NEW MEXICO 20.2.70 NMAC
APPLICATION TO RENEW
TITLE V OPERATING PERMIT NUMBER P275-M1

BUENA VISTA COMPRESSOR STATION

Submitted By:

Harvest Four Corners, LLC

1755 Arroyo Drive
Bloomfield, New Mexico 87413

Prepared By:

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June 2022
(Revision 0 – Revision 1)

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Introduction

Application Summary

The Harvest Four Corners, LLC (Harvest) Buena Vista Compressor Station (Buena Vista) currently operates under construction permit 6362-R2 dated June 18, 2021; and Title V operating permit P275, issued on June 19, 2018, as revised through P275-M1 (for facility ownership change).

The Title V Operating Permit renewal application was submitted under 20.2.70.300.B(2) of the New Mexico Administrative Code (NMAC). As required by the regulation, this renewal application was submitted at least 12 months prior to the expiration date of the current Title V Operating Permit. This application update is submitted in accordance with 20.2.70.300.C(2) NMAC. A list of the updated information is provided in Section 3, *Application Summary*.

Tables 2-A and 2-B of Section 2 of this application contains the list of authorized equipment and emissions sources as well as changes to the current regulated equipment list. Changes to the permit and permit application include

- Approved Construction permit changes to the manufacturer/model of the “b” compressor engine selection (Table 2-A);
- Aggregation of volatile organic compound emissions limits from condensate tank working and breathing losses with the tank flash volatile organic compound emissions (Table 2-E);
- Updated Startup, Shutdown, and Routine Maintenance compressor blowdown emission calculations (Section 6);
- Deletion of malfunction emissions from the permit (Table 2-A);
- The addition of reciprocating compressors and pneumatic devices as regulated equipment (Table 2-A); and
- The addition of 20.2.50 NMAC to Section 13, *Determination of State & Federal Air Quality Regulations*; and the addition of a completed ‘Compliance History Disclosure Form’ (Section 20).

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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

☒ 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.

☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance program (SBEAP) and qualifies for 50% of the normal application and permit fees. Enclosed is a check for 50% of the normal application fee which will be verified with the Small Business Certification Form for your company.

☐ This facility qualifies to receive assistance from the Small Business Environmental Assistance Program (SBEAP) but does not qualify for 50% of the normal application and permit fees. To see if you qualify for SBEAP assistance and for the small business certification form go to https://www.env.nm.gov/aqb/sbap/small_business_criteria.html).

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.70.300.C(2) 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.): 35662	Updating Permit/NOI #: Application P275-R1
1	Facility Name: Buena Vista Compressor Station	Plant primary SIC Code (4 digits): 1389	
		Plant NAIC code (6 digits): 213112	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): See Section 1-D.4.		
2	Plant Operator Company Name: Harvest Four Corners, LLC	Phone/Fax: 505-632-4600 / 505-632-4782	
a	Plant Operator Address: 1755 Arroyo Drive, Bloomfield, NM 87413		

b	Plant Operator's New Mexico Corporate ID or Tax ID: 76-0451075	
3	Plant Owner(s) name(s): Same as #2 above	Phone/Fax: Same as #2 above
a	Plant Owner(s) Mailing Address(s): Same as #2a above	
4	Bill To (Company): Same as #2 above	Phone/Fax: Same as #2 above
a	Mailing Address: Same as #2a above	E-mail: N/A
5	☐ Preparer: ☑ Consultant: Lisa Killion, Cirrus Consulting, LLC	Phone/Fax: 505-466-1790
a	Mailing Address: c/o 11139 Crisp Air Drive, Colorado Springs, Colorado 80908	E-mail: lkillion@cirrusllc.com
6	Plant Operator Contact: Monica Smith	Phone/Fax: 505-632-4625 / (505) 632-4782
a	Address: Same as #2a above	E-mail: Monica.Smith@harvestmidstream.com
7	Air Permit Contact: Same as #6 above	Title: Environmental Specialist
a	E-mail: Same as #6a above	Phone/Fax: Same as #6 above
b	Mailing Address: Same as #2a above	
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? [x] Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? [x] 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 [x] 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? [x] Yes ☐ No
3	Is the facility currently shut down? ☐ Yes [x] No	If yes, give month and year of shut down (MM/YY):
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes [x] 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 [x] N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? [x] Yes ☐ No	If yes, the permit No. is: P-275-M1
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes [x] No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes [x] No	If yes, the NOI No. is:
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? [x] Yes ☐ No	If yes, the permit No. is: 6362-R2
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes [x] No	If yes, the register No. is:

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: 1.25 mmcfh[(a)]	Daily: 30 mmscfd[(a)]	Annually: 10,950 mmscfd[(a)]
b	Proposed	Hourly: 1.25 mmcfh[(a)]	Daily: 30 mmscfd[(a)]	Annually: 10,950 mmscfd[(a)]
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: 1.25 mmcfh[(a)]	Daily: 30 mmscfd[(a)]	Annually: 10,950 mmscfd[(a)]
b	Proposed	Hourly: 1.25 mmcfh[(a)]	Daily: 30 mmscfd[(a)]	Annually: 10,950 mmscfd[(a)]

[a] Station capacity is a direct function of available horsepower. The throughput is therefore dependent on atmospheric temperature, gas temperature, atmospheric pressure, gas pressure, relative humidity and gas quality, as well as other factors. The "capacity" expressed in the application is a nominal quantity, neither an absolute maximum nor an average. The actual throughput will vary from the nominal amount.

Section 1-D: Facility Location Information

1	Section: 32	Range: 08W	Township: 24N	County: San Juan	Elevation (ft): 7,000
2	UTM Zone: ☐ 12 or ☒ 13			Datum: ☐ NAD 27 ☐ NAD 83 ☒ WGS 84	
a	UTM E (in meters, to nearest 10 meters): 257,618 m			UTM N (in meters, to nearest 10 meters): 4,017,876 m	
b	**AND** Latitude (deg., min., sec.): 36° 16' 31.52"			Longitude (deg., min., sec.): -107° 41' 54.36"	
3	Name and zip code of nearest New Mexico town: Nageezi, NM 87037				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): From Bloomfield, NM, drive south on US Hwy 550 to mile point 116.6. Turn left (east) on oilfield road. Drive 0.7 miles. Then proceed straight through the cattle guard at the intersection. Continue on the main road for 1.3 miles. Turn left on small road. Drive 0.6 miles east/southeast. Compressor station is on the left.				
5	The facility is ~ 2 (distance) miles east-northeast (direction) of Nageezi, NM (nearest town).				
6	Status of land at facility (check one): ☐ Private ☐ Indian/Pueblo ☐ Federal BLM ☐ Federal Forest Service ☒ Other (specify) State of New Mexico				
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: None; Navajo tribal lands; San Juan County, Rio Arriba County, Sandoval 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: Not applicable				
9	Name nearest Class I area: San Pedro Parks Wilderness				
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 69.340 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: ~3,700 m				
12	Method(s) used to delineate the Restricted Area: Fencing "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.				
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☐ Yes ☒ No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.				
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☒ No ☐ Yes If yes, what is the name and permit number (if known) of the other facility?				

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

1	Facility **maximum** operating ($\frac{\text{hours}}{\text{day}}$): 24	($\frac{\text{days}}{\text{week}}$): 7	($\frac{\text{weeks}}{\text{year}}$): 52	($\frac{\text{hours}}{\text{year}}$): 8,760			
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:		
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: Not applicable. Commercial power is purchased from a commercial utility company, which specifically does not include power generated on site for the sole purpose of the user.		

Section 1-G: Streamline Application

(This section applies to 20.2.72.300 NMAC Streamline applications only)

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

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

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

1	Responsible Official (R.O.) (20.2.70.300.D.2 NMAC): Travis Jones		Phone: 713-289-2630
a	R.O. Title: EH&S Manager	R.O. e-mail: trjones@harvestmidstream.com	
b	R. O. Address: 1111 Travis Street, Houston, TX 77002		
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC): TBD		Phone: TBD
a	A. R.O. Title: TBD	A. R.O. e-mail: TBD	
b	A. R. O. Address: TBD		
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): N/A		
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.): Harvest Midstream		
a	Address of Parent Company: 1111 Travis Street, 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: N/A		
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: Yes: Colorado (80 km); Southern Ute Tribe (80 km); Jicarilla Apache Tribe (25.9 km); Ute Mountain Ute Tribe (80 km); and Navajo Tribal Lands – checkerboard area (1.25 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.

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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.
1a	Reciprocating Internal Combustion Engine	Waukesha	7042GL	C-11661/2 (Pkg. X00102)	1,480 hp	1,347 hp	6/20/1995 6/20/1995	N/A 1a	20200202	**X Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
1b	Reciprocating Internal Combustion Engine	Caterpillar	3516 TALE	TBD	1,340 hp	1,219 hp	TBD TBD	N/A 1b	20200202	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit **X To Be Modified** ☐ To be Replaced	4SLB	N/A
2a	Reciprocating Internal Combustion Engine	Waukesha	7042GL	TBD	1,480 hp	1,347 hp	TBD TBD	N/A 2a	20200202	**X Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
2b	Reciprocating Internal Combustion Engine	Caterpillar	3516 TALE	TBD	1,340 hp	1,219 hp	TBD TBD	N/A 2b	20200202	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit **X To Be Modified** ☐ To be Replaced	4SLB	N/A
3a	Reciprocating Internal Combustion Engine	Waukesha	7042GL	C-11100/4 (Pkg 70889)	1,480 hp	1,347 hp	2/7/1994 2/7/1994	N/A 3a	20200202	**X Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	4SLB	N/A
3b	Reciprocating Internal Combustion Engine	Caterpillar	3516 TALE	TBD	1,340 hp	1,219 hp	TBD TBD	N/A 3b	20200202	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit **X To Be Modified** ☐ To be Replaced	4SLB	N/A
SSM	Compressors & Associated Piping (SSM)	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31000299	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit **X To Be Modified** ☐ To be Replaced	N/A	N/A
T1	Condensate Storage Tank	Cimmaron Tank Company	N/A	2209	400 bbl	400 bbl	12/1/1980 12/1/1980	N/A N/A	40400311-12	**X Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
T2	Condensate Storage Tank	TBD	N/A	N/A	400 bbl	400 bbl	TBD TBD	N/A N/A	40400311-12	**X Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
F1	Fugitive Emissions	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	**X Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
C1a/b, C2a/b, C3a/b	Reciptocating Compressor Venting	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31000299	**X Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
PC 1 - PC 16	Pneumatic Controllers	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31000299	**X Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
M1	Malfunctions	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31000299	☐ Existing (unchanged) **X To be Removed** ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	N/A
										☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
										☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		
										☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced		

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

[2] Specify dates required to determine regulatory applicability.

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

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

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

All 20.2.70 NMAC (Title V) applications must list all Insignificant Activities in this table. All 20.2.72 NMAC applications must list Exempted Equipment in this table. If equipment listed on this table is exempt under 20.2.72.202.B.5, include emissions calculations and emissions totals for 202.B.5 "similar functions" units, operations, and activities in Section 6, Calculations. Equipment and activities exempted under 20.2.72.202 NMAC may not necessarily be Insignificant under 20.2.70 NMAC (and vice versa). Unit & stack numbering must be consistent throughout the application package. Per Exemptions Policy 02-012.00 (see http://www.env.nm.gov/aqb/permit/aqb_pol.html), 20.2.72.202.B NMAC Exemptions do not apply, but 20.2.72.202.A NMAC exemptions do apply to NOI facilities under 20.2.73 NMAC. List 20.2.72.301.D.4 NMAC Auxiliary Equipment for Streamline applications in Table 2-A. The List of Insignificant Activities (for TV) can be found online at 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.	Max Capacity	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5)	Date of Manufacture /Reconstruction[2]	For Each Piece of Equipment, Check Onc
			Serial No.	Capacity Units	Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Installation /Construction[2]	
T3	Produced Water Storage Tank			45	20.2.72.202.B(5) NMAC		X **Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				bbl	Insignificant Activity List Item #1		
L1	Truck Loading - Condensate			N/A			X **Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				N/A	Insignificant Activity List Item #1		
L2	Truck Loading - Produced water			N/A	20.2.72.202.B(5) NMAC		X **Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				N/A	Insignificant Activity List Item #1		
PR1	Pig Receiver			N/A	20.2.72.202.B(5) NMAC		X **Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				N/A	Insignificant Activity List Item #1		
T4	Waste Water Storage Tank			45	20.2.72.202.B(2) NMAC		X **Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				bbl	Insignificant Activity List Item #5		
T5, T6, T7 (each)	Lube Oil Storage Tank			500	20.2.72.202.B(2) NMAC		X **Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				gal	Insignificant Activity List Item #5		
T8, T9, T10 (each)	Used Lube Oil Storage Tank			500	20.2.72.202.B(2) NMAC		X **Existing (unchanged)** ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
				gal	Insignificant Activity List Item #5		
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced

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

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

Table 2-C: Emissions Control Equipment

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

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
N/A						

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

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

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

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

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
Totals	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-	-	-	-

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

Table 2-E: Requested Allowable Emissions

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

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
1a	4.45	19.51	7.87	34.46	2.97	13.00	5.85E-03	2.56E-02	9.94E-02	0.44	9.94E-02	0.44	9.94E-02	0.44	-	-	-	-
1b	5.38	23.55	7.98	34.97	2.77	12.13	5.86E-03	2.57E-02	9.95E-02	0.44	9.95E-02	0.44	9.95E-02	0.44	-	-	-	-
2a	4.45	19.51	7.87	34.46	2.97	13.00	5.85E-03	2.56E-02	9.94E-02	0.44	9.94E-02	0.44	9.94E-02	0.44	-	-	-	-
2b	5.38	23.55	7.98	34.97	2.77	12.13	5.86E-03	2.57E-02	9.95E-02	0.44	9.95E-02	0.44	9.95E-02	0.44	-	-	-	-
3a	4.45	19.51	7.87	34.46	2.97	13.00	5.85E-03	2.56E-02	9.94E-02	0.44	9.94E-02	0.44	9.94E-02	0.44	-	-	-	-
3b	5.38	23.55	7.98	34.97	2.77	12.13	5.86E-03	2.57E-02	9.95E-02	0.44	9.95E-02	0.44	9.95E-02	0.44	-	-	-	-
SSM	-	-	-	-	Not specified	37.92	-	-	-	-	-	-	-	-	-	-	-	-
T1[2]	-	-	-	-	Not specified	143.50	-	-	-	-	-	-	-	-	-	-	-	-
T2[2]	-	-	-	-	with T1	with T1	-	-	-	-	-	-	-	-	-	-	-	-
F1	-	-	-	-	2.13	9.34	-	-	-	-	-	-	-	-	-	-	-	-
Totals[3]	16.13	70.64	23.95	104.90	11.04	229.77	1.76E-02	7.70E-02	0.30	1.31	0.30	1.31	0.30	1.31	-	-	-	-

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

[2] Operating Permit (P275) currently distinguishes the condensate (hydrocarbon) tank working and breathing (W/B) losses (units T1 and T2) from flash emissions (T1 (flash), T2 (flash). With this application, the W/B losses are aggregatged with the flash emissions under one emission limit (7.6 tpy W/B losses + 136.4 tpy flash emissions = **143.5 tpy total VOC emissions**). The aggregated total emissions are brought forward from the current permit.

[3] The worst-case PTE is shown (units 1b, 2b & 3b for NO_X, CO, SO_X and particulate, and units 1a, 2a, & 3a for VOC), and the worst-case compressor emissions scenario (all three compressors are 2-stage).

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

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

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

Unit No.	NOx		CO		VOC		SOx		PM[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
SSM	-	-	-	-	not specified	37.9	-	-	-	-	-	-	-	-	-	-	-	-
Totals	-	-	-	-	not specified	37.92	-	-	-	-	-	-	-	-	-	-	-	-

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

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

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

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

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

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

Table 2-H: Stack Exit Conditions

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

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter (ft)
						(acfs)	(dscfs)			
1a	1a	V	N	22	700	125			153	1.02
1b	1b	V	N	22	965	124			158	1.00
2a	2a	V	N	22	700	125			153	1.02
2b	2b	V	N	22	965	124			158	1.00
3a	3a	V	N	22	700	125			153	1.02
3b	3b	V	N	22	965	124			158	1.00

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

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

Stack No.	Unit No.(s)	Total HAPs		Formaldehyde X HAP or ☐ TAP		n-Hexane X HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ HAP or ☐ TAP		Provide Pollutant Name Here ☐ 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
1a	1a	0.5	2.3	0.5	2.2	-	-												
1b	1b	0.5	2.1	0.5	2.0	-	-												
2a	2a	0.5	2.3	0.5	2.2	-	-												
2b	2b	0.5	2.1	0.5	2.0	-	-												
3a	3a	0.5	2.3	0.5	2.2	-	-												
3b	3b	0.5	2.1	0.5	2.0	-	-												
SSM	SSM	-	0.5	-	-	-	0.5												
T1, T2	T1, T2	-	4.2	-	-	-	3.8	The T1, T2 aggregated condensate tank source includes tank working & breathing losses and flash emissions (including inlet separator S1)											
T3	T3	-	-	-	-	-	-												
L1	L1	4.6	0.1	-	-	3.5	-												
L2	L2	-	-	-	-	-	-												
F1	F1	-	0.1	-	-	-	0.1												
Totals[1]		6.22	12.0	1.5	6.6	3.6	4.5												

[1] The Total HAP PTE sums are based on the selection of the three worst-case emitting RICE (units 1a, 2a, & 3a) and the worst-case compressor emissions scenario (all three compressors are 2-stage).

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
1a	Natural Gas	Field natural gas	900 Btu/scf	11,056 scfh	95.85 MMscf/yr	-	-
1b	Natural Gas	Field natural gas	900 Btu/scf	11,075 scfh	97.01 MMscf/yr	-	-
2a	Natural Gas	Field natural gas	900 Btu/scf	11,056 scfh	95.85 MMscf/yr	-	-
2b	Natural Gas	Field natural gas	900 Btu/scf	11,075 scfh	97.01 MMscf/yr	-	-
3a	Natural Gas	Field natural gas	900 Btu/scf	11,056 scfh	95.85 MMscf/yr	-	-
3b	Natural Gas	Field natural gas	900 Btu/scf	11,075 scfh	97.01 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)
T1, T2	40400311	Condensate	Mixed hydrocarbons	6	65.6853	67.36	5.5749	80.79	7.1986
T3	40400315	Produced Water	Produced water w/trace of hydrocarbons	Insignificant source					
T4	40400313	Waste Water	Waste water w/trace of hydrocarbons	Insignificant source					
T5, T6, T7	40400313	Lube Oil	Lubrication Oil	Insignificant source					
T8, T9, T10	40400313	Used Lube Oil	Used Lubrication Oil	Insignificant source					

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			
T1, T2		Condensate	N/A	FX	400	63.6	3.7	3.1	OT	OT	Good	378,084	22.5
T3		Produced Water	N/A	FX	45	7.2	Insignificant source						
T4		Waste Water	N/A	FX	100	15.9	Insignificant source						
T5, T6, T7		Lube Oil	N/A	FX	12	1.9	Insignificant source						
T8, T9, T10		Used Lube Oil	N/A	FX	11.9	1.9	Insignificant source						

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

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

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

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

Material Processed				Material Produced			
Description	**Chemical Composition**	**Phase (Gas, Liquid, or Solid)**	**Quantity (specify units)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (specify units)**
Low pressure natural gas	C1-C6+	Gas	10,950 mmscfy[1]	High pressure natural gas	C1-C6+	Gas	10,950 mmscfy[1]
Condensate	Mixed HC	Liquid	378,084 gal/yr[1]	Hydrocarbon (HC) liquid	Mixed HC	Liquid	378,084 gal/yr[1]
Produced water	H2O + Mixed HC	Liquid	159,600 gal/yr[1]	Produced water	H2O + Mixed HC	Liquid	159,600 gal/yr[1]

[1] The material processed and material produced are both a direct function of available horsepower. The material processing and production rates are therefore dependent on atmospheric temperature and pressure, gas temperature and pressure, relative humidity and gas quality, was well as other factors. The values expressed above are a nominal quantities (with a safety factor), neither an absolute maximum, nor an average. Actual values will vary from the nominal amount.

