Enterprise Products

ENTERPRISE PRODUCTS PARTNERS L.P.
ENTERPRISE PRODUCTS HOLDINGS LLC
(General Partner)

ENTERPRISE PRODUCTS OPERATING LLC

March 23, 2022

7021 1970 0001 0861 4559
Return Receipt Requested

New Mexico Environment Department
Air Quality Bureau
525 Camino de los Marquez, Suite 1
Santa Fe, NM 87505-1816

Re: NSR Permit No. 3662-M8R5 Significant Revision Application
Enterprise Fields Services, LLC – Chaparral Gas Plant
Eddy County, New Mexico

Sir or Madam:

Enterprise Field Services, LLC (Enterprise) is submitting this application for an NSR Significant Revision, pursuant to 20.2.72.219.D(1)(a) NMAC, to the current NSR Construction Permit No. 3662-M8-R5, issued on November 10, 2021 for the Chaparral Gas Plant (Chaparral).

Chaparral is a natural gas processing plant, which currently consists of seven (7) natural gas combustion engines used for natural gas compression, two TEG dehydrators, a molecular sieve dehydrator, an amine sweetening system for liquid treating, a cryogenic natural gas processing train, three (3) 300-barrel condensate tanks, and a flare. Other equipment being included are considered exempt and are not sources of regulated emissions. The facility is located in Eddy County, New Mexico approximately 12 miles southwest of Loco Hills, NM.

The purpose of this revision is to authorize an increase the permitted horsepower capacity of combustion engines E-1000, E-2000, and E-5000. These engines have had recent upgrades and are now capable of running at the manufacturer-rated capacity of 1340-horsepower (hp). The engines are currently permitted to operate at 1151-hp.

Should you have questions or require further information regarding this submittal, please contact Jing Li at (713) 381-5766 (jli@eprod.com) or Pranav Kulkarni at (713) 381-5830.

Enterprise Field Services, LLC

Jing Li
Staff Environmental Engineer

Pranav Kulkarni, Ph.D.
Manager, Environmental Permitting

/bjm
Attachments

cc. District III Filed Office – Carlsbad, 406 N. Guadalupe, Suite C, Carlsbad, NM 88220

P.O. BOX 4324
HOUSTON, TEXAS 77210-4324
713.381.6500

1100 LOUISIANA STREET
HOUSTON, TEXAS 77002-5227
www.enterpriseproducts.com

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		AIRS No.:

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. See Section 1-I for submittal instructions for other permits.

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: ☐ a 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.: 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 (see 1st 3 to 5 #s of permit IDEA ID No.): **26896**	Updating Permit/NOI #: **3662-M8R5**
1	Facility Name: **Chaparral Gas plant**	Plant primary SIC Code (4 digits): **1321**	
		Plant NAIC code (6 digits): **211130**	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark**): To reach the facility from Loco Hills, NM head east on US-82 E toward Goat Ropers rd for 5.7 miles, then turn right onto Shugart Rd and continue for 10.6 miles. Then turn right onto an access road and drive 2.4 miles to the entrance for the Chaparral Gas Plant.**		
2	Plant Operator Company Name: **Enterprise Products Operating LLC**	Phone/Fax: **(713) 381-5766 / (713) 759-3931**	
a	Plant Operator Address: **PO Box 4324 Houston, TX 77210-4324**		

b	Plant Operator's New Mexico Corporate ID or Tax ID: **328 9188**	
3	Plant Owner(s) name(s): **Enterprise Field Services, LLC**	Phone/Fax: **(713) 381-5766 / 281 887-8086**
a	Plant Owner(s) Mailing Address(s): **PO Box 4324 Houston, TX 77210-4324**	
4	Bill To (Company): **Enterprise Field Services, LLC**	Phone/Fax: **(713) 381-5766 / (713) 759-3931**
a	Mailing Address: **PO Box 4324 Houston, TX 77210-4324**	E-mail: **environmental@eprod.com**
5	☑ Preparer: **Jing Li** ☐ Consultant: **N/A**	Phone/Fax: **(713) 381-5766 / (713) 759-3931**
a	Mailing Address: **PO Box 4324, Houston TX 77210-4324**	E-mail: **jli@eprod.com**
6	Plant Operator Contact: **Rob Dunaway**	Phone/Fax: **(361) 815-0990**
a	Address: **PO Box 4324, Houston TX 77210-4324**	E-mail: **rhdunaway@eprod.com**
7	Air Permit Contact: **Jing Li**	Title: **Staff Environmental Engineer**
a	E-mail: **jli@eprod.com**	Phone/Fax: **(713) 381-5766 / (713) 759-3931**
b	Mailing Address: **PO Box 4324, Houston TX 77210-4324**	
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: **P-264R1**
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: **3662-M8R5**
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: **2.9 MMscf/hour**	Daily: **70 MMscf/day**	Annually: **25,550 MMscf/year**
b	Proposed	Hourly: **2.9 MMscf/hour**	Daily: **70 MMscf/day**	Annually: **25,550 MMscf/year**
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: **2.9 MMscf/hour**	Daily: **70 MMscf/day**	Annually: **25,550 MMscf/year**
b	Proposed	Hourly: **2.9 MMscf/hour**	Daily: **70 MMscf/day**	Annually: **25,550 MMscf/year**

Section 1-D: Facility Location Information

1	Section: **17**	Range: **31E**	Township: **19S**	County: **Eddy**	Elevation (ft): **3,431**
2	UTM Zone: ☐ 12 or ☑ 13			Datum: ☐ NAD 27 ☐ NAD 83 ☑ WGS 84	
a	UTM E (in meters, to nearest 10 meters): **603,640 m E**			UTM N (in meters, to nearest 10 meters): **3,613,490 m N**	
b	**AND** Latitude (deg., min., sec.): **32°39'15.06"N**			Longitude (deg., min., sec.): **103°53'41.54"W**	
3	Name and zip code of nearest New Mexico town: **Loco Hills, NM 88255**				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): **To reach the facility from Loco Hills, NM head east on US-82 E toward Goat Ropers rd for 5.7 miles, then turn right onto Shugart Rd and continue for 10.6 miles. Then turn right onto an access road and drive 2.4 miles to the entrance for the Chaparral Gas Plant.**				
5	The facility is 12 miles southwest of Loco Hills, NM 88255.				
6	Status of land at facility (check one): ☐ Private ☐ Indian/Pueblo ☑ Federal BLM ☐ Federal Forest Service ☐ Other				
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: **Municipalities:** None. **Indian tribes:** None. **Counties:** Eddy County, Lea 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/aqb/modeling/class1areas.html)? ☐ Yes ☑ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: **N/A**				
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): **67.7 km**				
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: **19,593 m**				
12	Method(s) used to delineate the Restricted Area: **Fence** "**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: **N/A**					
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.) **Graham Bacon** (20.2.70.300.D.2 NMAC):	Phone: **(713) 381-6595**
a	R.O. Title: Title: **Executive Vice President-EHS&T**	R.O. **environmental@eprod.com**
b	R. O. Address: **P.O. Box 4324, Houston, TX 77210-4324**	
2	Alternate Responsible Official: **Ivan W Zirbes** (20.2.70.300.D.2 NMAC):	Phone: **(713) 381-6595**
a	A. R.O. Title: **Vice President-EHS&T**	A. R.O. **environmental@eprod.com**
b	A. R. O. Address: **P.O. Box 4324, Houston, TX 77210-4324**	
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): **Enterprise Field Services LLC and Enterprise Products Operating LLC**	
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.): **Enterprise Product Partners, LP**	
a	Address of Parent Company: **1100 Louisiana St., Houston, TX 77002**	
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.): **N/A**	
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations: **Daryl Arredondo (575) 628-6819 / Jing Li (713) 381-5766 / (713) 759-3931**	
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 – 78 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_____

Email_____

Phone number _____

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.
E-1000	Compressor Engine	Caterpillar	G3516 TALE	WPW02043	1340 hp	1340 hp	15-Feb-08 21-Jun-17	E-1000 E-1000	31000203	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
E-2000	Compressor Engine	Caterpillar	G3516 TALE	WPW01848	1340 hp	1340 hp	26-Nov-07 13-Feb-09	E-2000 E-2000	31000203	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
E-3000	Compressor Engine	Waukesha	7042 GL	296656	1547 hp	1547 hp	23-May-79 1-Dec-07	E-3000 E-3000	31000203	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
E-4000	Compressor Engine	Waukesha	7042 GL	335197	1547 hp	1547 hp	11-Sep-81 1-Dec-07	E-4000 E-4000	31000203	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
E-5000	Compressor Engine	Caterpillar	G3516 TALE	4EK01789	1340 hp	1340 hp	24-Jun-94 1-Jan-08	E-5000 E-5000	31000203	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	4SLB	N/A
E-6000	Compressor Engine	Caterpillar	G3516 TALE	WPW02312	1340 hp	1340 hp	1-Nov-04 Jan-14	E-6000 E-6000	31000203	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
E-7000	Compressor Engine	Caterpillar	G3516 TALE	WPW01845	1340 hp	1340 hp	26-Nov-07 1-Jul-18	E-7000 E-7000	31000203	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
AMINE-1 & 2**	Amine Flash Tank & Still Vent	OPD	N/A	08040-1 08040-3	19.9 gpm	19.9 gpm	1-Jul-08 May-09	FLARE FLARE	31000305	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
CRYO[5]	Cryogenic Unit (NGL, Distillation Train)	LA Turbine	N/A	10034ESC	70 MMscfd	70 MMscfd	1-Jan-88 May-09	N/A N/A	31000199	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
DEHY-1a (Reboiler)	Glycol Dehy Reboiler Burner	Hanover	N/A	3418	2.0 MMbtu/hr (Reboiler)	2.0 MMbtu/hr (Reboiler)	1-Feb-06 May-09	DEHY-1 DEHY-1a (Reboiler)	31000302	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
DEHY-1b (Still Vent)	Glycol Dehy Still Vent/Flash Tank	Smith	N/A	CR5097	70 MMscfd (Vent/Flash Tank)	70 MMscfd (Vent/Flash Tank)	Apr-06 May-09	BTEX/ ECD BTEX/ ECD	31000301	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	N/A
DEHY-2a (Reboiler)	Glycol Dehy Reboiler Burner	Flame Co	N/A	1310-72K	1.0 MMbtu/hr (Reboiler)	1.0 MMbtu/hr (Reboiler)	2014 2014	DEHY-2 DEHY-2	31000302	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
DEHY-2b (Still Vent)	Glycol Dehy Still Vent/Flash Tank	Valerus	N/A	P3908	70 MMscfd (Vent/Flash Tank)	70 MMscfd (Vent/Flash Tank)	2014 2015	BTEX Buster/Flare BTEX Buster/Flare	31000301	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
MOLE-1	Molecular Sieve Regenerator Heater	Power Flame Inc.	C4-F-25	028944665	2.8 MMbtu/hr	2.8 MMbtu/hr	1-Jan-88 May-09	N/A MOLE-1	31000404	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
TK-1	Condensate Tank	Permian Tank	N/A	48396	300 bbl	300 bbl	Jan-09 Dec-07	N/A TK-1	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
TK-2	Condensate Tank	Permian Tank	N/A	41892	300 bbl	300 bbl	Apr-06 Dec-07	N/A TK-2	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
TK-3	Condensate Tank	N/A	N/A	N/A	300 bbl	300 bbl	5-Jan-09 5-Jan-09	N/A TK-3	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	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.
LOAD-1	Truck Loading of Condensate	N/A	N/A	N/A	30,000 bpy	30,000 bpy	1-Jan-08 Jan-08	N/A N/A	31000199	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
FLARE[5]	Process Flare	Flare Industries	N/A	8416	0.024 MMscf/hr	0.024 MMscf/hr	1-Jan-09 1-Jan-09	N/A FLARE	31000215	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
FLARE[5]	Emergency Flare	Flare Industries	N/A	8416	1.4 MMscf/hr	1.4 MMscf/hr	1-Jan-09 1-Jan-09	N/A FLARE	31000215	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
ECD-1	Enclosed Combustor	SpiralX	N/A	TBD	1.4 MMscf/hr	0.38 Mscf/hr	10-2021 2-2022	N/A ECD-1	31000215	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
FUG-1	Sitewide Fugitives - NSPSKKK	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
FUG-2	Sitewide Fugitives - NSPSKKK	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
HAUL	Unpaved Haul Road Emissions	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
SSM/M1	Startup, Shutdown, Maintenance and Malfunction Emissions	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
MRU[6]	Mechanical Refrigeration Unit (MRU)	TBD	TBD	TBD	70 MMscfd	70 MMscfd	9-Apr-15 TBD	N/A N/A	31000199	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
P24A	Centrifugal Pump	Schlumberger	100330179	H12T23870147-11 1	125 bbl/hr	125 bbl/hr	10-Jan-11 22-Dec-15	N/A N/A	31000309	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
P24B	Centrifugal Pump	Schlumberger	100330179	H12T638628 61-11 1	125 bbl/hr	125 bbl/hr	1-Oct-11 22-Dec-15	N/A N/A	31000309	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
E-VRU-1	VRU Compressor Engine	Caterpillar	G3508 LE	9TG0045	515	515	6-Mar-95 TBD	E-VRU-1 E-VRU-1	31000203	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A

** Amine -1 emissions will be controlled by the EPN Flare.

[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

[5] This facility has a single flare unit that operates as a Process Flare with a rating of 0.024 MMscf/hr, but also as an Emergency Flare with an operational rating of 1.4 MMscf/hr.

[6] The CRYO and MRU are not sources of regulated pollutants other than fugitives. Fugitives from the CRYO and MRU units are encompassed in the facility fugitive emissions calculation.

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 http://www.env.nm.gov/aqb/forms/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. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
TK-Misc	Slop Tank	N/A	N/A N/A	N/A N/A	20.2.72.202.B.5 N/A	N/A N/A	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
P24A	Centrifugal pump	Schlumberger	G3A1B XDB2I23982	125 brl/hr	20.2.72.202.B.5 N/A	Oct. 2011 TBD	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
P24B	Centrifugal pump	Schlumberger	G3A1B XDB2I21574	125 brl/hr	20.2.72.202.B.5 N/A	Oct. 2011 TBD	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
C-1000	Reciprocating Compressor	Unknown	Unknown Unknown	Unknown Unknown	20.2.72.202.B.5 N/A	<8/23/2011 <8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
C-2000	Reciprocating Compressor	Unknown	Unknown Unknown	Unknown Unknown	20.2.72.202.B.5 N/A	<8/23/2011 <8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
C-3000	Reciprocating Compressor	Unknown	Unknown Unknown	Unknown Unknown	20.2.72.202.B.5 N/A	<8/23/2011 <8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
C-4000	Reciprocating Compressor	Unknown	Unknown Unknown	Unknown Unknown	20.2.72.202.B.5 N/A	<8/23/2011 <8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
C-5000	Reciprocating Compressor	Unknown	Unknown Unknown	Unknown Unknown	20.2.72.202.B.5 N/A	<8/23/2011 <8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
C-6000	Reciprocating Compressor	Unknown	Unknown Unknown	Unknown Unknown	20.2.72.202.B.5 N/A	<8/23/2011 <8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
C-VRU1	Reciprocating Compressor	TBD	Unknown Unknown	Unknown Unknown	20.2.72.202.B.5 N/A	<8/23/2011 <8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-LO	Lube Oil Tank	N/A	N/A N/A	1020 gallons	20.2.72.202.B.5 N/A	<8/23/2011 <8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-EC	Engine Coolant Tank	N/A	N/A N/A	1020 gallons	20.2.72.202.B.5 N/A	TBD TBD	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-PC	Booster Pump Coolant Tank	N/A	N/A N/A	750 gallons	20.2.72.202.B.5 N/A	TBD TBD	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-AF	Antifreeze Tank	N/A	N/A N/A	500 gallons	20.2.72.202.B.5 N/A	TBD TBD	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
TK-M2	Methanol Tank	N/A	N/A N/A	1000 gallons	20.2.72.202.B.5 N/A	<8/23/2011 <8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced

Unit Number	Source Description	Manufacturer	Model No. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
TK-M3	Methanol Tank	N/A	N/A	1000	20.2.72.202.B.5	<8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gallons	N/A	<8/23/2011	
TK-M4	Methanol Tank	N/A	N/A	500	20.2.72.202.B.5	TBD	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gallons	N/A	TBD	
TK-G1	Glycol Tank	N/A	N/A	100	20.2.72.202.B.5	<8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	N/A	<8/23/2011	
TK-G2	Glycol Tank	N/A	N/A	3000	20.2.72.202.B.5	<8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gallons	N/A	<8/23/2011	
TK-TEG1	TEG Tank	N/A	N/A	3000	20.2.72.202.B.5	TBD	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	gallons	N/A	TBD	
TK-A1	Amine Make-Up Tank	N/A	N/A	210	20.2.72.202.B.5	<8/23/2011	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	N/A	<8/23/2011	
TK-Misc	Slop oil tank	N/A	N/A	400	20.2.72.202.B.5	TBD	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	N/A	TBD	
LD-Misc	Oil Loading	N/A	N/A	400	20.2.72.202.B.5	TBD	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
			N/A	bbl	N/A	TBD	

[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
E-1000	AFRC and Catalytic Converter	13-Feb-09	CO, VOC, HAPs	E-1000	83% CO, HCHO; 50% VOC	Engineering Est.
E-3000	AFRC and Catalytic Converter	1-Dec-07	CO, HAPs	E-3000	80% CO and HAPs	Engineering Est.
E-4000	AFRC and Catalytic Converter	Unknown	CO, HAPs	E-4000	80% CO and HAPs	Engineering Est.
E-6000	AFRC and Catalytic Converter	TBD	CO, HAPs	E-6000	80% CO and HAPs	Engineering Est.
E-7000	AFRC and Catalytic Converter	TBD	CO, HAPs	E-7000	80% CO and HAPs	Engineering Est.
DEHY-1	Flare, Firebox, Condenser, Enclosed Combustor	Unknown	VOC, HAPs	DEHY-1	98%	Manufacturer Specifications
	BTEX Buster	Unknown	VOC, HAPs	DEHY-1	~90%	Engineering Est.
DEHY-2	Condenser, BTEX Buster	TBD	VOC, HAPs	DEHY-2	~90%	GRI-GLYCalc
	Flare, Firebox, Glow Plug	TBD	VOC, HAPs	DEHY-2	98%	Engineering Est.
FLARE	Flare	Unknown	VOC, HAPs	Various	98%	Engineering Est.
E-VRU-1	AFRC and Catalytic Converter	TBD	NOx, CO, VOC, HAPs	VRU-1	83% CO, HCHO; 50% VOC	Engineering Est.
AMINE-1	Flare	Unknown	VOC, H_2S, HAPs	AMINE-1	98%	Engineering Est.
ECD-1	Enclosed Combustor	TBD	VOC, HAPs	DEHY-1	98%	Manufacturer Specifications

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		TSP[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
E-1000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	-	-
E-2000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.099	0.43	0.099	0.43	0.099	0.43	-	-	-	-
E-3000	5.12	22.41	9.04	39.59	3.41	14.94	0.17	0.75	0.11	0.50	0.11	0.50	0.11	0.50	-	-	-	-
E-4000	5.12	22.41	9.04	39.59	3.41	14.94	0.17	0.75	0.11	0.50	0.11	0.50	0.11	0.50	-	-	-	-
E-5000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	-	-
E-6000	5.91	25.88	5.49	24.07	0.77	3.36	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	-	-
E-7000	5.91	25.88	6.85	30.02	1.24	5.43	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	-	-
DEHY-1a (reboiler)	0.21	0.92	0.18	0.77	0.01	0.05	0.03	0.13	0.02	0.07	0.02	0.07	0.02	0.07	-	-	-	-
DEHY-1b (Still vent)	-	-	-	-	52.35	229.29	-	-	-	-	-	-	-	-	0.027	0.12	-	-
DEHY-2a (reboiler)	0.11	0.46	0.088	0.39	0.0058	0.025	0.015	0.066	0.0080	0.035	0.0080	0.035	0.0080	0.035	-	-	-	-
DEHY-2b (still vent)	-	-	-	-	56.94	249.41	-	-	-	-	-	-	-	-	0.034	0.15	-	-
AMINE 1 and 2	-	-	-	-	2.02	8.84	-	-	-	-	-	-	-	-	0.094	0.41	-	-
MOLE-1	0.28	1.21	0.23	1.01	0.015	0.066	0.042	0.19	0.021	0.092	0.021	0.092	0.021	0.092	-	-	-	-
TK-1 through TK-3	-	-	-	-	*	14.98	-	-	-	-	-	-	-	-	-	-	-	-
LOAD-1	-	-	-	-	*	9.73	-	-	-	-	-	-	-	-	-	-	-	-
FLARE	0.020	0.086	0.039	0.17	-	-	0.0021	0.0094	-	-	-	-	-	-	-	-	-	-
HAUL	-	-	-	-	-	-	-	-	5.52	3.37	1.25	0.77	0.13	0.077	-	-	-	-
FUG-1	-	-	-	-	*	44.58	-	-	-	-	-	-	-	-	*	1.11E-03	-	-
FUG-2	-	-	-	-	*	23.40	-	-	-	-	-	-	-	-	*	5.83E-04	-	-
E-VRU-1	2.27	9.95	2.27	9.95	0.79	3.48	0.058	0.25	0.039	0.17	0.039	0.17	0.039	0.17	-	-	-	-
ECD-1	0.023	0.10	0.046	0.20	-	-	2.00E-03	8.76E-03	-	-	-	-	-	-	-	-	-	-
Totals	38.25	167.52	49.23	215.62	125.31	641.54	1.24	5.42	6.33	6.90	2.06	4.29	0.93	3.61	0.16	0.68	-	-

[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 TSP unless TSP is set equal to PM10 and PM2.5.

