand standard cubic meters per day. The dehydrator does not meet the definition of a Large Glycol Dehydration Unit in 40 CFR 63.761 because the actual annual average benzene emissions are not equal to or greater than 0.90 Mg/yr as determined according to 40 CFR 63.772(b). When determining the benzene emissions with federally enforceable controls as allowed in 40 CFR 63.772(b)(2), the benzene emissions are less than 0.9 Mg/yr.
MACT 40 CFR 63 Subpart HHH	National Emissions Standards for Hazardous Air Pollutants from Natural Gas Transmission and Storage facilities	No	N/A	This facility is not a natural gas transmission or storage facility. Thus this subpart does not apply.
MACT 40 CFR 63 Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Major Industrial, Commercial, and Institutional Boilers & Process Heaters	Yes	RBL-1	This regulation establishes the national emissions standards for hazardous air pollutants for major industrial, commercial, and institutional boilers and process heaters. This facility operates a glycol reboiler which meets the definition of a process heater as defined in § 63.7575 and it is located at a major source of HAPs and is therefore subject to the requirements of this regulation.
MACT 40 CFR 63 Subpart UUUUU	National Emission Standards for Hazardous Air Pollutants Coal & Oil Fire Electric Utility Steam Generating Unit	No	N/A	This subpart establishes national emission limitations and work practice standards for hazardous air pollutants (HAP) emitted from coal- and oil-fired electric utility steam generating units (EGUs) as defined in §63.10042 of this subpart. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations. This facility does not contain the affected units and is therefore not subject to this regulation.
MACT	National Emissions Standards for Hazardous Air	Yes	ENG-1 through	This regulation defines national emissions standards for HAPs from stationary reciprocating Internal Combustion Engines. ENG-1 through ENG-10 are subject to

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
40 CFR 63 Subpart ZZZZ	Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)		ENG-10, GEN-1	MACT ZZZZ and comply by following the requirements of NSPS JJJJ. GEN-1 is subject to MACT ZZZZ and complies by following the requirements of NSPS JJJJ.
40 CFR 64	**Compliance Assurance Monitoring**	No	N/A	This regulation establishes requirements for a Compliance Assurance Monitoring (CAM) plan for pollutant-specific emissions units at a major source required for part 70 or 71 permitting. This application is being submitted under part 72 and is therefore not subject to this regulation.
40 CFR 68	**Chemical Accident Prevention**	No	N/A	This facility does not have any sources listed in this subpart. Therefore, this regulation does not apply.
Title IV – Acid Rain 40 CFR 72	**Acid Rain**	No	N/A	Not applicable as this facility is not an acid rain source.
Title IV – Acid Rain 40 CFR 73	**Sulfur Dioxide** Allowance Emissions	No	N/A	Not applicable as this facility is not an acid rain source.
Title IV-Acid Rain 40 CFR 75	**Continuous Emissions Monitoring**	No	N/A	Not applicable as this facility does not generate commercial electric power or electric power for sale.
Title IV – Acid Rain 40 CFR 76	**Acid Rain** Nitrogen Oxides **Emission Reduction Program**	No	N/A	Not applicable as this facility is not an acid rain source.
Title VI – 40 CFR 82	Protection of **Stratospheric Ozone**	No	N/A	Not applicable as the facility does not service, maintain, repair class I or class II appliances nor disposes of the appliances.

Section 14

Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☐ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☒ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☒ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

- To the maximum extent practicable, the air pollution control equipment, process equipment, or processes, will be maintained and operated in a manner consistent with good practice for minimizing emissions;
- Repairs will be made in an expeditious fashion when the operator becomes aware that applicable emission limitations are being exceeded;
- Off-shift labor and overtime will be utilized, to the extent practicable, to ensure that such repairs were made as expeditiously as practicable;
- Scheduled maintenance will be planned ahead to coincide with maintenance on other production equipment, or other source shutdowns, to the extent practicable;
- The amount and duration of the excess emissions (including any during bypass) periods will be minimized to the maximum extent practicable;
- All possible steps will be taken to minimize the impact of the excess emissions on ambient air quality; and,
- The facility will monitor all operations to ensure that excess emissions are not part of a recurring pattern indicative of inadequate design, operation, or maintenance.