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									

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								

Table 2-P: Green House 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.

Unit No.		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**									
1a	**mass GHG**	6010.45	0.01	0.11										6010.6	-
	CO_2e	6010.45	3.38	2.83										-	6016.7
1b	**mass GHG**	5662.37	0.01	0.11										5662.5	-
	CO_2e	5662.37	3.18	2.67										-	5668.2
2a	**mass GHG**	6010.45	0.01	0.11										6010.6	-
	CO_2e	6010.45	3.38	2.83										-	6016.7
2b	**mass GHG**	5662.37	0.01	0.11										5662.5	-
	CO_2e	5662.37	3.18	2.67										-	5668.2
3a	**mass GHG**	6010.45	0.01	0.11										6010.6	-
	CO_2e	6010.45	3.38	2.83										-	6016.7
3b	**mass GHG**	5662.37	0.01	0.11										5662.5	-
	CO_2e	5662.37	3.18	2.67										-	5668.2
SSM	**mass GHG**	1.00		40.74		SSM includes reciprocating compressor blowdowns and pigging.								41.7	-
	CO_2e	1.00	0.00	1018.41										-	1019.4
T1 & T2	**mass GHG**	0.04	-	19.71		Includes aggregated GHG from the tank flash emissions from both of the condensate storage tanks and inlet separator (S1) flash emissions.								19.8	-
	CO_2e	0.04	-	492.75										-	492.8
T3	**mass GHG**	0.00	-	0.00										0.0	-
	CO_2e	0.00	-	0.00										-	0.0
L1	**mass GHG**	0.00	-	0.00										0.0	-
	CO_2e	0.00	-	0.00										-	0.0
L2	**mass GHG**	0.00	-	0.00										0.0	-
	CO_2e	0.00	-	0.00										-	0.0
F1	**mass GHG**	1.87		76.84		F-1 Includes reciprocating compressor venting, centrifugal compressor venting, pneumatic devices, and pneumatic pumps.								78.7	-
	CO_2e	1.87	-	1920.90										-	1922.8
	mass GHG													0.0	-
	CO_2e													-	0.0
	mass GHG													0.0	-
	CO_2e													-	0.0
Total[6]	**mass GHG**	18,034.3	0.03	137.62										18,172	-
	CO_2e	18,034.3	10.1	3,440.6										-	21,485.0

[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.

[6] **Total Emission Rates (tpy) = worst case emissions from three compressor engines (3 x Waukesha 7042GL RICE)**

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.

Application Summary

The Harvest Four Corners, LLC (Harvest) Buena Vista Compressor Station (Buena Vista) currently operates under construction permit 6362-M1, issued on March 21, 2023; and Title V operating permit P275, dated June 19, 2018, as revised through P275-M1 (for facility ownership change).

The Title V renewal application is submitted under 20.2.70.300.B(2) of the New Mexico Administrative Code (NMAC). As required by the regulation, the renewal application was submitted at least 12 months prior to the expiration date of the current Title V Operating Permit. The application is being updated to incorporate the recent changes in the Construction Permit and current Department requirements as required under 20.2.70.300.C(2) NMAC.

A list of the equipment approved for use at the facility under the Construction permit and Title V Operating permit can be found in Tables 2-A and 2-B of Section 2 of this application.

Changes incorporated into this application include:

- Aggregate the volatile organic compounds (VOC) from condensate tank working and breathing losses (units T1 and T1) in the Section 2 emissions, with the associated tank flash emissions of VOC (units T1 flash and T2 flash). This change is an Administrative permit revision. No emission increases result from this change.
- Change the "b" selection (1a, 2b, and 3b) engine from the currently allowed Waukesha 5790 GL to a Caterpillar 3516 TALE at Harvest's sole discretion (Construction Permit 6362-M1).

- Update the startup, shutdown and maintenance (SSM) blowdown emission calculations. As of May 2023, the updated blowdown volume and number of SSM events are required by NMAQB for the placement of new SSM blowdown parameters to enhance enforceability. There are two possible compressors used at the facility, a 2-stage and a 3-stage with the 2-stage compressor having the higher volume and corresponding higher Potential To Emit (PTE) of VOC emissions.

  At the Buena Vista Compressor Station, the "a" selection Waukesha 7042 GL (units 1a, 2a, and 3a) engines are coupled with 2-stage compressors, and the Caterpillar 3516 TALEs ("b" selection engines, units 1b, 2b, and 3b) are coupled with 3-stage compressors. (Other facilities may use a different number of compressor stages for the same model engine.) As shown in Section 6, the 2-stage compressors have higher blowdown volumes and higher corresponding SSM VOC PTE emissions than the 3-stage compressors.

  It follows that (for the Buena Vista facility) the worst-case SSM PTE occurs if all three of the permitted compressor engines are Waukesha 7042 GLs with 2-stage compressors. The current facility compressor engine configuration is indicated in Table 2-A.

- Delete the currently allowed 10 tpy of malfunction emissions of VOC from the permit;

- Identify the individual reciprocating compressors and pneumatic controllers as regulated equipment in Table 2-A; and

- Add a 'Compliance History Disclosure Form' as required by NMAQB. The completed form has been placed in Section 20, *Other Relevant Information*.

The changes in permitted equipment contained in this application do not result in any de-bottlenecking of impacts or changes to the major/minor status of the facility under the Prevention of Significant Deterioration (PSD) program and/or the Title V Operating Permits program.

Process Description

Buena Vista is a production gathering field compressor station that pressurizes and dehydrates natural gas for transport through natural gas pipelines. The facility is authorized to operate continuously.

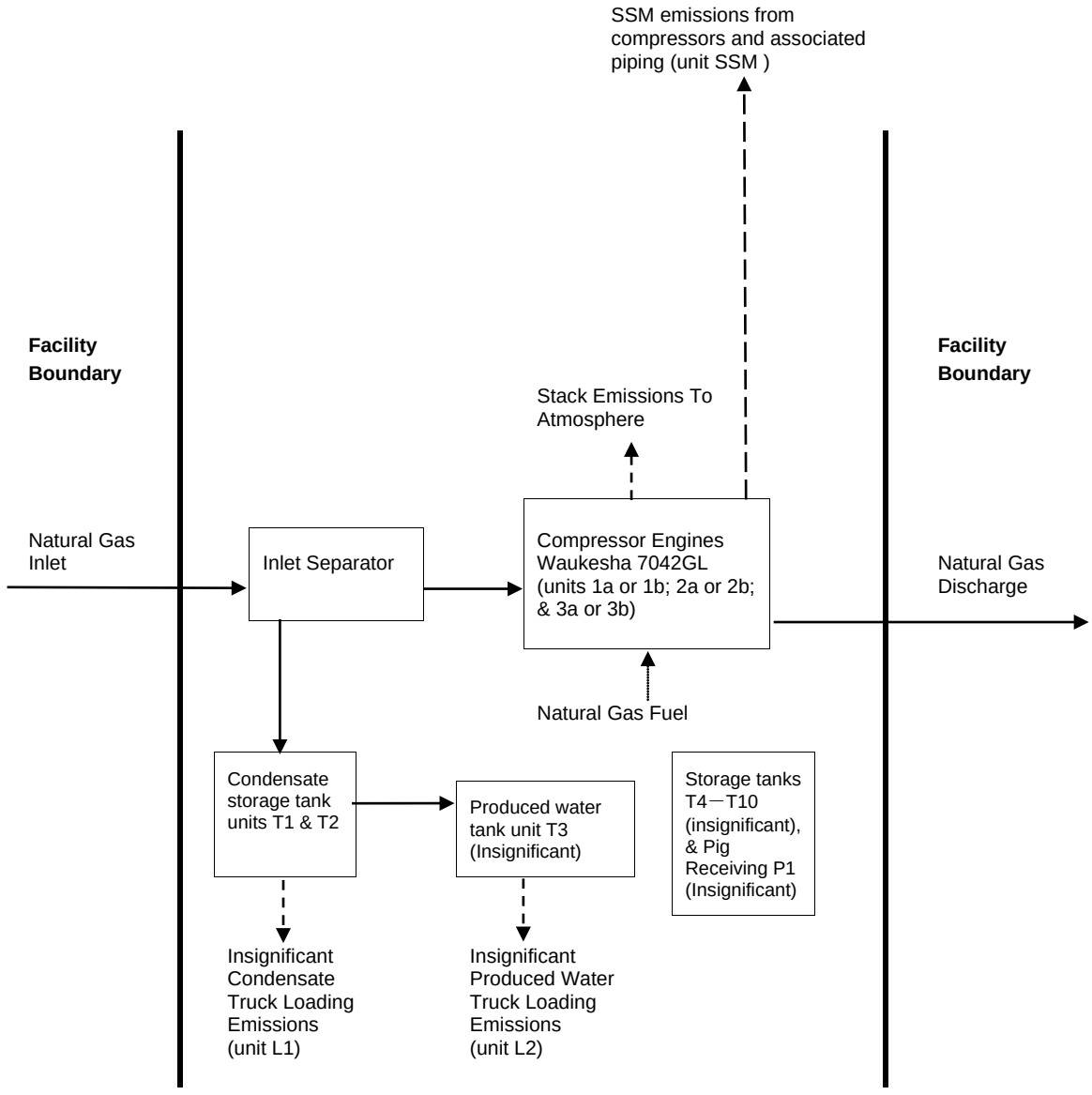
Startup, Shutdown and Maintenance Emissions (SSM)

Except for facility compressor and piping blowdown events identified in tables 2-E and 2-F in application Section 2, there are no SSM emissions of VOC in excess of those identified for steady-state operation. Discussions justifying this conclusion are provided in Section 6.

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.



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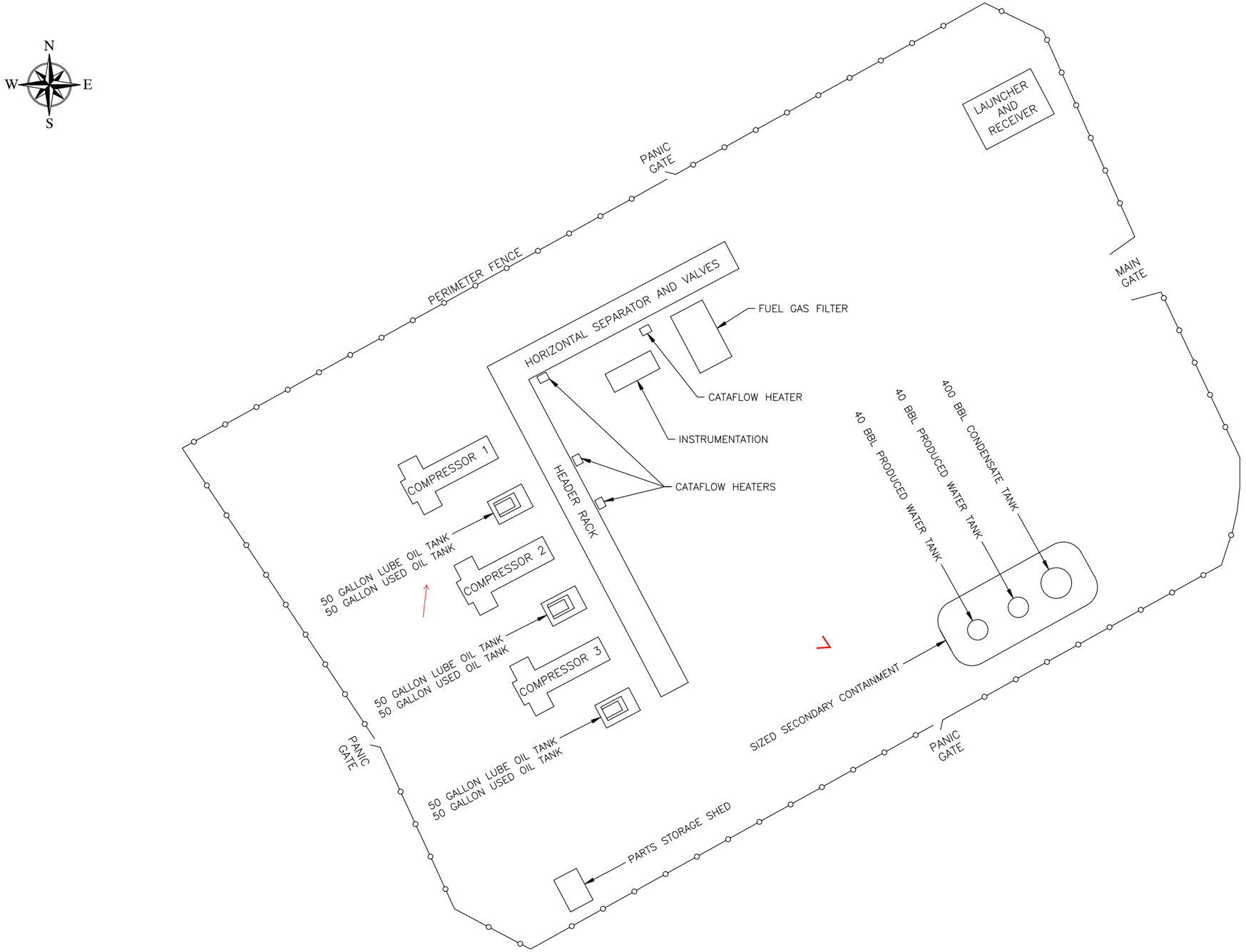
Section 5

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 provided in this section. Please see the following page.



NOTES:

SCALE

0 25 50 75 100

(FEET)

TOWNSHIP: 28N
RANGE: 8W
SECTION: 32
LONGITUDE: 36.274722°
LATITUDE: −107.699023°

DRAWING NO.	TITLE
..	..
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REFERENCE DRAWINGS

REV	DRAWN BY	DATE REVISED	CHECKED BY	PROJECT ENG.	APPROVED BY

REVISIONS

HARVEST MIDSTREAM
H4C Office
1755 Arroyo Drive
Bloomfield, NM 87413

BUENA VISTA COMPRESSOR STATION
BASIC PLOT PLAN

SAN JUAN NEW MEXICO

DRAWN BY	T. GOOSSEN	SCALE: NONE	A.F.E.:
CHECKED BY	M.S.		
PROJECT ENG.	M.S.		
APPROVED BY			
DATE ISSUED	10/7/2022		

BNV-P11-001

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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.

Engines

The NO_2, CO, and VOC emissions from the engines were calculated from manufacturer's data. The SO_2 and particulate emissions were calculated using AP-42 emission factors from Table 3.2-2. HAP emissions were calculated using GRI-HAPCalc 3.0. All emissions were calculated assuming each engine operates at full site capacity for 8,760 hours per year.

The engines startup with no load and a rich fuel mixture. As a result, emissions are minimized. Because the engines take only minutes to reach operating temperature, emissions during startup are not expected to exceed the steady-state allowable limits. Similarly, emissions during shutdown do not exceed the steady-state allowable limits, because fuel and air flow cease within seconds of shutdown. Emissions due to scheduled maintenance are negligible as the engines are not in operation during maintenance.

As previously noted, this Title V renewal application incorporates changes to the allowed "b" engine from a Waukesha 5790 GL to a Caterpillar 3516 TALE from the revised Construction Permit. There are no changes to the "a" engine selection, and permitted criteria pollutant and HAP emissions for the "a" engine selections are carried forward and not revised.

SSM Blowdown and Piping Emissions

SSM blowdown emissions from the compressors and piping associated with the facility occur when high pressure gas is used to purge air from the system prior to startup. Also, after shutdowns, high pressure gas is released to atmosphere as a safety precaution.

VOC and HAP emissions from blowdowns of the compressors and piping associated with the station were calculated from the quantity of gas vented during each event, the composition of the gas, and the number of events. The quantity of gas vented during each event was determined by Harvest engineering. The composition of the gas was determined from a recent extended gas analysis. For each unit, the annual number of blowdown events were estimated based on historical operations. A safety factor is included because emissions from each blowdown event are dependent on the composition of the gas in the pipeline, and because the number of blowdowns in a year may vary. Use of the safety factor is also designed to ensure an adequate emissions limit, which includes emissions from other miscellaneous startup, shutdown and maintenance activities.

At the Buena Vista Compressor Station, there are two different compressor types (2-stage and 3-stage) with different blowdown volume sizes. The larger blowdown volume (and higher per-event emissions) are

associated with the 2-stage compressors. For Buena Vista Compressor Station, the Waukesha 7042 GL engines (units 1a, 2a, and 3a) are coupled with the 2-stage compressors, and the Caterpillar 3516 TALE engines (units 1b, 2b, and 3b) are coupled with the 3-stage compressors. Emission calculations for both 2-stage and 3-stage compressors is provided. The facility-wide worst-case aggregated PTE for SSM blowdown emissions corresponds with if all three compressor engines are Waukesha 7042 GLs (i.e., placement of units 1a, 2a, and 3a onsite) with their associated 2-stage compressors.

SSM emission calculations for each of the 2-stage and 2-stage compressors are provided. Detailed engineering calculations of the compressor blowdown volumes is included in the Excel file containing the Section 6 spreadsheet calculations. (The application PDF does not include the engineering volume calculations, only the corresponding emission calculations.)

The SSM emissions identified in this application are routine or predictable startup/shutdown and scheduled maintenance, and do not include malfunctions or upsets.

Pig Receiver SSM Emissions

VOC and HAP emissions from the pig receiver were calculated from the quantity of gas vented during each event, the composition of the gas, and the number of events. The quantity of gas vented during each event was determined by Harvest engineering. The composition of the gas was determined from a recent extended gas analysis. The annual number of blowdown events were estimated based on historical operations. A safety factor was added because VOC and HAP emissions from each blowdown event are dependent on the composition of the gas in the pipeline and because the number of blowdowns in a year may vary. Experience indicates there will be a nominal variation in the composition of the gas.

Due to the nature of the source, it is estimated that SSM emissions from the pig receiver is already accounted for in the calculations.

The pig receiver is an existing unit. No modifications are being made to the unit or its operation. As the calculated VOC emission rate is less than 0.5 tpy, the pig receiver is a Title V insignificant source in accordance with Insignificant Activity Item #1, and an NSR exempt source under 20.2.72.202.B(5) NMAC.

Storage Tanks

Emissions from the condensate storage tanks were calculated using TANKS 4.0.9d for working-breathing losses and VMG Symmetry for flash emissions with the currently permitted (post-flash) condensate throughput of 9,002 barrels per year. Note that the Symmetry model run also includes flash gas emissions from the slug receiver inlet separator.

The produced water tank emissions of VOC and HAP were calculated using emission factors from the Colorado Department of Public Health and Environment (CDPHE) and Texas Commission on

Environmental Quality (TCEQ), and the maximum produced water throughput. As the VOC emission rate from the produced water storage tank is less than 0.5 tpy, the produced water storage tank is an NSR exempt source in accordance with 20.2.72.202.B(5) NMAC, and an insignificant source under the Title V Insignificant Activity list, Item #1.

For the remaining tanks, the following assumptions were made:

- Residual oil #6 was used as an estimate for lubrication oil. As the vapor pressure of residual oil #6 is less than 0.2 psia, the tanks containing lubrication oil are NSR exempt sources under 20.2.72.202.B(2) NMAC, and insignificant sources under Title V Insignificant Activity list, Item #5; and

- The wastewater storage tank liquid composition is assumed to be 99% water and 1% residual oil. As the vapor pressure of residual oil is less than 0.2 psia, the wastewater storage tank is an exempt source under 20.2.72.202.B(2) NMAC, and an insignificant source under Title V Insignificant Activity list, Item #5.