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		TSP[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
E-1000	4.43	19.41	0.90	3.96	0.72	3.17	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	-	-
E-2000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	-	-
E-3000	5.12	22.41	1.81	7.92	3.41	14.94	0.17	0.75	0.11	0.50	0.11	0.50	0.11	0.50	-	-	-	-
E-4000	5.12	22.41	1.81	7.92	3.41	14.94	0.17	0.75	0.11	0.50	0.11	0.50	0.11	0.50	-	-	-	-
E-5000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	-	-
E-6000	5.91	25.88	5.49	24.07	0.77	3.36	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	-	-
E-7000	5.91	25.88	1.37	6.00	1.24	5.43	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	-	-
DEHY-1a (reboiler)	0.21	0.92	0.18	0.77	0.01	0.05	0.03	0.13	0.02	0.07	0.02	0.07	0.02	0.07	-	-	-	-
DEHY-1b (Still vent)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEHY-2a (reboiler)	0.11	0.46	0.088	0.39	0.0058	0.025	0.015	0.066	0.0080	0.035	0.0080	0.035	0.0080	0.035	-	-	-	-
DEHY-2b (still vent)	-	-	-	-	0.60	2.61	0.048	0.21	-	-	-	-	-	-	5.17E-04	2.27E-03	-	-
AMINE 1 and 2	-	-	-	-	2.02	8.84	-	-	-	-	-	-	-	-	0.094	0.41	-	-
MOLE-1	0.28	1.21	0.23	1.01	0.015	0.066	0.042	0.19	0.021	0.092	0.021	0.092	0.021	0.092	-	-	-	-
TK-1 through TK-3	-	-	-	-	*	14.98	-	-	-	-	-	-	-	-	-	-	-	-
LOAD-1	-	-	-	-	*	9.73	-	-	-	-	-	-	-	-	-	-	-	-
FLARE	5.27	23.09	10.52	46.09	24.82	108.71	0.065	0.28	-	-	-	-	-	-	6.82E-04	2.99E-03	-	-
HAUL	-	-	-	-	-	-	-	-	5.52	3.37	1.25	0.77	0.13	0.077	-	-	-	-
FUG-1[2]	-	-	-	-	*	44.58	-	-	-	-	-	-	-	-	*	1.11E-03	-	-
FUG-2[2]	-	-	-	-	*	23.40	-	-	-	-	-	-	-	-	*	5.83E-04	-	-
E-VRU-1	2.27	9.95	0.39	1.69	0.40	1.74	0.058	0.25	0.039	0.17	0.039	0.17	0.039	0.17	-	-	-	-
ECD-1	0.092	0.40	0.18	0.80	0.42	1.85	2.00E-03	8.76E-03	-	-	-	-	-	-	-	-		
Totals	43.57	190.83	33.61	147.21	40.74	271.11	1.35	5.91	6.33	6.90	2.06	4.30	0.93	3.61	0.10	0.42	-	-

[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 TSP unless TSP is set equal to PM10 and PM2.5.

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		TSP[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/M1	230.27	10.00	459.71	10.00	1857.90	10.00	0.95	4.15	-	-	-	-	-	-	0.010	0.045	-	-
Totals	230.27	10.00	459.71	10.00	1857.90	10.00	0.95	4.15	-	-	-	-	-	-	0.010	0.045	-	-

[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 TSP unless TSP is set equal to PM10 and PM2.5.

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		TSP		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
N/A - There are no special stacks present at the facility.																	
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	Height Above	Temp.	Flow Rate		Moisture by	Velocity	Inside Diameter (ft)
			(Yes or No)	Ground (ft)	(F)	(acfs)	(dscfs)	Volume (%)	(ft/sec)	
E-1000	E-1000	V	No	24	840	106.9	-	-	100.0	1.20
E-2000	E-2000	V	No	24	840	106.9	-	-	100.0	1.20
E-3000	E-3000	V	No	24	810	153.0	-	-	86.6	1.50
E-4000	E-4000	V	No	24	810	153.0	-	-	86.6	1.50
E-5000	E-5000	V	No	21	840	106.9	-	-	100.0	1.20
E-6000	E-6000	V	No	21	873	127.7	-	-	112.9	1.20
E-7000	E-7000	V	No	21	873	127.7			112.9	1.20
DEHY-1	DEHY-1	V	No	15	212	8.4	-	-	43.0	0.50
DEHY-2	DEHY-2	V	No	15	212	4.3	-	-	21.7	0.50
MOLE-1	MOLE-1	V	No	15	212	12.0	-	-	61.0	0.50
FLARE	FLARE	V	No	100	1832	N/A	-	-	65.6	1.50
E-VRU-1	E-VRU-1	V	No	18	1007	68.8	-	-	195.1	0.67
ECD-1	ECD-1	V	No	9.42	1150	2.0	-	-	0.4	2.50

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		Benzene ☑ HAP or ☐ TAP		n-Hexane ☑HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ 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	lb/hr	ton/yr
E-1000	E-1000	0.12	0.53	0.089	0.39	0.014	0.062	0.0087	0.038	7.40E-04	0.0033	0.0019	0.0082	-	-	-	-		
E-2000	E-2000	0.72	3.14	0.52	2.30	0.083	0.36	0.051	0.22	0.0040	0.019	0.0110	0.048	-	-	-	-		
E-3000	E-3000	0.24	1.06	0.20	0.87	0.019	0.082	0.012	0.051	9.91E-04	0.0043	0.0025	0.011	-	-	-	-		
E-4000	E-4000	0.24	1.06	0.20	0.87	0.019	0.082	0.012	0.05	9.91E-04	0.0043	0.0025	0.011	-	-	-	-		
E-5000	E-5000	0.72	3.14	0.52	2.30	0.083	0.36	0.051	0.22	0.0040	0.019	0.0110	0.048	-	-	-	-		
E-6000	E-6000	0.70	3.08	0.51	2.25	0.081	0.36	0.050	0.22	0.0043	0.019	0.011	0.047	-	-	-	-		
E-7000	E-7000	0.17	0.73	0.13	0.57	0.016	0.071	0.010	0.04	8.58E-04	0.0038	0.0022	0.0095	-	-	-	-		
DEHY-1	DEHY-1[1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
DEHY-2	DEHY-2	0.22	0.96	8.45E-04	0.0037	7.31E-04	0.0032	-	-	0.14	0.61	0.015	0.066	-	-	-	-		
FLARE	AMINE-1&2	0.39	1.71	-	-	-	-	-	-	0.31	1.38	9.20E-04	0.0040	-	-	-	-		
MOLE-1	MOLE-1	0.040	0.18	0.0024	0.010	0.0021	0.0090	-	-	0.0021	0.0092	0.0039	0.017	-	-	-	-		
TK-1 through TK-3	TK-1 through TK-3	*	0.10	-	-	-	-	-	-	*	0.035	*	0.038	-	-	-	-		
N/A	LOAD-1	*	0.065	-	-	-	-	-	-	*	0.023	*	0.024	-	-	-	-		
FLARE	FLARE	1.70	7.43	-	-	-	-	-	-	0.61	2.66	0.88	3.84	-	-	-	-		
N/A	FUG-1	*	0.81	-	-	-	-	-	-	*	0.22	-	0.43	-	-	-	-		
N/A	FUG-2	*	0.42	-	-	-	-	-	-	*	0.12	*	0.23	-	-	-	-		
E-VRU-1	E-VRU-1	0.042	0.18	0.024	0.11	0.0031	0.014	0.0014	0.0063	6.75E-04	0.0030	6.21E-04	0.0027	-	-	-	-		
ECD-1	ECD-1	0.036	0.16	-	-	-	-	-	-	-	-	-	-						
N/A	SSM/M1	20.61	0.07	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
Totals:		25.95	24.84	2.21	9.66	0.32	1.41	0.20	0.86	1.08	5.14	0.94	4.83						

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
E-1000	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	10.5 Mscf	91.6 MMscf	5 gr S/ 100 scf	Negligible
E-2000	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	10.5 Mscf	91.6 MMscf	5 gr S/ 100 scf	Negligible
E-3000	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	12.0 Mscf	104.8 MMscf	5 gr S/ 100 scf	Negligible
E-4000	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	12.0 Mscf	104.8 MMscf	5 gr S/ 100 scf	Negligible
E-5000	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	10.5 Mscf	91.6 MMscf	5 gr S/ 100 scf	Negligible
E-6000	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	10.4 Mscf	91.5 MMscf	5 gr S/ 100 scf	Negligible
E-7000	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	10.4 Mscf	91.5 MMscf	5 gr S/ 100 scf	Negligible
DEHY-1	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	2.1 Mscf	18.4 MMscf	5 gr S/ 100 scf	Negligible
DEHY-2	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	1.1 Mscf	9.2 MMscf	5 gr S/ 100 scf	Negligible
FLARE (pilot)	Natural Gas	Pipeline Quality Natural Gas	1816 Btu/scf[1]	150 scf	1.3 MMscf	5 gr S/ 100 scf	Negligible
FLARE (process)	Natural Gas	Pipeline Quality Natural Gas,Facility Offgas	1816 Btu/scf[2]	19.5 Mscf[3]	171.0 MMscf[4]	5 gr S/ 100 scf	Negligible
MOLE-1	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	3.0 Mscf	25.9 MMscf	5 gr S/ 100 scf	Negligible
E-VRU-1	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	4.1 Mscf	35.7 MMscf	5 gr S/ 100 scf	Negligible
ECD-1	Natural Gas	Pipeline Quality Natural Gas	950 Btu/scf	175 scf	1.53 MMscf	5 gr S/ 100 scf	Negligible

[1]The Flare's Pilot runs with waste gas.

[2]The Process Flare runs with waste gas.

[3]Pilot Flow + Process Flow = (0.019 MMscf/hr * 1X106 scf/ MMscf) + 150 scf/hr = 19525 scf/hr = 19.5 Mscf/hr

[4]Then, to convert Mscf/hr to MMscf/ yr : (19.5 Mscf/hr) * (8760 hrs/yr) * (1MMscf/1000 Mscf) = 171.0 MMscf/yr

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	Mixed Hydrocarbon Liquids	5.6	67	76.3	6.3	93.2	8.5
TK-2	40400311	Condensate	Mixed Hydrocarbon Liquids	5.6	67	76.3	6.3	93.2	8.5
TK-3	40400311	Condensate	Mixed Hydrocarbon Liquids	5.6	67	73.6	6.3	93.2	8.5

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	Jan-09	Condensate	N/A	FX	300	48	3.7	2.3	OT: Red Primer	OT: Red Primer	Poor	840,000	66.6
TK-2	Apr-06	Condensate	N/A	FX	300	48	3.7	2.3	OT: Red Primer	OT: Red Primer	Poor	840,000	66.6
TK-3	Jan-09	Condensate	N/A	FX	300	48	3.7	2.3	OT: Red Primer	OT: Red Primer	Poor	840,000	66.6

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: Red Primer	

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	70 MMscf/day	Natural Gas	Mixed Hydrocarbons	Gas	70 MMscf/day
				Condensate	Mixed Hydrocarbons	Liquid	~164 bbl/day
				NGL	Mixed Hydrocarbons	Liquid	2218 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 located at the 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 is no PEM equipment located at the 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**								
E-1000	**mass GHG**	5,090.9	0.0096	0.096									5,091.0	
	CO_2e	5,090.9	2.9	2.4										5,096.2
E-2000	**mass GHG**	5,090.9	0.0096	0.096									5,091.0	
	CO_2e	5,090.9	2.9	2.4										5,096.2
E-3000	**mass GHG**	5,825.8	0.011	0.11									5,825.9	
	CO_2e	5,825.8	3.3	2.7										5,831.8
E-4000	**mass GHG**	5,825.8	0.011	0.11									5,825.9	
	CO_2e	5,825.8	3.3	2.7										5,831.8
E-5000	**mass GHG**	5,090.9	0.0096	0.096									5,091.0	
	CO_2e	5,090.9	2.9	2.4										5,096.2
E-6000	**mass GHG**	5,084.0	0.0096	0.10									5,084.1	
	CO_2e	5,084.0	2.9	2.4										5,089.2
E-7000	**mass GHG**	5,084.0	0.010	0.10									5,084.1	
	CO_2e	5,084.0	2.9	2.4										5,089.2
DEHY-1	**mass GHG**	1,142.3	0.0022	0.022									1,142.3	
	CO_2e	1,142.3	0.64	0.5										1,143.5
DEHY-2	**mass GHG**	522.0	0.00098	0.0098									522.0	
	CO_2e	522.0	0.293	0.246										522.6
AMINE-1 and 2	**mass GHG**	1,332.9	-	0.6									1,333.5	
	CO_2e	1,332.9	-	14.8										1,347.7
MOLE-1	**mass GHG**	1,606.6	0.0030	0.030									1,606.7	
	CO_2e	1,606.6	0.90	0.76										1,608.3
TK-1	**mass GHG**	-	-	-										
	CO_2e	-	-	-										
TK-2	**mass GHG**	-	-	-										
	CO_2e	-	-	-										
TK-3	**mass GHG**	-	-	-										
	CO_2e	-	-	-										
LOAD-1	**mass GHG**	-	-	-										
	CO_2e	-	-	-										
FLARE	**mass GHG**	52.1	0.037	1,598.2									1,650.3	
	CO_2e	52.1	11.0	39,955.3										40,018.3
HAUL	**mass GHG**	-	-	-										
	CO_2e	-	-	-										
FUG-1	**mass GHG**	-	-	-										
	CO2e	-	-	-										
FUG-2	**mass GHG**	-	-	-										
	CO_2e	-	-	-										
E-VRU-1	**mass GHG**	1,981.6	0.0037	0.037									1,981.7	
	CO_2e	1,981.6	1.1	0.9										1,983.7
SSM/M1	**mass GHG**	1,126.3	0.0014	1.7									1,128.1	
	CO_2e	1,126.3	0.4	43.2										1,169.9
ECD-1	**mass GHG**	310.0	0.0006	0.006									310.0	
	CO_2e	310.0	0.2	0.2										310.4
Total	**mass GHG**	44,856.1	0.1	1,601.3									46,767.6	
	CO_2e	44,856.1	35.1	40,032.7										85,234.8

[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.

Enterprise Field Services, LLC (Enterprise) is submitting this application for an NSR Significant Revision, pursuant to 20.2.72.219.D(1)(a) NMAC, to the current NSR Construction Permit No. 3662-M8-R5, issued on November 10, 2021 for the Chaparral Gas Plant (Chaparral).

Chaparral is a natural gas processing plant, which currently consists of seven (7) natural gas combustion engines used for natural gas compression, two TEG dehydrators, a molecular sieve dehydrator, an amine sweetening system for liquid treating, a cryogenic natural gas processing train, three (3) 300-barrel condensate tanks, and a flare. Other equipment being included are considered exempt and are not sources of regulated emissions. The facility is located in Eddy County, New Mexico approximately 12 miles southwest of Loco Hills, NM.

The purpose of this revision is to authorize an increase the permitted horsepower capacity of combustion engines E-1000, E-2000, and E-5000. These engines have had recent upgrades and are now capable of running at the manufacturer-rated capacity of 1340-horsepower (hp). The engines are currently permitted to operate at 1151-hp. There are no changes to the engine emission factors used in previous permit applications, but with the increased engine horsepower capacity, engine emissions will be increasing with this application. As this application is considered a significant permit revision, national and New Mexico ambient air quality dispersion modeling has been performed and results can be found in Section 16.

Section 4

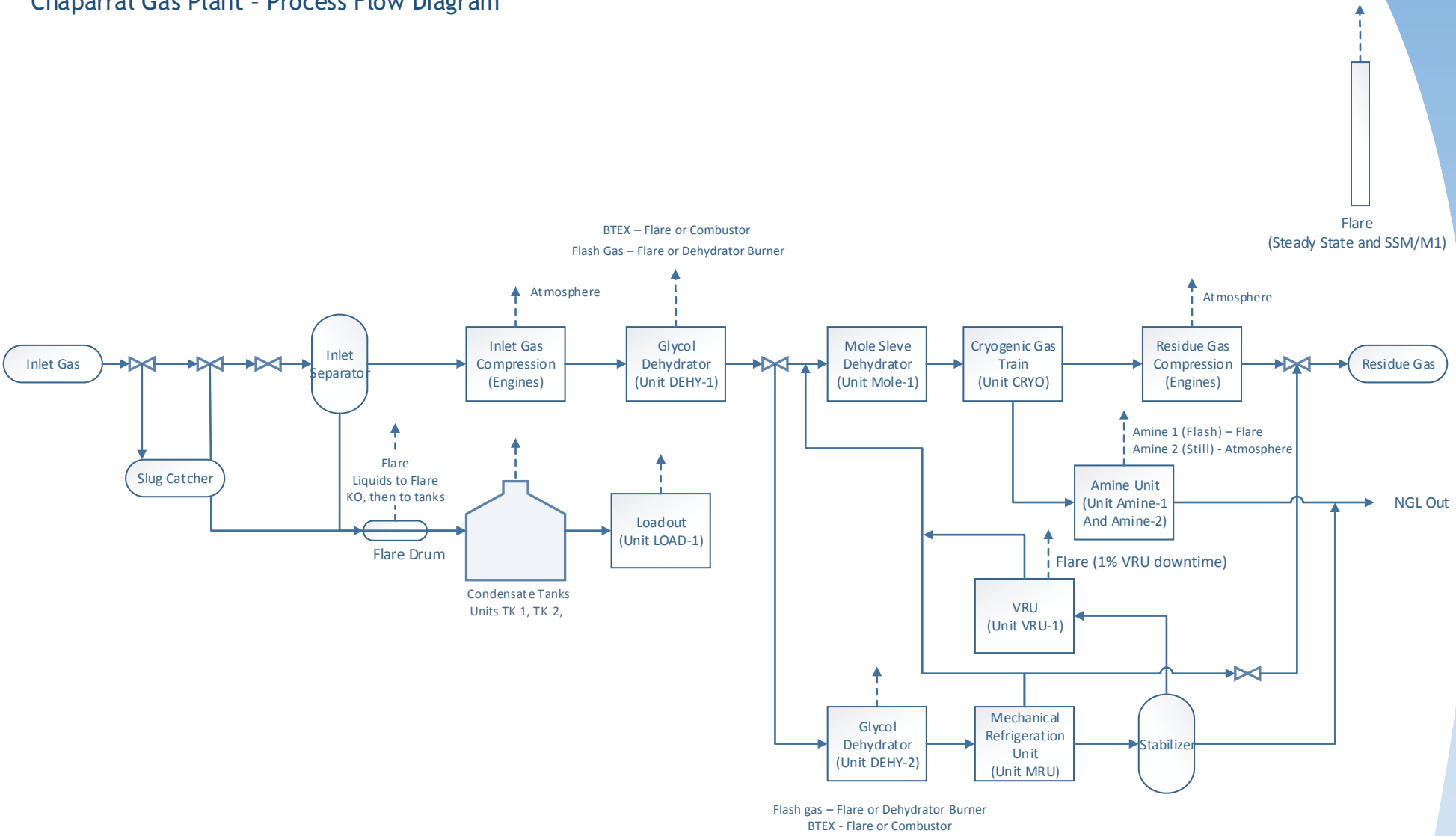
Process Flow Sheet

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.

A process flow diagram is attached.