Section 15

Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Alternative Operating Scenarios: Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

Construction Scenarios: When a permit is modified authorizing new construction to an existing facility, NMED includes a condition to clearly address which permit condition(s) (from the previous permit and the new permit) govern during the interval between the date of issuance of the modification permit and the completion of construction of the modification(s). There are many possible variables that need to be addressed such as: Is simultaneous operation of the old and new units permitted and, if so for example, for how long and under what restraints? In general, these types of requirements will be addressed in Section A100 of the permit, but additional requirements may be added elsewhere. Look in A100 of our NSR and/or TV permit template for sample language dealing with these requirements. Find these permit templates at: www.env.nm.gov/air-quality/permitting-section-procedures-and-guidance/. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

In this section, under the bolded title "Construction Scenarios", specify any information necessary to write these conditions, such as: conservative-realistic estimated time for completion of construction of the various units, whether simultaneous operation of old and new units is being requested (and, if so, modeled), whether the old units will be removed or decommissioned, any PSD ramifications, any temporary limits requested during phased construction, whether any increase in emissions is being requested as SSM emissions or will instead be handled as a separate Construction Scenario (with corresponding emission limits and conditions, etc.

There are no alternate operating scenarios at this facility.

Section 16

Air Dispersion Modeling

1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

What is the purpose of this application?	Enter an X for each purpose that applies
New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above.	
New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions.	X
Reporting existing pollutants that were not previously reported.	
Reporting existing pollutants where the ambient impact is being addressed for the first time.	
Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above.	
Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC)	
Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements.	
Other: i.e. SSM modeling. See #2 above.	
This application does not require modeling since this is a No Permit Required (NPR) application.	
This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC).	
This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines.	

Check each box that applies:

☐ See attached, approved modeling **waiver for all** pollutants from the facility.

☐ See attached, approved modeling **waiver for some** pollutants from the facility.

☒ Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.

☐ Attached in UA4 is a **modeling report for some** pollutants from the facility.

☐ No modeling is required.

AIR DISPERSION MODELING PROTOCOL

NSR Significant Revision Modeling Protocol

Targa Northern Delaware, LLC
Cadillac Compressor Station

Prepared By:

Jaimy Karacaoglu - Consultant

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March 2024

Project 243201.0017

Trinity Consultants

1. INTRODUCTION

1.1 Purpose of Modeling

Cadillac Compressor Station (Cadillac) is a natural gas compressor station for transport of natural gas owned by and operated by Targa Northern Delaware, LLC (Targa). Gas enters the facility through an inlet separator, is compressed, and then dehydrated before transported offsite via pipeline. The facility collects and stores condensate generated at the inlet separator and compressors, which will be transported offsite via truck. Cadillac is located approximately 5.0 miles south of Malaga, NM in Eddy County.

Targa is submitting an application pursuant to 20.2.72.219.D.1.a NMAC for significant revision of NSR Permit No. 7995-M3. The purpose of this revision is: to add one (1) heater trailer (unit Trailer-1), one (1) air compressor generator (unit GEN-1), and one (1) vapor combustion unit (unit VCU-1); remove one (1) Caterpillar 3516 compressor engine (unit 18-0345), and one (1) 300 bbl storage tank (unit TK-4); replace two (2) Caterpillar 3516 compressor engines (units 18-0341 & 18-0342) with like-kind compressor engines (units ENG-1 & ENG-7, respectively), and five (5) Caterpillar 3606 compressor engines (units 18-0246, 18-0296, 18-0304, ENG-1, & ENG-2) with like-kind replacements (ENG-2 through ENG-6, respectively); and to modify all other units based on a recent inlet gas analysis (units ENG-8 through ENG-10, Dehy-1, RBL-1, TK-1 through TK-3, LOAD, FUG, SSM/M).

Targa seeks to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS), New Mexico Ambient Air Quality Standards (NMAAQS), and PSD Increment standards as applicable for the following pollutants and averaging periods: NO_2 (1-hour and annual), CO (1-hour and 8-hour), SO_2 (1-hour, 3-hour, 24-hour, and annual), H_2S (1-hour), $PM_{2.5}$ (24-hour and annual), and PM_{10} (24-hour and annual).

1.2 Facility Description and Location

The approximate UTM coordinates of the facility are 589,773 meters East and 3,557,456 meters North with WGS84 datum at an elevation of approximately 2,955 feet above mean sea level.

2.1 Model Input Options

The latest version of the AERMOD dispersion model (version 23122) will be used for this analysis. The model will be run in regulatory mode with all default options. The ARM2 method will be used to convert NO_X to NO_2. Default minimum and maximum ambient ratios will be utilized.

Table 1 shows the emission sources and stack parameters for the facility including the new units (VCU-1, Trailer-1, and GEN-1). Please note that emissions and stack parameters may vary throughout the development of this application.

Table 1- Emission sources and stack parameters to be included in the air dispersion modeling.