Due to the nature of operations, startup and shutdown emissions from the storage tanks are assumed to be accounted for in the calculations discussed above. Emissions due to maintenance are negligible as the units are not in operation during maintenance.

No changes are being made to the storage tanks or their operation. Emissions from the tanks are carried forward and not revised.

Truck Loading – Condensate

VOC emissions from truck loading of condensate were calculated using the AP-42 emission factor from Section 5.2 and data provided by Harvest. HAP emissions were calculated from the composition of the condensate as determined from TANKS 4.0 results.

Due to the nature of the source, it is estimated that SSM emissions from truck loading are accounted for in the calculations; therefore, there are no SSM emissions associated with the truck loading. No SSM maintenance activities are performed during the truck loading.

Based on the potential to emit, condensate truck loading is an exempt source in accordance with 20.2.72.202.B(5) NMAC (VOC emissions are less than 0.5 tons per year) and a Title V insignificant source in accordance with Insignificant Activity Item #1.

Truck Loading - Produced Water

The VOC emissions from truck loading of produced water were calculated using the AP-42 emissions factor identified in Section 5.2-1. The data used to calculate the emission factor was obtained assuming the liquid was pure water.

Due to the nature of the source, it is estimated that SSM emissions from truck loading are accounted for in the calculations; therefore, there are no SSM emissions associated with truck loading. No SSM maintenance activities are performed during the truck loading.

Based on the potential to emit, produced water truck loading is an exempt source in accordance with 20.2.72.202.B(5) NMAC (VOC emissions are less than 0.5 tons per year) and a Title V insignificant source in accordance with Insignificant Activity Item #1.

Equipment Leaks - Fugitive Emissions

Fugitive VOC and HAP emissions from equipment leaks were calculated using emission factors from Table 2.4 of the 1995 Protocol for Equipment Leak Emission Estimates published by the Environmental Protection Agency (EPA) and the gas stream composition obtained from a recent extended gas analysis. Emissions were calculated assuming the equipment operates 8,760 hours per year.

Due to the nature of the source, it is estimated that SSM emissions from the equipment are accounted for in the calculations.

Engine Exhaust Emissions Calculations

Unit Number: 1a, 2a, 3a
Description: Waukesha L7042GL
Type: Four Stroke Lean Burn (Turbocharged)

Note: The data on this worksheet applies to each individual emissions unit identified above.

Horsepower Calculations

7,004	ft above MSL	Elevation	
1,480	hp	Nameplate hp	Mfg. data
1,347	hp	NMAQB Site-rated hp	NMAQB Procedure # 02.002-00 (loss of 3% for every 1,000 ft over 4,000 ft)
1,317	hp	Mfg. Site-rated hp	Mfg. product bulletin Power Derate, S8154-6, April 2001 (loss of 2% for every 1,000 ft over 1,500 ft)

Engine Specifications

1200	rpm	Engine rpm	Mfg. data
7,040	cu in	Engine displacement	Mfg. data
126.25	psi	BMEP	Mfg. data (+[(792,000 x NMAQB Site-rated hp) / (rpm * in^3)])

Fuel Consumption

7,389	Btu/hp-hr	Brake specific fuel consumption	Mfg. data
9.95	MMBtu/hr	Hourly fuel consumption	Btu/hp-hr x NMAQB site-rated hp / 1,000,000
900	Btu/scf	Field gas heating value	Nominal heat content
11,056	scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
8,760	hr/yr	Annual operating time	Harvest Four Corners, LLC
87,162	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr
96.85	MMscf/yr	Annual fuel consumption	scf/hr x hr/yr / 1,000,000

Steady-State Emission Rates

Pollutants	Emission Factors, g/hp-hr	Uncontrolled Emission Rates, pph	Uncontrolled Emission Rates, tpy
NOX	1.50	4.453	19.51
CO	2.65	7.867	34.46
VOC	1.00	2.97	13.00

Emission factors taken from Waukesha Bulletin 7005 0107
Uncontrolled Emission Rates (pph) = g/hp-hr x NMAQB Site-rated hp / 453.59 g/lb
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Pollutants	Emission Factors, lb/MMBtu	Uncontrolled Emission Rates, pph	Uncontrolled Emission Rates, tpy
SO2	5.88E-04	5.85E-03	2.56E-02
PM	9.99E-03	9.94E-02	4.35E-01
PM10	9.99E-03	9.94E-02	4.35E-01
PM2.5	9.99E-03	9.94E-02	4.35E-01

Emission factors taken from AP-42, Table 3.2-2
Particulate factors include both filterable and condensible emissions
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Exhaust Parameters

700	°F		Stack exit temperature	Mfg. data
7498	acfm	124.9656977	Stack flowrate	Mfg. data
1.02	ft		Stack exit diameter	Harvest Four Corners, LLC
0.82	ft^2		Stack exit area	3.1416 x ((ft / 2) ^2)
152.68	fps		Stack exit velocity	acfm / ft^2 / 60 sec/min
22.00	ft		Stack height	Harvest Four Corners, LLC

GRI-HAPCalc® 3.0
Engines Report

Facility ID:	**BUENA VISTA**	**Notes:**
Operation Type:	**COMPRESSOR STATION**	
Facility Name:	**BUENA VISTA COMPRESSOR STATION**	
User Name:	**Harvest Four Corners LLC**	
Units of Measure:	**U.S. STANDARD**	

***Note:** Emissions less than 5.00E-09 tons (or tonnes) per year are considered insignificant and are treated as zero. These emissions are indicated on the report with a "0". Emissions between 5.00E-09 and 5.00E-05 tons (or tonnes) per year are represented on the report with "0.0000".*

Engine Unit

Unit Name: 7042GL

Hours of Operation:	8,760	Yearly
Rate Power:	1,347	hp
Fuel Type:	FIELD GAS	
Engine Type:	4-Stroke, Lean Burn	
Emission Factor Set:	FIELD > EPA > LITERATURE	
Additional EF Set:	-NONE-	

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
Formaldehyde	2.1871	0.16830000 g/bhp-hr	GRI Literature
Benzene	0.0676	0.00520000 g/bhp-hr	GRI Literature
Toluene	0.0273	0.00210000 g/bhp-hr	GRI Literature
Xylenes(m,p,o)	0.0182	0.00140000 g/bhp-hr	GRI Literature
Total	2.3002		

Engine Exhaust Emissions Calculations

Unit Number: 1b, 2b, 3b
Description: Caterpillar 3516 TALE
Type: Four Stroke Lean Burn

Note: The data on this worksheet applies to each individual emissions unit identified above.

Horsepower Calculations

7,004	ft above MSL	Elevation	
1,340	hp	Nameplate hp	Mfg. data
1,219	hp	NMAQB Site-rated hp	NMAQB Procedure # 02.002-00 (loss of 3% for every 1,000 ft over 4,000 ft)
1,206	hp	Mfg. Site-rated hp	Caterpillar GERP Data Sheet

Engine Specifications

1,400	rpm	Engine rpm	Mfg. data
4,210	cu in	Engine displacement	Mfg. data

Fuel Consumption

8,175	Btu/hp-hr	Brake specific fuel consumption	Mfg. data
9.97	MMBtu/hr	Hourly fuel consumption	Btu/hp-hr x NMAQB site-rated hp / 1,000,000
900	Btu/scf	Field gas heating value	Nominal heat content
11,075	scf/hr	Hourly fuel consumption	MMBtu/hr x 1,000,000 / Btu/scf
8,760	hr/yr	Annual operating time	Harvest Four Corners, LLC
87,313	MMBtu/yr	Annual fuel consumption	MMBtu/hr x hr/yr
97.01	MMscf/yr	Annual fuel consumption	scf/hr x hr/yr / 1,000,000

Steady-State Emission Rates

Pollutants	Emission Factors, g/hp-hr	Uncontrolled Emission Rates, pph	tpy
NOX	2.00	5.38	23.55
CO	2.97	7.98	34.97
VOC	1.03	2.77	12.13

Emission factors taken from Waukesha Document S 8483-5
Per the manfacturer, VOC = NMNEHC + HCHO
Uncontrolled Emission Rates (pph) = g/hp-hr x NMAQB Site-rated hp / 453.59 g/lb
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Pollutants	Emission Factors, lb/MMBtu	Uncontrolled Emission Rates, pph	tpy
SO2	5.88E-04	5.86E-03	2.57E-02
PM	9.99E-03	9.95E-02	4.36E-01
PM10	9.99E-03	9.95E-02	4.36E-01
PM2.5	9.99E-03	9.95E-02	4.36E-01

Emission factors taken from AP-42, Table 3.2-2
Particulate factors include both filterable and condensible emissions
Uncontrolled Emission Rates (pph) = lb/MMBtu x MMBtu/hr
Uncontrolled Emission Rates (tpy) = Uncontrolled Emission Rates (pph) x hr/yr / 2,000 lb/ton

Exhaust Parameters

965	°F		Stack exit temperature	Mfg. data
7469	acfm	124.4833333	Stack flowrate	Mfg. data
1.00	ft		Stack exit diameter	Harvest Four Corners, LLC
0.79	ft^2		Stack exit area	3.1416 x ((ft / 2) ^2)
158.50	fps		Stack exit velocity	acfm / ft^2 / 60 sec/min
22.00	ft		Stack height	Harvest Four Corners, LLC

GRI-HAPCalc® 3.0
Engines Report

Facility ID:	**BUENA VISTA**	**Notes:**
Operation Type:	**COMPRESSOR STATION**	
Facility Name:	**BUENA VISTA COMPRESSOR STATION**	
User Name:		
Units of Measure:	**U.S. STANDARD**	

Note: Emissions less than 5.00E-09 tons (or tonnes) per year are considered insignificant and are treated as zero. These emissions are indicated on the report with a "0". Emissions between 5.00E-09 and 5.00E-05 tons (or tonnes) per year are represented on the report with "0.0000".

Engine Unit

Unit Name: CAT 3516

Hours of Operation:	8,760	Yearly
Rate Power:	1,219	hp
Fuel Type:	FIELD GAS	
Engine Type:	4-Stroke, Lean Burn	
Emission Factor Set:	FIELD > EPA > LITERATURE	
Additional EF Set:	-NONE-	

Calculated Emissions (ton/yr)

Chemical Name	Emissions	Emission Factor	Emission Factor Set
HAPs			
Formaldehyde	1.9793	0.16830000 g/bhp-hr	GRI Literature
Benzene	0.0612	0.00520000 g/bhp-hr	GRI Literature
Toluene	0.0247	0.00210000 g/bhp-hr	GRI Literature
Xylenes(m,p,o)	0.0165	0.00140000 g/bhp-hr	GRI Literature
Total	2.0817		

Compressor Blowdown Emissions Calculations

Unit Number: SSM Engine units **1a, 2a, & 3a**
Description: Compressor & Piping Associated With Station - 2-Stage Compressor(s)

Throughput

3	# of units	Number of units	Harvest Four Corners, LLC
145	events/yr/unit	Blowdowns per year per unit	Harvest Four Corners, LLC
6,865	scf/event	Gas loss per blowdown	Harvest Four Corners, LLC
2,976,136	scf/yr	Annual gas loss	# of units x events/yr/unit x scf/ever

Emission Rates

Pollutants	Emission Factors, lb/scf	Uncontrolled, Emission Rates, tpy
VOC	2.548E-02	37.92
Benzene	1.853E-05	2.76E-02
Ethylbenzene	8.395E-07	1.25E-03
n-Hexane	3.239E-04	4.82E-01
2,2,4-Trimethlypentane (Isooctane)	5.811E-06	8.65E-03
Toluene	1.627E-05	2.42E-02
Xylene	4.198E-06	6.25E-03

Emission factors calculated from gas composition (see table below)
Uncontrolled Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Gas Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	0.5742	44.01	6.661E-04
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	4.0195	28.01	2.967E-03
Methane	64.7125	16.04	2.736E-02
Ethane	12.0347	30.07	9.538E-03
Propane	11.3402	44.09	1.318E-02
Isobutane	1.4244	58.12	2.182E-03
n-Butane	3.7038	58.12	5.674E-03
Isopentane	0.7949	72.15	1.512E-03
n-Pentane	0.7318	72.15	1.392E-03
Cyclopentane	0.0220	70.14	4.067E-05
n-Hexane	0.1426	86.17	3.239E-04
Cyclohexane	0.0316	84.16	7.010E-05
Other hexanes	0.3246	86.18	7.373E-04
Heptanes	0.0649	100.20	1.714E-04
Methylcyclohexane	0.0409	98.19	1.059E-04
2,2,4-Trimethlypentane (Isooctane)	0.0022	100.21	5.811E-06
Benzene	0.0090	78.11	1.853E-05
Toluene	0.0067	92.14	1.627E-05
Ethylbenzene	0.0003	106.17	8.395E-07
Xylenes	0.0015	106.17	4.198E-06
C8+ Heavies	0.0180	110.00	5.219E-05
Total	100.0003		
Total VOC			2.548E-02

Gas stream composition obtained from the Buena Vista extended gas analysis dated Nov. 29, 2021.
Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.4 scf/lb-mole

Compressor Blowdown Emissions Calculations

Unit Number: SSM Engine units **1b, 2b, & 3b**
Description: Compressor & Piping Associated With Station - 3-Stage Compressor(s)

Throughput

3	# of units	Number of units	Harvest Four Corners, LLC
145	events/yr/unit	Blowdowns per year per unit	Harvest Four Corners, LLC
5,481	scf/event	Gas loss per blowdown	Harvest Four Corners, LLC
2,376,010	scf/yr	Annual gas loss	# of units x events/yr/unit x scf/ever

Emission Rates

Pollutants	Emission Factors, lb/scf	Uncontrolled, Emission Rates, tpy
VOC	2.548E-02	30.28
Benzene	1.853E-05	2.20E-02
Ethylbenzene	8.395E-07	9.97E-04
n-Hexane	3.239E-04	3.85E-01
2,2,4-Trimethlypentane (Isooctane)	5.811E-06	6.90E-03
Toluene	1.627E-05	1.93E-02
Xylene	4.198E-06	4.99E-03

Emission factors calculated from gas composition (see table below)
Uncontrolled Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Gas Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	0.5742	44.01	6.661E-04
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	4.0195	28.01	2.967E-03
Methane	64.7125	16.04	2.736E-02
Ethane	12.0347	30.07	9.538E-03
Propane	11.3402	44.09	1.318E-02
Isobutane	1.4244	58.12	2.182E-03
n-Butane	3.7038	58.12	5.674E-03
Isopentane	0.7949	72.15	1.512E-03
n-Pentane	0.7318	72.15	1.392E-03
Cyclopentane	0.0220	70.14	4.067E-05
n-Hexane	0.1426	86.17	3.239E-04
Cyclohexane	0.0316	84.16	7.010E-05
Other hexanes	0.3246	86.18	7.373E-04
Heptanes	0.0649	100.20	1.714E-04
Methylcyclohexane	0.0409	98.19	1.059E-04
2,2,4-Trimethlypentane (Isooctane)	0.0022	100.21	5.811E-06
Benzene	0.0090	78.11	1.853E-05
Toluene	0.0067	92.14	1.627E-05
Ethylbenzene	0.0003	106.17	8.395E-07
Xylenes	0.0015	106.17	4.198E-06
C8+ Heavies	0.0180	110.00	5.219E-05
Total	100.0003		
Total VOC			2.548E-02

Gas stream composition obtained from the Buena Vista extended gas analysis dated Nov. 29, 2021.
Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.4 scf/lb-mole

Separator & Storage Tank Emissions Data and Calculations

Unit Number: S1, T1 & T2
Description: Separator & Storage Tanks (with flash emissions)

Emission Rates

Source/Pollutants	Working/Breathing Losses, ppy	Working/Breathing Losses, tpy	Flash Losses, pph	Flash Losses, tpy	Uncontrolled Emission Rates, tpy
S1					
VOC	--	--	0.24	1.05	1.05
Benzene	--	--	0.00	0.00E+00	0.00E+00
Ethylbenzene	--	--	0.00	0.00E+00	0.00E+00
n-Hexane	--	--	0.01	4.38E-02	4.38E-02
2,2,4-Trimethlypentane (Isooctane)	--	--	0.00	0.00E+00	0.00E+00
Toluene	--	--	0.00	0.00E+00	0.00E+00
Xylene	--	--	0.00	0.00E+00	0.00E+00
T1					
VOC	6,686.10	3.34	13.06	57.20	60.55
Benzene	29.18	1.46E-02	0.08	3.50E-01	3.65E-01
Ethylbenzene	3.80	1.90E-03	0.01	4.38E-02	4.57E-02
n-Hexane	476.72	2.38E-01	0.80	3.50E+00	3.74E+00
2,2,4-Trimethlypentane (Isooctane)	2.52	1.26E-03	0.00	0.00E+00	1.26E-03
Toluene	1.77	8.85E-04	0.00	0.00E+00	8.85E-04
Xylene	7.09	3.55E-03	0.01	4.38E-02	4.73E-02
T2					
VOC	with T1	with T1	with T1	with T1	with T1
Benzene	with T1	with T1	with T1	with T1	with T1
Ethylbenzene	with T1	with T1	with T1	with T1	with T1
n-Hexane	with T1	with T1	with T1	with T1	with T1
2,2,4-Trimethlypentane (Isooctane)	with T1	with T1	with T1	with T1	with T1
Toluene	with T1	with T1	with T1	with T1	with T1
Xylene	with T1	with T1	with T1	with T1	with T1
Combined Total					
VOC	6,686.10	3.34	13.30	58.25	61.60
Benzene	29.18	1.46E-02	0.08	0.35	0.36
Ethylbenzene	3.80	1.90E-03	0.01	0.04	0.05
n-Hexane	476.72	2.38E-01	0.81	3.55	3.79
2,2,4-Trimethlypentane (Isooctane)	2.52	1.26E-03	0.00	0.00	0.00
Toluene	1.77	8.85E-04	0.00	0.00	0.00
Xylene	7.09	3.55E-03	0.01	0.04	0.05

Working/breathing losses taken from TANKS 4.0 results
Flash emissions taken from VMG Symmetry results

Separator Emissions Data and Calculations

Unit Number: S1
Description: Separator (flash emissions)

Calculation of Emission Rates from Symmetry Results

Pollutant	Emission Rate,	
	pph	tpy
VOC	2.40E-01	1.05
Benzene	0.00E+00	0.00
Ethylbenzene	0.00E+00	0.00
n-Hexane	1.00E-02	0.04
Isooctane	0.00E+00	0.00
Toluene	0.00E+00	0.00
Xylenes	0.00E+00	0.00

VOC tpy and HAP pph emission rates are obtained from the Symmetry output
HAP Emission Rate (tpy) = HAP Emission Rate (pph) x 8,760 hr/yr / 2,000 lb/ton

Storage Tank Emissions Data and Calculations

Unit Number: T1 & T2 (aggregated)
Description: Condensate Tanks (flash emissions)

Calculation of Emission Rates from Symmetry Results

Pollutant	Emission Rate, pph	Emission Rate, tpy
VOC	13.06	57.20
Benzene	8.00E-02	0.35
Ethylbenzene	1.00E-02	0.04
n-Hexane	8.00E-01	3.50
Isooctane	0.00E+00	0.00
Toluene	0.00E+00	0.00
Xylenes	1.00E-02	0.04

VOC tpy and HAP pph emission rates are obtained from the Symmetry output
HAP Emission Rate (tpy) = HAP Emission Rate (pph) x 8,760 hr/yr / 2,000 lb/ton