Enterprise Products

Chaparral Gas Plant – Process Flow Diagram

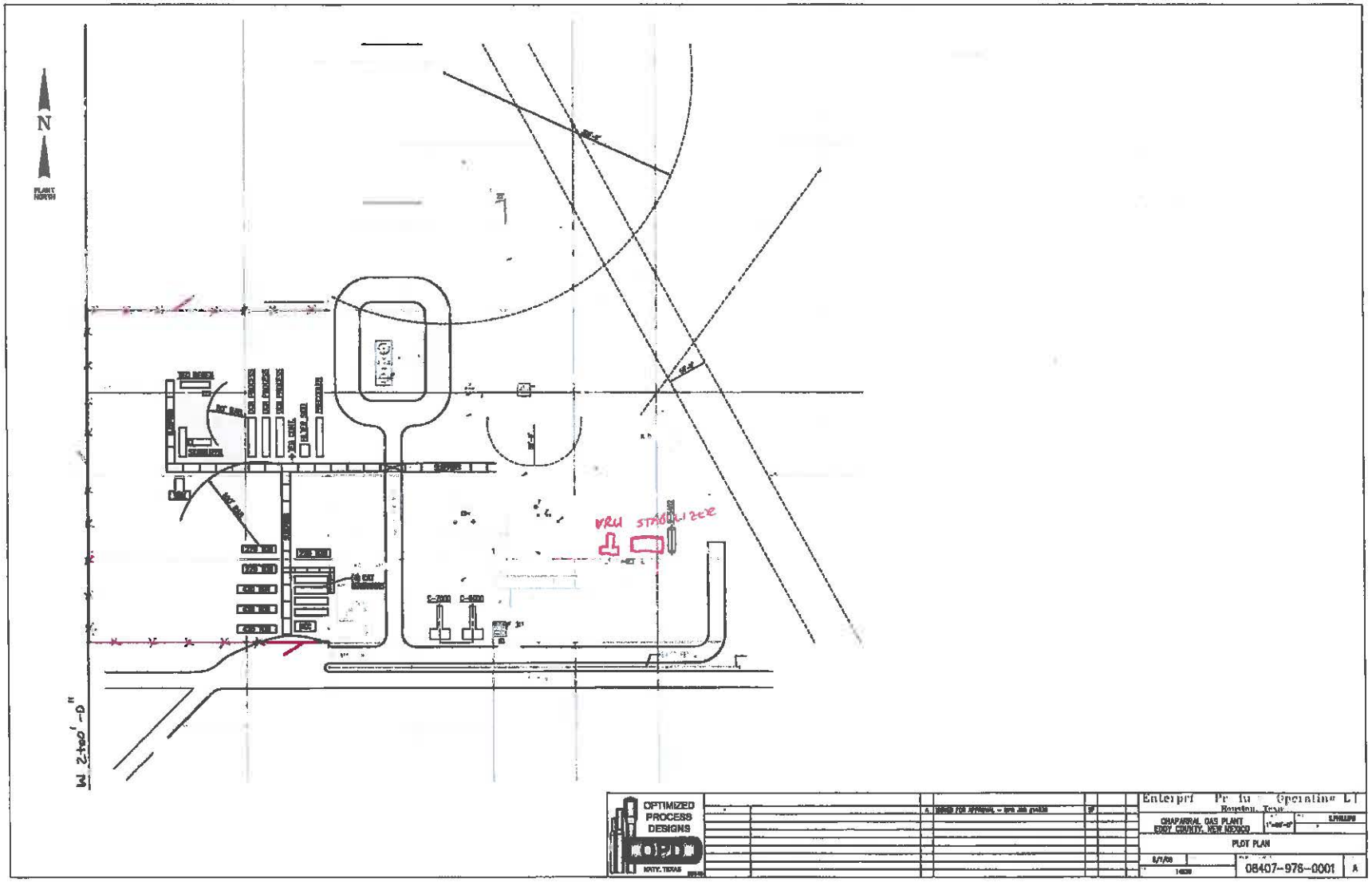


Section 5

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.


N
PLANT NORTH
VRU STABILIZER
W 2100'-0"
OPTIMIZED PROCESS DESIGNS
CHAPARRAL GAS PLANT
EDDY COUNTY, NEW MEXICO
PLOT PLAN
08407-976-0001
A

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.

Compressor Engines:

Units E-1000, E-2000, E-5000

Combustion engines E-1000, E-2000, and E-5000 have had upgrades and are now capable of running at their manufacturer-rated capacity of 1340-horsepower (hp). The engines are currently permitted to operate at 1151-hp. There are no changes to the engine emission factors used in previous permit applications, but with the increased engine horsepower capacity, engine emissions will be increasing with this application. Engine emissions are calculated using the manufacturer emission factors for NOx, CO, and VOC; AP-42 emission factors for PM; and pipeline specifications of 5 grains Sulfur per 100 standard cubic feet for SO_2 emissions. HAP emissions are based on emissions calculated using AP-42, Section 3.2 for 4-stroke lean burn engines.

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)

Greenhouse gas emissions are included in this application.

Uncontrolled Emissions for Revision																	
	NOx		CO		VOC		SO_2		TSP		PM-10		PM-2.5		H_2S		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
E-1000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.099	0.43	0.099	0.43	0.099	0.43	-	-	5096.12
E-2000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.099	0.43	0.099	0.43	0.099	0.43	-	-	5096.12
E-3000	5.12	22.41	9.04	39.59	3.41	14.94	0.17	0.75	0.11	0.50	0.11	0.50	0.11	0.50	-	-	5831.78
E-4000	5.12	22.41	9.04	39.59	3.41	14.94	0.17	0.75	0.11	0.50	0.11	0.50	0.11	0.50	-	-	5831.78
E-5000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.099	0.43	0.099	0.43	0.099	0.43	-	-	5096.12
E-6000	5.91	25.88	5.49	24.07	0.77	3.36	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	5089.24
E-7000	5.91	25.88	6.85	30.02	1.24	5.43	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	5089.24
DEHY-1a (reboiler)	0.21	0.92	0.18	0.77	0.012	0.051	0.030	0.132	0.016	0.070	0.016	0.070	0.016	0.070	-	-	1025.77
DEHY-1b (Still vent)	-	-	-	-	52.35	229.29	-	-	-	-	-	-	-	-	0.027	0.12	-
DEHY-2a (reboiler)	0.11	0.46	0.088	0.39	0.0058	0.025	0.015	0.066	0.0080	0.035	0.0080	0.035	0.0080	0.035	-	-	522.56
DEHY-2b (still vent)	-	-	-	-	56.94	249.41	-	-	-	-	-	-	-	-	0.034	0.15	-
ECD-1	0.023	0.10	0.046	0.20	-	-	2.00E-03	8.76E-03	-	-	-	-	-	-	-	-	310.36
AMINE 1&2	-	-	-	-	2.02	8.84	-	-	-	-	-	-	-	-	0.094	0.41	1347.66
MOLE-1	0.28	1.21	0.23	1.01	0.015	0.066	0.042	0.19	0.021	0.092	0.021	0.09	0.021	0.092	-	-	1608.29
TK-1 through TK-3	-	-	-	-	*	14.98	-	-	-	-	-	-	-	-	-	-	-
LOAD-1	-	-	-	-	*	9.73	-	-	-	-	-	-	-	-	-	-	-
FLARE (Pilot Only)	0.020	0.086	0.039	0.17	-	-	0.0021	0.0094	-	-	-	-	-	-	-	-	-
HAUL	-	-	-	-	-	-	-	-	5.52	3.37	1.25	0.77	0.13	0.077	-	-	-
FUG-1	-	-	-	-	*	44.58	-	-	-	-	-	-	-	-	*	0.0011	-
FUG-2	-	-	-	-	*	23.40	-	-	-	-	-	-	-	-	*	5.83E-04	-
E-VRU-1	2.27	9.95	2.27	9.95	0.79	3.48	0.058	0.25	0.039	0.17	0.039	0.17	0.039	0.17	-	-	1983.68
SSM/M1	230.27	10.00	459.71	10.00	1857.9	10.00	0.95	4.15	-	-	-	-	-	-	0.010	0.045	1169.91
Totals	**268.52**	**177.52**	**508.94**	**225.63**	**1983.21**	**651.54**	**2.19**	**9.58**	**6.33**	**6.90**	**2.06**	**4.30**	**0.93**	**3.61**	**0.17**	**0.73**	**45098.6**

Uncontrolled HAP Emissions for Revision												
	HAPs		Formaldehyde		Acetaldehyde		Acrolein		Benzene		n-Hexane	
Unit	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
E-1000	0.72	3.14	0.52	2.30	0.08	0.36	0.05	0.22	0.004	0.019	0.011	0.048
E-2000	0.72	3.14	0.52	2.30	0.08	0.36	0.05	0.22	0.004	0.019	0.011	0.048
E-3000	1.21	5.29	0.99	4.33	0.094	0.41	0.058	0.25	0.0050	0.022	0.012	0.055
E-4000	1.21	5.29	0.99	4.33	0.094	0.41	0.058	0.25	0.0050	0.022	0.012	0.055
E-5000	0.72	3.14	0.52	2.30	0.083	0.36	0.051	0.22	0.0044	0.019	0.0110	0.048
E-6000	0.70	3.08	0.51	2.25	0.081	0.36	0.050	0.22	0.0043	0.019	0.011	0.047
E-7000	0.17	0.73	0.13	0.57	0.016	0.071	0.010	0.044	0.00086	0.0038	0.0022	0.0095
DEHY-1	9.49	41.56	1.69E-03	7.40E-03	-	-	-	-	5.78	25.32	1.31	5.75
DEHY-2	11.42	50.02	8.45E-04	0.0037	7.31E-04	0.0032	-	-	7.42	32.52	1.11	4.86
ECD-1	-	-	-	-	-	-	-	-	-	-	-	-
AMINE 1&2	0.39	1.71	-	-	-	-	-	-	0.31	1.38	9.20E-04	0.0040
MOLE-1	0.040	0.18	0.0024	0.010	0.0021	0.0090	-	-	0.0021	0.0092	0.0039	0.017
TK-1 through TK-3	*	0.10	-	-	-	-	-	-	*	0.035	*	0.038
LOAD-1	*	0.065	-	-	-	-	-	-	*	0.023	*	0.024
FLARE	-	-	-	-	-	-	-	-	-	-	-	-
FUG-1	*	0.81	-	-	-	-	-	-	*	0.22	*	0.43
FUG-2	*	0.42	-	-	-	-	-	-	*	0.12	*	0.23
E-VRU-1	0.20	0.86	0.14	0.63	0.019	0.081	0.0084	0.037	0.0040	0.017	0.0037	0.016
SSM/M1[1]	20.61	0.072	-	-	-	-	-	-	-	-	-	-
Totals	**47.58**	**119.60**	**4.35**	**19.03**	**0.56**	**2.44**	**0.34**	**1.48**	**13.55**	**59.77**	**2.50**	**11.68**

* Indicates an hourly emission rate is not appropriate for this unit

[1] Annual HAP emissions for SSM/M1 calculated assuming same HAP/VOC ratio as hourly emission rates [HAP tpy = HAP lb/hr / VOC lb/hr * VOC tpy]

Enterprise Field Services
Chaparral Gas Plant

Controlled Emissions for Revision																	
	NOx		CO		VOC		SO_2		TSP		PM-10		PM-2.5		H_2S		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
E-1000	4.43	19.41	0.90	3.96	0.72	3.17	0.15	0.65	0.099	0.43	0.099	0.43	0.099	0.43	-	-	5096.12
E-2000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.099	0.43	0.099	0.43	0.099	0.43	-	-	5096.12
E-3000	5.12	22.41	1.81	7.92	3.41	14.94	0.17	0.75	0.11	0.50	0.11	0.50	0.11	0.50	-	-	5831.78
E-4000	5.12	22.41	1.81	7.92	3.41	14.94	0.17	0.75	0.11	0.50	0.11	0.50	0.11	0.50	-	-	5831.78
E-5000	4.43	19.41	5.32	23.29	1.45	6.34	0.15	0.65	0.099	0.43	0.099	0.43	0.10	0.43	-	-	5096.12
E-6000	5.91	25.88	5.49	24.07	0.77	3.36	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	5089.24
E-7000	5.91	25.88	1.37	6.00	1.24	5.43	0.15	0.65	0.10	0.43	0.10	0.43	0.10	0.43	-	-	5089.24
DEHY-1a (reboiler)	0.21	0.92	0.18	0.77	0.012	0.051	0.030	0.132	0.016	0.07	0.016	0.07	0.016	0.07	-	-	1025.77
DEHY-1b (Still vent)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEHY-2a (reboiler)	0.11	0.46	0.088	0.39	0.0058	0.025	0.015	0.066	0.0080	0.035	0.0080	0.035	0.0080	0.035	-	-	522.56
DEHY-2b (still vent)	-	-	-	-	0.60	2.61	0.048	0.21	-	-	-	-	-	-	5.17E-04	0.0023	-
ECD-1	0.092	0.40	0.18	0.80	0.42	1.85	0.002	0.009	-	-	-	-	-	-	-	-	310.36
AMINE 1&2	-	-	-	-	2.02	8.84	-	-	-	-	-	-	-	-	0.094	0.41	1347.66
MOLE-1	0.28	1.21	0.23	1.01	0.015	0.066	0.042	0.19	0.021	0.092	0.021	0.092	0.021	0.092	-	-	1608.29
TK-1 through TK-3	-	-	-	-	*	14.98	-	-	-	-	-	-	-	-	-	-	-
LOAD-1	-	-	-	-	*	9.73	-	-	-	-	-	-	-	-	-	-	-
FLARE	5.27	23.09	10.52	46.09	24.82	108.71	0.065	0.28	-	-	-	-	-	-	6.82E-04	0.0030	40018.31
HAUL	-	-	-	-	-	-	-	-	5.52	3.37	1.25	0.77	0.13	0.077	-	-	-
FUG-1	-	-	-	-	*	44.58	-	-	-	-	-	-	-	-	*	0.0011	-
FUG-2	-	-	-	-	*	23.40	-	-	-	-	-	-	-	-	*	5.83E-04	-
E-VRU-1	2.27	9.95	0.39	1.69	0.40	1.74	0.058	0.25	0.039	0.17	0.039	0.17	0.039	0.17	-	-	1983.68
SSM/M1	230.27	10.00	459.71	10.00	1857.90	10.00	0.95	4.15	-	-	-	-	-	-	0.010	0.045	1169.91
Totals	**273.84**	**200.83**	**493.32**	**157.21**	**1898.64**	**281.11**	**2.30**	**10.06**	**6.33**	**6.90**	**2.06**	**4.30**	**0.93**	**3.61**	**0.11**	**0.46**	**85116.9**

Controlled HAP Emissions for Revision												
	HAPs		Formaldehyde		Acetaldehyde		Acrolein		Benzene		n-Hexane	
Unit	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
E-1000	0.12	0.53	0.089	0.39	0.014	0.062	0.0087	0.038	7.43E-04	0.0033	0.0019	0.0082
E-2000	0.72	3.14	0.52	2.30	0.083	0.36	0.051	0.22	0.0044	0.019	0.0110	0.048
E-3000	0.24	1.06	0.20	0.87	0.019	0.082	0.012	0.051	0.0010	0.0043	0.0025	0.011
E-4000	0.24	1.06	0.20	0.87	0.019	0.082	0.012	0.051	0.0010	0.0043	0.0025	0.011
E-5000	0.72	3.14	0.52	2.30	0.083	0.36	0.051	0.22	0.0044	0.019	0.0110	0.048
E-6000	0.70	3.08	0.51	2.25	0.081	0.36	0.050	0.22	0.0043	0.019	0.011	0.047
E-7000	0.17	0.73	0.13	0.57	0.016	0.071	0.010	0.044	8.58E-04	0.0038	0.0022	0.0095
DEHY-1	-	-	-	-	-	-	-	-	-	-	-	-
DEHY-2	0.22	0.96	8.45E-04	0.0037	7.31E-04	0.0032	-	-	0.14	0.61	0.015	0.066
ECD-1	0.036	0.16	-	-	-	-	-	-	-	-	-	-
AMINE 1&2	0.39	1.71	-	-	-	-	-	-	0.31	1.38	9.20E-04	0.0040
MOLE-1	0.040	0.18	0.0024	0.010	0.0021	0.0090	-	-	0.0021	0.0092	0.0039	0.017
TK-1 through TK-3	*	0.10	-	-	-	-	-	-	*	0.035	*	0.038
LOAD-1	*	0.065	-	-	-	-	-	-	*	0.023	*	0.024
FLARE	1.70	7.43	-	-	-	-	-	-	0.61	2.66	0.88	3.84
FUG-1	*	0.81	-	-	-	-	-	-	*	0.22	-	0.43
FUG-2	*	0.42	-	-	-	-	-	-	*	0.12	*	0.23
E-VRU-1	0.042	0.18	0.024	0.11	0.0031	0.014	0.0014	0.0063	6.75E-04	0.0030	6.21E-04	0.0027
SSM/M1[1]	20.61	0.072	-	-	-	-	-	-	-	-	-	-
Totals	**25.95**	**24.84**	**2.21**	**9.66**	**0.32**	**1.41**	**0.20**	**0.86**	**1.08**	**5.14**	**0.94**	**4.83**

* Indicates an hourly emission rate is not appropriate for this unit

[1] Annual HAP emissions for SSM/M1 calculated assuming same HAP/VOC ratio as hourly emission rates [HAP tpy = HAP lb/hr / VOC lb/hr * VOC tpy]

Enterprise Field Services - Chaparral Gas Plant

Enclosed Combustion Device

Emission Unit: ECD-1
Source Description: DEHY-1 Still Vent Emissions

VOC Heat Input and Flow Rate Calculation Per Unit

Parameters	Value	Unit	Notes
Number of ECDs	1	-	
VOC Emissions	74.18	tpy	DEHY-1 Still Vent Emissions
HAP Emissions	6.29	tpy	DEHY-1 Still Vent Emissions
Capture Effiency	100%		
Captured VOC Emissions	74.18	tpy	DEHY-1 Still Vent Emissions
Captured HAP Emissions	6.29	tpy	DEHY-1 Still Vent Emissions
Safety Factor	25%		
VOC Emissions w/ SF	92.73	tpy	DEHY-1 Still Vent Emissions
HAP Emissions w/ SF	7.87	tpy	DEHY-1 Still Vent Emissions
Total Flared Gas Heating Value	2438.27	Btu/scf	Weighted average heating value from all streams
Total Flared Gas Flow	164.31	scf/hr	Total flow from all streams to flare
Total Flared Gas Heating Rate	0.401	MMBtu/hr	Calculated based on heating value and steady-state flow
	25%	%	Safety factor
Flared Gas Flow Rate with Safety Factor	205.39	scf/hr	Flow with safety factor
	1.799178	MMscf/yr	
Short-Term Safety Factor	0%	-	Applied to emissions to account for variations in heat content.
Heating Rate	0.501	MMBtu/hr	
	140	scf/hr	Engineering Estimate
	25%		Safety factor
Flare pilot	175	scf/hr	Pilot flow with safety factor
	1.75E-04	MMscf/hr	
Hours of Operation	8760.00	hrs	
Pipeline Gas HHV	950.00	Btu/scf	Facility specification
	0.166	MMBtu/hr	
Flare Heat Input	1.53	MMscf/yr	
Total Flare Flow Rate	9129.25	SCF/D	
Heating Rate + Pilot	0.67	MMBtu/hr	

Emission Rates Per Unit

	NO_X	CO	VOC[1]	SO_2[2]	H_2S	HAPs[1]	Units	Notes
Emission Factors	0.1380	0.2755					lb/MMBtu	TNRCC RG-109 (high Btu; other)
							lb H_2S/Mscf	
				1.00E-03			lb S/hr	
			92.73		-	7.87	tpy	DEHY-1 Still Vent Emissions
Pilot Emissions	0.023	0.046	-	2.00E-03		-	lb/hr	
	0.100	0.201	-	0.009		-	tpy	
Process Emissions	0.069	0.138	-	-	-	-	lb/hr	
			0.42	-	-	0.036	lb/hr	
	0.30	0.60	1.85	-	-	0.16	tpy	
Total Emissions	***0.092***	***0.18***	***0.42***	***2.00E-03***	***-***	***0.036***	lb/hr	
	0.40	***0.80***	***1.85***	***8.76E-03***	***-***	***0.16***	tpy	
							98%	DRE