Unit Number	NO_X lb/hr	CO lb/hr	SO_2 lb/hr	PM_{10} lb/hr	$PM_{2.5}$ lb/hr	H_2S lb/hr	Height ft	Temp F	Velocity ft/s	Diam. ft
ENG-1	1.52	1.52	0.045	0.20	0.20	0	25.50	847	97.67	1.33
ENG-2	2.07	2.07	0.057	0.25	0.25	0	28.00	814	90.45	1.67
ENG-3	2.07	2.07	0.057	0.25	0.25	0	28.00	814	90.45	1.67
ENG-4	2.07	2.07	0.057	0.25	0.25	0	28.00	814	90.45	1.67
ENG-5	2.07	2.07	0.057	0.25	0.25	0	28.00	814	90.45	1.67
ENG-6	2.07	2.07	0.057	0.25	0.25	0	28.00	814	90.45	1.67
ENG-7	1.52	1.52	0.045	0.20	0.20	0	25.50	847	97.67	1.33
ENG-8	2.76	3.79	0.075	0.33	0.33	0	28.00	835	84.85	2.00
ENG-9	2.76	3.79	0.075	0.33	0.33	0	28.00	835	84.85	2.00
ENG-10	2.76	3.79	0.075	0.33	0.33	0	28.00	835	84.85	2.00
Trailer-1	0.16	0.15	0.29	0.0091	0.0091	0	6.99	782	9.83	1.33
GEN-1	0.80	1.60	0.013	0.029	0.029	0	8.21	1382	240.74	0.33
RBL-1	0.20	0.16	0.0089	0.015	0.015	0	19.00	600	29.82	1.00
VCU-1	0.51	0.42	0.079	0.038	0.038	0.00085	12.50	1000	6.62	4.00

Volume Source	H_2S lb/hr	Release Height ft	Initial lateral Dimension ft	Initial Vertical Dimension ft
SSM/FUG/LOAD	0.15	10	17.44	9.30

A downwash analysis using the latest version of BPIP will be conducted and incorporated into the modeling analysis to account for potential effluent downwash due to structures at the facility.

Table 3- Circular Building Downwash Structures

Building ID	X Coordinate m	Y Coordinate m	Elevation m	Height m	Radius m	Corners
TK-1	589723.14	3557474.86	897.33	4.57	1.83	24
TK-2	589730.23	3557476.83	897.33	4.57	1.83	24
TK-3	589736.02	3557478.81	897.33	4.57	1.83	24

2.2 Receptor Grid Description and Elevation Data

The center point of the facility will be designated at 589,725 meters east and 3,557,446 meters north. This center point will serve as the center point for a variable density circular receptor grid. The facility fenceline will be modeled using 25 meter grid spacing. A 50 meter grid spacing will extend out to 800 meters in each direction from the facility center point for a very fine grid resolution. A 100 meter grid spacing will extend from 800 meters to 3,000 meters in each direction for a fine grid resolution. A 250 meter grid spacing will extend from 3,000 meters to 6,000 meters in each directions for a medium grid resolution. A 500 meter grid spacing will extend from 6,000 meters to 10,000 meters in each direction for a coarse grid resolution. A 1000 meter grid spacing will extend from 10,000 meters to 50,000 meters in each direction for a very coarse grid resolution. It is expected that the highest impacts from the proposed source will be at or near the facility property.

For the Class I area analysis, a grid spacing of 1000 m is used for receptors over the Class I area. Class I receptors will be obtained through NMED MergeMaster.

The elevations of receptors and facility sources will be determined using the most recent NED data currently available (1/3 arc-second DEM).

2.3 Meteorological Data

The Carlsbad NWS dataset will be used for five meteorological years (2017-2021) as available on the NMED website.

2.4 Significance Analysis (SIL) and Cumulative Impact Analysis (CIA)

The modeled ground-level concentrations will be compared to the corresponding significant impact levels (SILs) to determine whether any modeled ground-level concentrations at any receptor locations are greater than the SIL (i.e., "significant" receptors). If the significance analysis reveals that modeled ground-level concentrations for a particular pollutant and averaging period are greater than the applicable SIL, a Cumulative Impact Analysis (CIA) will be performed at the significant receptors. The CIA will include impacts from the facility sources and background concentrations/surround sources if applicable.

If necessary, the background concentration used for NO_2 from the Carlsbad Monitor (5ZR) will be used. The Hobbs-Jefferson Monitor (5ZS) dataset will be used for $PM_{2.5}$ and PM_{10} background concentrations. The inclusion of background concentrations will follow the guidance shown in Table 20: "Modeling the Design Value Summary (Default Modeling)" from the Modeling Guidelines[1].