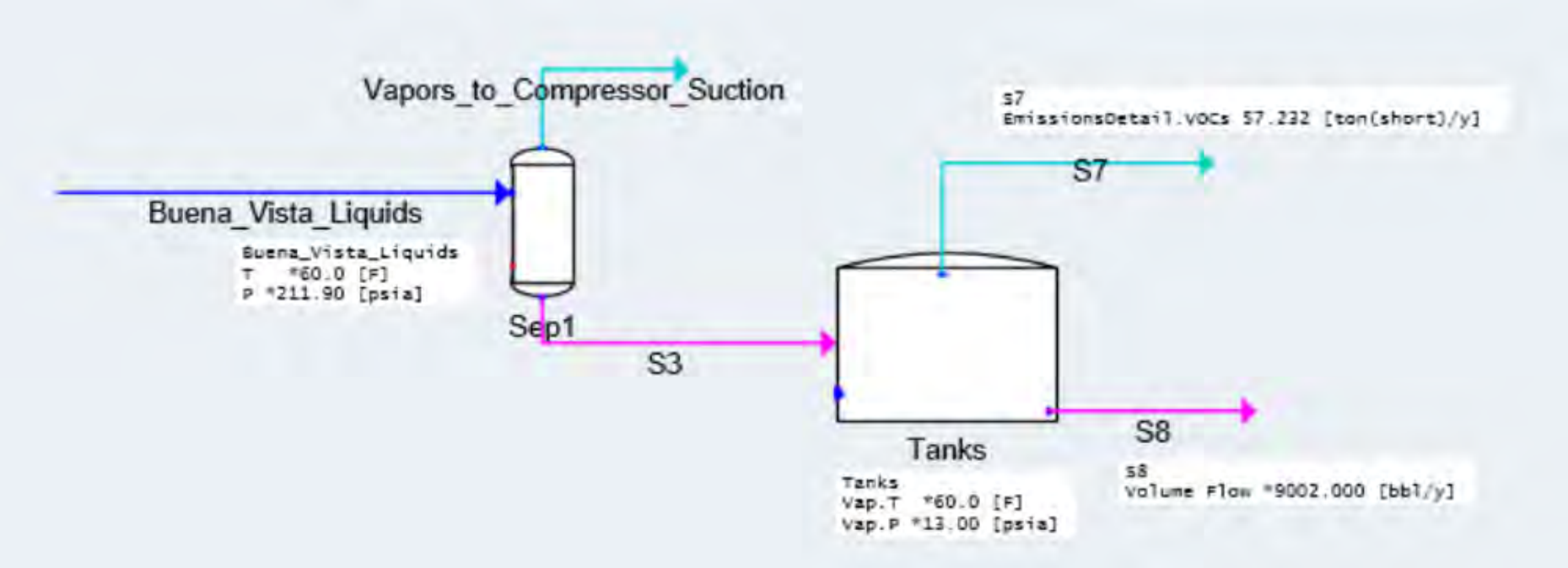
Composition of Post Flash Condensate (for use in TANKS 4)

Component	Speciated Mass Fraction	Mass Percent, Of VOC, %
Carbon dioxide	0.000E+00	--
Nitrogen	0.000E+00	--
Methane	3.225E-04	--
Ethane	1.209E-03	--
Propane	4.192E-03	--
Isobutane	1.298E-02	1.5099
n-Butane	4.563E-02	4.7800
Isopentane	6.091E-02	6.1001
n-Pentane	5.321E-02	5.3290
Cyclopentane	4.676E-03	0.4683
n-Hexane	1.188E-01	11.9015
Cyclohexane	5.353E-02	5.3613
n-Heptane	1.726E-01	17.2911
Methylcyclohexane	7.405E-02	7.4162
Octane	1.240E-01	12.4182
Nonane	1.047E-01	10.4885
Decane	1.022E-01	10.2342
Benzene	1.177E-02	1.1788
Ethylbenzene	1.568E-02	1.5704
Isooctane	1.975E-03	0.1978
Toluene	2.459E-03	0.2463
Xylenes	3.503E-02	3.5083
Total	1.0000	
VOC Total	0.9985	100.0000

`

Speciated Mass Fractions are obtained from the Symmetry output
Total = Sum (Carbon Dioxide - Xylene Mass Fractions)
VOC Total = Sum (Propane - Xylene Mass Fractions)
Mass Percent of VOC (%) = 100 x Component Mass Fraction / VOC Total Mass Fraction
Propane Mass Percent of VOC is included with the n-butane and isobutane percentages (even distribution)

VMG Symmetry Flash Emissions Model - Main Flow Sheet



File Name:	Buena Vista Condensate Flash 5.10.2022
Company:	VMG, a Schlumberger Technology
Project:	
Job No:	
Prepared By:	
Report Date:	5/31/2022 3:33:15 PM
Unit Set:	Field

File: U:\Environmental\Condensate Flash Calcs\Buena Vista Condensate Flash 5.10.2022.vsym

Simulation Report

Symmetry

File Name:	Buena Vista Condensate Flash 5.10.2022
Company:	VMG, a Schlumberger Technology
Project:	
Job No:	
Prepared By:	
Report Date:	5/31/2022 3:33:15 PM
Unit Set:	Field
File:	U:\Environmental\Condensate Flash Calcs\Buena Vista Condensate Flash 5.10.2022.vsym

*Bold face throughout the report denotes specified values.
*Italic face throughout the report denotes recycle values.

/Buena_Vista_Liquids (Material Stream)		
Thermo Model: APRNGL2		
Connections		
Material Inlets		
	Connection	Up Stream Unit Op
In	<Disconnected>	----
Material Outlets		
	Connection	Down Stream Unit Op
Out	Sep1.In0	----
Allocation / Product Allocation		
Auto Calculate	**False**	Is Up To Date	False
Status	Y?No Results		

Equilibrium Results

	Bulk	Vap	Liq0	Liq1
Phase Frac [Fraction]	1.00	0.0257	0.8728	0.1016
T [F]	60.0	60.0	60.0	60.0
P [psia]	211.90	211.90	211.90	211.90
Mole Flow [lbmol/h]	3.52	0.09	3.08	0.36
Mass Flow [lb/h]	274.23	1.69	266.09	6.45
MassFlows [lb/h]				
NITROGEN	0.01	0.00	0.00	0.00
METHANE	4.58	1.31	3.27	0.00
CARBON DIOXIDE	0.01	0.00	0.01	0.00
HYDROGEN SULFIDE	0.02	0.00	0.02	0.00
ETHANE	2.13	0.13	2.01	0.00
PROPANE	2.69	0.05	2.64	0.00
ISOBUTANE	5.13	0.04	5.09	0.00
n-BUTANE	15.68	0.08	15.60	0.00
ISOPENTANE	17.25	0.03	17.22	0.00
n-PENTANE	14.61	0.02	14.59	0.00
CYCLOPENTANE	1.23	0.00	1.23	0.00
n-HEXANE	30.30	0.01	30.28	0.00
METHYLCYCLOHEXANE	18.51	0.00	18.51	0.00
2,2,4-TRIMETHYLPENTANE	0.49	0.00	0.49	0.00
BENZENE	3.00	0.00	3.00	0.00
CYCLOHEXANE	13.53	0.00	13.53	0.00
n-HEPTANE	43.18	0.01	43.17	0.00
TOLUENE	0.61	0.00	0.61	0.00
n-OCTANE	30.84	0.00	30.84	0.00
ETHYLBENZENE	3.90	0.00	3.90	0.00
o-XYLENE	0.08	0.00	0.08	0.00
m-XYLENE	8.62	0.00	8.62	0.00
n-NONANE	26.00	0.00	26.00	0.00
n-DECANE	1.78	0.00	1.78	0.00
n-UNDECANE	11.28	0.00	11.28	0.00
n-DODECANE	12.29	0.00	12.29	0.00
WATER	6.47	0.00	0.02	6.45

/S3 (Material Stream)		
Thermo Model: APRNGL2		
Connections		
Material Inlets		
	Connection	Up Stream Unit Op
In	Sep1.Liq0	----
Material Outlets		
	Connection	Down Stream Unit Op
Out	Tanks.In0	----
Allocation / Product Allocation		
Auto Calculate	**False**	Is Up To Date	False
Status	Y?No Results		

Equilibrium Results				
	Bulk	**Vap**	**Liq0**	**Liq1**
Phase Frac [Fraction]	1.00	0.00	1.00	
T [F]	60.0	60.0	60.0	
P [psia]	211.90	211.90	211.90	
Mole Flow [lbmol/h]	3.43	0.00	3.43	
Mass Flow [lb/h]	272.54	0.00	272.54	
MassFlows [lb/h]				
NITROGEN	0.00	0.00	0.00	
METHANE	3.27	0.00	3.27	
CARBON DIOXIDE	0.01	0.00	0.01	
HYDROGEN SULFIDE	0.02	0.00	0.02	
ETHANE	2.01	0.00	2.01	
PROPANE	2.64	0.00	2.64	
ISOBUTANE	5.09	0.00	5.09	
n-BUTANE	15.60	0.00	15.60	
ISOPENTANE	17.22	0.00	17.22	
n-PENTANE	14.59	0.00	14.59	
CYCLOPENTANE	1.23	0.00	1.23	
n-HEXANE	30.28	0.00	30.28	
METHYLCYCLOHEXANE	18.51	0.00	18.51	
2,2,4-TRIMETHYLPENTANE	0.49	0.00	0.49	
BENZENE	3.00	0.00	3.00	
CYCLOHEXANE	13.53	0.00	13.53	
n-HEPTANE	43.17	0.00	43.17	
TOLUENE	0.61	0.00	0.61	
n-OCTANE	30.84	0.00	30.84	
ETHYLBENZENE	3.90	0.00	3.90	
o-XYLENE	0.08	0.00	0.08	
m-XYLENE	8.62	0.00	8.62	
n-NONANE	26.00	0.00	26.00	
n-DECANE	1.78	0.00	1.78	
n-UNDECANE	11.28	0.00	11.28	
n-DODECANE	12.29	0.00	12.29	
WATER	6.47	0.00	6.47	

/S7 (Material Stream)					
Thermo Model: APRNGL2					
Connections					
Material Inlets					
	Connection	Up Stream Unit Op			
In	Tanks.Vap	----			
Material Outlets					
	Connection	Down Stream Unit Op			
Out	<Disconnected>	----			
Allocation / Product Allocation					
Auto Calculate	**False**	Is Up To Date	False		
Status	Y?No Results				
Equilibrium Results					
	Bulk	**Vap**	**Liq0**	**Liq1**	
Phase Frac [Fraction]	1.00	1.00	0.00		
T [F]	60.0	60.0	60.0		
P [psia]	13.00	13.00	13.00		
Mole Flow [lbmol/h]	0.48	0.48	0.00		
Mass Flow [lb/h]	18.16	18.16	0.00		
MassFlows [lb/h]					
NITROGEN	0.00	0.00	0.00		
METHANE	3.19	3.19	0.00		
CARBON DIOXIDE	0.01	0.01	0.00		
HYDROGEN SULFIDE	0.02	0.02	0.00		
ETHANE	1.71	1.71	0.00		
PROPANE	1.60	1.60	0.00		
ISOBUTANE	1.87	1.87	0.00		
n-BUTANE	4.28	4.28	0.00		
ISOPENTANE	2.11	2.11	0.00		
n-PENTANE	1.39	1.39	0.00		
CYCLOPENTANE	0.07	0.07	0.00		
n-HEXANE	0.80	0.80	0.00		
METHYLCYCLOHEXANE	0.14	0.14	0.00		
2,2,4-TRIMETHYLPENTANE	0.00	0.00	0.00		
BENZENE	0.08	0.08	0.00		
CYCLOHEXANE	0.25	0.25	0.00		
n-HEPTANE	0.35	0.35	0.00		
TOLUENE	0.00	0.00	0.00		
n-OCTANE	0.08	0.08	0.00		
ETHYLBENZENE	0.01	0.01	0.00		
o-XYLENE	0.00	0.00	0.00		
m-XYLENE	0.01	0.01	0.00		
n-NONANE	0.02	0.02	0.00		
n-DECANE	0.00	0.00	0.00		
n-UNDECANE	0.00	0.00	0.00		
n-DODECANE	0.00	0.00	0.00		
WATER	0.16	0.16	0.00		

/S8 (Material Stream)		
Thermo Model: APRNGL2		
Connections		
Material Inlets		
	Connection	Up Stream Unit Op
In	Tanks.Liq0	----
Material Outlets		
	Connection	Down Stream Unit Op
Out	<Disconnected>	----
Allocation / Product Allocation		
Auto Calculate	**False**	Is Up To Date	False
Status	Y?No Results		

Equilibrium Results				
	Bulk	**Vap**	**Liq0**	**Liq1**
Phase Frac [Fraction]	1.00	0.00	1.00	
T [F]	60.0	60.0	60.0	
P [psia]	13.00	13.00	13.00	
Mole Flow [lbmol/h]	2.96	0.00	2.96	
Mass Flow [lb/h]	254.38	0.00	254.38	
MassFlows [lb/h]				
NITROGEN	0.00	0.00	0.00	
METHANE	0.08	0.00	0.08	
CARBON DIOXIDE	0.00	0.00	0.00	
HYDROGEN SULFIDE	0.00	0.00	0.00	
ETHANE	0.30	0.00	0.30	
PROPANE	1.04	0.00	1.04	
ISOBUTANE	3.22	0.00	3.22	
n-BUTANE	11.32	0.00	11.32	
ISOPENTANE	15.11	0.00	15.11	
n-PENTANE	13.20	0.00	13.20	
CYCLOPENTANE	1.16	0.00	1.16	
n-HEXANE	29.48	0.00	29.48	
METHYLCYCLOHEXANE	18.37	0.00	18.37	
2,2,4-TRIMETHYLPENTANE	0.49	0.00	0.49	
BENZENE	2.92	0.00	2.92	
CYCLOHEXANE	13.28	0.00	13.28	
n-HEPTANE	42.83	0.00	42.83	
TOLUENE	0.61	0.00	0.61	
n-OCTANE	30.76	0.00	30.76	
ETHYLBENZENE	3.89	0.00	3.89	
o-XYLENE	0.08	0.00	0.08	
m-XYLENE	8.61	0.00	8.61	
n-NONANE	25.98	0.00	25.98	
n-DECANE	1.78	0.00	1.78	
n-UNDECANE	11.28	0.00	11.28	
n-DODECANE	12.29	0.00	12.29	
WATER	6.30	0.00	6.30	

/v (Material Stream)					
Thermo Model: APRNGL2					
Connections					
Material Inlets					
	Connection	Up Stream Unit Op			
In	<Disconnected>	----			
Material Outlets					
	Connection	Down Stream Unit Op			
Out	<Disconnected>	----			
Allocation / Product Allocation					
Auto Calculate	**False**	Is Up To Date	False		
Status	Y?No Results				
Equilibrium Results					
	Bulk	**Vap**	**Liq0**	**Liq1**	
Phase Frac [Fraction]					
T [F]					
P [psia]					
Mole Flow [lbmol/h]					
Mass Flow [lb/h]					
MassFlows [lb/h]					
NITROGEN					
METHANE					
CARBON DIOXIDE					
HYDROGEN SULFIDE					
ETHANE					
PROPANE					
ISOBUTANE					
n-BUTANE					
ISOPENTANE					
n-PENTANE					
CYCLOPENTANE					
n-HEXANE					
METHYLCYCLOHEXANE					
2,2,4-TRIMETHYLPENTANE					
BENZENE					
CYCLOHEXANE					
n-HEPTANE					
TOLUENE					
n-OCTANE					
ETHYLBENZENE					
o-XYLENE					
m-XYLENE					
n-NONANE					
n-DECANE					
n-UNDECANE					
n-DODECANE					
WATER					

/Vapors_to_Compressor_Suction (Material Stream)					
Thermo Model: APRNGL2					
Connections					
Material Inlets					
	Connection	Up Stream Unit Op			
In	Sep1.Vap	----			
Material Outlets					
	Connection	Down Stream Unit Op			
Out	<Disconnected>	----			
Allocation / Product Allocation					
Auto Calculate	**False**	Is Up To Date	False		
Status	Y?No Results				
Equilibrium Results					
	Bulk	**Vap**	**Liq0**	**Liq1**	
Phase Frac [Fraction]	1.00	1.00	0.00		
T [F]	60.0	60.0	60.0		
P [psia]	211.90	211.90	211.90		
Mole Flow [lbmol/h]	0.09	0.09	0.00		
Mass Flow [lb/h]	1.69	1.69	0.00		
MassFlows [lb/h]					
NITROGEN	0.00	0.00	0.00		
METHANE	1.31	1.31	0.00		
CARBON DIOXIDE	0.00	0.00	0.00		
HYDROGEN SULFIDE	0.00	0.00	0.00		
ETHANE	0.13	0.13	0.00		
PROPANE	0.05	0.05	0.00		
ISOBUTANE	0.04	0.04	0.00		
n-BUTANE	0.08	0.08	0.00		
ISOPENTANE	0.03	0.03	0.00		
n-PENTANE	0.02	0.02	0.00		
CYCLOPENTANE	0.00	0.00	0.00		
n-HEXANE	0.01	0.01	0.00		
METHYLCYCLOHEXANE	0.00	0.00	0.00		
2,2,4-TRIMETHYLPENTANE	0.00	0.00	0.00		
BENZENE	0.00	0.00	0.00		
CYCLOHEXANE	0.00	0.00	0.00		
n-HEPTANE	0.01	0.01	0.00		
TOLUENE	0.00	0.00	0.00		
n-OCTANE	0.00	0.00	0.00		
ETHYLBENZENE	0.00	0.00	0.00		
o-XYLENE	0.00	0.00	0.00		
m-XYLENE	0.00	0.00	0.00		
n-NONANE	0.00	0.00	0.00		
n-DECANE	0.00	0.00	0.00		
n-UNDECANE	0.00	0.00	0.00		
n-DODECANE	0.00	0.00	0.00		
WATER	0.00	0.00	0.00		

/Sep1 (2ph Separator)		
Thermo Model: APRNGL2		
Connections		
Material Inlets		
	Connection	Up Stream Unit Op
In0	Buena_ Vista_ Liquids	----
Material Outlets		
	Connection	Down Stream Unit Op
Liq0	S3	Tanks.Mixer
Vap	Vapors_ to_ Compressor_ Suction	----
Energy Streams		
	Connection	Value
InQ [Btu/h]		**0.000E+0**

Material

	In0	Liq0	Vap	
VapFrac	0.0257	0.00	1.00	
T [F]	60.0	60.0	60.0	
P [psia]	211.90	211.90	211.90	
Mole Flow [lbmol/h]	3.52	3.43	0.09	
Mass Flow [lb/h]	274.23	272.54	1.69	
MassFlows [lb/h]				
NITROGEN	0.01	0.00	0.00	
METHANE	4.58	3.27	1.31	
CARBON DIOXIDE	0.01	0.01	0.00	
HYDROGEN SULFIDE	0.02	0.02	0.00	
ETHANE	2.13	2.01	0.13	
PROPANE	2.69	2.64	0.05	
ISOBUTANE	5.13	5.09	0.04	
n-BUTANE	15.68	15.60	0.08	
ISOPENTANE	17.25	17.22	0.03	
n-PENTANE	14.61	14.59	0.02	
CYCLOPENTANE	1.23	1.23	0.00	
n-HEXANE	30.30	30.28	0.01	
METHYLCYCLOHEXANE	18.51	18.51	0.00	
2,2,4-TRIMETHYLPENTANE	0.49	0.49	0.00	
BENZENE	3.00	3.00	0.00	
CYCLOHEXANE	13.53	13.53	0.00	
n-HEPTANE	43.18	43.17	0.01	
TOLUENE	0.61	0.61	0.00	
n-OCTANE	30.84	30.84	0.00	
ETHYLBENZENE	3.90	3.90	0.00	
o-XYLENE	0.08	0.08	0.00	
m-XYLENE	8.62	8.62	0.00	
n-NONANE	26.00	26.00	0.00	
n-DECANE	1.78	1.78	0.00	
n-UNDECANE	11.28	11.28	0.00	
n-DODECANE	12.29	12.29	0.00	
WATER	6.47	6.47	0.00	