[1] DEHY-1 BTEX emissions are controlled by ECD-1.
[2] Fuel sulfur content is assumed to be 5 gr/100 Scf
"-" Indicates emissions of this pollutant are not expected.
3 From TCEQ "Air Permit Guidance For Chemical Sources, Flare And Vapor Oxidizers" (Draft Oct. 2000) Table 4, emission factors for industrial flares combusting high-Btu vapors.
4 Based on US EPA AP-42 Chapter 1.4, Table 1.4-2, PM emission factor is used with a ratio of the default heating value of natural gas to the heating value of the waste gas.
5 Maximum Potential Hourly Emission Rate (lb/hr) = Gas Stream Heat Input (MMBtu/hr) x Emission Factor (lb/MMBtu)

Example NOx Hourly Emission Rate (lb/hr): 0.40 MMBtu / hr × 0.138 lb / MMBtu = 0.06 lb / hr

6 Maximum Potential Annual Emission Rate (tpy) = Gas Stream Heat Input (MMBtu/yr) x Emission Factor (lb/MMBtu) / (2,000 lb/ton)

Example NOx Annual Emission Rate (tpy): 3,509 MMBtu / yr × 0.138 lb / MMBtu × 1 ton / 2,000 lb = 0.24 ton / yr

Exhaust Parameters (F-factor method)

Heat Rate:	0.67	MMBtu/hr	Minimum Mfg. Specifications
Exhaust temp (Tstk):	1150	°F	Engineer Estimate
Site Elevation:	3374	ft MSL	
Ambient pressure (Pstk):	26.42	in. Hg	Calculated based on elevation
F factor:	10610	scf/MMBtu	40 CFR 60 Appx A Method 19
Exhaust flow	2.0	cfs	F Factor (scf/MMBtu) * Input Heat Rate (MMBtu/hr) / (60 min/hr) / (60 sec/min)
Stack diameter:	2.5	ft	Mfg. Specifications
Stack height:	9.42	ft	Mfg. Specifications
Exhaust velocity:	0.4	ft/sec	Exhaust flow ÷ stack area

GHGs	EF	Units	Source	CO2e mt/yr	GWP	CO2e mt CO_{2e}/yr
CO_2	53.06	kg/mmBTU	40 CFR 98	310.042	1	310.04
CH_4	1.00E-03	kg/mmBTU	40 CFR 98	0.00584	25	0.15
N_2O	1.00E-04	kg/mmBTU	40 CFR 98	0.00058	298	0.17
					Total	310.36

Enterprise Field Services - Chaparral Gas Plant

TEG Dehydrator Emissions

Unit: DEHY-1

Description: TEG Gylcol Dehydrator

Component	Flash Tank Emissions [1]		BTEX Condenser Emissions [1]		Total Uncontrolled Emissions	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
H2S	0.011	0.049	0.016	0.070	0.027	0.119
N2	0.260	1.138	0.003	0.012	0.262	1.150
CO2	2.977	13.038	0.931	4.080	3.908	17.117
C1	21.348	93.506	0.835	3.657	22.183	97.163
C2	13.713	60.064	1.755	7.686	15.468	67.750
C3	13.670	59.874	3.099	13.574	16.769	73.449
iC4	2.055	9.001	0.500	2.192	2.555	11.193
nC4	6.210	27.200	1.973	8.640	8.183	35.841
2,2-Dimethylpropane	0.021	0.091	0.006	0.027	0.027	0.118
iC5	2.040	8.933	0.843	3.692	2.883	12.626
nC5	2.351	10.298	1.012	4.435	3.364	14.733
2,2-Dimethylbutane	0.040	0.174	0.016	0.069	0.055	0.243
Cyclopentane	0.000	0.000	0.000	0.000	0.000	0.000
2,3-Dimethylbutane	0.337	1.475	0.144	0.630	0.481	2.105
2-Methylpentane	0.758	3.321	0.298	1.305	1.056	4.626
3-Methylpentane	0.465	2.036	0.204	0.893	0.669	2.929
nC6	0.946	4.144	0.366	1.605	1.313	5.749
Methylcyclopentane	0.914	4.005	0.938	4.110	1.853	8.115
Benzene	1.408	6.167	4.374	19.158	5.782	25.325
Cyclohexane	1.032	4.518	0.808	3.539	1.840	8.057
2-Methylhexane	0.149	0.655	0.048	0.208	0.197	0.863
3-Methylhexane	0.179	0.783	0.061	0.266	0.239	1.049
2,2,4-Trimethylpentane	0.000	0.000	0.000	0.000	0.000	0.000
nC7	0.732	3.206	0.224	0.981	0.956	4.186
Methylcyclohexane	0.737	3.227	0.385	1.685	1.121	4.912
Toluene	0.727	3.186	1.434	6.279	2.161	9.465
nC8	0.435	1.907	0.074	0.326	0.510	2.233
Ethylbenzene	0.000	0.000	0.000	0.000	0.000	0.000
m-Xylene	0.042	0.186	0.042	0.184	0.084	0.369
p-Xylene	0.042	0.182	0.040	0.174	0.081	0.356
o-Xylene	0.030	0.129	0.038	0.167	0.068	0.296
n-C9	0.092	0.403	0.011	0.046	0.103	0.450
n-Decane	0.000	0.000	0.000	0.000	0.000	0.000
H2O	0.608	2.662	0.881	3.857	1.488	6.520
TEG	0.006	0.025	0.000	0.000	0.006	0.025
Total VOC	**35.41**	**155.10**	**16.94**	**74.18**	**52.35**	**229.29**
Total HAP	**3.19**	**13.99**	**6.29**	**27.57**	**9.49**	**41.56**

[1] Glycol regenerator overheads are routed to a BTEX condenser are sent to the ECD-1 with a 98%. Flash gas emissions are routed to the fuel system and not to the still vent.

Enterprise Field Services - Chaparral Gas Plant

TEG Dehydrator Emissions

Unit: REBOILER-1
Description: Dehydrator Reboiler

Streams Controlled: Flash Gas

Heating Rate	2.00	MMBtu/hr	Input heat rate	
Fuel Heat Value	950	Btu/scf	Default	
Operating Hours	8760	hr/yr	Continuous operation	
	2.11	Mscf/hr	Caclulated	Heating Rate (MMBtu/hr) * (10^6 Btu/MMBtu) / Fuel HV (Btu/scf) * (Mscf/1000 scf)
Fuel Usage	50.53	Mscf/d	Calculated	Hourly fuel usage (Mscf/hr) * 24 hr/d
	18.44	MMscf/yr	Calculated	Hourly fuel usage (Mscf/hr) * 8760 hr/yr

	NO_x	CO	VOC	SO_2[1]	H_2S[1]	PM		
Reboiler Fuel Usage (Uncontrolled Emissions)	100.00	84.00	5.50			7.60	lb/MMscf	Unit emission rates from AP-42 Table 1.4-1 & 2
				0.0071			lb S/Mscf	Field gas assumed to contain 5 gr S/100scf
				0.0301			lb SO_2/hr	SO_2 Rate * fuel usage
	0.211	0.18	0.012	0.030	-	0.016	lb/hr	lb/MMscf * (Mscf/hr / 1000 Mscf/1 MMscf)
	0.92	0.77	0.051	0.13	-	0.070	tpy	lb/hr * 8760 hrs/yr / 2000 lb/ton
Controlled	**0.21**	**0.18**	**0.012**	**0.030**	**-**	**0.016**	**lb/hr**	
Emissions	**0.92**	**0.77**	**0.05**	**0.13**	**-**	**0.070**	**tpy**	

	n-Hexane	Benzene	Toluene	Ethylbenzene	Xylenes	HCHO	Total HAPs		
Reboiler Fuel Usage (Uncontrolled Emissions)	0.0028	0.0014	0.0020	0.0042	0.0026	0.0017	0.0288	lb/hr	Reboiler Emissions (based on GRI-HAPCalc calculations)
	0.0123	0.0060	0.0089	0.0185	0.0116	0.0074	0.1263	tpy	
Controlled	**0.003**	**0.001**	**0.002**	**0.004**	**0.003**	**0.002**	**0.029**	**lb/hr**	
Emissions	**0.025**	**0.012**	**0.018**	**0.019**	**0.012**	**0.007**	**0.13**	**tpy**	

[1] 100% of combusted H2S is converted to SO_2.

GHG Calculations

	CO_2[3]	N_2O[3]	CH_4[3]	CO_2e[3]		
Reboiler Fuel Usage (Uncontrolled Emissions)	53.06	0.00010	0.0010		kg/MMBtu	40 CFR 98 Subpart C Tables C-1 and C-2
	1	298	25		GWP	40 CFR 98 Table A-1
	1024.7	0.0019	0.019		tpy	Reboiler
	1024.71	**0.58**	**0.48**	**1025.77**	tpy CO_2e	
Total	**1024.71**	**0.58**	**0.48**	**1025.77**	**tpy CO_2e**	

[3] N2O, CH4, and CO2 tpy Emission Rate= EF* Fuel Usage * Fuel Heat Value * 2.20462 lb/1 kg * 1 ton/2000 lb
CO_2e tpy Emission Rate = CO_2 Emission Rate + N_2O Emission Rate*GWP Factor +CH_4 Emission Rate*GWP Factor

Reboiler Stack Parameters

Heat Rate:	2000	MBtu/hr	
Exhaust temp (Tstk):	600	°F	Estimate
Site Elevation:	2,884	ft MSL	
Ambient pressure (Pstk):	26.91	in. Hg	Calculated based on elevation
F factor:	10610	wscf/MMBtu	40 CFR 60 Appx A Method 19
Exhaust flow	353.7	scfm	Calculated from F factor and heat rate
Exhaust flow:	801.6	acfm	scfm * (Pstd/Pstk)*(Tstk/Tstd), Pstd = 29.92 "Hg, Tstd = 520 °R
Stack diameter:	3.50	ft	Engineering estimate
Stack height:	11.5	ft	Engineering estimate
Exhaust velocity:	1.39	ft/sec	Exhaust flow ÷ stack area

Unit(s): E-1000
Description: CAT G3516 LE Natural gas-fired reciprocating compressor engines

Engine Horsepower and RPM

Engine speed:	1200	rpm	Mfg data
Rating:	1340	hp	
Load:	100%		

Fuel Consumption

BSFC:	7415	Btu/hp-hr	Mfg data
Fuel heat value:	950	Btu/scf	Nominal LHV
Heat input:	9.9	MMBtu/hr	BSFC * site hp
Fuel consumption:	10.5	Mscf/hr	Heat input / fuel heat value
Annual fuel usage:	91.6	MMscf/yr	8760 hrs/yr operation

Uncontrolled Emissions

NO_x	CO	NMHC	SO_2[1]	PM[2]		
1.5	1.8	0.49			g/hp-hr	Mfg data
				9.99E-03	lb/MMBtu	AP-42 Table 3.2-2 (7/00)
			5		gr S/100 scf	Pipeline specification
4.43	**5.32**	**1.45**	**0.15**	**0.099**	lb/hr[4]	Hourly emission rate
19.41	**23.29**	**6.34**	**0.65**	**0.43**	tpy[5]	Annual emission rate (8760 hrs/yr)

Controlled Emissions

NO_x	CO	NMHC	SO_2[1]	PM[2]	
0%	83%	50%	0%	0%	%Control
4.43	**0.90**	**0.72**	**0.15**	**0.099**	lb/hr
19.41	**3.96**	**3.17**	**0.65**	**0.43**	tpy

HAP Emissions[3]

Pollutant	EF	Uncontrolled Emissions		Controlled Emissions	
	(lb/MMBtu)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
1,1,2,2-Tetrachloroethane	4.00E-05	0.0004	0.00174	0.00007	0.00030
1,1,2-Trichloroethane	3.18E-05	0.0003	0.00138	0.00005	0.00024
1,3-Butadiene	2.67E-04	0.0027	0.01162	0.00045	0.00198
1,3-Dichloropropene	2.64E-05	0.0003	0.00115	0.00004	0.00020
2-Methylnaphthalene	3.32E-05	0.0003	0.00144	0.00006	0.00025
2,2,4-Trimethylpentane	2.50E-04	0.0025	0.01088	0.00042	0.00185
Acenaphthene	1.25E-06	0.0000	0.00005	0.00000	0.00001
Acenaphthylene	5.53E-06	0.0001	0.00024	0.00001	0.00004
Acetaldehyde	8.36E-03	0.0831	0.36383	0.01412	0.06185
Acrolein	5.14E-03	0.0511	0.22369	0.00868	0.03803
Benzene	4.40E-04	0.0044	0.01915	0.00074	0.00326
Benzo(b)fluoranthene	1.66E-07	0.0000	0.00001	0.00000	0.00000
Benzo(e)pyrene	4.15E-07	0.0000	0.00002	0.00000	0.00000
Benzo(g,h,i)perylene	4.14E-07	0.0000	0.00002	0.00000	0.00000
Biphenyl	2.12E-04	0.0021	0.00923	0.00036	0.00157
Carbon Tetrachloride	3.67E-05	0.0004	0.00160	0.00006	0.00027
Chlorobenzene	3.04E-05	0.0003	0.00132	0.00005	0.00022
Chloroform	2.85E-05	0.0003	0.00124	0.00005	0.00021
Chrysene	6.93E-07	0.0000	0.00003	0.00000	0.00001
Ethylbenzene	3.97E-05	0.0004	0.00173	0.00007	0.00029
Ethylene Dibromide	4.43E-05	0.0004	0.00193	0.00007	0.00033
Fluoranthene	1.11E-06	0.0000	0.00005	0.00000	0.00001
Fluorene	5.67E-06	0.0001	0.00025	0.00001	0.00004
Formaldehyde	5.28E-02	0.5246	2.29786	0.08919	0.39064
Methanol	2.50E-03	0.0248	0.10880	0.00422	0.01850
Methylene Chloride	2.00E-05	0.0002	0.00087	0.00003	0.00015
n-Hexane	1.11E-03	0.0110	0.04831	0.00187	0.00821
Naphthalene	7.44E-05	0.0007	0.00324	0.00013	0.00055
PAH	2.69E-05	0.0003	0.00117	0.00005	0.00020
Phenanthrene	1.04E-05	0.0001	0.00045	0.00002	0.00008
Phenol	2.40E-05	0.0002	0.00104	0.00004	0.00018
Pyrene	1.36E-06	0.0000	0.00006	0.00000	0.00001
Styrene	2.36E-05	0.0002	0.00103	0.00004	0.00017
Tetrachloroethane	2.48E-06	0.0000	0.00011	0.00000	0.00002
Toluene	4.08E-04	0.0041	0.01776	0.00069	0.00302
Vinyl Chloride	1.49E-05	0.0001	0.00065	0.00003	0.00011
Xylene	1.84E-04	0.0018	0.00801	0.00031	0.00136
	Total	**0.72**	**3.14**	**0.12**	**0.53**

*HAP emissions are controlled at 83% by oxidation catalyst.

[1] SO_2 calculation assumes 100% converstion of fuel elemental sulfur to SO_2.
[2] TSP = PM-10 = PM2.5 = AP-42 PM10(filterable) + PM Condensable
[3] HAPs calculated using AP-42 Table 3.2-2 (7/2000) for 4SLB engines
[4] NO_x, CO, and VOC lb/hr Emission Rate = EF * 1lb/453.592g * hp
SO2 lb/hr Emission Rate = (5 grains S/100 scf) * (1 lb/7000 grains) * Fuel Consumption (Mscf/hr) * ((64 g/mol SO2) / (32 g/mol S))
PM lb/hr Emission Rate = EF (lb/MMBtu) * Heat Input (MMBtu/hr)
[5] tpy = lb/hr * hours of operation * 1ton/2000lb

Greenhouse Gas Calculations[7]

CO_2	N_2O	CH_4	CO_2e	
53.1	0.0001	0.001		kg/MMBtu
1	298	25		GWP[8]
1162.3	0.0022	0.022	1163.5	lb/hr[9]
5090.9	0.0096	0.096	5096.1	tpy[6]

[7] Greenhouse gas emission factors are from 40 CFR 98 Subpart C
[8] 40 CFR 98 Subpart A, Table A-1
[9] CO_2, N_2O, CH_4 lb/hr = EF (kg/MMBtu) * 2.20462lb/kg * Fuel consumption (MMBtu/hr) * Engine hp * 1MMBtu/10^6Btu
CO_2e lb/hr = CO_2 lb/hr + (CH_4 lb/hr * GWP) + (N_2O lb/hr * GWP)

Exhaust Parameters

Exhaust temp (Tstk):	840	°F	Mfg data
Stack height:	23.5	ft	Eng estimate
Stack diameter:	1.167	ft	Eng estimate
Exhaust flow:	6415	acfm	Mfg data
Exhaust velocity:	100.0	ft/sec	Exhaust flow ÷ stack area

Unit(s): E-2000,E-5000
Description: CAT G3516 LE Natural gas-fired reciprocating compressor engines

Engine Horsepower and RPM

Engine speed:	1200	rpm	Mfg data
Rating:	1340	hp	
Load:	100%		

Fuel Consumption

BSFC:	7415	Btu/hp-hr	Mfg data
Fuel heat value:	950	Btu/scf	Nominal LHV
Heat input:	9.9	MMBtu/hr	BSFC * site hp
Fuel consumption:	10.5	Mscf/hr	Heat input / fuel heat value
Annual fuel usage:	91.6	MMscf/yr	8760 hrs/yr operation

Uncontrolled Emissions

NO_x	CO	NMHC	SO_2[1]	PM^2		
1.5	1.8	0.49			g/hp-hr	Mfg data
				9.99E-03	lb/MMBtu	AP-42 Table 3.2-2 (7/00)
			5		gr S/100 scf	Pipeline specification
4.43	**5.32**	**1.45**	**0.15**	**0.099**	lb/hr[4]	Hourly emission rate
19.41	**23.29**	**6.34**	**0.65**	**0.43**	tpy[5]	Annual emission rate (8760 hrs/yr)

Controlled Emissions

NO_x	CO	NMHC	SO_2[1]	PM^2	
0%	0%	0%	0%	0%	%Control
4.43	**5.32**	**1.45**	**0.15**	**0.099**	lb/hr
19.41	**23.29**	**6.34**	**0.65**	**0.43**	tpy

HAP Emissions[3]

Pollutant	EF	Emissions	
	(lb/MMBtu)	(lb/hr)	(tpy)
1,1,2,2-Tetrachloroethane	4.00E-05	0.0004	0.00174
1,1,2-Trichloroethane	3.18E-05	0.0003	0.00138
1,3-Butadiene	2.67E-04	0.0027	0.01162
1,3-Dichloropropene	2.64E-05	0.0003	0.00115
2-Methylnaphthalene	3.32E-05	0.0003	0.00144
2,2,4-Trimethylpentane	2.50E-04	0.0025	0.01088
Acenaphthene	1.25E-06	0.0000	0.00005
Acenaphthylene	5.53E-06	0.0001	0.00024
Acetaldehyde	8.36E-03	0.0831	0.36383
Acrolein	5.14E-03	0.0511	0.22369
Benzene	4.40E-04	0.0044	0.01915
Benzo(b)fluoranthene	1.66E-07	0.0000	0.00001
Benzo(e)pyrene	4.15E-07	0.0000	0.00002
Benzo(g,h,i)perylene	4.14E-07	0.0000	0.00002
Biphenyl	2.12E-04	0.0021	0.00923
Carbon Tetrachloride	3.67E-05	0.0004	0.00160
Chlorobenzene	3.04E-05	0.0003	0.00132
Chloroform	2.85E-05	0.0003	0.00124
Chrysene	6.93E-07	0.0000	0.00003
Ethylbenzene	3.97E-05	0.0004	0.00173
Ethylene Dibromide	4.43E-05	0.0004	0.00193
Fluoranthene	1.11E-06	0.0000	0.00005
Fluorene	5.67E-06	0.0001	0.00025
Formaldehyde	5.28E-02	0.5246	2.29786
Methanol	2.50E-03	0.0248	0.10880
Methylene Chloride	2.00E-05	0.0002	0.00087
n-Hexane	1.11E-03	0.0110	0.04831
Naphthalene	7.44E-05	0.0007	0.00324
PAH	2.69E-05	0.0003	0.00117
Phenanthrene	1.04E-05	0.0001	0.00045
Phenol	2.40E-05	0.0002	0.00104
Pyrene	1.36E-06	0.0000	0.00006
Styrene	2.36E-05	0.0002	0.00103
Tetrachloroethane	2.48E-06	0.0000	0.00011
Toluene	4.08E-04	0.0041	0.01776
Vinyl Chloride	1.49E-05	0.0001	0.00065
Xylene	1.84E-04	0.0018	0.00801
	Total	**0.72**	**3.14**