Based on the NMED Modeling Guidelines for SO_2 modeling, if the facility is in the Pecos-Permian Basin Intrastate AQCR (AQCR 155), it will be modeled with surrounding sources, as representative monitoring is not available for background data.

For $PM_{2.5}$ and PM_{10} modeling, the facility will be modeled with nearby sources, secondary formation (if applicable), and a background concentration. For modeling nearby sources, all sources within 10 km of the facility will be included in the model. An inventory of the surrounding sources will be obtained from the NMED MergeMaster. Based on EPA's Guidance for $PM_{2.5}$ Permit Modeling and NMED'S Modeling Guidelines, sources that emit at least 40 tons per year of NO_x or at least 40 tons per year of SO_2 are considered to emit

[1] New Mexico Air Quality Bureau Air Dispersion Modeling Guidelines Revised December 2023

significant amounts of precursors. Sources with significant increases of $PM_{2.5}$ precursors must qualitatively and/or quantitatively account for the secondary formation of $PM_{2.5}$. The secondary formation of $PM_{2.5}$ will be calculated in this modeling following the NMED Modeling Guidelines.

For H_2S modeling, the only sources at the facility that produced H_2S will be the vapor combustion unit (Unit VCU-1), loading emissions (Unit LOAD), fugitive equipment emissions (Unit FUG-1), and startup, shutdown, and maintenance/malfunction emissions (Unit SSM/M). The VCU is going to be modeled as a point source. Fugitives, SSM/M, and loading will be modeled as a single volume source at the center of the facility with dimensions determined per Section 4.3.2 of NMED's modeling guidelines. Based on the NMED Modeling Guidelines for H_2S modeling, if the facility is in the Pecos-Permian Basin Intrastate AQCR, H_2S will be modeling using the 1-hour averaging time and compared to the 1/2-hour averaging period.

2.5 PSD Increment Analysis

If the results of the ROI analysis for NO_x, SO_2, $PM_{2.5}$, or PM_{10} indicate concentrations greater than significance levels, PSD increment analysis will be conducted for the appropriate averaging periods. If required, the PSD increment analysis will be conducted including all PSD increment consuming and expanding sources within 25 km of the facility, plus sources emitting over 1000 pounds per hour within 50 km of the facility. The surrounding source information will be obtained from NMED MergeMaster. The predicted maximum concentrations will be compared to the appropriate Class II PSD Standard.

2.6 Class I Areas Analysis

The nearest Class I area is Carlsbad Caverns National Park at 30.5 km from the facility. Pollutants will be modeled for significance using the Carlsbad Caverns receptor grid obtained from NMED MergeMaster. A Class I area analysis will be performed if concentrations are greater than significance levels as the national park is within the 50 km inclusion zone for PSD minor sources.

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification

1	Name of facility:	Cadillac Compressor Station
2	Name of company:	Targa Northern Delaware, LLC
3	Current Permit number:	7995-M3
4	Name of applicant's modeler:	George Iwaszek
5	Phone number of modeler:	303-349-4673
6	E-mail of modeler:	GIwaszek@trinityconsultants.com

16-B: Brief

1	Was a modeling protocol submitted and approved?	Yes☐	No☒
2	Why is the modeling being done?	Adding New Equipment	
3	Describe the permit changes relevant to the modeling.		
	The purpose of this significant revisions is to add one heater trailer (unit Trailer-1), one air compressor generator (unit GEN-1), and one vapor combustion unit (unit VCU-1); remove one Caterpillar 3516 compressor engine (unit 18-0345), replace two (2) Caterpillar 3516 compressor engines (units 18-0341 & 18-0342) with like-kind compressor engines (units ENG-1 & ENG-7, respectively), and five (5) Caterpillar 3606 compressor engines (units 18-0246, 18-0296, 18-0304, ENG-1, & ENG-2) with like-kind replacements (ENG-2 through ENG-6, respectively); and to modify all other units based on a recent inlet gas analysis (units ENG-8 through ENG-10, RBL-1, LOAD, FUG, SSM/M).		
4	What geodetic datum was used in the modeling?	WGS84	

5	How long will the facility be at this location?	Longer than 1 year	
6	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes☐	No☒
7	Identify the Air Quality Control Region (AQCR) in which the facility is located	155	
8	List the PSD baseline dates for this region (minor or major, as appropriate).		
	NO2	3/16/1988	
	SO2	7/28/1978	
	PM10	2/20/1979	
	PM2.5	11/13/2013	
9	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits).		
	Carlsbad Caverns National Park (~30.5 km)		
10	Is the facility located in a non-attainment area? If so describe below	Yes☐	No☒
	N/A		
11	Describe any special modeling requirements, such as streamline permit requirements.		
	N/A		