Summary / Main Data			
InQ [Btu/h]	0.000E+0	Delta P [psi]	0.00
Settings / Settings			
Is Source of Emissions	False		
Recycle Detail / Material Recycle:			
Recycle Detail / Material Recycle			
Database / Equipment Database Selection			
Source Database	<No Database>	Connection Status	Y?Disconnected
ID	<None>	Version	<None>
Auto Connect	True	Connected to Database	False
Validate Connection	False		
Database / Catalyst and Thermal Db. Selection			

/Tanks (2ph Separator)		
Thermo Model: APRNGL2		
Connections		
Material Inlets		
	Connection	Up Stream Unit Op
In0	S3	Sep1.Sep
Material Outlets		
	Connection	Down Stream Unit Op
Liq0	S8	----
Vap	S7	----
Energy Streams		
	Connection	Value
InQ [Btu/h]		2.720E+3

Material

	In0	Liq0	Vap	
VapFrac	0.00	0.00	1.00	
T [F]	60.0	60.0	**60.0**	
P [psia]	211.90	13.00	**13.00**	
Mole Flow [lbmol/h]	3.43	2.96	0.48	
Mass Flow [lb/h]	272.54	254.38	18.16	
MassFlows [lb/h]				
NITROGEN	0.00	0.00	0.00	
METHANE	3.27	0.08	3.19	
CARBON DIOXIDE	0.01	0.00	0.01	
HYDROGEN SULFIDE	0.02	0.00	0.02	
ETHANE	2.01	0.30	1.71	
PROPANE	2.64	1.04	1.60	
ISOBUTANE	5.09	3.22	1.87	
n-BUTANE	15.60	11.32	4.28	
ISOPENTANE	17.22	15.11	2.11	
n-PENTANE	14.59	13.20	1.39	
CYCLOPENTANE	1.23	1.16	0.07	
n-HEXANE	30.28	29.48	0.80	
METHYLCYCLOHEXANE	18.51	18.37	0.14	
2,2,4-TRIMETHYLPENTANE	0.49	0.49	0.00	
BENZENE	3.00	2.92	0.08	
CYCLOHEXANE	13.53	13.28	0.25	
n-HEPTANE	43.17	42.83	0.35	
TOLUENE	0.61	0.61	0.00	
n-OCTANE	30.84	30.76	0.08	
ETHYLBENZENE	3.90	3.89	0.01	
o-XYLENE	0.08	0.08	0.00	
m-XYLENE	8.62	8.61	0.01	
n-NONANE	26.00	25.98	0.02	
n-DECANE	1.78	1.78	0.00	
n-UNDECANE	11.28	11.28	0.00	
n-DODECANE	12.29	12.29	0.00	
WATER	6.47	6.30	0.16	

Summary / Main Data			
InQ [Btu/h]	2.720E+3	Delta P [psi]	198.90
Settings / Settings			
Is Source of Emissions	**True**		
Recycle Detail / Material Recycle:			
Recycle Detail / Material Recycle			
Database / Equipment Database Selection			
Source Database	**<No Database>**	Connection Status	Y?Disconnected
ID	**<None>**	Version	**<None>**
Auto Connect	**True**	Connected to Database	**False**
Validate Connection	**False**		
Database / Catalyst and Thermal Db. Selection			

TANKS 4.0.9d
Emissions Report - Detail Format
Tank Indentification and Physical Characteristics

Identification

User Identification:	Buena Vista Condensate_Heated 400 bbl (9002 bpy)
City:	San Juan Co., T32N, R08W, Sec. 24
State:	NM
Company:	Harvest Four Corners, LLC
Type of Tank:	Vertical Fixed Roof Tank
Description:	Buena Vista Condensate, normalized. AST, 400 bbl (16,800 gal) capacity. 9,002 bpy (378,084 gal/yr) throughput

Tank Dimensions

Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		20.00
Avg. Liquid Height (ft):		10.00
Volume (gallons):		16,800.00
Turnovers:		22.50
Net Throughput(gal/yr):		378,084.00
Is Tank Heated (y/n):	Y	

Paint Characteristics

Shell Color/Shade:	Gray/Medium
Shell Condition	Good
Roof Color/Shade:	Gray/Medium
Roof Condition:	Good

Roof Characteristics

Type:	Cone	
Height (ft)		0.00
Slope (ft/ft) (Cone Roof)		0.06

Breather Vent Settings

Vacuum Settings (psig):	0.00
Pressure Settings (psig)	0.00

Meterological Data used in Emissions Calculations: Albuquerque, New Mexico (Avg Atmospheric Pressure = 12.15 psia)

TANKS 4.0.9d
Emissions Report - Detail Format
Liquid Contents of Storage Tank

Buena Vista Condensate_Heated 400 bbl (9002 bpy) - Vertical Fixed Roof Tank
San Juan Co., T32N, R08W, Sec. 24, NM

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate	All	67.36	53.93	80.79	59.23	5.5749	4.2459	7.1986	65.6853			94.97	
2,2,4-Trimethylpentane (isooctane)						0.7338	0.4989	1.0546	114.2300	0.0020	0.0004	114.23	Option 2: A=6.8118, B=1257.84, C=220.74
Benzene						1.4274	0.9846	2.0237	78.1100	0.0118	0.0044	78.11	Option 2: A=6.905, B=1211.033, C=220.79
Butane						29.9323	23.3587	37.8099	58.1300	0.0478	0.3711	58.13	Option 1: VP60 = 26.098 VP70 = 31.306
Cyclohexane						1.4738	1.0254	2.0729	84.1600	0.0536	0.0205	84.16	Option 2: A=6.841, B=1201.53, C=222.65
Cyclopentane						4.9596	3.6370	6.6394	70.1300	0.0047	0.0060	70.13	Option 1: VP60 = 4.177 VP70 = 5.24
Decane (-n)						0.0395	0.0291	0.0536	142.2900	0.1023	0.0010	142.29	Option 1: VP60 = .033211 VP70 = .041762
Ethylbenzene						0.1396	0.0876	0.2162	106.1700	0.0157	0.0006	106.17	Option 2: A=6.975, B=1424.255, C=213.21
Heptane (-n)						0.7600	0.5088	1.1128	100.2000	0.1729	0.0341	100.20	Option 3: A=37358, B=8.2585
Hexane (-n)						2.3100	1.6303	3.2059	86.1700	0.1190	0.0713	86.17	Option 2: A=6.876, B=1171.17, C=224.41
Isobutane						43.3083	34.4026	53.8185	58.1230	0.0151	0.1696	58.12	Option 1: VP60 = 38.14 VP70 = 45.16
Isopentane						11.8640	8.7212	15.5743	72.1500	0.0610	0.1877	72.15	Option 1: VP60 = 10.005 VP70 = 12.53
Methylcyclohexane						0.6886	0.4673	0.9913	98.1800	0.0742	0.0132	98.18	Option 2: A=6.823, B=1270.763, C=221.42
Nonane (-n)						0.0784	0.0568	0.1080	128.2600	0.1049	0.0021	128.26	Option 1: VP60 = .065278 VP70 = .08309
Octane (-n)						0.1769	0.1254	0.2493	114.2300	0.1242	0.0057	114.23	Option 1: VP60 = .145444 VP70 = .188224
Pentane (-n)						8.0308	5.9649	10.6537	72.1500	0.0533	0.1110	72.15	Option 3: A=27691, B=7.558
Toluene						0.4136	0.2726	0.6120	92.1300	0.0025	0.0003	92.13	Option 2: A=6.954, B=1344.8, C=219.48
Xylenes (mixed isomers)						0.1165	0.0728	0.1813	106.1700	0.0351	0.0011	106.17	Option 2: A=7.009, B=1462.266, C=215.11

TANKS 4.0.9d
Emissions Report - Detail Format
Detail Calculations (AP-42)

Buena Vista Condensate_Heated 400 bbl (9002 bpy) - Vertical Fixed Roof Tank
San Juan Co., T32N, R08W, Sec. 24, NM

Annual Emission Calcaulations	
Standing Losses (lb):	3,389.6753
Vapor Space Volume (cu ft):	1,145.1105
Vapor Density (lb/cu ft):	0.0647
Vapor Space Expansion Factor:	0.5000
Vented Vapor Saturation Factor:	0.2505
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,145.1105
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	10.1250
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	10.0000
Roof Outage (ft):	0.1250
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.1250
Roof Height (ft):	0.0000
Roof Slope (ft/ft):	0.0625
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0647
Vapor Molecular Weight (lb/lb-mole):	65.6853
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.5749
Daily Avg. Liquid Surface Temp. (deg. R):	527.0322
Daily Average Ambient Temp. (deg. F):	56.1542
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	518.9042
Tank Paint Solar Absorptance (Shell):	0.6800
Tank Paint Solar Absorptance (Roof):	0.6800
Daily Total Solar Insulation Factor (Btu/sqft day):	1,765.3167
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.5000
Daily Vapor Temperature Range (deg. R):	26.8588
Daily Vapor Pressure Range (psia):	2.9527
Breather Vent Press. Setting Range(psia):	0.0000
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.5749
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.2459
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	7.1986
Daily Avg. Liquid Surface Temp. (deg R):	527.0322
Daily Min. Liquid Surface Temp. (deg R):	513.6028
Daily Max. Liquid Surface Temp. (deg R):	540.4617
Daily Ambient Temp. Range (deg. R):	27.9250
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.2505
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	5.5749
Vapor Space Outage (ft):	10.1250

Working Losses (lb):	3,296.4225
Vapor Molecular Weight (lb/lb-mole):	65.6853
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	5.5749
Annual Net Throughput (gal/yr.):	378,084.0000
Annual Turnovers:	22.5000
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	16,800.0000
Maximum Liquid Height (ft):	20.0000
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	1.0000
Total Losses (lb):	6,686.0979

TANKS 4.0.9d
Emissions Report - Detail Format
Individual Tank Emission Totals

Emissions Report for: Annual

Buena Vista Condensate_Heated 400 bbl (9002 bpy) - Vertical Fixed Roof Tank
San Juan Co., T32N, R08W, Sec. 24, NM

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Benzene	14.39	14.79	29.18
Ethylbenzene	1.87	1.93	3.80
2,2,4-Trimethylpentane (isooctane)	1.24	1.28	2.52
Toluene	0.87	0.90	1.77
Xylenes (mixed isomers)	3.50	3.59	7.09
Condensate	3,296.42	3,389.68	6,686.10
Isobutane	559.04	574.86	1,133.90
Butane	1,223.19	1,257.80	2,480.99
Isopentane	618.72	636.22	1,254.94
Pentane (-n)	365.88	376.23	742.10
Cyclopentane	19.86	20.42	40.27
Hexane (-n)	235.04	241.68	476.72
Cyclohexane	67.55	69.46	137.02
Heptane (-n)	112.35	115.53	227.88
Methylcyclohexane	43.66	44.89	88.55
Octane (-n)	18.79	19.32	38.10
Nonane (-n)	7.03	7.23	14.26
Decane (-n)	3.46	3.55	7.01

Storage Tank Emissions Calculations

Unit Number: T3 *Insignificant Source*
Description: Produced Water Tank

Note: The data on this worksheet applies to each individual emissions unit identified above.

Throughput

45	bbl/turnover	Tank capacity	Harvest Four Corners, LLC
84.4445	turnover/yr	Turnovers per year	Harvest Four Corners, LLC
3,800	bbl/yr	Annual liquid throughput	bbl/turnover x turnover/yr
159,600	gal/yr	Annual liquid throughput	bbl/yr x 42 gal/bbl

Emission Rates

Pollutant	Emission Factor, lb/bbl	Uncontrolled, Emission Rate, tpy
VOC	0.262	0.498
Benzene	0.007	1.33E-02
Ethylbenzene	0.0007	1.33E-03
n-Hexane	0.022	4.18E-02
Toluene	0.009	1.71E-02
Xylene	0.006	1.14E-02

VOC, Benzene, and n-Hexane emission factors are taken from the CDPHE PS Memo 09-02 (Oil & Gas Produced Water Tank Batteries - Regulatory Definitions & Permitting Guidance)
Ethylbenzene, toluene, and xylene emissions factors (Non-Texas) are taken from the TCEQ Project 2010-29 (Emission Factor Determination for Produced Water Storage Tanks) report
Uncontrolled Emission Rates (tpy) = lb/bbl x bbl/yr / 2,000 lb/ton

Truck Loading (Condensate) Emissions Calculations

Unit Number: L1 *Insignificant Source*
Description: Truck Loading

Emission Factor

0.6		Saturation factor, S	AP-42, Table 5.2-1 (submerged loading & dedicated service)
7.1986	psia (maximum)	True vapor pressure of liquid, P	TANKS 4.0 output file
5.5749	psia (average)	True vapor pressure of liquid, P	TANKS 4.0 output file
65.6853	lb/lb-mole	Molecular weight of vapors, M	TANKS 4.0 output file
80.79	°F (maximum)	Temperature of liquid	TANKS 4.0 output file
67.36	°F (average)	Temperature of liquid	TANKS 4.0 output file
540.46	°R (maximum)	Temperature of liquid, T	°F + 459.67
527.03	°R (average)	Temperature of liquid, T	°F + 459.67
6.54	$lb/10^3$ gal (maximum)	Emission factor, L	AP-42, Section 5.2, Equation 1
5.19	$lb/10^3$ gal (average)	Emission factor, L	AP-42, Section 5.2, Equation 1

$$L = 12.46 \frac{SPM}{T}$$

Note: The total control efficiency is equal to the collection efficiency of the system (90 percent for trucks subjected to annual leak checks) times the control efficiency of the control device

Production Rate

7.56	10^3 gal/hr	Maximum hourly production rate	Harvest Four Corners, LLC
378.084	10^3 gal/yr	Maximum annual production rate	Harvest Four Corners, LLC

Steady-State Emission Rates

Pollutant	Uncontrolled Emission Rates, pph	tpy
VOC	49.45	0.98

The short-term emission rates are calculated using the maximum true vapor pressure and maximum temperature of the liquid
The annual emission rates are calculated using the average true vapor pressure and average temperature of the liquid
Uncontrolled Emission Rate (pph) = lb/10^3 gal x 10^3 gal/hr
Uncontrolled Emission Rate (tpy) = lb/10^3 gal x 10^3 gal/yr / 2,000 lb/ton

Pollutants	Percent of VOC, %	Emission Rates pph	tpy
Benzene	0.44	2.18E-01	4.32E-03
Cumene	0.00	0.00E+00	0.00E+00
Ethylbenzene	1.57	7.76E-01	1.54E-02
n-Hexane	7.13	3.53E+00	7.00E-02
2,2,4-Trimethlyp	0.04	1.98E-02	3.93E-04
Toluene	0.03	1.48E-02	2.95E-04
m-Xylene	0.11	5.44E-02	1.08E-03

Percent of VOC calculated from the TANKS 4.0 results
Percent of VOC (%) = 100 x Pollutant Emission Rate (lb/yr) / Total VOC Emission Rate (lb/yr)

Truck Loading (Produced Water) Emissions Calculations

Unit Number: L2 *Insignificant Source*
Description: Truck Loading

Emission Factor

0.6		Saturation factor, S	AP-42, Table 5.2-1 (submerged loading & dedicated service)
0.4581	psia (maximum)	True vapor pressure of liquid, P	Estimated using Antoine's Equation (see calculations below)
0.3045	psia (average)	True vapor pressure of liquid, P	Estimated using Antoine's Equation (see calculations below)
18.02	lb/lb-mole	Molecular weight of vapors, M	TANKS 4.0 Database
77	°F (maximum)	Temperature of liquid	Estimated (see calculations below)
65	°F (average)	Temperature of liquid	Estimated (see calculations below)
536.67	°R (maximum)	Temperature of liquid, T	°F + 459.67
524.67	°R (average)	Temperature of liquid, T	°F + 459.67
0.11	lb/10^3 gal (maximum)	Emission factor, L	AP-42, Section 5.2, Equation 1
0.08	lb/10^3 gal (average)	Emission factor, L	AP-42, Section 5.2, Equation 1

$$L = 12.46 \frac{SPM}{T}$$

Production Rate

3.36	10^3 gal/hr	Maximum hourly production rate	Harvest Four Corners, LLC
159.60	10^3 gal/yr	Maximum annual production rate	Harvest Four Corners, LLC

Steady-State Emission Rates

Pollutant	Uncontrolled Emission Rates, pph	tpy
VOC	0.39	6.24E-03

The short-term emission rates are calculated using the maximum true vapor pressure and maximum temperature of the liquid
The annual emission rates are calculated using the average true vapor pressure and average temperature of the liquid
Uncontrolled Emission Rate (pph) = lb/10^3 gal x 10^3 gal/hr
Uncontrolled Emission Rate (tpy) = lb/10^3 gal x 10^3 gal/yr / 2,000 lb/ton

Pollutants	Mass Fraction	Uncontrolled Emission Rates, pph	tpy
Benzene	0.0267	1.03E-04	1.67E-06
Ethylbenzene	0.0027	1.03E-05	1.67E-07
n-Hexane	0.0840	3.24E-04	5.24E-06
Toluene	0.0344	1.33E-04	2.14E-06
m-Xylene	0.0229	8.85E-05	1.43E-06

HAP mass fractions are estimated from the produced water tank emission factors
HAP Mass Fraction = HAP Emission Factor (lb/bbl) / VOC Emission Factor (lb/bbl)
Emission Rates (pph) = VOC Emission Rate (pph) x HAP Mass Fraction
Emission Rates (tpy) = VOC Emission Rate (tpy) x HAP Mass Fraction

Truck Loading (Produced Water) Emissions Calculations

Unit Number: L2 *Insignificant Source*
Description: Truck Loading

Vapor Pressure of Produced Water:

It is estimated that the true vapor pressure of produced water is approximately equal to the true vapor pressure of pure water. An estimate of the true vapor pressure for water is calculated using Antoine's equation (see AP-42, Section 7.1, Equation 1-25).