[1] SO_2 calculation assumes 100% converstion of fuel elemental sulfur to SO_2.
[2] TSP = PM-10 = PM2.5 = AP-42 PM10(filterable) + PM Condensable
[3] HAPs calculated using GRI-HAPCalc
[4] NO_x, CO, and VOC lb/hr Emission Rate = EF * 1lb/453.592g * hp
SO2 lb/hr Emission Rate = (5 grains S/100 scf) * (1 lb/7000 grains) * Fuel Consumption (Mscf/hr) * ((64 g/mol SO2) / (32 g/mol S))
PM lb/hr Emission Rate = EF (lb/MMBtu) * Heat Input (MMBtu/hr)
[5] tpy = lb/hr * hours of operation * 1ton/2000lb

Greenhouse Gas Calculations[7]

CO_2	N_2O	CH_4	CO_2e	
53.1	0.0001	0.001		kg/MMBtu
1	298	25		GWP[8]
1162.3	0.0022	0.022	1163.5	lb/hr[9]
5090.9	0.0096	0.096	5096.1	tpy[6]

[7] Greenhouse gas emission factors are from 40 CFR 98 Subpart C
[8] 40 CFR 98 Subpart A, Table A-1
[9] CO_2, N_2O, CH_4 lb/hr = EF (kg/MMBtu) * 2.20462lb/kg * Fuel consumption (MMBtu/hr) * Engine hp * 1MMBtu/10^6Btu
CO_2e lb/hr = CO_2 lb/hr + (CH_4 lb/hr * GWP) + (N_2O lb/hr * GWP)

Exhaust Parameters

Exhaust temp (Tstk):	840	°F	Mfg data
Stack height:	23.8, 21	ft	Eng estimate
Stack diameter:	1.167	ft	Eng estimate
Exhaust flow:	6415	acfm	Mfg data
Exhaust velocity:	100.0	ft/sec	Exhaust flow ÷ stack area

Unit(s):	E-3000, E-4000
Description:	Natural gas-fired reciprocating compressor engines
Manufacturer:	Wauskesha
Model:	L7042 GL
Aspiration:	TA
Compression ratio:	10.5:1

Engine Horsepower and RPM

Engine speed:	1200	rpm	Mfg data
Rating:	1547	hp	
Load:	100%		

Fuel Consumption

BSFC:	7350	Btu/hp-hr	Mfg data
Fuel heat value:	950	Btu/scf	Nominal LHV
Heat input:	11.4	MMBtu/hr	BSFC * site hp
Fuel consumption:	12.0	Mscf/hr	Heat input / fuel heat value
Annual fuel usage:	104.8	MMscf/yr	8760 hrs/yr operation

Uncontrolled Emissions

NO_x[2]	CO[2]	NMHC[2]	SO_2[1]	TSP[2]		
1.5	2.65	1.0			g/hp-hr	Mfg data
			5		grains S/100 scf	Pipeline specification
				9.99E-03	lb/MMBtu	AP-42 Table 3.2-2 (7/00)
5.1	**9.0**	**3.4**	**0.17**	**0.11**	lb/hr	Hourly emission rate
22.4	**39.6**	**14.9**	**0.75**	**0.50**	tpy	Annual emission rate (8760 hrs/yr)

Controlled Emissions

NO_x[2]	CO[2]	NMHC[2]	SO_2[1]	TSP[3]		
5.1	9.04	3.4	0.17	0.11	lb/hr	Calculated above
	80%					Catalyst control efficiency
5.1	**1.8**	**3.4**	**0.17**	**0.11**	lb/hr	Hourly emission rate
22.4	**7.9**	**14.9**	**0.75**	**0.50**	tpy	Annual emission rate (8760 hrs/yr)

HAPs	g/hp-hr	tpy[5]	Control	Controlled (tpy)
Formaldehyde[2]	0.29	4.3321	80%	0.87
Methanol		0.1231	80%	0.025
Acetaldehyde		0.4118	80%	0.082
Acrolein		0.2532	80%	0.051
Benzene		0.0217	80%	0.0043
Toluene		0.0201	80%	0.0040
Ethylbenzene		0.0020	80%	0.0004
Xylene		0.0091	80%	0.0018
n-Hexane		0.0547	80%	0.01094
Other HAPs		0.060	80%	0.012
Total HAPs		5.2876	80%	1.06

[1] SO_2 calculation assumes 100% converstion of fuel elemental sulfur to SO_2.

[2] Manufacturer's Data

[3] TSP = PM-10 = AP-42 PM10(filterable) + PM Condensable

[4] PM-2.5 = AP-42 PM2.5(filterable) + PM Condensable

[5] GRI-HAPCalc 3.01

[6] NO_x, CO, and VOC lb/hr Emission Rate = EF * 1lb/453.592g * hp

SO2 lb/hr = (5gr S/100 scf) * (1lb/7000 gr) * Fuel Consumption (Mscf/hr) * 64g/molSO2 / 32g/mol S

PM lb/hr = EF * Fuel Consumption * hp * 1MMBtu/10^6Btu

[7] tpy = lb/hr * hours of operation * 1ton/2000lb

Greenhouse Gas Calculations[8]

CO_2	N_2O	CH_4	CO_2e	
53.1	0.0001	0.001		kg/MMBtu
1	298	25		GWP[9]
1330.1	0.0025	0.025	1331.5	lb/hr[10]
5825.8	0.011	0.11	5831.8	tpy[7]

[8] Greenhouse gas emission factors are from 40 CFR 98 Subpart C

[9] 40 CFR 98 Subpart A, Table A-1

[10] CO_2, N_2O, CH_4 lb/hr = EF (kg/MMBtu) * 2.20462lb/kg * Fuel consumption (MMBtu/hr) * Engine hp * 1MMBtu/10^6Btu

CO_2e lb/hr = CO_2 lb/hr + (CH_4 lb/hr * GWP) + (N_2O lb/hr * GWP)

Exhaust Parameters

Exhaust temp (Tstk):	810	°F	Mfg data
Exhaust flow	16450	lb/hr	Mfg data
Exhaust flow	9183.1	acfm	Mfg data
Stack diameter:	1.5	ft	Design
Stack height:	24	ft	Design
Exhaust velocity:	86.6	ft/sec	Exhaust flow ÷ stack area

Unit(s): E-6000
Description: CAT G3516LE natural gas-fired reciprocating compressor engine

Engine Horsepower and RPM

Engine speed:	1400	rpm	Mfg data
Rating:	1340	hp	
Load:	100%		

Fuel Consumption

BSFC:	7405	Btu/hp-hr	Mfg data
Fuel heat value:	950	Btu/scf	Nominal LHV
Heat input:	9.9	MMBtu/hr	BSFC * site hp
Fuel consumption:	10.4	Mscf/hr	Heat input / fuel heat value
Annual fuel usage:	91.5	MMscf/yr	8760 hrs/yr operation

Uncontrolled Emissions

NO_x	CO	NMHC	SO_2[1]	TSP[2]		
2.00	1.86	0.26			g/hp-hr	Mfg data
			5		gr S/100scf	Pipeline specification
				9.987E-03	lb/MMBtu	AP-42 Table 3.2-2 (7/00)
5.9	**5.5**	**0.77**	**0.15**	**0.10**	lb/hr[4]	Hourly emission rate
25.9	**24.1**	**3.4**	**0.65**	**0.43**	tpy[5]	Annual emission rate (8760 hrs/yr)

Controlled Emissions

NO_x	CO	NMHC	SO_2[1]	PM[2]	
0%	0%	0%	0%	0%	%Control
5.9	**5.49**	**0.77**	**0.15**	**0.099**	lb/hr
25.9	**24.1**	**3.4**	**0.65**	**0.43**	tpy

HAPs Emissions[3]

HCHO	Methanol	Acetaldehyde	Acrolein	Benzene	Toluene	e-Benzene	Xylene	n-Hexane	Other HAPs	Total HAPs	
0.5143	0.0244	0.0814	0.0501	0.0043	0.0040	0.0004	0.0018	0.0108	0.012	0.7032	lb/hr
2.2528	0.1067	0.3567	0.2193	0.0188	0.0174	0.0017	0.0079	0.0474	0.051	3.0802	tpy
0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	%Control
0.5143	0.0244	0.0814	0.0501	0.0043	0.0040	0.0004	0.0018	0.0108	0.012	0.7032	lb/hr
2.2528	0.1067	0.3567	0.2193	0.0188	0.0174	0.0017	0.0079	0.0474	0.051	3.0802	tpy

[1] SO_2 calculation assumes 100% converstion of fuel elemental sulfur to SO_2.

[2] TSP = PM10 = PM2.5 = AP-42 PM10(filterable) + PM Condensable

[3] HAPs calculated using GRI-HAPCalc

[4] NOx, CO, and VOC lb/hr Emission Rate = EF * 1lb/453.592g * hp
SO2 lb/hr Emission Rate = (5 grains S/100 scf) * (1 lb/7000 grains) * Fuel Consumption (Mscf/hr) * ((64 g/mol SO2) / (32 g/mol S))
PM lb/hr Emission Rate = EF * Fuel Consumption * hp * 1MMBtu/106Btu

[5] tpy = lb/hr * hours of operation * 1ton/2000lb

Greenhouse Gas Calculations[7]

CO_2	N_2O	CH_4	CO_2e	
53.1	0.0001	0.001		kg/MMBtu
1	298	25		GWP[8]
1160.7	0.0022	0.022	1161.9	lb/hr[9]
5084.0	0.010	0.10	5089.2	tpy[6]

[7] Greenhouse gas emission factors are from 40 CFR 98 Subpart C

[8] 40 CFR 98 Subpart A, Table A-1

[9] CO2, N2O, CH4 lb/hr = EF (kg/MMBtu) * 2.20462lb/kg * Fuel consumption (MMBtu/hr) * Engine hp * 1MMBtu/106Btu
CO2e lb/hr = CO2 lb/hr + (CH4 lb/hr * GWP) + (N2O lb/hr * GWP)

Exhaust Parameters

Exhaust temp (Tstk):	873	°F	Mfg data
Stack height:	21	ft	Eng estimate
Stack diameter:	1.20	ft	Eng estimate
Exhaust flow:	7663	acfm	Mfg data
Exhaust velocity:	112.9	ft/sec	Exhaust flow ÷ stack area

Unit Numbers:	E-7000
Source description:	4SLB
Manufacturer:	Caterpillar
Model:	G3516LE
Aspiration:	Turbocharged-Aftercooled

Engine Horsepower and RPM

Engine speed:	1,400.0	rpm	Mfg data
Sea level hp:	1,340.0	hp	Mfg data
	-	%	Per 1,000 ft above 4,000 ft
Elevation	3,431.0	ft	
Derated hp:	1,340.00	hp	
Conversion Factor	1.34	hp/kW	
Conversion Factor	0.0022	g/lb	
Conversion Factor	2,000.00	lb/ton	
Annual Hours of Operation	8,760.00	hr	
Fuel Rate	47.00	L/hr	
Fuel Rate	12.42	gal/hr	

Fuel Consumption

BSFC:	7405.00	Btu/hp-hr	Mfg data
Fuel heat value:	950.00	Btu/scf	Pipeline Specifcation
Heat Input	9.92	MMBtu/hr	BSFC*site hp
Fuel Consumption	10.44	Mscf/hr	Heat input / fuel heat value
Annual Fuel Usage	91.50	MMscf/yr	8760 hrs operation

Exhaust Parameters

Exhaust Temp	873	F	Mfg Data
Exhaust Flow	7663.0	cfm	Mfg Data

Emission Calculations

Uncontrolled Emissions

NOx	CO	VOC	SO_2[1]	HCHO	TSP[2]		
2.0	2.32	0.42		0.22		g/hp-hr	Mfg Data
			5.0			gr S/100Scf	Pipeline Specification
					0.00991	lb/MMBtu	AP-42 Table 3.2-2(7/00)
5.91	**6.85**	**1.24**	**0.15**	**0.65**	**0.10**	lb/hr[3]	Hourly emission rate
25.88	**30.02**	**5.43**	**0.65**	**2.85**	**0.43**	tpy[4]	Annual emission rate

Controlled Emissions

NOx	CO	VOC	SO_2	TSP	
5.9	6.9	1.2	0.15	0.10	
0%	80%	0%	0%	0%	% Control
5.91	**1.37**	**1.24**	**0.15**	**0.10**	lb/hr
25.88	**6.00**	**5.43**	**0.65**	**0.43**	tpy

HAPs Emissions [5]

HCHO	Methanol	Acetaldehyde	Acrolein	Benzene	Toluene	e-Benzene	Xylene	n-Hexane	Other HAPs	Total HAPs	
0.6499	0.0244	0.0814	0.0501	0.0043	0.0040	0.0004	0.0018	0.0108	0.012	0.8388	lb/hr
2.8467	0.1067	0.3567	0.2193	0.0188	0.0174	0.0017	0.0079	0.0474	0.051	3.6741	tpy
80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	80%	%Control
0.1300	0.0049	0.0163	0.0100	0.0009	0.0008	0.0001	0.0004	0.0022	0.0024	0.1678	lb/hr
0.5693	0.0213	0.0713	0.0439	0.0038	0.0035	0.0003	0.0016	0.0095	0.010	0.7348	tpy

[1] SO_2 calculation assumes 100% converstion of fuel elemental sulfur to SO_2.

[2] TSP = PM10 = PM2.5 = AP-42 PM10(filterable) + PM Condensable

[3] NOx, CO, and VOC lb/hr Emission Rate = EF * 1lb/453.592g * hp
SO2 lb/hr Emission Rate = (5 grains S/100 scf) * (1 lb/7000 grains) * Fuel Consumption (Mscf/hr) * ((64 g/mol SO2) / (32 g/mol S))
PM lb/hr Emission Rate = EF * Fuel Consumption * hp * 1MMBtu/106Btu

[4] tpy = lb/hr * hours of operation * 1ton/2000lb

[5] HAPs calculated using GRI-HAPCalc

Correction of GRI-HAPCalc, HAPs emissions rates to account for Mfg. HCHO rates

Total HAP	3.0802	tpy	From Gri-HAPCalc
Total HCHO	-2.2528	tpy	From Gri-HAPCalc
Total HAP-HCHO	0.827	tpy	Total Gri-HAP Calc HAP emission rate without HCHO
Mfg HCHO	2.847	tpy	Manufactures HCHO tpy emission rate based on 0.022 g/bhp-hr
Total HAP	3.674	tpy	Corrected Total HAPs emission rate taking into consideration mfg HCHO emission rate

Greenhouse Gas Calculations[6]

CO_2	N_2O	CH_4	CO_2e	
53.1	0.0001	0.001		kg/MMBtu
1	298	25		GWP[7]
1160.7290	0.0022	0.0219	1161.9	lb/hr[8]
5083.9932	0.0096	0.0958	5089.2	tpy

[6] Greenhouse gas emission factors are from 40 CFR 98 Subpart C

[7] 40 CFR 98 Subpart A, Table A-1

[8] CO2, N2O, CH4 lb/hr = EF (kg/MMBtu) * 2.20462lb/kg * Fuel consumption (MMBtu/hr) * Engine hp * 1MMBtu/10^6Btu
CO2e lb/hr = CO2 lb/hr + (CH4 lb/hr * GWP) + (N2O lb/hr * GWP)

Exhaust Parameters

Exhaust temp (Tstk):	873	°F	Mfg data
Stack height:	21	ft	Eng estimate
Stack diameter:	1.20	ft	Eng estimate
Exhaust flow:	7663	acfm	Mfg data
Exhaust velocity:	112.9	ft/sec	Exhaust flow ÷ stack area

Unit(s): E-VRU-1
Description: CAT G3508 LE natural-gas fired engine

Engine Horsepower and RPM

Engine speed:	1400	rpm	Mfg data
Rating:	515	hp	

Fuel Consumption

BSFC:	7510	Btu/hp-hr	Mfg data
Fuel heat value:	950	Btu/scf	Pipeline specification
Heat input:	3.9	MMBtu/hr	BSFC * site hp
Fuel consumption:	4.1	Mscf/hr	Heat input / fuel heat value
Annual fuel usage:	35.7	MMscf/yr	8760 hrs/yr operation

Uncontrolled Emission Calculations

NO_x	CO	VOC	SO_2[1]	PM[2]		
2.0	2.00	0.70			g/hp-hr	Mfg data
			5		gr S/100 scf	Pipeline specification
				9.99E-03	lb/MMBtu	AP-42 Table 3.2-2 (7/00)
2.3	**2.3**	**0.79**	**0.058**	**0.039**	lb/hr[5]	Hourly emission rate
9.9	**9.9**	**3.5**	**0.25**	**0.17**	tpy[6]	Annual emission rate (8760 hrs/yr)

Controlled Emission Calculations

NO_x	CO	VOCs	SO_2[1]	PM[2]		
0%	83%	50%	0%	0%	%Control	
2.3	**0.39**	**0.40**	**0.058**	**0.039**	lb/hr[4]	Hourly emission rate
9.9	**1.7**	**1.7**	**0.25**	**0.17**	tpy[5]	Annual emission rate (8760 hrs/yr)

HAP Emissions Calculations[3]

HCOH	Acetaldehyde	Acrolein	Benzene	Toluene	e-Benzene	Xylenes	n-Hexane	Other HAPs	Total HAPs	
0.14	0.019	0.0084	0.0040	0.0041	0.00037	0.0014	0.0037	0.011	0.20	lb/hr
0.63	0.081	0.037	0.017	0.018	0.0016	0.0063	0.016	0.047	0.86	tpy
83%	83%	83%	83%	83%	83%	83%	83%	83%	83%	%Control
0.024	0.003	0.0014	0.0007	0.0007	0.000	0.0002	0.0006	0.0018	0.042	lb/hr
0.11	0.014	0.006	0.003	0.003	0.0003	0.0011	0.003	0.0080	0.18	tpy

[1] SO_2 calculation assumes 100% converstion of fuel elemental sulfur to SO_2.

[2] TSP = PM10 = PM2.5 = AP-42 PM10(filterable) + PM Condensable

[3] HAPs calculated using GRI-HAPCalc

[5] NO_x, CO, and VOC lb/hr Emission Rate = EF * 1lb/453.592g * hp
SO2 lb/hr Emission Rate = (5 grains S/100 scf) * (1 lb/7000 grains) * Fuel Consumption (Mscf/hr) * ((64 g/mol SO2) / (32 g/mol S))
PM lb/hr Emission Rate = EF (lb/MMBtu) * Heat Input (MMBtu/hr)

[6] tpy = lb/hr * hours of operation * 1ton/2000lb

Greenhouse Gas Calculations[7]

CO_2	N_2O	CH_4	CO_2e	
53.06	0.0001	0.001		kg/MMBtu
1	298	25		GWP[8]
452.4	0.0009	0.009	452.9	lb/hr[9]
1981.6	0.0037	0.037	1983.7	tpy[6]

[7] Greenhouse gas emission factors are from 40 CFR 98 Subpart C

[8] 40 CFR 98 Subpart A, Table A-1

[9] CO_2, N_2O, CH_4 lb/hr = EF (kg/MMBtu) * 2.20462lb/kg * Fuel consumption (MMBtu/hr) *
CO_2e lb/hr = CO_2 lb/hr + (CH_4 lb/hr * GWP) + (N_2O lb/hr * GWP)

Exhaust Parameters

Exhaust temp (Tstk):	1007	°F	Mfg data
Stack height:	18	ft	Eng estimate
Stack diameter:	0.67	ft	Eng estimate
Exhaust flow:	4086	acfm	Mfg data
Exhaust velocity:	195.1	ft/sec	Exhaust flow ÷ stack area

Unit(s):	MOLE-1
Description:	Natural gas fired heater
Manufacturer:	Power Flame

Fuel Consumption

Total input heat rate:	2.8	MMBtu/hr	
Fuel heat value:	950	Btu/scf	Nominal LHV
Max fuel rate:	3.0	Mscf/hr	Input heat rate / fuel heat value
Max annual fuel usage:	25.9	MMscf/yr	8760 hrs/yr operation

Emission Rates

NO_x	CO	NMHC	SO_2[1]	TSP[2]	
100	84	5.5		7.6	lb/MMscf
93.14	78.24	5.12		7.08	lb/MMscf Convert emission factor based on heat value, divide by 1,020 multiply by 950 Btu/scf
			5		gr S/100scf
0.28	**0.23**	**0.015**	**0.042**	**0.021**	lb/hr[3]
1.2	**1.0**	**0.066**	**0.19**	**0.092**	tpy[4]

HAPs

HCHO	Methanol	Acetaldehyde	Acrolein	Benzene	Toluene	e-Benzene	Xylene	n-Hexane	Total HAPs		
0.0024	0.0027	0.0021	-	0.0021	0.0029	0.0059	0.0037	0.0039	0.0404		
0.0104	0.0118	0.0090	-	0.0092	0.0125	0.0259	0.0162	0.0173	0.1769	tpy	GRI-HAPCalc

[1] 5 gr S/100scf. SO_2 calculation assumes 100% conversion of fuel elemental sulfur to SO_2.