16-C: Modeling History of Facility

Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

1	Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
	CO	7995-M3	03/19/2020	
	NO_2	7995-M3	03/19/2020	
	SO_2	7995-M3	03/19/2020	
	H_2S	7995-M3	03/19/2020	
	PM2.5	7995-M3	03/19/2020	
	PM10	7995-M3	03/19/2020	
	Lead	N/A		
	Ozone (PSD only)	N/A		
	NM Toxic Air Pollutants (20.2.72.402 NMAC)	N/A		

16-D: Modeling performed for this application

For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

	Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
1	CO	☒	☐	☐	☐	☐
	NO_2	☒	☒	☐	☐	☐
	SO_2	☒	☒	☐	☐	☐
	H_2S	☒	☒	☐	☐	☐
	PM2.5	☒	☒	☐	☐	☐
	PM10	☒	☒	☐	☐	☐
	Lead	☐	☐	☐	☐	☒
	Ozone	☐	☐	☐	☐	☒
	State air toxic(s) (20.2.72.402 NMAC)	☐	☐	☐	☐	☒

16-E: New Mexico toxic air pollutants modeling

1 List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application.
N/A – No TAPs were modeled at this facility.

2 List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.

Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor

16-F: Modeling options

1	Was the latest version of AERMOD used with regulatory default options? If not explain below.	Yes☒	No☐

16-G: Surrounding source modeling

1	Date of surrounding source retrieval	2/16/2024
2	If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. *Add rows as needed.*	
	38468E2	Point source has incorrect facility coordinates (previously 601768.321 m E and 3587209.057 m N). Coordinates were updated to 593650 m E, 3575300 m N based on NMED AP-MAP of this facility.
	3589E2	Point sources have incorrect facility coordinates (previously 598991.878 m E and 3600197.969 m N). Coordinates were updated to 590800 m E, 3575390 m N based on facility information provided in the surrounding source file. Facility does not appear in NMED AP-MAP and may need to be removed if the facility is no longer in operation.
	3589E3	
	3589E4	
	3589E5	
	3589E6	
	3589E7	
	3589E8	
	3589E9	
	3589E10	
	38339E17	Point sources have incorrect facility coordinates (previously 568241.173 m E and 3595198.763 m N). Coordinates were updated to 581830 m E, 3572260 m N based on NMED AP-MAP of this facility.
	38339E18	

16-H: Building and structure downwash

1	*How many buildings are present at the facility?*	0	
2	How many above ground storage tanks are present at the facility?	3	
3	Was building downwash modeled for all buildings and tanks? If not explain why below.	Yes☒	No☐
4	Building comments	N/A	

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area.
	The property is enclosed by a fence and receptors are placed starting along the fenceline.

2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?	Yes☐	No☒
3	Are restricted area boundary coordinates included in the modeling files?	Yes☐	No☒

4 Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.

Grid Type	Shape	Spacing	Start distance from restricted area or center of facility	End distance from restricted area or center of facility	Comments
Variable Density	Square	50	0	800	
Variable Density	Square	100	800	3,000	
Variable Density	Square	250	3,000	6,000	
Variable Density	Square	500	6,000	10,000	
Variable Density	Square	1000	10,000	50,000	

5 Describe receptor spacing along the fence line.

25 m spacing

6 Describe the PSD Class I area receptors.

The PSD Class I Area receptors were acquired from the MergeMaster database.

16-J: Sensitive areas

1	Are there schools or hospitals or other sensitive areas near the facility? If so describe below. This information is optional (and purposely undefined) but may help determine issues related to public notice.	Yes☐	No☒
3	The modeling review process may need to be accelerated if there is a public hearing. Are there likely to be public comments opposing the permit application?	Yes☐	No☒

16-K: Modeling Scenarios

1 Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3).

The modeled facility operates 24 hours a day, 7 days a week, and 8760 hours a year.

2 Which scenario produces the highest concentrations? Why?

N/A

3	Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)	Yes☐	No☒

4 If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.)
Sources: N/A

5

Hour of Day	Factor	Hour of Day	Factor
1		13	
2		14	
3		15	
4		16	
5		17	
6		18	
7		19	
8		20	
9		21	
10		22	
11		23	
12		24	

If hourly, variable emission rates were used that were not described above, describe them below.