Maximum:

Temperature = 77 °F

log P = A - (B / (C + T))

A = 8.07131
B = 1730.63
C = 233.426
T = 25.00 °C
P = mmHg

P = 10^(A - (B / (C + T))

P = 23.69 mmHg
P = 0.4581 psi

Average:

Temperature = 65 °F

log P = A - (B / (C + T))

A = 8.07131
B = 1730.63
C = 233.426
T = 18.33 °C
P = mmHg

P = 10^(A - (B / (C + T))

P = 15.75 mmHg
P = 0.3045 psi

Note: 760 mmHg = 14.7 psia

Pig Receiver Emissions Calculations

Unit Number: PR1
Description: Pig Receiver

Pipe Volume

Outside Diameter, in	Wall Thickness, in	Pipe Length, ft	Pipe Volume, ft^3
16	0.375	9	11.416

Pipe Volume
3.1416 x (((Outside Diameter - (2 x Wall Thickness)) / 12 / 2) ^2) x Pipeline Length

Blowdown Volume (Per Event)

Blowdown Pressure, psig	Atmospheric Pressure, psi	Blowdown Gas Loss, scf	Number of Purges, #	Purge Pressure, psig	Purge Gas Loss, mscf	Total Gas Loss, scf
100	11.97	87	2	30	65	152.1

Blowdown Gas Loss
Pipe Volume x ((Blowdown Pressure + Atmospheric Pressure) / 14.7)
Purge Gas Loss
Number of Purges x Pipe Volume x ((Purge Pressure + Atmospheric Pressure) / 14.7)

Throughput

12	events/yr	Blowdowns per year	Harvest Four Corners, LLC
152.1	scf/event	Gas loss per blowdown	Calculated (see table above)
1,826	scf/yr	Annual gas loss	events/yr x scf/event

Emission Rates

Pollutants	Emission Factors, lb/scf	Uncontrolled, Emission Rates, tpy
VOC	2.548E-02	2.33E-02
Benzene	1.853E-05	1.69E-05
Ethylbenzene	8.395E-07	7.66E-07
n-Hexane	3.239E-04	2.96E-04
Isooctane	5.811E-06	5.30E-06
Toluene	1.627E-05	1.49E-05
Xylene	4.198E-06	3.83E-06

Emission factors calculated from gas composition (see table below)
Uncontrolled Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Gas Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Emission Factors, lb/scf
Carbon dioxide	0.5742	44.01	6.661E-04
Hydrogen sulfide	0.0000	34.07	0.000E+00
Nitrogen	4.0195	28.01	2.967E-03
Methane	64.7125	16.04	2.736E-02
Ethane	12.0347	30.07	9.538E-03
Propane	11.3402	44.09	1.318E-02
Isobutane	1.4244	58.12	2.182E-03
n-Butane	3.7038	58.12	5.674E-03
Isopentane	0.7949	72.15	1.512E-03
n-Pentane	0.7318	72.15	1.392E-03
Cyclopentane	0.0220	70.14	4.067E-05
n-Hexane	0.1426	86.17	3.239E-04
Cyclohexane	0.0316	84.16	7.010E-05
Other hexanes	0.3246	86.18	7.373E-04
Heptanes	0.0649	100.20	1.714E-04
Methylcyclohexane	0.0409	98.19	1.059E-04
Isooctane	0.0022	100.21	5.811E-06
Benzene	0.0090	78.11	1.853E-05
Toluene	0.0067	92.14	1.627E-05
Ethylbenzene	0.0003	106.17	8.395E-07
Xylenes	0.0015	106.17	4.198E-06
C8+ Heavies	0.0180	110.00	5.219E-05
Total	100.0003		
Total VOC			2.548E-02

Gas stream composition obtained from the Buena Vista extended gas analysis dated Nov. 29, 2021.
Emission Factors (lb/scf) = (% / 100) x lb/lb-mole / 379.4 scf/lb-mole

Equipment Leaks Emissions Calculations

Unit Number: F1
Description: Valves, Connectors, Seals & Open-Ended Lines

Steady-State Emission Rates

Equipment	Number of Components, # of sources	Emission Factors, kg/hr/source	Emission Factors, lb/hr/source	Uncontrolled Emission Rates, pph	tpy
Valves	378	0.0045	0.0099	3.74	16.39
Connectors	339	0.0002	0.0004	0.15	0.65
Pump Seals	0	0.0024	0.0053	0.00	0.00
Compressor Seals	36	0.0088	0.0194	0.70	3.05
Pressure Relief Valves	25	0.0088	0.0194	0.48	2.12
Open-Ended Lines	103	0.0020	0.0044	0.45	1.99
Total				**5.53**	**24.20**

Number of components based on the numbers of compressors and dehydrators at the station (see next page)
Emission factors taken from the EPA "1995 Protocol for Equipment Leak Emission Estimates"
Emission factors (lb/hr/source) = Emission factors (kg/hr/source) x 2.2 lb/kg
Uncontrolled TOC Emission Rates (pph) = lb/hr/source x # of sources
Uncontrolled TOC Emission Rates (tpy) = Uncontrolled TOC Emission Rates (pph) x 8,760 hr/yr / 2,000 lb/ton

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight, Percent %	Uncontrolled Emission Rates, pph	tpy
Carbon dioxide	0.5742	44.010	0.253	1.009	5.57E-02	2.44E-01
Hydrogen sulfide	0.0000	34.070	0.000	0.000	0.00E+00	0.00E+00
Nitrogen	4.0195	28.013	1.126	4.495	2.48E-01	1.09E+00
Methane	64.7125	16.043	10.382	41.444	2.29E+00	1.00E+01
Ethane	12.0347	30.070	3.619	14.446	7.98E-01	3.50E+00
Propane	11.3402	44.097	5.001	19.963	1.10E+00	4.83E+00
Isobutane	1.4244	58.123	0.828	3.305	1.83E-01	8.00E-01
n-Butane	3.7038	58.123	2.153	8.594	4.75E-01	2.08E+00
Isopentane	0.7949	72.150	0.574	2.289	1.27E-01	5.54E-01
n-Pentane	0.7318	72.150	0.528	2.108	1.16E-01	5.10E-01
Cyclopentane	0.0220	70.134	0.015	0.062	3.40E-03	1.49E-02
n-Hexane	0.1426	86.177	0.123	0.491	2.71E-02	1.19E-01
Cyclohexane	0.0316	84.161	0.027	0.106	5.87E-03	2.57E-02
Other hexanes	0.3246	86.177	0.280	1.117	6.17E-02	2.70E-01
Heptanes	0.0649	100.204	0.065	0.260	1.43E-02	6.28E-02
Methylcyclohexane	0.0409	98.188	0.040	0.160	8.86E-03	3.88E-02
2,2,4-Trimethylpentane (Isooctane	0.0022	114.231	0.003	0.010	5.54E-04	2.43E-03
Benzene	0.0090	78.114	0.007	0.028	1.55E-03	6.79E-03
Toluene	0.0067	92.141	0.006	0.025	1.36E-03	5.96E-03
Ethylbenzene	0.0003	106.167	0.000	0.001	7.03E-05	3.08E-04
Xylenes	0.0015	106.167	0.002	0.006	3.51E-04	1.54E-03
C8+ Heavies	0.0180	114.231	0.021	0.082	4.54E-03	1.99E-02
Total	100.0003		25.050			
Total VOC				38.606	2.13	9.34

Gas stream composition obtained from the Buena Vista extended gas analysis dated Nov. 29, 2021.
Component Weights (lb/lb-mole) = (% / 100) * Molecular Weights (lb/lb-mole)
Weight Percent (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)
Uncontrolled Emission Rates (pph) = Total Uncontrolled Emission Rate (from Table 1 above) (pph) x (% / 100)
Uncontrolled Emission Rates (tpy) = Total Uncontrolled Emission Rate (from Table 1 above) (tpy) x (% / 100)

Equipment Leaks Emissions Calculations

Unit Number: F1
Description: Valves, Connectors, Seals & Open-Ended Lines

Component Count

Number of Compressors at the Facility: 3
Number of Dehydrators at the Facility: 0

Process Equipment Description	Equipment Count						Instrument Count		
	Valves	Connectors	Pump Seals	Compressor Seals	Pressure Relief Valves	Open-End	Flow	Level	Pressure
Station inlet, meter run to pulsation dampener	17	14	0	0	1	13	3	0	3
Pulsation dampener	12	8	0	0	0	2	0	4	1
Compressor suction header	7	4	0	0	0	3	0	0	1
Suction header feed to instrument gas header	3	1	0	0	0	1	0	0	0
Compressor discharge header and bypass to station discharge	6	5	0	0	0	3	0	1	1
Compressor discharge header and suction header bypass lines	4	2	0	0	0	2	0	0	1
Fuel gas header	2	2	0	0	1	2	0	0	1
Instrument gas header	2	2	0	0	1	2	0	0	0
Station discharge header	9	5	0	0	1	6	0	0	2
Fuel gas recovery header	2	2	0	0	1	2	0	0	0
Fuel gas feed and filter loop	15	9	0	0	0	1	0	4	1
Instrument gas feed and filter loop	9	11	0	0	0	3	0	0	0
Produced water storage tank	1	0	0	0	0	1	0	1	0
ESD panel	12	0	0	0	0	0	0	0	0
Starting gas header	6	2	0	0	1	3	0	0	0
Hot gas header	2	2	0	0	0	2	0	0	0
Volume bottle lop	12	4	0	24	1	2	0	0	1
Components from Compressors	132	177	0	12	18	33	0	12	27
Components from dehydrators	0	0	0	0	0	0	0	0	0
Total	253	250	0	36	25	81	3	22	39
Adjusted Total	378	339	0	36	25	103			

The following additions are included in the Adjusted Total:

1 valve is added for each open end line
2 connectors are added for each flow meter
2 valves, 2 connectors and 1 open end line are added for each level gauge
1 connector is added for each pressure gauge

The component count is based on the evaluation of a comparable facility (Sim Mesa Central Delivery Point)

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)

CO_2, CH_4, and N_2O exhaust emissions were calculated using emission factors from 40 Code of Federal Regulations (CFR), Part C, Tables C-1 & C-2 and the combustion source higher heating value (HHV) design heat rates.

The SSM emissions of CO_2 and CH_4 from blowdown events and pig receiving were calculated from the annual blowdown and event volumes and gas composition.

The flash emissions of CO_2 and CH_4 from the condensate storage tanks were calculated from the throughput and emissions stream composition data in the Symmetry output file.

There are no GHG emissions associated with the truck loading operations.

CO_2 and CH_4 from equipment leaks (fugitive emissions) were calculated using the TOC emission factors and the facility gas stream composition.

The reciprocating compressor CO_2 and CH_4 emissions were calculated using a combination of equations W-26 & W-36 (from Subpart W).

CH_4 from gas-driven pneumatic device emissions and non-routine emissions were calculated from the facility CH_4 gas stream composition using the emission factors and baseline CH_4 content from the API Compendium, Section 5.6.1, Table 5-15. CO_2 gas-driven pneumatic device emissions and non-routine emissions were calculated from the CH_4 emissions and facility gas stream CO_2 composition.

Green House Gas Emissions Data and Calculations

Sources	Facility Total Emissions				
	CO2, tpy	N2O, tpy	CH4, tpy	GHG, tpy	CO2e, tpy
Engine & Turbine Exhaust	18,031.36	3.40E-02	0.34	18,031.7	18049.98
SSM Blowdowns	0.99	--	40.71	41.70	1018.78
Reciprocating Compressor Venting*	1.02	--	42.08	43.10	1052.91
Pigging*	0.00	--	0.02	0.03	0.62
Equipment Leaks	0.17	--	7.14	7.31	178.69
Natural Gas Pneumatic Device Venting*	0.63	--	26.03	26.66	651.31
Natural Gas Driven Pneumatic Pump Venting*	0.04	--	1.59	1.63	39.85
Separators & Storage Tanks (Flash Emissions)	0.04	--	19.71	19.75	492.79
Total	18,034.26	3.40E-02	137.62	18,171.92	21,484.95

* GHG emissions are aggregated with SSM in application Table 2P reporting.

Engine & Turbine Exhaust Emissions

Unit Numbers	Description	Emission Factors			Emission Rates		
		CO2, kg/MMBtu	N2O, kg/MMBtu	CH4, kg/MMBtu	CO2, tpy	N2O, tpy	CH4, tpy
1a (1b)	Wauk 7042GL (worst-case)	53.06	1.00E-04	1.00E-03	6,010.45	1.13E-02	1.13E-01
2a (2b)	Wauk 7042GL (worst-case)	53.06	1.00E-04	1.00E-03	6,010.45	1.13E-02	1.13E-01
3a (3b)	Wauk 7042GL (worst-case)	53.06	1.00E-04	1.00E-03	6,010.45	1.13E-02	1.13E-01
	Total				18,031.36	3.40E-02	3.40E-01

The emissions factors are taken from 40 CFR 98, Subpart C, Tables C-1 & C-2
Emission Rates (tpy) = kg/MMBtu x 2.2 lb/kg x MMBtu/yr / 2,000 lb/ton

Unit Numbers	Description	Fuel Types	Operating Times, hr/yr	LHV Design Heat Rates, MMBtu/hr	HHV	
					Design Heat Rates, MMBtu/hr	Fuel Usages, MMBtu/yr
1a (1b)	Wauk 7042GL (worst-case)	Nat. Gas	8,760	10.58	11.76	102,979
2a (2b)	Wauk 7042GL (worst-case)	Nat. Gas	8,760	10.58	11.76	102,979
3a (3b)	Wauk 7042GL (worst-case)	Nat. Gas	8,760	10.58	11.76	102,979

The fuel types and operating times are provided by Harvest f*or the RICE with the highest design heat rate (i.e., units 1a, 2a, and 3a)* .
The LHV design heat rates are taken from manufacturers data
HHV Design Heat Rates (MMBtu/hr) = LHV Design Heat Rates (MMBtu/hr) / 0.9 LHV/HHV
HHV Fuel Usages (MMBtu/yr) = HHV Design Heat Rates (MMBtu/hr) x hr/yr

SSM Blowdown Emissions

Unit Numbers	Description	Total Gas Losses, scf/yr	CO2 Emission Factors, lb/scf	CH4 Emission Factors, lb/scf	Emission Rates		
					CO2, tpy	N2O, tpy	CH4, tpy
SSM	SSM Blowdowns (worst case)	2,976,136	0.0007	0.0274	0.99	-	40.71

The annual blowdown volumes are calculated from data provided by Harvest
The CO2 and CH4 emission factors are calculated from the facility extended gas analysis
Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Green House Gas Emissions Data and Calculations

Reciprocating Compressor Venting Emissions

Unit Numbers	Description	Emission Rates		
		CO2, tpy	N2O, tpy	CH4, tpy
NA	Blowdown Valve Leakage	0.10	-	4.02
NA	Rod Packing Emissions	0.93	-	38.06
NA	Isolation Valve Leakage	0.00	-	0.00
	Total	1.02	-	42.08

Operating or standby mode - includes blowdown valve leakage through blowdown vent stack
Operating mode - includes rod packing emissions
Non-operating depressurized mode - includes isolation valve leakage through open blowdown vents (without blind flanges)
Rod packing gas emissions assume 4 cylinders per compressor
A combination of equations W-26 & W-36 (Subpart W) is used to calculate reciprocating compressor emissions
As the NMED requires CO2 & CH4 emissions rather than CO2e emissions, it is not necessary to include the global warming potential from equation W-36
CO2 Emission Rates (tpy) = # x scf/hr x hr/yr x (CO2 Mole Percent (%) / 100) x CO2 Density (kg/scf)
x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne
CH4 Emission Rates (tpy) = # x scf/hr x hr/yr x (CH4 Mole Percent (%) / 100) x CH4 Density (kg/scf)
x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

Unit Numbers	Description	Number of Compressors #	Gas Emissions, scf/hr	Operating Times, hr/yr	CO2 Mole Percents, %	CH4 Mole Percents, %	CO2 Density, kg/scf	CH4 Density, kg/scf
NA	Blowdown Valve Leakage	1	33.5	8,760	0.57	64.71	0.0526	0.0192
NA	Rod Packing Emissions	1	317.2	8,760	0.57	64.71	0.0526	0.0192
NA	Isolation Valve Leakage	1	10.5	0	0.57	64.71	0.0526	0.0192

The number of compressors is provided by Harvest
Blowdown valve leakage (33.5 scf/hr) and rod packing emissions occur in operating mode
Blowdown valve leakage (10.5 scf/hr) occurs in standby pressurized mode
Emission factors are the three year rolling average (2012-2014) of all measurements in the [now] Harvest Four Corners, LLC compressor fleet located at natural gas processing plants
The operating times (the average operating times for all station compressors combined) are provided by Harvest
The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The CO2 & CH4 densities (kg/scf) are taken from Subpart W, Paragraph 98.233(v)

Pig Launcher & Receiver Emissions

Unit Numbers	Description	Total Gas Losses, scf/yr	CO2 Emission Factors, lb/scf	CH4 Emission Factors, lb/scf	Emission Rates		
					CO2, tpy	N2O, tpy	CH4, tpy
P1	Pig Receiver	1,825.71	0.0007	0.0274	0.00	-	0.02
	Total				0.00	-	0.02

The annual blowdown volumes are calculated from data provided by Harvest
The CO2 and CH4 emission factors are calculated from the facility extended gas analysis
Emission Rates (tpy) = scf/yr x lb/scf / 2,000 lb/ton

Green House Gas Emissions Data and Calculations

Equipment Leaks Emissions

Unit Numbers	Description	Emission Rates		
		CO2, tpy	N2O, tpy	CH4, tpy
NA	Valves	0.1	-	5.5
NA	Connectors	0.0	-	0.7
NA	Open-Ended Lines	0.0	-	0.4
NA	Pressure Relief Valves	0.0	-	0.6
	Total	0.2	-	7.1

A combination of equations W-31 & W-36 (Subpart W) is used to calculate uncombusted CO2 & CH4 emissions
As the NMED requires CO2 & CH4 emissions rather than CO2e emissions, it is not necessary to include the global warming potential from equation W-36
CO2 Emission Rate (tpy) = # x scf/hr/component x (CO2 Content (mole %) / 100) x hr/yr x CO2 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne
CH4 Emission Rate (tpy) = # x scf/hr/component x (CH4 Content (mole %) / 100) x hr/yr x CH4 Density (kg/scf) x (2,204.6 lb/tonne / 2,000 lb/ton) / 1,000 kg/tonne

Unit Numbers	Description	Number of Components, #	Emission Factors, scf/hr /component	CO2 Contents, mole %	CH4 Contents, mole %	Operating Times, hr/yr	CO2 Density, kg/scf	CH4 Density, kg/scf
NA	Valves	378	0.121	0.57	64.71	8,760	0.0526	0.0192
NA	Connectors	339	0.017	0.57	64.71	8,760	0.0526	0.0192
NA	Open-Ended Lines	103	0.031	0.57	64.71	8,760	0.0526	0.0192
NA	Pressure Relief Valves	25	0.193	0.57	64.71	8,760	0.0526	0.0192

The number of sources are calculated based on the number of compressors and dehydrators at the station (see criteria pollutant and HAP equipment leaks calculations)
The emission factors are taken from Subpart W, Table W-1A (Western U.S. - Gas Service)
The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The operating times are provided by Harvest (default is the entire year)
The CO2 & CH4 densities are taken from Subpart W, Paragraph 98.233(v)

Natural Gas Pneumatic Device Venting Emissions

Unit Numbers	Description	Number of Devices, #	Emission Factors, scf/hr/device	Operating Times, hr/yr	Emission Rates		
					CO2, tpy	N2O, tpy	CH4, tpy
NA	Continuous High Bleed Pneumatic Devices	0	37.3	8,760	0.00	-	0.00
NA	Intermittent Bleed Pneumatic Devices	16	13.5	8,760	0.63	-	25.86
NA	Continuous Low Bleed Pneumatic Devices	1	1.39	8,760	0.00	-	0.17
	Total				0.63	-	26.03

The number of devices and operating times are provided by Harvest
The emission factors are taken from Subpart W, Table W-1A (Western U.S. - Gas Service)
Equation W-1 (Subpart W) is used to calculate CO2 & CH4 emissions
As the NMED requires CO2 & CH4 emissions in addition to CO2e emissions, it is necessary to divide by the global warming potentials
CO2 Emission Rates (tpy) = # x scf/hr/device x (CO2 Content (mole %) / 100) x CO2 Conversion Factors (tonne CO2e/scf) x hr/yr x (2,204.6 lb/tonne / 2,000 lb/ton) / CO2 Global Warming Potentials (tonne CO2e/tonne CO2)
CH4 Emission Rates (tpy) = # x scf/hr/device x (CH4 Contents (mole %) / 100) x CH4 Conversion Factors (tonne CO2e/scf) x hr/yr x (2,204.6 lb/tonne / 2,000 lb/ton) / CH4 Global Warming Potentials (tonne CO2e/tonne CH4)

Unit Numbers	Description	CO2 Contents, mole %	CH4 Contents, mole %	CO2 Conversion Factors, tonne CO2e /scf	CH4 Conversion Factors, tonne CO2e /scf	CO2 Global Warming Potentials, tonne CO2e /tonne CO2	CH4 Global Warming Potentials, tonne CO2e /tonne CH4
NA	Continuous High Bleed Pneumatic Devices	0.57	64.71	5.262E-05	4.790E-04	1	25
NA	Continuous Low Bleed Pneumatic Devices	0.57	64.71	5.262E-05	4.790E-04	1	25
NA	Intermittent Bleed Pneumatic Devices	0.57	64.71	5.262E-05	4.790E-04	1	25