[2] Assumes PM (Total) = TSP = PM-10 = PM-2.5

[3] lb/hr = Emission Factor (lb/MMscf) x Max Fuel Rate (Mscf/hr) x 10^-3 (MMscf/Mscf)

[4] tpy = lb/hr * hours of operation * 1ton/2000lb

[5] HAPs from GRI-HAPCalc 3.01

Greenhouse Gas Calculations[5]

CO_2	N_2O	CH_4	CO_2e	
53.1	0.0001	0.001		kg/MMBtu
1	298	25		GWP[6]
366.8	0.00069	0.0069	367.2	lb/hr[7]
1606.6	0.0030	0.030	1608.3	tpy[4]

[5] Greenhouse gas emission factors are from 40 CFR 98 Subpart C

[6] 40 CFR 98 Subpart A, Table A-1

[7] CO2, N2O, CH4 lb/hr = EF (kg/MMBtu) * 2.20462lb/kg * Fuel Rate (Mscf/hr) * 10^-3 (MMscf/Mscf)*Heating Value (MMBtu/MMscf)
CO2e lb/hr = CO2 lb/hr + (CH4 lb/hr * GWP) + (N2O lb/hr * GWP)

Reboiler Stack Exhaust Parameters

Site elevation:	3431	ft MSL	
Standard pressure:	29.92	in Hg	
Pressure at elevation:	26.4	in Hg	Hess, Introduction to Theoretical Meteorology, eqn. 6.8
Standard temperature:	528	R	
Exhaust temp:	212	°F	Eng. estimate
Stack height:	15	ft	Design specification
Stack diameter:	0.5	ft	Design specification
F factor:	10610	wscf/10e6 Btu	40 CFR 60 Appx A Method 19
Exhaust flow:	497	scfm	Heat input * F factor/60
Exhaust flow:	718	acfm	Va = Vs*(Ps/Pa)*(Ta/Ts)
Exhaust velocity:	61	ft/sec	Exhaust flow / stack area

Unit: FLARE
Destruction Efficiency: 98% Manufacturer guarantee

Waste stream flaring

Operating hours:	8760	hr/yr	
Hourly process flow:	0.019	MMscf/hr	Per 'Chaparral Flare List_DEW Pt Running_70MMSCFD_REV2' spreadsheet
Higher Heating Value:	1964.0	Btu/scf	Per 'Chaparral Flare List_DEW Pt Running_70MMSCFD_REV2' spreadsheet
Max hourly heat rate:	38.1	MMBtu/hr	Heating value of flare analysis (Btu/scf) * Volume (Mscf/hr)

Pilot emissions

Pilot gas flow:	150	scf/hr	Based on previous emission calculation
Natural Gas Heat Value	950	Btu/Scf	
Max hourly heat rate:	0.14	MMBtu/hr	

Composition[1]	Mol%	Spec Volume[2] (scf/lb)	Mass Fraction	Mass Flow (lb/hr)
Hydrogen Sulfide	0.0020%	11.14	1.8E-05	0.034
Carbon Dioxide	0.53%	8.62	0.0063	11.88
Nitrogen	0.46%	13.55	0.0034	6.55
Methane	44.49%	23.65	0.1919	364.50
Ethane	17.14%	12.62	0.1385	263.09
Propane	16.07%	8.61	0.1905	361.83
i-Butane	3.14%	6.53	0.0491	93.21
n-Butane	8.60%	6.53	0.1343	255.11
i-Pentane	3.48%	5.26	0.0675	128.23
n-Pentane	3.61%	5.26	0.0700	132.95
2,2-methylpropane	0.08%	4.40	0.0018	3.33
2,2-dimethylbutane	0.05%	4.40	0.0012	2.30
2,3-dimethylbutane	0.30%	4.40	0.0069	13.09
2-methylpentane	0.52%	4.40	0.0121	23.07
3-methylpentane	0.82%	4.40	0.0191	36.18
n-Hexane	0.99%	4.40	0.0231	43.79
Methylcyclopentane	0.63%	4.51	0.0143	27.09
Benzene	0.76%	4.9	0.0160	30.37
Cyclohexane	0.79%	4.51	0.0178	33.77
2-methylhexane	0.14%	3.79	0.0038	7.27
3-methylhexane	0.11%	3.79	0.0031	5.85
n-Heptane	0.17%	3.79	0.0047	8.91
Methylcyclohexane	0.36%	3.87	0.0096	18.14
Toluene	0.21%	4.12	0.0052	9.78
n-Octane	0.08%	3.32	0.0023	4.42
Ethylbenzene	0.00%	3.57	5.5E-05	0.10
m-Xylene	0.01%	3.57	1.9E-04	0.36
p-Xylene	0.01%	3.57	1.9E-04	0.35
o-Xylene	0.00%	3.57	4.9E-05	0.093
n-Nonane	0.01%	2.96	2.1E-04	0.40
n-Decane	0.00%	2.67	1.4E-05	0.027
n-C11	0.00%	2.67	5.6E-07	1.1E-03
n-C12	0.00%	2.67	1.6E-08	3.0E-05
n-C13	0.00%	2.67	4.2E-10	8.1E-07
n-C14	0.00%	2.67	7.8E-12	1.5E-08
n-C15	0.00%	2.67	1.1E-12	2.0E-09
			VOC Total	**1240.03**
			Total	**1886.09**

NO_x	CO	VOC	H_2S	SO_2[3]		
0.138	0.2755	0.14			lb/MMBtu	TNRCC RG-109 (high Btu; other), AP-42, Ch. 13, Table 13.5-1 (VOC)
				98%		Estimated conversion of combusted H_2S to SO_2
0.020	0.039	0.020	-	2.14E-03	lb/hr[4]	Pilot emissions
5.3	10.5	24.8	0.00068	0.0629		Waste stream flaring
0.09	0.17	0.09	-	0.0094	tpy	Pilot emissions
23.0	45.9	108.6	0.0030	0.2756		Waste stream flaring
5.3	**10.5**	**24.8**	**0.00068**	**0.0651**	**lb/hr**	**Total flare emissions**
23.1	**46.1**	**108.7**	**0.0030**	**0.2850**	**tpy**	

n-Hexane	Benzene	Toluene	Ethylbenzene	Xylenes	Total HAPs	
0.9	**0.61**	**0.20**	**0.0021**	**0.016**	**1.7**	**lb/hr[4]**
3.8	**2.7**	**0.9**	**0.0092**	**0.070**	**7.4**	**tpy**

[1] Per 'Chaparral Flare List_DEW Pt Running_70MMSCFD_REV2' spreadsheet
[2] From "Physical Properties of Hydrocarbons"
[3] Assumed 98% conversion of combusted H_2S to SO_2. Pilot Emissions assume 5 gr S / 100 scf
[4] For NOx and CO, lb/hr = EF (lb/MMBtu) * Heat input (MMBtu/hr)
For VOC, HAPs, and H_2S lb/hr = Flow (lb/hr) * (1 - Control%)

CO_2	N_2O	CH_4	CO_2e		
897734.573		75514266.4		cf/yr	40 CFR 98 Eqns. W-19, W-20, W-21, W-40
	1.00E-04			kg/MMBtu	40 CFR 98 Eqn. W-40
0.0526		0.0192		kg/cf	40 CFR 98.233(v)
1	298	25		GWP	40 CFR 98 Table A-1
52.1	3.67E-02	1598.2	1650.3	tons/yr	40 CFR 98 Eqns. W-36 and W-40
52.1	10.95	39955.3	40018.3	tons/yr CO_2e	tons/yr * GWP

Unit(s): DEHY-2
Description: 70 MMscf/day Natural gas-fired dehydrator with reboiler, condensor and combustion

Fuel consumption:

1	MMBtu/hr	Input heat rate	Design specification
950	Btu/scf	Fuel heat value	Nominal for natural gas
1.1	Mscf/hr	Fuel rate	Input heat rate / Fuel heat value
9.2	MMscf/yr	Annual fuel usage	

Emission Rates

Uncontrolled Emissions	**NOx**	**CO**	**VOC**	**SO_2**	**PM**	**H_2S**	**Units**	
Reboiler (a)	100	84	5.5		7.6		lb/MMscf	AP-42 Table 1.4-1 & 2
				5			gr S/100scf	Nominal
	0.11	0.088	0.0058	0.015	0.008		lb/hr	EF * Fuel rate (Mscf/hr) * 1000scf/Mscf
	0.46	0.39	0.025	0.07	0.035		tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb
Still Vent (b)			56.9			0.034	lb/hr	Promax Run TEG-2
			249.4			0.15	tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb
Total dehydrator emissions	0.11	0.088	56.95	0.015	0.0080	0.034	lb/hr	Total Emission rates (reboiler+regenerator)
	0.46	0.39	249.43	0.066	0.035	0.15	tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb

Controlled Emissions	**NOx**	**CO**	**VOC**	**SO_2**	**PM**	**H_2S**	**Units**	
Reboiler (a)	100	84	5.5		7.6		lb/MMscf	AP-42 Table 1.4-1 & 2
				5			gr S/100scf	Nominal
	0.11	0.088	0.0058	0.015	0.008		lb/hr	EF * Fuel rate (Mscf/hr) * 1000scf/Mscf
	0.46	0.39	0.025	0.07	0.035		tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb
Still Vent (b)			0.60	0.048		0.00052	lb/hr	Promax Run with 98 % Control Efficiency*
			2.6	0.21		0.0023	tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb
Total dehydrator emissions	0.11	0.088	0.60	0.063	0.0080	0.00052	lb/hr	Total Emission rates (reboiler+regenerator)
	0.46	0.39	2.63	0.27	0.035	0.0023	tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb

* This unit is controlled by a BTEX Buster, a Firebox and a Glow Plug.

Note: Under the uncontrolled scenario, Still Vent emissions are the result of the BTEX Vent and Flash Gas Emissions. Under the control scenario, only the BTEX Vent emissions contribute to the still vent emissions. Flash gas emissions are routed to the fuel system and not to the still vent.

Process Streams	**BTEX Vent**	**Flash Gas**
Composition	**Solved**	**Solved**
Phase: **Total**	**VSSL-100**	**VSSL-100**
	--	**--**
Mass Flow	**lb/h**	**lb/h**
H2S	0.0258602	0.00831695
N2	0.00352548	0.273376
CO2	1.840645	2.95352
C1	1.330671	23.3218
C2	3.14414	14.2795
C3	5.83906	13.1589
iC4	0.993505	1.92145
nC4	3.98885	5.48377
2,2-Dimethylpropane	0.01264485	0.0186757
iC5	1.678997	1.49343
nC5	1.96386	1.57250
2,2-Dimethylbutane	0.026838011	0.0218043
Cyclopentane	0.000000	0
2,3-Dimethylbutane	0.262883	0.184305
2-Methylpentane	0.534667	0.401879
3-Methylpentane	0.347326	0.226901
nC6	0.652842	0.455406
Methylcyclopentane	1.47358	0.350973
Benzene	6.979161	0.444318
Cyclohexane	1.2138768	0.399971
2-Methylhexane	0.0762048	0.0552776
3-Methylhexane	0.102331166	0.0663851
2,2,4-Trimethylpentane	0.000000	0
nC7	0.370390	0.260888
Methylcyclohexane	0.56841	0.238187
Toluene	1.9445409	0.170868
nC8	0.095966312	0.110419
Ethylbenzene	0.0569326	0.0105133
m-Xylene	0.3015059	0.0508805
p-Xylene	0.2873960	0.0505237
o-Xylene	0.0000000	0
n-C9	0.008546262	0.0132369
n-Decane	0.000000	0
H2O	1.56091E+00	0.0961301
TEG	1.8169E-07	0.000513919

Volatile Organic Compounds

Unit(s): DEHY-2
Description: 70 MMscf/day Natural gas-fired dehydrator with reboiler, condensor and combustion

Uncontrolled Emissions	HCHO	Acetaldehyde	Acrolein	Benzene	Toluene	e-Benzene	Xylenes	n-Hexane	Total HAPs	Units	
Reboiler (a)	0.00084	0.00073	-	0.00075	0.0010	0.0013	0.0014	0.0021	0.0144	lb/hr	Unit Emissions w/Safety Factors
	0.0037	0.0032	-	0.0033	0.0045	0.0058	0.0062	0.0093	0.0632	tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb
	-	-	-	7.4	2.1	0.06745	0.69031	1.10825	11.4	lb/hr	Promax Run TEG Unit 98 wt%
	-	-	-	32.5	9.3	0.2954	3.0235	4.85412	50.0	tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb
Total dehydrator emissions[2]	**0.00084**	**0.00073**	**-**	**7.4**	**2.1**	**0.0688**	**0.6917**	**1.110**	**11.4**	lb/hr	Total Emission rates (reboiler+regenerator)
	0.0037	**0.0032**	**-**	**32.5**	**9.3**	**0.3**	**3.0297**	**4.86**	**50.0**	tpy	lb/hr * 8760 hrs/yr / 2000lb/ton

Controlled Emissions	HCHO	Acetaldehyde	Acrolein	Benzene	Toluene	e-Benzene	Xylenes	n-Hexane	Total HAPs	Units	
Reboiler (a)	0.00084	0.0007	-	0.00075	0.0010	0.0013	0.0014	0.0021	0.014	lb/hr	Unit Emissions w/Safety Factors
	0.0037	0.0032	-	0.0033	0.0045	0.0058	0.0062	0.0093	0.063	tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb
	-	-	-	0.14	0.039	0.0011	0.012	0.013	0.20	lb/hr	Promax Run with 98 % Control Efficiency*
	-	-	-	0.61	0.17	0.005	0.052	0.0572	0.90	tpy	lb/hr * 8760 hrs/yr * 1ton/2000lb
Total dehydrator emissions	**0.00084**	**0.00073**	**-**	**0.14**	**0.040**	**0.002**	**0.013**	**0.015**	**0.22**	lb/hr	Total Emission rates (reboiler+regenerator)
	0.0037	**0.0032**	**-**	**0.61**	**0.17**	**0.011**	**0.058**	**0.066**	**0.96**	tpy	lb/hr * 8760 hrs/yr / 2000lb/ton

Greenhouse Gas Calculations[3]

CO_2	N_2O	CH_4	CO_2e	
53.06	0.0001	0.001		kg/MMBtu
1	298	25		GWP[8]
119.2	0.0002	0.0022		lb/hr[9]
522.0	0.0010	0.010	522.6	tpy[6]

[3] Greenhouse gas emission factors are from 40 CFR 98 Subpart C

Reboiler Stack Exhaust Parameters

Site elevation:	3431	ft MSL	
Standard pressure:	29.92	in Hg	
Pressure at elevation:	26.4	in Hg	Hess, Introduction to Theoretical Meteorology, eqn. 6.8
Standard temperature:	528	R	
Exhaust temp:	212	°F	Eng. estimate
Stack height:	15	ft	Design specification
Stack diameter:	0.5	ft	Design specification
F factor:	10610	wscf/10e6 Btu	40 CFR 60 Appx A Method 19
Exhaust flow:	177	scfm	Heat input * F factor/60
Exhaust flow:	255	acfm	Va = Vs*(Ps/Pa)*(Ta/Ts)
Exhaust velocity:	22	ft/sec	Exhaust flow / stack area

Greenhouse Gas Calculations[2]

CO_2	N_2O	CH_4	CO_2e	
53.0	0.0001	0.001		kg/MMBtu
1	298	25		GWP[3]
130.3	0.0002	0.002	130.4	lb/hr[4]
570.7	0.001	0.01	571.3	tpy[5]

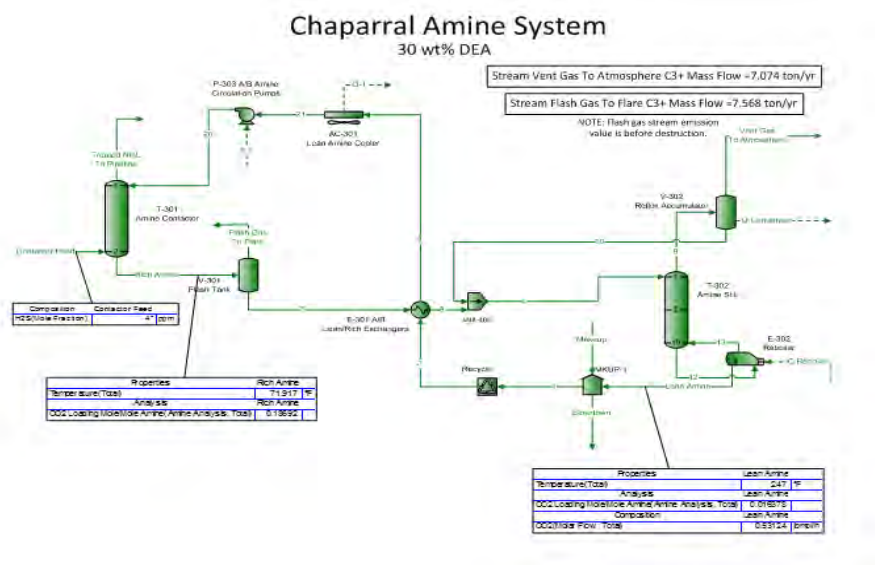
[2] Greenhouse gas emission factors are from 40 CFR 98 Subpart C
[3] 40 CFR 98 Subpart A, Table A-1
[4] CO2, N2O, CH4 lb/hr = EF (kg/MMBtu) * 2.20462lb/kg * Fuel Rate (Mscf/hr) * 10^-3 (MMscf/Mscf)*Heating Value (MMBtu/MMscf
CO2e lb/hr = CO2 lb/hr + (CH4 lb/hr * GWP) + (N2O lb/hr * GWP)
[5] tpy = lb/hr * hours of operation * 1ton/2000lb

Unit(s): AMINE-1, AMINE-2
Description: 1109 bbd DEA Amine Liquid-Liquid Treater with Flash Tank and Still Vent

Emission Rates (Based on ProMax run dated 7/18/2017 @ 12:36:15 PM)

	VOC	H_2S	Benzene	Toluene	e-Benzene	Xylenes	n-Hexane	Total HAPs		
	1.6	**0.075**	**0.25**	**0.057**	**2.3E-04**	**2.0E-03**	**7.4E-04**	**0.31**	lb/hr	
Flash Tank and Still Vent	7.07	0.33	1.10	0.25	1.0E-03	8.6E-03	3.2E-03	1.37	tpy	ProMax
	25%	25%	25%	25%	25%	25%	25%	25%		Scale-up and safety factor
	8.8	**0.41**	**1.38**	**0.31**	**1.3E-03**	**1.1E-02**	**4.0E-03**	**1.71**	tpy	

	CO_2e			
Still Vent and Flash Tank	1066.32	tpy, CO_2	Promax calculations at 1109 bbd	
	0.47248	tpy, CH_4	Promax calculations at 1109 bbd	
	25%		Scale-up and safety factor	
	1,332.9	tpy, CO_2	tpy w/SF	
	0.6	tpy, CH_4	tpy w/SF	14.76488943
	1347.7	tpy, CO_2e		



ProMax Run (7/18)

Composition	Still Vent (pph)
CO2	243.452
N2	2.36933E-07
C1	0.107871
C2	4.37793
C3	1.09022
iC4	0.0460583
nC4	0.131689
iC5	0.0104068
nC5	0.0111702
2,2-Dimethylpropane	0.000334195
2,2-Dimethylbutane	6.68176E-05
2,3-Dimethylbutane	0.000285653
3-Methylpentane	0.000388905
2-Methylpentane	0.000777727
nC6	0.000735999
Methylcyclopentane	0.00324799
Benzene	0.251702
Cyclohexane	0.00740842
2-Methylhexane	4.03327E-05
3-Methylhexane	3.00314E-05
nC7	4.45437E-05
Methylcyclohexane	0.00120185
Toluene	0.0571222
nC8	6.85961E-06
Ethylbenzene	0.000229667
m-Xylene	0.000776113
p-Xylene	0.000828850
o-Xylene	0.000353451
n-C9	1.01912E-07
n-Decane	0
nC11	0
nC12	0
nC13	0
nC14	0
nC15	0
H2O	4.42959
DEA	1.23780E-11
H2S	0.0753853