N/A

6	Were different emission rates used for short-term and annual modeling? If so describe below.	Yes☐	No☒

16-L: NO_2 Modeling

1 Which types of NO_2 modeling were used?
Check all that apply.

☒	ARM2
☐	100% NO_X to NO_2 conversion
☐	PVMRM
☐	OLM
☐	Other:

2 Describe the NO_2 modeling.

The ARM2 Methodology was used with the default maximum and minimum ambient ratios

3	Were default NO_2/NO_X ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below.	Yes☒	No☐
	N/A		

4	Describe the design value used for each averaging period modeled.
	1-hour: High eighth high Annual: One Year Annual Average

16-M: Particulate Matter Modeling

1	Select the pollutants for which plume depletion modeling was used.	
	☐	PM2.5
	☐	PM10
	☒	None
2	Describe the particle size distributions used. Include the source of information.	
	N/A	
3	Does the facility emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2? Sources that emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5.	Yes☒ No☐
4	Was secondary PM modeled for PM2.5?	Yes☐ No☒

5 If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below.

NO_X (ton/yr)	SO_2 (ton/yr)	$[PM2.5]_{annual}$	$[PM2.5]_{24\text{-}hour}$
100.56	3.07	7.92E-04	0.018

16-N: Setback Distances

1	Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.
	N/A
2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling.
	N/A

16-O: PSD Increment and Source IDs

1	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below.	Yes☒	No☒

Unit Number in UA-2	Unit Number in Modeling Files
FUG-1	SSM_L_F
LOAD	
SSM/M	

2	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below.	Yes☒	No☒
	SSM_L_F representation in the model does not allow for scrubber blowdowns to occur at the same time as any other SSM activity. The maximum emission between all other SSM and scrubber blowdowns was used for the SSM contribution to the SSM_L_F source in the models.		
3	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?	Yes☐	No☒

4 Which units consume increment for which pollutants?

Unit ID	NO_2	SO_2	PM10	PM2.5
ENG-1	Yes	Yes	Yes	Yes
ENG-2	Yes	Yes	Yes	Yes
ENG-3	Yes	Yes	Yes	Yes
ENG-4	Yes	Yes	Yes	Yes
ENG-5	Yes	Yes	Yes	Yes
ENG-6	Yes	Yes	Yes	Yes
ENG-7	Yes	Yes	Yes	Yes
ENG-8	Yes	Yes	Yes	Yes
ENG-9	Yes	Yes	Yes	Yes
ENG-10	Yes	Yes	Yes	Yes
Trailer-1	Yes	Yes	Yes	Yes
GEN-1	Yes	Yes	Yes	Yes
RBL-1	Yes	Yes	Yes	Yes
VCU-1	Yes	Yes	Yes	Yes
LOAD	No	No	No	No
FUG	No	No	No	No
SSM/M	No	No	No	No

5	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).	N/A

6	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐

16-P: Flare Modeling

1	For each flare or flaring scenario, complete the following			
	Flare ID (and scenario)	Average Molecular Weight	Gross Heat Release (cal/s)	Effective Flare Diameter (m)
	N/A	N/A	N/A	N/A

16-Q: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines? If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☐	No☒
2	Describe the determination of sigma-Y and sigma-Z for fugitive sources.		
	The determination of the initial lateral dimension and initial vertical dimension was completed according to the guidance set forth in Section 5.3.2 of the NMED's Air Dispersion Modeling Guidelines (Revised December 2023).		
3	Describe how the volume sources are related to unit numbers. Or say they are the same.		
	Instead of modeling individual volume sources for condensate loading (LOAD), facility fugitives (FUG-1), and startup, shutdown, and maintenance/malfunction emissions (SSM/M), the sources were grouped together as one source modeled at the center of the facility.		
4	Describe any open pits.		
	N/A		
5	Describe emission units included in each open pit.		
	N/A		

16-R: Background Concentrations

1	Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used.	Yes☒	No☐
	CO: N/A		
	NO_2: Outside Carlsbad (350151005)		
	PM2.5: Hobbs-Jefferson (350450019)		
	PM10: Hobbs-Jefferson (350250008)		
	SO_2: N/A		
	Other:		

	Comments:		
2	Were background concentrations refined to monthly or hourly values? If so describe below.	Yes☐	No☒

16-S: Meteorological Data

1	Was NMED provided meteorological data used? If so select the station used. Carlsbad	Yes☒	No☐
2	If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed.		
	N/A		

16-T: Terrain

1	Was complex terrain used in the modeling? If not, describe why below.	Yes☒	No☐
	N/A		
2	What was the source of the terrain data?		
	Terrain was incorporated into the modeling analysis through the use of AERMAP with the most recent 1/3 degree DEM data currently available from https://apps.nationalmap.gov/downloader/#/		

16-U: Modeling Files

1

Describe the modeling files:

Meteorological data inputs – obtained from NMED web site.