The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The conversion factors are taken from Subpart W, Paragraph 98.233(a)
The global warming potentials are taken from 40 CFR Part 98, Table A-1

Green House Gas Emissions Data and Calculations

Natural Gas Driven Pneumatic Pump Venting Emissions

Emission Rates

Unit Number	Description	Number of Pumps, #	Emission Factor, scf/hr/pump	Operating Time, hr/yr	Emission Rates		
					CO2, tpy	N2O, tpy	CH4, tpy
NA	Pneumatic Pump Venting	1	13.3	8,760	0.04	-	1.59

The number of pumps is provided by Harvest
The emission factor is taken from Subpart W, Table W-1A (Western U.S. - Gas Service)
The operating time is provided by Harvest (default is the entire year)
Equation W-2 (Subpart W) is used to calculate CO2 & CH4 emissions
As the NMED requires CO2 & CH4 emissions in addition to CO2e emissions, it is necessary to divide by the global warming potentials
CO2 Emission Rate (tpy) = # x scf/hr/pump x (CO2 Content (mole %) / 100) x CO2 Conversion Factor (tonne CO2e/scf) x hr/yr
x (2,204.6 lb/tonne / 2,000 lb/ton) / CO2 Global Warming Potentials (tonne CO2e/tonne CO2)
CH4 Emission Rate (tpy) = # x scf/hr/pump x (CH4 Content (mole %) / 100) x CH4 Conversion Factor (tonne CO2e/scf) x hr/yr
x (2,204.6 lb/tonne / 2,000 lb/ton) / CH4 Global Warming Potentials (tonne CO2e/tonne CH4)

Unit Number	Description	CO2 Content, mole %	CH4 Content, mole %	CO2 Conversion Factor, tonne CO2e /scf	CH4 Conversion Factor, tonne CO2e /scf	CO2 Global Warming Potential, tonne CO2e /tonne CO2	CH4 Global Warming Potential, tonne CO2e /tonne CH4
NA	Pneumatic Pump Venting	0.57	64.71	5.262E-05	4.790E-04	1	25

The facility CO2 and CH4 contents are taken from the facility extended gas analysis
The conversion factors are taken from Subpart W, Paragraph 98.233(a)
The operating time is provided by Harvest (the default is the entire year)
The global warming potentials are taken from 40 CFR Part 98, Table A-1

Separators & Storage Tanks (Flash Emissions)

Unit Number	Description	Emission Rates		Operating Time, hr/yr	Emission Rates		
		CO2, pph	CH4, pph		CO2, tpy	N2O, tpy	CH4, tpy
S1	Separator	0.00E+00	1.31	8,760	0.00	-	5.74
T1, T2	Condensate Tanks	1.00E-02	3.19	8,760	4.38E-02	-	13.97
	Total				0.04	-	19.71

Short-term emission rates (pph) are taken from Symmetry output
The operating times are provided by Harvest
Emission Rate (tpy) = Emission Rate (pph) x Operating Time (hr/yr) / 2,000 lb/ton

Green House Gas Emissions Data and Calculations

Gas Stream Composition

Components	Mole Percents, %	Molecular Weights, lb/lb-mole	Component Weights, lb/lb-mole	Weight Percent of Total, %	Emission Factors, lb/scf
Carbon Dioxide	0.5742	44.01	0.25	1.0090	0.0007
Hydrogen Sulfide	0.0000	34.07	0.00	0.0000	0.0000
Nitrogen	4.0195	28.01	1.13	4.4951	0.0030
Methane	64.7125	16.04	10.38	41.4430	0.0274
Ethane	12.0347	30.07	3.62	14.4487	0.0095
Propane	11.3402	44.09	5.00	19.9627	0.0132
IsoButane	1.4244	58.12	0.83	3.3053	0.0022
Normal Butane	3.7038	58.12	2.15	8.5947	0.0057
IsoPentane	0.7949	72.15	0.57	2.2899	0.0015
Normal Pentane	0.7318	72.15	0.53	2.1081	0.0014
Cyclopentane	0.0220	70.14	0.02	0.0616	0.0000
n-Hexane	0.1426	86.17	0.12	0.4906	0.0003
Cyclohexane	0.0316	84.16	0.03	0.1062	0.0001
Other Hexanes	0.3246	86.18	0.28	1.1169	0.0007
Heptanes	0.0649	100.20	0.07	0.2596	0.0002
Methylcyclohexane	0.0409	98.19	0.04	0.1603	0.0001
2,2,4-Trimethylpentane	0.0022	100.21	0.00	0.0088	0.0000
Benzene	0.0090	78.11	0.01	0.0281	0.0000
Toluene	0.0067	92.14	0.01	0.0246	0.0000
Ethylbenzene	0.0003	106.17	0.00	0.0013	0.0000
Xylenes	0.0015	106.17	0.00	0.0064	0.0000
C8+ heavies	0.0180	110.00	0.02	0.0791	0.0001
Total	100.0003		25.05	100.0000	0.0660
VOC			9.67	--	0.0255

Gas stream composition obtained from the Buena Vista extended gas analysis dated Nov. 29, 2021.
Component Weights (lb/lb-mole) = [Mole Percents (%) / 100] x Molecular Weights (lb/lb-mole)
Weight Percent of Total (%) = 100 x Component Weights (lb/lb-mole) / Total Component Weight (lb/lb-mole)
Emission Factors (lb/scf) = [Mole Percents (%) / 100] x Molecular Weights (lb/lb-mole) / 379.4 scf/lb-mole

Section 7

Information Used To Determine Emissions

Information Used to Determine Emissions shall include the following:

- [x] 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.
- [x] 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.
- [x] If an EPA document or other material is referenced, include a complete copy.
- [ ] Fuel specifications sheet.
- [x] 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.

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STANDARD EQUIPMENT

AIR CLEANER – Two, 3" dry type filter with hinged rain shield and service indicator.

BARRING DEVICE – Manual.

BATTERY BOX – Ship loose battery box designed to accommodate two series 31 12 VDC batteries. Includes power disconnect switch and 20 foot (6.1 m) cable for connection to ESM Power Distribution Box.

BEARINGS – Heavy duty, replaceable, precision type.

BREATHER – Self regulating, closed system.

CONNECTING RODS – Drop forged steel, rifle drilled.

CONTROL SYSTEM – Waukesha Engine System Manager (ESM) integrates spark timing control, speed governing, detonation detection, start-stop control, diagnostic tools, fault logging and engine safeties. Engine Control Unit (ECU) is central brain of the control system and main customer interface. Interface with ESM is through 25 foot (7.6 m) harness to local panel, through MODBUS RTU slave connection RS-485 multidrop hardware, and through the Electronic Service Program (ESP). Customer connections are only required to the local panel, fuel valve, and 24V DC power supply. Compatible with Woodward load sharing module. ESM meets Canadian Standards Association Class I, Division 2, Group D, hazardous location requirements. ESM controlled prechamber logic.

CRANKCASE – Integral crankcase and cylinder frame. Main bearing caps drilled and tapped for temperature sensors. Does not include sensors.

CRANKSHAFT – Counterweighted, forged steel, seven main bearings, and dynamically balanced.

CYLINDERS – Removable bainitic cast iron wet type cylinder liners, chrome plated on outer diameter.

CYLINDER HEADS – Twelve interchangeable. Two hard faced intake and two hard faced exhaust valves per cylinder. Hard faced intake and exhaust valve seat inserts. Roller valve lifters and hydraulic push rods. Includes prechamber and related fuel control valves.

ENGINE ROTATION – Counterclockwise when facing flywheel.

ENGINE MONITORING DEVICES – Factory mounted and wired sensors for lube oil pressure and temperature; intake manifold temperature and pressure; overspeed; and jacket water temperature; all accessible through ESM®. ESM continually monitors combustion performance through accelerometers to provide detonation protection. Dual magnetic pick-ups are used for accurate engine speed monitoring. ESM provides predictive spark plug diagnostics as well as advanced diagnostics of engine and all ESM sensors and logs any faults into non-volatile flash memory.

EXHAUST THERMOCOUPLES – 14 K-type thermocouples. One for each individual cylinder and one pre-turbine for each bank and 25 foot (7.6 m) harness.

EXHAUST OUTLET – Single vertical at rear. Flexible stainless steel connection with 8" (203 mm) pipe flange.

FLYWHEEL – Approx. WR2 = 155000 lb-in2; with ring gear (208 teeth), machined to accept two drive adapters: 31.88" (810 mm) pilot bore, 30.25"(768 mm) bolt circle, (12) 0.75"–10 tapped holes; or 28.88" (734 mm) pilot bore, 27.25" (692 mm) bolt circle, (12) 0.625"–11 tapped holes and (12) 0.75"–10 tapped holes.

FLYWHEEL HOUSING – No. 00 SAE.

FUEL SYSTEM – Single 3" ANSI flange fuel inlet connection. Dual natural gas, 4" (102 mm) duplex updraft carburetors. Two mounted Mooney Flowgrid 250, 2" (51 mm) gas regulators, 43 – 60 psi (296 – 414 kPa) gas inlet pressure required. Prechamber fuel system and control logic. 10 foot (3 m) harness provided for ESM control of customer supplied fuel shutoff valve.

GOVERNOR – Electric throttle actuator controlled by ESM with throttle position feedback. Governor tuning is performed using ESP. ESM includes option of a load-coming feature to improve engine response to step loads.

IGNITION SYSTEM – Ignition Power Module (IPM) controlled by ESM, with spark timing optimized for any speed-load condition. Dual voltage energy levels automatically controlled by ESM to maximize spark plug life.

INTERCOOLER – Air–to–water.

LEVELING BOLTS

LIFTING EYES – Requires 9.5 ton Working Load Limit (W.L.L.) anchor shackles.

LUBRICATION – Full pressure, gear type pump. Engine mounted full flow lube oil micro-fiberglass filters with mounted differential pressure gauge. MICROSPIN® bypass filter, engine mounted. Lube oil strainer, mounted. Air/gas motor driven prelube pump, requires final piping.

MANIFOLDS – Exhaust, (2) water cooled.

OIL COOLER – Shell and tube type, with thermostatic temperature controller and pressure regulating valve. Factory mounted.

OIL PAN – Deep sump type. 190 gallon (719 L) capacity including filter and cooler.

PAINT – Oilfield orange primer.

PISTONS – Aluminum with floating pin. Oil cooled.

SHIPPING SKID – For domestic truck or rail.

TURBOCHARGERS – Two, dry type. Wastegate controlled.

VIBRATION DAMPER – Two, viscous type. Guard included with remote mounted radiator or no radiator.

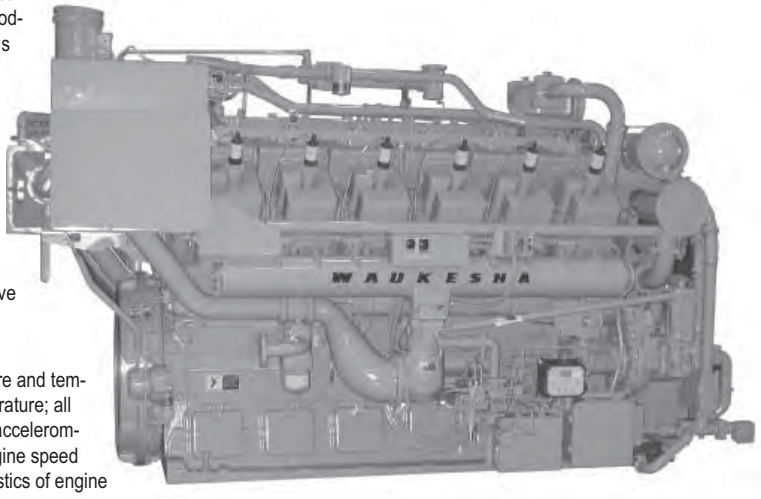
WATER CIRCULATING SYSTEM, AUXILIARY CIRCUIT – Belt driven water circulating high capacity pump for intercooler and lube oil cooler. See S6543-38 performance curve for use with standard 10" diameter crankshaft pulley. Includes thermostatic valve.

WATER CIRCULATING SYSTEM, ENGINE JACKET – Belt driven water circulating pump, cluster type thermostatic temperature regulating valve, full flow bypass type. Flange connections and mating flanges for (2) 4" (102 mm) inlets and (1) 5" (127 mm) outlet.

Waukesha
POWERING PERFORMANCE

L7042GL

VHP® Gas Engine
886 - 1547 BHP



Engine shown without Extender Series Features.

Model L7042GL with ESM®
Turbocharged and Intercooled, Twelve Cylinder, Lean Combustion, Four-Cycle Gas Engine

SPECIFICATIONS

Cylinders
V 12

Piston Displacement
7040 cu. in.
(115 L)

Bore & Stroke
9.375″ x 8.5″
(238 x 216 mm)

Compression Ratio
10.5:1

Jacket Water System Capacity
107 gal.
(405 L)

Lube Oil Capacity
190 gal.
(719 L)

Starting System
125 - 150 psi air/gas
24/32V electric

Dry Weight
21,000 lb.
(9525 kg)

POWER RATINGS: L7042GL VHP® GAS ENGINES

Model	I.C. Water Inlet Temp. °F (°C) (Tcra)	C.R.	Brake Horsepower (kWb Output) 800 rpm	900 rpm	1000 rpm	1100 rpm	1200 rpm
L7042GL	85° (29°)	10.5:1	928 (692)	1160 (865)	1289 (961)	1418 (1057)	1547 (1154)
L7042GL	130° (54°)	10.5:1	886 (661)	1110 (828)	1233 (919)	1357 (1012)	1480 (1104)

Rating Standard: All models: Ratings are based on ISO 3046/1-1995 with mechanical efficiency of 90% and auxiliary water temperature Tcra (clause 10.1) as specified above limited to ± 10° F (± 5° C). Ratings are also valid for SAE J1349, BS5514, DIN6271 and AP17B-11C standard atmospheric conditions.

ISO Standard Power/Continuous Power Rating: The highest load and speed which can be applied 24 hours a day, seven days a week, 365 days per year except for normal maintenance. It is permissible to operate the engine at up to 10% overload, or maximum load indicated by the intermittent rating, whichever is lower, for two hours in each 24 hour period.

All natural gas engine ratings are based on a fuel of 900 Btu/ft^3 (35.3 MJ/nm^3) SLHV value, with a 91 Waukesha Knock Index®.

For conditions or fuels other than standard, contact the Waukesha Engine Sales Engineering Department.

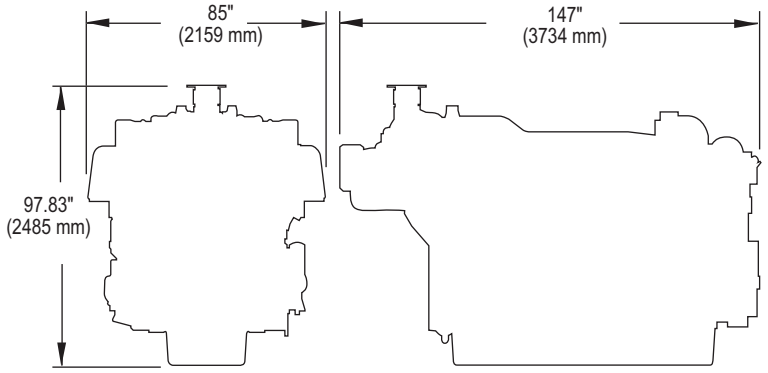
PERFORMANCE: L7042GL VHP® GAS ENGINES

NO_x Settings	English	130° F ICW		85° F ICW	
	RPM	**1200**	**1000**	**1200**	**1000**
1.5 g NO_x	Power (Bhp)	1480	1233	1547	1289
	BSFC (Btu/bhp-hr)	7135	6850	7160	6865
	NOx (grams/bhp-hr)	1.50	1.50	1.50	1.50
	CO (grams/bhp-hr)	2.65	2.65	2.65	2.65
	NMHC (grams/bhp--hr)	0.70	0.80	0.80	0.90

NO_x Settings	Metric	54° C ICW		29° C ICW	
	RPM	**1200**	**1000**	**1200**	**1000**
1.5 g NO_x	Power (kWb)	1104	919	1154	962
	BSFC (kJ/kW-hr)	10089	9686	10124	9707
	NOx (g/nm^3)	0.62	0.62	0.62	0.62
	CO (g/nm^3)	1.09	1.09	1.09	1.09
	NMHC (g/nm^3)	0.29	0.41	0.33	0.37

NOTES:

1) Fuel consumption and exhaust emissions are based on ISO 3046/1-1995 standard reference conditions and commercial quality natural gas of 900 Btu/ft^3 (35.38 MJ/m^3 [25, V(0; 101.325)]) saturated lower heat value, Waukesha Knock Index® of 91 and 93% methane content by volume. ISO 3046/1-1995 standard reference conditions are 77°F (25°C) ambient temperature, 29.54 inches Hg (100 kPa) barometric pressure, 30% relative humidity (1kPa/0.3 inches Hg water vapor pressure).
2) S.I. exhaust emissions are corrected to 5% O_2 (0°C and 101.325 kPa).
3) Data will vary due to variations in site conditions. For conditions and/or fuels other than standard, consult the Waukesha Engine Sales Engineering Department.
4) Fuel consumption based on ISO 3046/1-1995 with a +5% tolerance for commercial quality natural gas having a 900 Btu/ft^3 saturated low heat valve



DRESSER
Waukesha

WAUKESHA ENGINE
DRESSER, INC.
1101 West St. Paul Avenue
Waukesha, WI 53188-4999
Phone: (262) 547-3311 Fax: (262) 549-2795
waukeshaengine.dresser.com

Bulletin 7005 0107

Consult your local Waukesha Distributor for system application assistance. The manufacturer reserves the right to change or modify without notice, the design or equipment specifications as herein set forth without incurring any obligation either with respect to equipment previously sold or in the process of construction except where otherwise specifically guaranteed by the manufacturer.