VOC = 1.62
HAPs= 0.31

Unit(s): FUG-1
Description: Facility fugitives associated with existing equipment (monitored under NSPS KKK)

Gas Analysis

Components	MW	Inlet Gas Before Dehydration	
		Mol %	Weight %
Nitrogen	28.01	2.0611	2.7992
Methane	16.04	79.7031	61.9991
Carbon Dioxide	44.01	0.4875	1.0404
Hydrogen Sulfide	34.08	0.0010	0.0017
Ethane	30.07	10.1545	14.8053
Propane	44.10	4.5887	9.8114
i-Butane	58.12	0.5395	1.5205
n-Butane	58.12	1.2428	3.5027
2,2-Dimethylpropane	72.15	0.0040	0.0140
i-Pentane	72.15	0.2827	0.9891
n-Pentane	72.15	0.2837	0.9926
2,2-Dimethylbutane	86.17	0.0040	0.0167
Cyclopentane	70.10	0.0000	0.0000
2,3-Dimethylbutane	86.18	0.0300	0.1252
2-Methylpentane	86.18	0.0699	0.2922
3-Methylpentane	86.18	0.0390	0.1628
i-Hexane	86.18	0.0000	0.0000
n-Hexane	86.18	0.0819	0.3423
Methylcyclopentane	84.16	0.0470	0.1916
Benzene	78.11	0.0470	0.1778
CC6	84.16	0.0619	0.2528
2-Methylhexane	100.20	0.0110	0.0534
3-Methylhexane	100.20	0.0120	0.0582
2,2,4-Trimethylpentane	114.22	0.0000	0.0000
i-Heptane	100.21	0.0000	0.0000
n-Heptane	100.21	0.0520	0.2524
Methylcyclohexane	98.19	0.0410	0.1950
Toluene	92.14	0.0230	0.1027
i-Octane	114.23	0.0000	0.0000
n-Octane	114.23	0.0290	0.1605
Ethylbenzene	106.17	0.0000	0.0000
p-m-Xylene	106.16	0.0030	0.0154
o-Xylene	106.16	0.0010	0.0051
i-Nonane	128.20	0.0000	0.0000
n-Nonane	128.20	0.0060	0.0373
i-Decane	142.29	0.0000	0.0000
n-Dexane+	142.29	0.0000	0.0000
i-Undecanes+	156.31	0.0002	0.0015
H2O	18.02	0.0928	0.0810
Total[1]	20.62	100.00	99.92
Total VOC		7.50	19.27
Total H2S		0.0010	0.0017
Total HAP		0.156	0.64

Emission Calculations

Component Type	Service	EF[2] (kg/hr/source)	Count[3]	Weight % VOC[4]	Weight % HAP[4]	Weight % H_2S[4]	VOC Emissions[5] (lb/hr)	HAP Emissions[5] (lb/hr)	H2S Emissions[5] (lb/hr)
Valves	Gas/Vapor	4.50E-03	1257	19.3	0.64	0.00165	2.4	0.080	2.1E-04
	Light Liquid	2.50E-03	1040	99.9	1.00	0.0	5.7	0.06	0.000
	Heavy Liquid	8.40E-06	124	100.0	5.00	0.0	0.0023	0.0001	0.0000
Flanges	Gas/Vapor	3.90E-04	701	19.3	0.64	0.00165	0.12	0.004	1.0E-05
	Light Liquid	1.10E-04	272	99.9	1.00	0.0	0.07	0.001	0.0000
	Heavy Liquid	3.90E-07	41	100	5.00	0	0.0000	0.0000	0.0000
Open End Lines	Gas/Vapor	2.00E-03	0	19.3	0.64	0.00165	0.0000	0.0000	0.0E+00
	Light Liquid	1.40E-03	0	100	1.00	0.0	0.0000	0.0000	0.0000
	Heavy Liquid	1.40E-04	0	100.0	5.00	0.0	0.0000	0.0000	0.0000
PRVs	Gas/Vapor	8.80E-03	51	19.3	0.64	0.00165	0.2	0.006	1.6E-05
	Light Liquid	7.50E-03	9	99.9	1.00	0.0	0.1487	0.0015	0.0000
	Heavy Liquid	3.20E-05	2	100.0	5.00	0.0	0.0001	0.0000	0.0000
Other	Gas/Vapor	8.80E-03	10	19.3	0.64	0.00165	0.037	0.0012	3.2E-06
	Light Liquid	7.50E-03	0	99.9	1.00	0.0	0.0000	0.0000	0.0000
	Heavy Liquid	3.20E-05	0	100.0	5.00	0.0	0.0000	0.0000	0.0000
Pumps	Gas/Vapor	2.40E-03	0	19.3	0.64	0.00165	0.000	0.00000	0.0E+00
	Light Liquid	1.30E-02	9	99.9	1.00	0.0	0.26	0.003	0.00000
	Heavy Liquid	1.30E-02	4	100.0	5.00	0.0	0.1146	0.0057	0.0000
Connectors	Gas/Vapor	2.00E-04	2521	19.3	0.64	0.00165	0.214	0.00715	1.8E-05
	Light Liquid	2.10E-04	1932	99.9	1.00	0.0	0.894	0.0089	0.0000
	Heavy Liquid	7.50E-06	284	100.0	5.00	0.0	0.0047	0.0002	0.0000

Total Criteria Pollutant Emissions

VOC	H_2S	
10.2	2.5E-04	lb/hr[6]
0%	0%	Safety factor
10.2	2.5E-04	lb/hr
44.6	1.1E-03	tpy[7]

HAP Emissions

n-Hexane	Benzene	Toluene	Xylenes	Total HAPs	
0.094	0.049	0.028	0.006	0.18	lb/hr[6]
5%	5%	5%	5%	5%	Safety factor
0.098	0.051	0.029	0.0059	0.185	lb/hr
0.43	0.224	0.129	0.0259	0.81	tpy[7]

Notes

[1] Total MW = Σ MW_i x Mol $\%_i$

[2] Emission factors from Table 2-4 of EPA Protocol for Equipment Leak Emission Estimates, 199

[3] Facility component count based on similar facility component coun

Safety factor = 5% added to facility component count.

[4] Weight% VOC and HAP of light liquid conservatively assumed to be 100% and 5%, respectively

Weight% of n-hexane, benzene, toluene, xylenes, and ethylbenzene in light liquid conservatively assumed to be 1% for each

[5] Emissions per component type (lb/hr) = EF (kg/hr/source) x Component Count x Weight% (VOC, HAP) x 2.20462 lb/kg

[6] Total Emissions (lb/hr) =Weight $\%_{gas}$ (VOC, HAP) x [Σ $Ef_{i, gas}$ (kg/hr/source) x Component $Count_{i, gas}$]x 2.20462 lb/kg

+ Weight %liquid (VOC, HAP) x [Σ Efi, liquid (kg/hr/source) x Component Counti, liquid] x2.20462 lb/kg

[7] tons/yr = lb/hr * Hours of operation (hr/yr) * 1ton/2000lb

[8] GHG ton/yr =Weight % (CO_2, CH_4) x [Σ $Ef_{i, gas}$ (kg/hr/source) * Component $Count_{i, gas}$] * 1tonne/1000kg * Hours of operation (hr/yr) * 1.1023ton/tonne

[9] tons/yr CO_2e = ton/yr * GWP

Unit: FUG-2
Description: Facility fugitives associated with MRU equipment
(to be monitored under NSPS OOOO)

Emission Rates

VOC	H_2S	Benzene	Toluene	Xylenes	n-Hexane	Total HAPs	
22.3	5.6E-04	0.112	0.065	0.0129	0.22	0.40	tpy[1]
5%	5%	5%	5%	5%	5%	5%	Safety Factor[2]
23.4	5.8E-04	0.117	0.068	0.0136	0.23	0.42	

[1] Assumes emissions for MRU equipment is 50% of the fugitive emissions associated with the equipment monitored under NSPS KKK (FUG-1)

2 10% safety factor added to account for additional fugitive components anticipated within the MRU/closed drain system

Unit(s): TK-1, TK-2, TK-3
Description: 300-bbl condensate storage tank

General Tank Information

No of Condensate Tank:	3			
Volume:	300	bbl		
Height (shell):	15	ft		
Diameter:	12	ft	60000 bbl/yr	Updated Throughput
Tank Throughput:	20,000	bbl/yr	2520000 gal/yr	
Tank Throughput:	840,000	gal/yr		
Turnovers:	66.67	maximum turnovers/yr		

Working and Breathing Losses[1]

Component	Emissions (lb/yr)	Emissions (tpy)
VOC	9986.15	4.99
Hexanes	25.10	0.013
Benzene	23.60	0.012
Toluene	11.73	0.0059
Ethylbenzene	1.63	0.00082
Xylenes	4.79	0.0024
Total HAPs	66.85	0.033

[1] Working and breathing losses calculated in TANKS 4.0.9d

Emission Total for unit TK-1 through TK-3

	lb/hr	tpy
VOC	-	14.98
Total HAPs	-	0.10
Benzene	-	0.035
n-Hexane	-	0.038

Emission unit: Load
Source Description: Oil Loadout

L_L = 12.46 (SPM) / T

Eq. 1, AP-42 Section 5.2, Transportation and Marketing of Petroleum Liquids

Parameter	Value	Unit	Notes
S =	0.6	Dimensionless	Submerged Loading, Table 5.2-1
T =	93.23	F	Tanks 4.0.9d Max Liquid Temperature
P =	8.5259	psia	Tanks 4.0.9.d Max Vapor Pressure
M =	67	lb/lbmole	Tanks 4.0.9.d Vapor Mol. Weight
LL =	7.7	lb VOC/1000 gal	

Uncontrolled VOC Emissions

Parameter	Value	Unit
Truck Capacity	180	bbl
Max Loadout Rate [1]	7,560	gallon/hr
	2,520,000	gallons/yr
	164	bbl/day
Annual Loadout	2,520	Mgal/yr
	60,000	bbl/yr
	19,453	lb/yr
VOC Emissions [2]	***9.73***	***tpy***

[1] Maximum hourly loadout rate based on the truck capacity, assuming 1 hour loadout time per truck.

[2] Requested emission rate for tpy =Requested Loadout * Loading Loss/1000/2000

HAP Emissions

Parameter	Value	Unit
Tank VOCs [1]	15.0	tpy
Loadout VOC	9.7	tpy
Truck Tank Volume	7,560	gallons
Annual Loadout	2,520,000	gallons/yr
Loadout Time	1	hour/ loadout
Turnovers [2]	333	per year

[1] Working and Breathing emissions for Tank-1 through Tank-3

[2] Turnovers = loading volume / truck tank volume

HAPs	Tanks Working & Breathing	Uncontrolled Loadout Emissions
	lb/yr	tpy
Benzene	70.80	0.023
Toluene	35.19	0.011
Ethylbenzene	4.89	0.0016
Xylene (m)	14.37	0.0047
n-Hexane	75.30	0.024
TOTAL HAPs	***200.55***	***0.065***

Mean Vehicle Weight and Trip Calculator for Unpaved Road Emissions

Plant Road

Vehicle Type	Empty Vehicle[1]	Load Size[2]	Loaded Vehicle[3]	Mean Vehicle[4]	Vehicles Per Day (VPD)[5]	Segments per trip	Trips per hour[6]
Condensate	16	21.2	37.2	26.6	24	1	6

Hours of Operation per Day	24	
Total Vehicles Per Day	24.0	
ted Mean Vehicle Weight (WMVW)[8]	26.6	tons
Total Trips per Hour	6.0	

[1] Empty vehicle weight includes driver and occupants and full fuel load.
[2] Cargo, transported materials, etc. (5.6 lb/gal RVP10 *7560 gal truck/ 2000lb/ton)
[3] Loaded vehicle weight = Empty + Load Size
[4] Mean Vehicle weight = (Loaded Weight + Empty Weight) / 2
[5] A conservative estimate of vehicles per day.
[6] Maximum expected trips per hour
[7] WMVW = (Mean Vehicle Weight*VPD) ÷ Total Vehicles per Day

Unpaved Road Emission Factors

	Factor Calculation (AP-42 Sec. 13.2.2.3 November, 2006, Equation 2)												Hourly Emission Factor			Annual, Wet Day, Emission Factor			
	Operating Hours per Year	**Surface material silt content[1]**	**Mean Vehicle Weight, tons**	**PM-30**	**PM-10**	**PM-2.5**	**PM-30**	**PM-10**	**PM-2.5**	**PM-30**	**PM-10**	**PM-2.5**	**E PM-30**	**E PM-10**	**E PM-2.5**	**E PM-30**	**E PM-10**	**E PM-2.5**	**Wet Days**
		s	W	k	k	k	a	a	a	b	b	b							
Route		%	tons	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	lb/VMT	
nsate trucks	8760	2.7	26.58	4.9	1.5	0.15	0.7	0.9	0.9	0.45	0.45	0.45	4.60	1.05	0.10	3.85	0.87	0.087	60

Unpaved Production Road Emissions

							Potential Emission Rate						**Potential to Emit**					
Route	**Segment Length**	**Trips per Segment**	**Trips per hour**	**Trips per day**	**Effective Segment Length**	**Average VMT/hr**	**PM-30**		**PM-10**		**PM-2.5**		**PM-30**		**PM-10**		**PM-2.5**	
	mi		T	T	mi	mi/hr	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
nsate trucks	0.20	1	6.0	24.0	0.20	1.20	5.5	3.4	1.3	0.77	0.13	0.077	5.5	3.4	1.3	0.77	0.13	0.077
						TOTAL	**5.52**	**3.37**	**1.25**	**0.77**	**0.13**	**0.077**	**5.52**	**3.37**	**1.25**	**0.77**	**0.13**	**0.077**

[1] Surface silt = % of 75 micron diameter and smaller particles
[2] E = k x (s/12)^a x (W/3)^b (AP-42 page 13.2.2-4 Equation 1a, November 2006)
E= Size Specific Emission Factor (lb/VMT)
s = surface material silt content (%), adjusted by 40% to account for gravel, rather than dirt roads
k, a, b = constants from AP-42 Table 13.2.2-2
W = Weighted Mean Vehicle Weight from Haul Road Inputs (tons)
[3] PM-30 emission factor in equation is assumed as a surrogate for TSP emissions
[4] VMT/hr = Vehicle Miles Travelled per hour= Trips per hour * Segment Length
[5] Wet Day Emission Factor = E * (365 - Wet Days)/365. Wet days value is the NM default allowed by NMED without additional justification.
[6] Controlled Emissions = Uncontrolled Emissions * (1 - Control Factor/100%)
Control Factor = 0%

Unit(s): FLARE
Description: SSM/M1 flaring

Blowdown Rates

75369	lb/hr	Design maximum
0.05267	lb/cf	Nominal density
1,431,089	scf/hr	Blowdown rate (lb/hr) / Density (lb/cf)
10,000,000	scf/yr	Expected annual volume
1166	Btu/scf	Flare gas sample (3/24/14)
1668.65	MMBtu/hr	
11660.00	MMBtu/yr	
Total 1668.65	MMBtu/hr	

Stack Parameters

1000	˚C	Exhaust temperature	Per NMAQB modeling guidelines
20	m/sec	Exhaust velocity	Per NMAQB modeling guidelines
100	ft	Flare height	Design
37.20	g/mol	Flared gas molecular weight	Wtd. MW from pilot and steady-state
116,805,474	cal/sec	Heat release (q)	MMBtu/hr * 10^6 * 252 cal/Btu ÷ 3600 sec/hr
82,609,427		q_n	$q_n = q(1\text{-}0.048(MW)^{1/2})$
9.0890	m	Effective stack diameter (D)	$D = (10^{-6}q_n)^{1/2}$

Emission Rates

SSM/M1

	NO_x	CO	VOC	H_2S	SO_2	HAPs	Units	
	0.1380	0.2755					lb/MMBtu	TNRCC RG-109, high Btu gas, other
			40.65%	0.0004%		0.4510%	mol%	Nominal for facility
			6.262	11.136		6.262	ft^3/lb	specific volume
			92895.19	0.5140		1030.62	lb/hr	vol. Gas * mole fraction / specific volume
			649122.4	3.59		7201.67	lb/yr	vol. Gas * mole fraction / specific volume
	230.3	**459.7**					lb/hr	lb/MMBtu * MMBtu/hr
			1857.9	**1.0E-02**	**0.95**	**20.6**	lb/hr	98% combustion; 100% conversion to SO_2
	0.80	**1.6**	**6.49**	**3.6E-05**	**3.31E-03**	**0.072**	tpy	
TOTAL	**230.3**	**459.7**	**1857.9**	**0.010**	**0.9**	**20.6**	lb/hr	
	0.80	**1.6**	**6.49**	**3.6E-05**	**3.3E-03**	**0.072**	tpy	
	10.0	**10.0**	**10.0**	**0.045**	**4.2**	**10.0**	tpy (assume for all annual emissions)	

Flare Gas Composition: Combined waste streams associated the VRU and other sources

Component	MW	Wet vol/mol%	Dry vol/mol%	MW * dry vol %	Mass Fraction (dry)	Spec. Volume ft^3/lb	Spec. Volume VOC ft^3/lb
Water	18.02	1.93%					
Nitrogen	28.01	0.42%	0.4307%	0.12064	0.33%	13.547	
CO_2	44.01	0.45%	0.4579%	0.20150	0.54%	8.623	
H_2S	34.08	0.00040%	0.00041%	0.00014	0.00038%	11.136	
Methane	16.04	40.80%	41.608%	6.67397	18.01%	23.65	
Ethane	30.07	15.74%	16.0516%	4.82671	13.03%	12.62	
Propane	44.10	14.89%	15.1835%	6.69593	18.07%	8.606	2.28420521
Iso-butane	58.12	2.97%	3.0262%	1.75883	4.75%	6.529	0.45519154
N-butane	58.12	8.20%	8.3631%	4.86063	13.12%	6.529	1.25794593
Iso-pentane	72.15	3.50%	3.5686%	2.57474	6.95%	5.26	0.53683588
N-pentane	72.15	3.73%	3.7987%	2.74073	7.40%	5.26	0.57144561
Iso-Hexanes	86.08	2.78%	2.8312%	2.43710	6.58%	4.404	0.42544465
*N-Hexane**	86.18	1.20%	1.2287%	1.05891	2.86%	4.404	0.1848535
*Benzene**	78.11	0.86%	0.8767%	0.68477	1.85%	4.858	0.13186351
Cyclohexane	84.16	0.99%	1.0112%	0.85106	2.30%	4.509	0.15211118
Iso-heptanes	100.20	1.10%	1.1176%	1.11986	3.02%	4.404	0.19549447
n-heptane	100.21	0.0000%	0.0000%	0.00000	0.00%	4.404	0.0000
*Toluene**	92.14	0.28%	0.2896%	0.26684	0.72%	4.119	0.04356835
iso-octanes	114.23	0.12%	0.1233%	0.14082	0.38%	3.322	0.01854367
n-octane	114.23	0.00%	0.0000%	0.00000	0.00%	3.322	0.000000
*Ethylbenzene**	106.07	0.00%	0.0000%	0.00000	0.00%	3.574	0
*m,o & p xylene**	106.16	0.021%	0.0215%	0.02279	0.06%	3.574	0.00322874
i-nonanes	128.26	0.010%	0.0106%	0.01364	0.04%	2.959	0.00160027
n-nonanes	128.20	0.00%	0.0000%	0.00000	0.00%	2.959	0
i-decanes	142.29	0.00067%	0.0007%	0.00097	0.00%	2.667	0.00010291
n-decanes	142.29	0.00%	0.0000%	0.00000	0.00%	2.667	0
i-undecanes +	142.29	0.00%	0.0000%	0.00005	0.00%	2.667	4.9004E-06
Total		100.00%	100.00%	37.05	100%		6.262
Dry total		98.07%		*(mixture mol. wt)*			
	NMEHC (VOC)	*40.65%*			68.09%		

Greenhouse Gas Calculations

CO_2	N_2O	CH_4	CO_2e		
1	298	25		GWP	40 CFR 98 Subpart A, Table A-1
1126.3	0.0014	1.7	1169.9	tpy	40 CFR 98 Equations W-19, W-20, W-21, and W-40