- NWS_CARLSBAD2017_2021.sfc Concatenated 5-yr surface data for 2017 – 2021
- NWS_CARLSBAD2017_2021.pfl Concatenated 5-yr upper air profile data for 2017 – 2021

Significant Impact Models

- File name format "PollSCarlsbad17-21-SIL.INP"
- "Poll" = N... nitrogen oxides; CO...carbon monoxide; H2S... hydrogen sulfide; PM10...particulate matter, PM10; PM25...particulate matter, PM2.5; S... sulfur dioxide "S" = SIL
- "Carlsbad17-21" = met dataset
- "SIL" redundant SIL designator
- Files may contain SIL for short-term, annual, and increment averaging periods.

NM/NAAQS and Increment Models

- File name format "PollXCarlsbad17-21-AvgPer.INP"
- "Poll" = N... nitrogen oxides; CO...carbon monoxide; H2S... hydrogen sulfide; PM10...particulate matter, PM10; PM25...particulate matter, PM2.5; S... sulfur dioxide
- "X" = N... NM/NAAQS; Inc... Increment

- "Carlsbad17-21" = met dataset
- "AvgPer" = averaging period. 1hr = 1 hour, etc. ANN = annual

File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
NSCarlsbad17-21SIL	NO_2	SIA
CSCarlsbad17-21SIL	CO	SIA
PM10SCarlsbad17-21SIL	PM_{10}	SIA
PM25SCarlsbad17-21SIL	$PM_{2.5}$	SIA
SSCarlsbad17-21SIL	SO_2	SIA
H2SSCarlsbad17-21SIL	H_2S	SIA
H2SNMCarlsbad17-21	H_2S	Cumulative – ½ hr
Cadillac CS_SIL Class I NO2_2024 0315	NO_2	Class I SIA
NCIIncCarlsbad17-21-Ann	NO_2	Class II Increment
NNCarlsbad17-21-1hr	NO_2	Cumulative – 1hr
NNCarlsbad17-21-Ann	NO_2	Cumulative – Annual
Cadillac CS_SIL Class I PM10_2024 0315	PM_{10}	Class I SIA
PM10NCarlsbad17-21-24hr	PM_{10}	Cumulative – 24 hr
PM10NCarlsbad17-21-Ann	PM_{10}	Cumulative – Annual
Cadillac CS_SIL Class I PM2.5_2024 0315	$PM_{2.5}$	Class I SIA
PM25NCarlsbad17-21-24hr	$PM_{2.5}$	Cumulative – 24hr
PM25NCarlsbad17-21-Ann	$PM_{2.5}$	Cumulative – Annual
Cadillac CS_SIL Class I SO2_2024 0315	SO_2	Class I SIA
SINCCarlsbad17-21-1hr	SO_2	Class II Increment
SNCarlsbad17-21-1h	SO_2	Cumulative – 1hr

16-V: PSD New or Major Modification Applications

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)?	Yes☐	No☒
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes☐	No☒
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
	N/A		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
	N/A		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below.	Yes☐	No☒

16-W: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below.	Yes☐	No☒
2	Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary.		

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
CO 8-hr SIL	150.85	-	-	-	150.85	500	30.2%	589668	3557494	2938.35
CO 1-hr SIL	213.56	-	-	-	213.56	2,000	10.7%	589668	3557494	2945.47
H_2S 1/2-hr SIL	103.91	-	-	-	103.91	5.0	Significant	589725	3557506	2944.19
NO_2 Annual SIL	8.48	-	-	-	8.48	1.0	Significant	589668	3557494	2945.47
NO_2 24-hr SIL	80.57	-	-	-	80.57	5.0	Significant	589815	3557462	2943.27
NO_2 1-hr SIL	124.94	-	-	-	124.94	7.52	Significant	589788	3557525	2942.85
$PM_{2.5}$ Annual SIL	0.89	-	-	-	0.89	0.2	Significant	589678	3557550	2945.54
$PM_{2.5}$ 24-hr SIL	10.79	-	-	-	10.79	1.2	Significant	589878	3557450	2937.60
PM_{10} Annual SIL	0.89	-	-	-	0.89	1.0	89.1%	589678	3557550	2945.54
PM_{10} 24-hr SIL	10.79	-	-	-	10.79	5.0	Significant	589878	3557450	2937.60

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
SO_2 Annual SIL	5.42	-	-	-	5.42	1.0	Significant	589815	3557462	2943.27
SO_2 24-hr SIL	59.03	-	-	-	59.03	5.0	Significant	589815	3557462	2943.27
SO_2 3-hr SIL	90.47	-	-	-	90.47	25.0	Significant	589815	3557462	2943.27
SO_2 1-hr SIL	95.65	-	-	-	95.65	7.8	Significant	589815	3557462	2943.27
H_2S 1/2-hr NMAAQS	103.91	103.91	-	-	103.91	139.3	74.6%	589725	3557506	2944.19
NO_2 Annual NMAAQS	8.48	-	-	9.3	17.78	94.02	18.9%	589668	3557494	2945.47
NO_2 1-hr NAAQS	122.26	-	-	54.5	176.76	188.03	94.0%	589815	3557462	2943.27
$PM_{2.5}$ Annual NAAQS	0.891	2.9	-	7.1	10.0	12	83.%	589978	3557600	2932.41
$PM_{2.5}$ 24-hr NAAQS	5.8	6.5	-	16.5	23.0	35	65.7%	589927	3557600	2940.16
PM_{10} 24-hr NAAQS	6.21	10.6	-	37.3	47.9	150	31.9%	589928	3557500	2927.30
SO_2 1-hr NAAQS	90.6	136.8	-	23.1	159.9	196.4	81.4%	589728	3557200	2945.54
NO_2 Annual Class I SIL	0.003	0.003	-	-	0.003	0.1	3%	558179	3558860	3597.54
NO_2 Annual PSD Increment Class II	8.5	-	-	9.3	17.8	25	71.2%	589668	3557494	2945.47
PM_{10} 24-hr Class I SIL	0.01	-	-	-	0.01	0.3	3.3%	559359	3560480	3620.90

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
PM_{10} 24-hr PSD Increment Class II	8.66	11.23	-	-	11.23	30	37.4%	589878	3557450	2937.60
PM_{10} Annual Class I SIL	0.0004	-	-	-	0.0004	0.2	0.2%	558179	3558860	3597.54
$PM_{2.5}$ 24-hr Class I SIL	0.0004	-	-	-	0.0004	0.27	0.2%	558179	3558860	3597.54
$PM_{2.5}$ 24-hr PSD Increment Class II	5.8	7.0	0.018	-	7.02	9	77.9%	589978	3557650	2933.59
$PM_{2.5}$ Annual Class I SIL	0.0004	-	-	-	0.0004	0.05	0.8%	558179	3558860	3597.54
$PM_{2.5}$ Annual PSD Increment Class II	0.89	2.4	0.00079	-	2.4	4	60.0%	589928	3557650	2940.16
SO_2 3-hr Class I SIL	0.031	0.031	-	-	0.031	1.0	3.1%	559359	356048	3620.90
SO_2 3-hr PSD Increment Class II	90.35	90.41	-	-	90.41	512	17.7%	589815	3557462	2943.27
SO_2 24-hr Class I SIL	0.006	0.006	-	-	0.006	0.2	3.0%	558558	3560080	3645.01
SO_2 24-hr PSD Increment Class II	50.10	50.14	-	-	50.14	91	55.1%	589815	3557462.3	897.11
SO_2 Annual Class I SIL	0.0001	0.001	-	-	0.001	0.1	1.0%	558179	3558860	3597.54

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
SO_2 Annual PSD Increment Class II	2.42	3.18	-	-	3.18	20	3.5%	589828	3557450	896.63

16-X: Summary/conclusions	
1	A statement that modeling requirements have been satisfied and that the permit can be issued.
	Targa has demonstrated that the proposed changes to NSR Permit 7995-M3 would neither cause nor contribute to an exceedance of the standards for CO, H2S, NO_2, $PM_{2.5}$, PM_{10}, and SO_2.

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

To show compliance with existing NSR permits conditions, you must submit a compliance test history. The table below provides an example.

Compliance Test History Table

Unit No.	Test Description	Test Date

Section 20

Other Relevant Information

Other relevant information. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

There is no other information needed for this application.

Section 22: Certification

Company Name: Targa Northern Delaware, LLC

I, Jimmy Oxford, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 6th day of March, 2024, upon my oath or affirmation, before a notary of the State of Texas.

*Signature

3/6/2024
Date

Jimmy Oxford
Printed Name

Vice President of Operations
Title

Scribed and sworn before me on this 6th day of March, 2024.

My authorization as a notary of the State of Texas expires on the 8th day of February, 2025.

Notary's Signature

3/6/2024
Date

Neva Rogers
Notary's Printed Name

NEVA ROGERS
My Notary ID # 3743435
Expires February 8, 2025

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.