Chaparral Flare Summary

	Flare Collection System Summary						Vent to Air from Tanks	
	Total Dump to Flare Drum		Flow to Flare		Flow to Condensate Tanks		Vent to Atmosphere from Tanks	
	Mass Frac	Mass Flow, lb/hr	Mass Frac	Mass Flow, lb/hr	Mass Frac	Mass Flow, lb/hr	Mass Frac	Mass Flow, lb/hr
H2S	0.000	0.024	0.0000	0.034	0.0000	0.000	0.0000	0.000
CO2	0.004	8.440	0.0063	11.885	0.0000	0.004	0.0047	0.000
Nitrogen	0.002	4.641	0.0034	6.552	0.0000	0.000	0.0007	0.000
Methane	0.128	258.370	0.1919	364.497	0.0003	0.036	0.0896	0.001
Ethane	0.093	187.359	0.1385	263.091	0.0015	0.183	0.1200	0.002
Propane	0.130	262.041	0.1905	361.834	0.0085	1.043	0.1971	0.003
i-Butane	0.035	70.344	0.0491	93.210	0.0064	0.784	0.0551	0.001
n-Butane	0.098	198.547	0.1343	255.111	0.0264	3.236	0.1556	0.002
i-Pentane	0.057	115.202	0.0675	128.230	0.0360	4.419	0.0829	0.001
n-Pentane	0.064	129.297	0.0700	132.948	0.0519	6.368	0.0883	0.001
22-Mpropane	0.001	2.664	0.0018	3.329	0.0005	0.056	0.0020	0.000
22-Mbutane	0.001	2.801	0.0012	2.296	0.0017	0.213	0.0016	0.000
23-Mbutane	0.008	17.051	0.0069	13.086	0.0115	1.411	0.0090	0.000
2-Mpentane	0.016	31.691	0.0121	23.073	0.0227	2.782	0.0161	0.000
3-Mpentane	0.026	53.443	0.0191	36.180	0.0411	5.042	0.0255	0.000
n-Hexane	0.037	73.980	0.0231	43.790	0.0635	7.788	0.0315	0.000
Mcyclopentan	0.024	48.747	0.0143	27.092	0.0437	5.358	0.0194	0.000
Benzene	0.029	57.875	0.0160	30.373	0.0537	6.591	0.0219	0.000
Cyclohexane	0.035	71.660	0.0178	33.766	0.0705	8.654	0.0244	0.000
2-Mhexane	0.011	22.529	0.0038	7.270	0.0257	3.150	0.0055	0.000
3-Mhexane	0.009	18.897	0.0031	5.846	0.0218	2.675	0.0044	0.000
n-Heptane	0.018	36.325	0.0047	8.911	0.0443	5.440	0.0069	0.000
Mcyclohexane	0.035	70.059	0.0096	18.142	0.0845	10.370	0.0137	0.000
Toluene	0.026	51.876	0.0052	9.782	0.0664	8.147	0.0076	0.000
n-Octane	0.026	53.356	0.0023	4.422	0.0742	9.104	0.0037	0.000
E-Benzene	0.001	1.700	0.0001	0.105	0.0024	0.295	0.0001	0.000
m-Xylene	0.004	7.093	0.0002	0.359	0.0101	1.240	0.0003	0.000
p-Xylene	0.003	6.832	0.0002	0.352	0.0097	1.193	0.0003	0.000
o-Xylene	0.001	1.986	0.0000	0.093	0.0028	0.348	0.0001	0.000
n-Nonane	0.007	15.116	0.0002	0.403	0.0219	2.688	0.0004	0.000
n-Decane	0.001	3.018	0.0000	0.027	0.0044	0.544	0.0000	0.000
n-C11	0.000	0.387	0.0000	0.001	0.0006	0.070	0.0000	0.000
n-C12	0.000	0.029	0.0000	0.000	0.0000	0.005	0.0000	0.000
n-C13	0.000	0.003	0.0000	0.000	0.0000	0.001	0.0000	0.000
n-C14	0.000	0.000	0.0000	0.000	0.0000	0.000	0.0000	0.000
n-C15	0.000	0.000	0.0000	0.000	0.0000	0.000	0.0000	0.000
H2O	0.069	138.563	0.0068	12.909	0.1912	23.459	0.0114	0.000
TEG	0.000	0.038	0.0000	0.005	0.0001	0.006	0.0000	0.000
Total Flow, lb/hr		2022.0		1899.0		122.7		0.01

Mole Wt	37.20	
Flow	19,375	SCFH
LHV	1861	Btu/SCF
HHV	1964	Btu/SCF

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.

- **Compressor Engines (E-1000, E-2000, E-5000)**
  - Manufacturer specification sheet
  - AP-42 Section 3.2
  - EPA 40 CFR 98 Subpart C

G3516 LE Gas Industrial Engine Performance

CATERPILLAR

Engine Speed (rpm)	1200	Fuel	NAT GAS
Compression Ratio	8:1	LHV of Fuel (Btu/SCF)	920
Aftercooler Inlet Temperature (°F)	130	Fuel System	HPG IMPCO
Jacket Water Outlet Temperature (°F)	210		
Ignition System	EIS	Minimum Fuel Pressure (psig)	35
Exhaust Manifold	WATER COOLED	Methane Number at Conditions Shown	80
Combustion System Type	LOW EMISSION	Rated Altitude (ft) at 77°F Design Temperature	5000

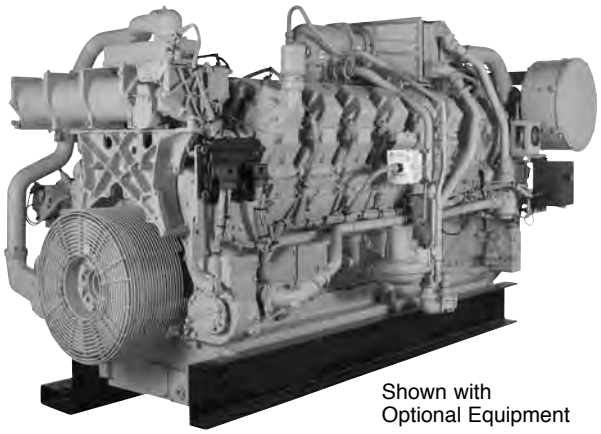
Engine Rating Data	**% Load**	**100%**	**75%**	**50%**
Engine Power (w/o fan)	bhp	1151	863	575
Engine Data				
Specific Fuel Consumption (BSFC) (1)	Btu/bhp-hr	7415	7594	8085
Air Flow (Wet, @ 77°F, 28.8 in Hg)	SCFM	2435	1866	1285
Air Mass Flow (Wet)	lb/hr	10796	8274	5697
Compressor Out Pressure	in. HG (abs)	74.2	69.4	52.3
Compressor Out Temperature	°F	306	283	209
Inlet Manifold Pressure	in. HG (abs)	66.7	52.6	37.1
Inlet Manifold Temperature (10)	°F	136	136	136
Timing (11)	°BTDC	33	33	33
Exhaust Stack Temperature	°F	840	817	808
Exhaust Gas Flow (Wet, @ stack temperature, 29.7 in Hg)	CFM	6415	4830	3306
Exhaust Gas Mass Flow (Wet)	lb/hr	11217	8600	5928
Engine Emissions Data				
Nitrous Oxides (NOx as NO2) (9)	g/bhp-hr	1.5	1.5	1.5
(Corr. 15% 02)	ppm	110	106	104
Carbon Monoxide (CO) (9)	g/bhp-hr	1.8	1.8	2.0
(Corr. 15% 02)	ppm	212	213	217
Total Hydrocarbons (THC) (9)	g/bhp-hr	3.3	3.5	4.0
(Corr. 15% 02)	ppm	694	720	770
Non-Methane Hydrocarbons (NMHC) (9)	g/bhp-hr	0.49	0.53	0.60
(Corr. 15% 02)	ppm	49	50	52
Exhaust Oxygen (9)	%	8.2	8.0	7.7
Lambda		1.58	1.57	1.52
Engine Heat Balance Data				
Input Energy LHV (1)	Btu/min	142195	109220	77514
Work Output	Btu/min	48817	36613	24408
Heat Rejection to Jacket (2) (6)	Btu/min	41210	33828	27726
Heat Rejection to Atmosphere (Radiated) (4)	Btu/min	4554	3795	3037
Heat Rejection to Lube Oil (5)	Btu/min	0	0	0
Total Heat Rejection to Exhaust (to 77°F) (2)	Btu/min	40027	29869	20489
Heat Rejection to Exhaust (LHV to 350°F) (2)	Btu/min	24609	17954	12153
Heat Rejection to Aftercooler (3) (7) (8)	Btu/min	7587	5115	1853

CATERPILLAR®

G3516 LE Gas Petroleum Engine

858-999 bkW
1150-1340 bhp
1200-1400 rpm

2.0 g/bhp-hr NOx (NTE)



Shown with Optional Equipment

CAT® ENGINE SPECIFICATIONS

V-16, 4-Stroke-Cycle

Bore	170 mm (6.7 in.)
Stroke	190 mm (7.5 in.)
Displacement	69 L (4210 cu. in.)
Aspiration	Turbocharged-Aftercooled
Digital Engine Management Governor and Protection	Electronic (ADEM™ A3)
Combustion	Low Emission (Lean Burn)
Engine Weight, net dry (approx)	8015 kg (17,670 lb)
Power Density	8 kg/kW (13.2 lb/bhp)
Power per Displacement	19.3 bhp/L
Total Cooling System Capacity	217.7 L (57.5 gal)
Jacket Water	200.6 L (53 gal)
Aftercooler Circuit	17 L (4.5 gal)
Lube Oil System (refill)	424 L (112 gal)
Oil Change Interval	1000 hours
Rotation (from flywheel end)	Counterclockwise
Flywheel and Flywheel Housing	SAE No. 00
Flywheel Teeth	183

FEATURES

Engine Design
- Proven reliability and durability
- Ability to burn a wide spectrum of gaseous fuels
- Robust diesel strength design prolongs life and lowers owning and operating costs
- Broad operating speed range

Emissions
Meets U.S. EPA Spark Ignited Stationary NSPS Emissions for 2007/8

Lean Burn Engine Technology
Lean-burn engines operate with large amounts of excess air. The excess air absorbs heat during combustion reducing the combustion temperature and pressure, greatly reducing levels of NOx. Lean-burn design also provides longer component life and excellent fuel consumption.

Advanced Digital Engine Management
ADEM A3 control system providing integrated ignition, speed governing, protection, and controls, including detonation-sensitive variable ignition timing. ADEM A3 has improved: user interface, display system, shutdown controls, and system diagnostics.

Ease of Operation
Side covers on block allow for inspection of internal components

Full Range of Attachments
Large variety of factory-installed engine attachments reduces packaging time

Testing
Every engine is full-load tested to ensure proper engine performance.

Gas Engine Rating Pro
GERP is a PC-based program designed to provide site performance capabilities for Cat® natural gas engines for the gas compression industry. GERP provides engine data for your site's altitude, ambient temperature, fuel, engine coolant heat rejection, performance data, installation drawings, spec sheets, and pump curves.

Product Support Offered Through Global Cat Dealer Network
More than 2,200 dealer outlets

Cat factory-trained dealer technicians service every aspect of your petroleum engine

Cat parts and labor warranty

Preventive maintenance agreements available for repair-before-failure options

S•O•S℠ program matches your oil and coolant samples against Caterpillar set standards to determine:
- Internal engine component condition
- Presence of unwanted fluids
- Presence of combustion by-products
- Site-specific oil change interval

Over 80 Years of Engine Manufacturing Experience
Over 60 years of natural gas engine production

Ownership of these manufacturing processes enables Caterpillar to produce high quality, dependable products.
- Cast engine blocks, heads, cylinder liners, and flywheel housings
- Machine critical components
- Assemble complete engine

Web Site
For all your petroleum power requirements, visit www.catoilandgas.cat.com.

STANDARD EQUIPMENT

Air Inlet System
Air cleaner — intermediate-duty with service indicator

Control System
A3 ECU
Air-fuel ratio control

Cooling System
Thermostats and housing
Jacket water pump
Aftercooler water pump
Aftercooler core for sea-air atmosphere
Aftercooler thermostats and housing

Exhaust System
Watercooled exhaust manifolds

Flywheels & Flywheel Housings
SAE No. 00 flywheel
SAE No. 00 flywheel housing
SAE standard rotation

Fuel System
Gas pressure regulator
Natural gas carburetor

Ignition System
A3 ECU

Instrumentation
PL1000 Advisor panel

Lubrication System
Crankcase breather — top mounted
Oil cooler
Oil filter — RH
Oil bypass filter
Oil pan — shallow
Oil sampling valve
Turbo oil accumulator

Mounting System
Rails, engine mounting — 254 mm (10 in)

Protection System
Electronic shutoff system
Gas shutoff valve

General
Paint — Cat yellow
Vibration damper and guard — dual 484 mm (23 in)

OPTIONAL EQUIPMENT

Air Inlet System
Remote air inlet adapters
Precleaner

Charging System
Battery chargers
Charging alternators

Cooling System
Aftercooler core
Thermostatic valve
Temperature switch
Connections
Expansion and overflow tank
Water level switch gauge

Exhaust System
Flexible fittings
Elbows
Flange
Flange and exhaust expanders
Rain cap
Mufflers

Fuel System
Low pressure gas conversions
Propane gas valve and jet kits
Fuel filter

Instrumentation
PL1000 communications modules

Lubrication System
Oil bypass filter removal and oil pan accessories
Sump pump
Air prelube pump
Manual prelube pump
Lubricating oil

Mounting System
Rails
Vibration isolators

Power Take-Offs
Front accessory drives
Auxiliary drive shafts and pulleys
Front stub shaft
Pulleys

Protection System
Explosion relief valves, status control box interconnect wiring harness

Starting System
Air starting motor
Air pressure regulator
Air silencer
Electric air start controls
Electric starting motors — dual 24-volt
Starting aids
Battery sets (24-volt dry), cables, and rack

General
Flywheel intertia weight
Guard removal
Engine barring group
Premium 8:1 pistons
Premium cylinder heads

TECHNICAL DATA

G3516 LE Gas Petroleum Engine

Fuel System		2 g NOx NTE Rating DM8618-01	2 g NOx NTE Rating DM8620-01
Engine Power			
@ 100% Load	bkW (bhp)	999 (1340)	858 (1150)
@ 75% Load	bkW (bhp)	749 (1004)	643 (862)
Engine Speed	rpm	**1400**	**1200**
Max Altitude @ Rated Torque and 38°C (100°F)	m (ft)	304.8 (1000)	1219.2 (4000)
Speed Turndown @ Max Altitude, Rated Torque, and 38°C (100°F)	%	25	9.2
SCAC Temperature	°C (°F)	54 (130)	54 (130)
Emissions*			
NOx	g/bkW-hr (g/bhp-hr)	2.68 (2)	2.68 (2)
CO	g/bkW-hr (g/bhp-hr)	2.49 (1.86)	2.35 (1.75)
CO_2	g/bkW-hr (g/bhp-hr)	632 (471)	624 (466)
VOC**	g/bkW-hr (g/bhp-hr)	0.35 (0.26)	0.4 (0.3)
Fuel Consumption***			
@ 100% Load	MJ/bkW-hr (Btu/bhp-hr)	10.48 (7405)	10.36 (7324)
@ 75% Load	MJ/bkW-hr (Btu/bhp-hr)	10.79 (7628)	10.76 (7605)
Heat Balance			
Heat Rejection to Jacket Water			
@ 100% Load	bkW (Btu/mn)	741 (42,123)	639 (36,343)
@ 75% Load	bkW (Btu/mn)	616.7 (35,075)	554 (31,480)
Heat Rejection to Aftercooler			
@ 100% Load	bkW (Btu/mn)	167.8 (9546)	131.9 (7509)
@ 75% Load	bkW (Btu/mn)	108.6 (6179)	72.2 (4108)
Heat Rejection to Exhaust			
@ 100% Load LHV to 25° C (77° F)	bkW (Btu/mn)	837.8 (47,643)	694.6 (39,536)
@ 75% Load LHV to 25° C (77° F)	bkW (Btu/mn)	630.4 (35,848)	524.1 (29,806)
Exhaust System			
Exhaust Gas Flow Rate			
@ 100% Load	m³/min (cfm)	217.0 (7663)	182.9 (6460)
@ 75% Load	m³/min (cfm)	163.8 (5785)	138.9 (4905)
Exhaust Stack Temperature			
@ 100% Load	°C (°F)	467.22 (873)	452.2 (846)
@ 75% Load	°C (°F)	467.22 (873)	450.5 (843)
Intake System			
Air Inlet Flow Rate			
@ 100% Load	m³/min (scfm)	80.6 (2847)	69.5 (2453)
@ 75% Load	m³/min (scfm)	60.8 (2147)	52.8 (1864)
Gas Pressure	kPag (psig)	241.5-275.8 (35-40)	241.5-275.8 (35-40)

*at 100% load and speed, all values are listed as not to exceed

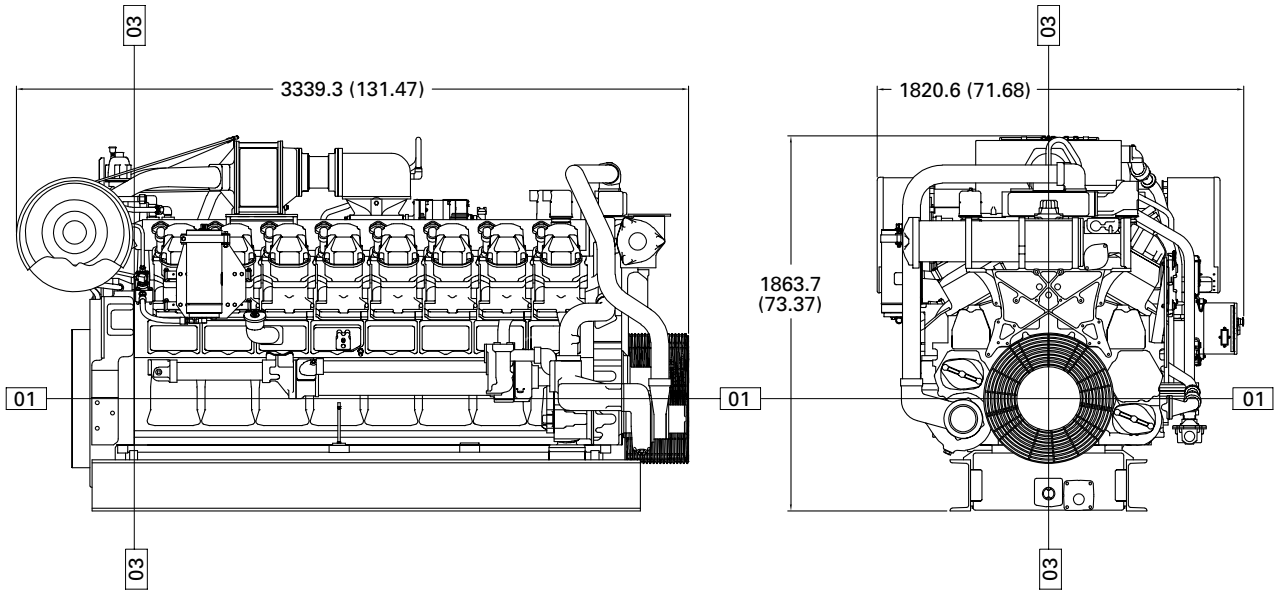
**Volatile organic compounds as defined in U.S. EPA 40 CFR 60, subpart JJJJ

***ISO 3046/1

G3516 LE GAS PETROLEUM ENGINE

858-999 bkW (1150-1340 bhp)

GAS PETROLEUM ENGINE



DIMENSIONS		
Length	mm (in.)	3339.3 (131.47)
Width	mm (in.)	1820.6 (71.68)
Height	mm (in.)	1863.7 (73.37)
Shipping Weight	kg (lb)	8015 (17,670)

Note: General configuration not to be used for installation. See general dimension drawings for detail (drawing #289-2971).

Dimensions are in mm (inches).

RATING DEFINITIONS AND CONDITIONS

Engine performance is obtained in accordance with SAE J1995, ISO3046/1, BS5514/1, and DIN6271/1 standards.

Transient response data is acquired from an engine/ generator combination at normal operating temperature and in accordance with ISO3046/1 standard ambient conditions. Also in accordance with SAE J1995, BS5514/1, and DIN6271/1 standard reference conditions.

Conditions: Power for gas engines is based on fuel having an LHV of 33.74 kJ/L (905 Btu/cu ft) at 101 kPa (29.91 in. Hg) and 15° C (59° F). Fuel rate is based on a cubic meter at 100 kPa (29.61 in. Hg) and 15.6° C (60.1° F). Air flow is based on a cubic foot at 100 kPa (29.61 in. Hg) and 25° C (77° F). Exhaust flow is based on a cubic foot at 100 kPa (29.61 in. Hg) and stack temperature.

Performance Numbers: DM8618-01, DM8620-01
LEHW0036-00 (11-09)
Supersedes LEHW6046-02