HEAT REJECTION AND OPERATING DATA
MODEL L7042GL
130° F INTERCOOLER WATER TEMPERATURE
180° F JACKET WATER TEMPERATURE

	BMEP (PSI)	ENGINE SPEED — RPM				
		LOW SPEED TURBOCHARGER			HIGH SPEED TURBOCHARGER	
		700	900	1000	1000	1200
HORSEPOWER (BHP)	152	—	—	1355	1355	1626
	138	—	1108	1232	1232	1478
	125	—	1000	1111	1111	1333
	100	622	800	889	889	1067
	75	467	600	667	667	800
	50	311	400	444	444	533
BRAKE SPEC FUEL CONSUMPTION (BTU/BHP-HR)	152	—	—	7061	6891	7168
	138	—	6889	7151	6984	7274
	125	—	6991	7259	7095	7401
	100	7051	7252	7535	7379	7726
	75	7492	7687	7995	7852	8267
	50	8374	8558	8914	8798	9349
FUEL CONSUMPTION (BTU/HR X 1000)	152	—	—	9565	9335	11650
	138	—	7635	8805	8600	10750
	125	—	6990	8065	7885	9870
	100	4385	5800	6700	6560	8240
	75	3495	4610	5330	5235	6615
	50	2605	3425	3960	3910	4985
HEAT TO JACKET WATER (BTU/HR X 1000)	152	—	—	2510	2400	3010
	138	—	1995	2335	2235	2815
	125	—	1850	2165	2070	2630
	100	1202	1585	1850	1775	2280
	75	1015	1323	1535	1475	1930
	50	829	1059	1219	1177	1585
HEAT TO LUBE OIL (BTU/HR X 1000)	152	—	—	372	358	449
	138	—	277	353	340	430
	125	—	263	334	323	412
	100	177	238	29	291	379
	75	155	213	264	258	346
	50	133	188	229	226	313
HEAT TO INTERCOOLER (BTU/HR X 1000)	152	—	—	532	452	616
	138	—	355	447	368	543
	125	—	291	370	295	472
	100	85	187	244	180	340
	75	25.5	98.5	139	91.5	207
	50	2	26.5	56.5	29.5	73
HEAT TO RADIATION (BTU/HR X 1000)	152	—	—	303	308	332
	138	—	294	302	305	328
	125	—	294	301	304	323
	100	282	292	300	304	314
	75	281	292	303	309	311
	50	280	292	317	318	320

HEAT REJECTION AND OPERATING DATA
MODEL L7042GL
130° F INTERCOOLER WATER TEMPERATURE
180° F JACKET WATER TEMPERATURE

	BMEP (PSI)	ENGINE SPEED — RPM				
		LOW SPEED TURBOCHARGER			HIGH SPEED TURBOCHARGER	
		700	900	1000	1000	1200
TOTAL ENERGY IN EXHAUST (BTU/HR X 1000)	152	—	—	2595	2580	3370
	138	—	2060	2390	2380	3085
	125	—	1890	2190	2180	2805
	100	1179	1575	1830	1830	2310
	75	942	1272	1494	1498	1865
	50	722	985	1188	1198	1485
EXHAUST TEMP AFTER TURBINE (± 50° F)	152	—	—	673	683	719
	138	—	661	669	679	709
	125	—	659	666	676	699
	100	645	656	664	675	684
	75	638	655	671	683	679
	50	620	653	690	704	691
INDUCTION AIR FLOW (SCFM)	152	—	—	3120	3045	3800
	138	—	2485	2865	2800	3500
	125	—	2275	2620	2565	3210
	100	1430	1885	2180	2135	2685
	75	1140	1500	1740	1705	2155
	50	845	1110	1285	1270	1620
EXHAUST GAS FLOW (LBS/HR)	152	—	—	14165	13825	17200
	138	—	11290	13020	12715	15890
	125	—	10330	11920	11645	14580
	100	6485	8585	9910	9710	12195
	75	5170	6830	7890	7750	9795
	50	3855	5050	5840	5765	7350

NOTES:

1. All data are based on ISO standard conditions of 29.54 inches Hg. barometric pressure, 77∞F ambient and induction air temperature, 30% relative humidity (0.3 inches of water vapor pressure), 180∞F engine jacket water outlet temperature, and standard 10∞BTDC ignition timing.
2. Data are average values at the standard conditions and will vary for individual engines and with operating and ambient conditions and with changes to ignition timing or air/fuel ratio. An adequate reserve should be used for cooling system or heat recovery calculations. See also Cooling System Guidelines S-6699-7, latest verison.
3. ISO Standard (continuous) power ratings conform to ISO 3046/1, latest version, with a mechanical efficiency of 90% and auxiliary water temperature, Tcra, of 130∞F limited to ± 10∞F.
4. Fuel rating standard; dry natural gas, 900 Btu/scf saturated lower heating value (SLHV), with a minimum 90 WKI™. Refer to S-7884-7, latest version, for the full fuel specification.
5. For heat rejection changes due to engine jacket water outlet temperature higher than standard (Note 1), refer to S-7613-3, latest version.
6. Total Exhaust Energy includes both recoverable and non-recoverable heat. For a procedure to calculate recoverable heat refer to S-8117-2, latest version.
7. Exhaust oxygen concentration set to 9.8% at rated speed and load at standard timing to provide 1.5 g/bhp-hr NOx, or less. This level is to be measured at the port located in the exhaust manifold, upstream of the turbocharger, for GL engines.
8. Reference curve C-968-19.
9. Exhaust flow at nominal 29.54 inches Hg. barometric pressure:

$$\text{Flow rate: ACFM} = \frac{(\text{Exh. Flow, lb/hr}) \times (\text{Exh. Temp. }^{\circ}\text{F} + 460^{\circ})}{2275}$$

Table 1 – ATGL EMISSION LEVELS‡

MODEL	CARBURETOR SETTING	GRAMS/BHP-HR				% OBSERVED DRY		MASS AFR[2]	VOLUME AFR[2]	EXCESS AIR RATIO
		NOx[1]	CO	NMHC[4]	THC	CO	O_2			
AT25GL	Standard	1.0	2.25	1.0	8.0	0.06	9.8	28.0:1	16.8:1	1.74
AT27GL	Standard	1.5	1.7	0.50	5.0	0.06	9.8	28.0:1	16.8:1	1.74
	Ultra Lean	1.25	1.5	0.40	3.5	0.05	11.2	32.0:1	19.2:1	2.00

‡ These AT-GL emission levels are based on 900 – 1000 rpm operation. For information at all other speeds contact Waukesha's Sales Engineering Department.

Table 2 – VHP EMISSION LEVELS

MODEL	CARBURETOR SETTING	GRAMS/BHP-HR				% OBSERVED DRY		MASS AFR[2]	VOLUME AFR[2]	EXCESS AIR RATIO
		NOX[1]	CO	NMHC[4]	THC	CO	O_2			
G, GSI	Lowest Manifold (Best Power)	8.5	32.0	0.35	2.3	1.15	0.30	15.5:1	9.3:1	0.97
	Equal NOx & CO	12.0	12.0	0.35	2.3	0.45	0.30	15.9:1	9.6:1	0.99
	Catalytic Conv. Input (3-way[3])	13.0	9.0	0.30	2.0	0.38	0.30	15.95:1	9.6:1	0.99
	Standard (Best Economy)	22.0	1.5	0.25	1.5	0.02	1.35	17.0:1	10.2:1	1.06
F3524GSI L7044GSI	Equal NOx & CO	14.0	14.0	0.25	1.1	0.45	0.30	15.85:1	9.5:1	0.99
	Catalytic Conv. Input (3-way[3])	15.0	13.0	0.20	1.0	0.38	0.30	15.95:1	9.6:1	0.99
	Standard (Best Economy)	23.0	2.0	0.20	0.8	0.02	1.35	17.0:1	10.2:1	1.06
L5794GSI	Equal NOx & CO	13.5	13.5	0.45	3.0	0.45	0.30	15.85:1	9.5:1	0.99
	Catalytic Conv. Input (3-way[3])	14.5	11.0	0.45	2.9	0.38	0.30	15.95:1	9.6:1	0.99
	Standard (Best Economy)	22.0	3.0	0.35	2.4	0.02	1.35	17.0:1	10.2:1	1.06
GL	Standard	1.5	2.65	1.0	5.5	0.06	9.8	28.0:1	16.8:1	1.74
L5774LT#	Standard	2.6	2.0	0.60	4.0	0.04	8.0	24.7:1	14.8:1	1.54
L5794LT#	Standard	2.6	2.0	0.60	4.0	0.04	7.8	24.5:1	14.7:1	1.52

L5774LT and L5794LT emission levels are based on 1000 – 1200 rpm operation. For information at all other speeds contact Waukesha's Sales Engineering Department.

NOTE:

The above tables indicate emission levels that are valid for new engines for the duration of the standard warranty period and are attainable by an engine in good operating condition running on commercial quality natural gas of 900 BTU/ft^3 (35.38 MJ/m^3 [25, V(0; 101.325)]) SLHV, Waukesha Knock Index of 91 or higher, 93% methane content by volume, and at ISO standard conditions. Emissions are based on standard engine timing at 91 WKI® with an absolute humidity of 42 grains/lb. Refer to engine specific WKI® Power & Timing curves for standard timing. Unless otherwise noted, these emission levels can be achieved across the continuous duty speed range and from 75% to 110% of the ISO Standard Power (continuous duty) rating. ***Contact the local Waukesha representative or Waukesha's Sales Engineering Department for emission values which can be obtained on a case-by-case basis for specific ratings, fuels, and site conditions.***

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

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

G3516

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
Buena Vista

CATERPILLAR®

GAS COMPRESSION APPLICATION			
ENGINE SPEED (rpm):	1400	RATING STRATEGY:	STANDARD
COMPRESSION RATIO:	8	FUEL SYSTEM:	HPG IMPCO
AFTERCOOLER TYPE:	SCAC		WITH AIR FUEL RATIO CONTROL
AFTERCOOLER WATER INLET (°F):	130	**SITE CONDITIONS:**	
JACKET WATER OUTLET (°F):	210	FUEL:	Buena Vista
ASPIRATION:	TA	FUEL PRESSURE RANGE(psig): (See note 1)	35.0-40.0
COOLING SYSTEM:	JW+OC, AC	FUEL METHANE NUMBER:	37.1
CONTROL SYSTEM:	ADEM3	FUEL LHV (Btu/scf):	1293
EXHAUST MANIFOLD:	ASWC	ALTITUDE(ft):	7004
COMBUSTION:	LOW EMISSION	INLET AIR TEMPERATURE(°F):	77
NOx EMISSION LEVEL (g/bhp-hr NOx):	2.0	STANDARD RATED POWER:	1340 bhp@1400rpm
SET POINT TIMING:	21		

				MAXIMUM RATING	SITE RATING AT MAXIMUM INLET AIR TEMPERATURE		
RATING		**NOTES**	**LOAD**	**100%**	**100%**	**75%**	**50%**
ENGINE POWER	(WITHOUT FAN)	(2)	bhp	1206	1131	848	670
INLET AIR TEMPERATURE			°F	52	77	77	77
ENGINE DATA							
FUEL CONSUMPTION (LHV)		(3)	Btu/bhp-hr	8175	8236	8532	8884
FUEL CONSUMPTION (HHV)		(3)	Btu/bhp-hr	8974	9041	9366	9753
AIR FLOW (@inlet air temp, 14.7 psia)	(WET)	(4)(5)	ft3/min	2484	2447	1851	1491
AIR FLOW	(WET)	(4)(5)	lb/hr	11556	10848	8210	6611
FUEL FLOW (60°F, 14.7 psia)			scfm	127	120	93	77
INLET MANIFOLD PRESSURE		(6)	in Hg(abs)	62.5	59.2	46.6	38.2
EXHAUST TEMPERATURE - ENGINE OUTLET		(7)	°F	965	965	965	967
EXHAUST GAS FLOW (@engine outlet temp, 14.5 psia)	(WET)	(8)(5)	ft3/min	7469	7014	5317	4295
EXHAUST GAS MASS FLOW	(WET)	(8)(5)	lb/hr	12058	11322	8578	6914
EMISSIONS DATA - ENGINE OUT							
NOx (as NO2)		(9)(10)	g/bhp-hr	2.00	2.00	2.00	2.00
CO		(9)(10)	g/bhp-hr	2.97	3.01	3.15	3.29
THC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	2.02	2.05	2.14	2.23
NMHC (mol. wt. of 15.84)		(9)(10)	g/bhp-hr	1.18	1.19	1.25	1.30
NMNEHC (VOCs) (mol. wt. of 15.84)		(9)(10)(11)	g/bhp-hr	0.87	0.88	0.92	0.95
HCHO (Formaldehyde)		(9)(10)	g/bhp-hr	0.16	0.16	0.16	0.17
CO2		(9)(10)	g/bhp-hr	571	575	594	618
EXHAUST OXYGEN		(9)(12)	% DRY	7.4	7.4	7.3	7.2
HEAT REJECTION							
HEAT REJ. TO JACKET WATER (JW)		(13)	Btu/min	44664	42950	35989	31922
HEAT REJ. TO ATMOSPHERE		(13)	Btu/min	4959	4761	4014	3543
HEAT REJ. TO LUBE OIL (OC)		(13)	Btu/min	6661	6405	5367	4761
HEAT REJ. TO AFTERCOOLER (AC)		(13)(14)	Btu/min	8759	8759	4686	2362
COOLING SYSTEM SIZING CRITERIA							
TOTAL JACKET WATER CIRCUIT (JW+OC)		(14)	Btu/min	57124			
TOTAL AFTERCOOLER CIRCUIT (AC)		(14)(15)	Btu/min	9197			
A cooling system safety factor of 0% has been added to the cooling system sizing criteria.							

CONDITIONS AND DEFINITIONS

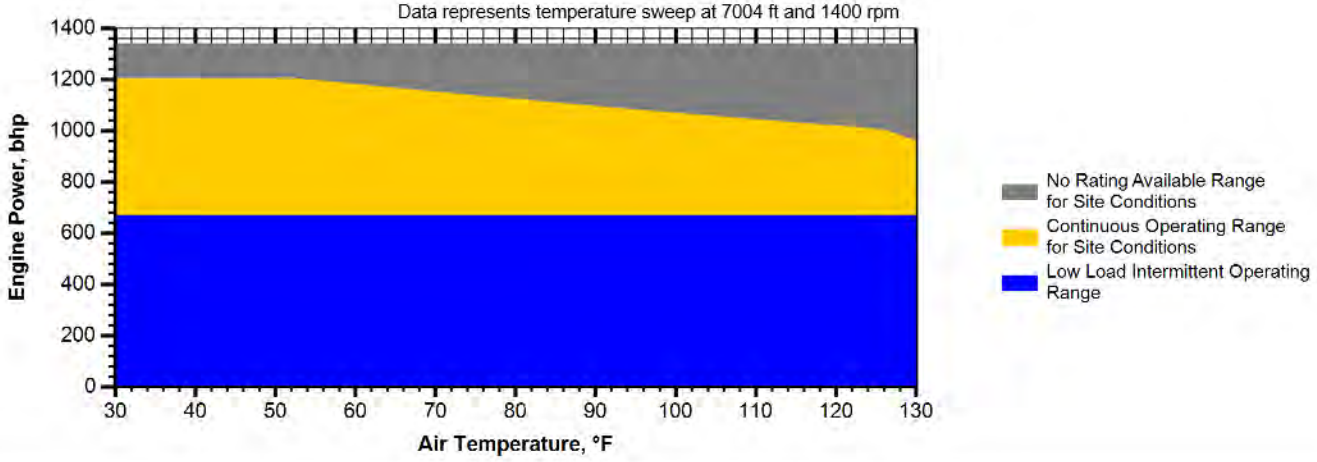
Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site inlet air temperature. 100% rating at maximum inlet air temperature is the maximum engine capability for the specified fuel at site altitude and maximum site inlet air temperature. Maximum rating is the maximum capability at the specified aftercooler inlet temperature for the specified fuel at site altitude and reduced inlet air temperature. Refer to product O&M manual for details on additional lower load capability. No overload permitted at rating shown.

For notes information consult page three.

*****WARNINGS ISSUED FOR THIS RATING CONSULT PAGE 3*****

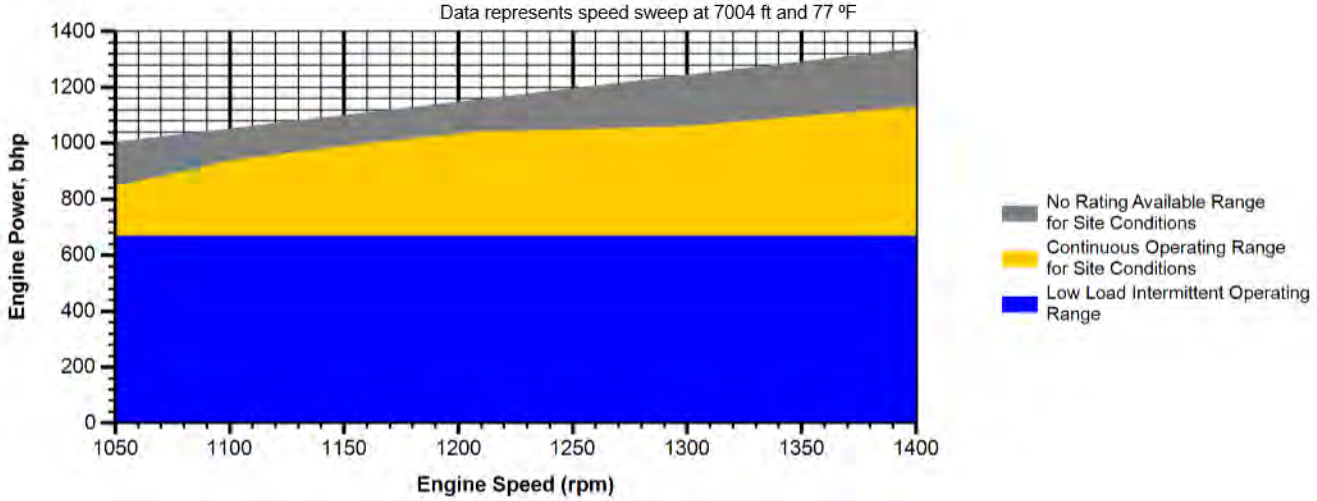
Engine Power vs. Inlet Air Temperature

Data represents temperature sweep at 7004 ft and 1400 rpm



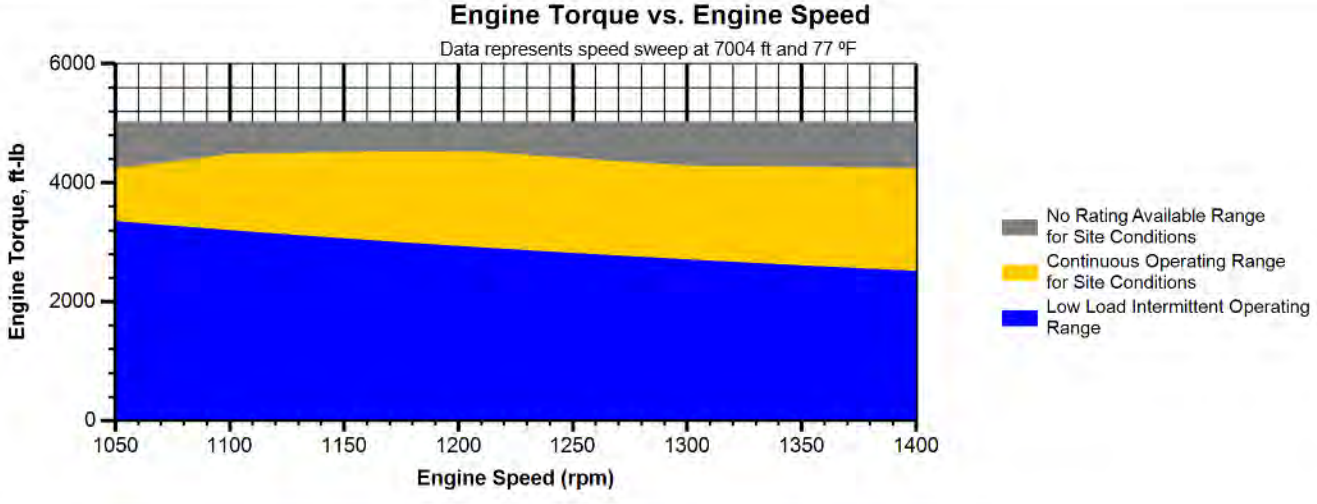
Engine Power vs. Engine Speed

Data represents speed sweep at 7004 ft and 77 ºF



Engine Torque vs. Engine Speed

Data represents speed sweep at 7004 ft and 77 ºF



Note:
At site conditions of 7004 ft and 77°F inlet air temp., constant torque can be maintained down to 1050 rpm.The minimum speed for loading at these conditions is 1050 rpm.

NOTES:

1. Fuel pressure range specified is to the engine fuel pressure regulator. Additional fuel train components should be considered in pressure and flow calculations.

2. Engine rating is with two engine driven water pumps. Tolerance is ± 3% of full load.

3. Engine rating obtained and presented in accordance with ISO 3046/1, adjusted for fuel, site altitude and site ambient temperature.

4. Air flow value is on a 'wet' basis. Flow is a nominal value with a tolerance of ± 5 %.

5. Inlet and Exhaust Restrictions must not exceed A&I limits based on full load flow rates from the standard technical data sheet.

6. Inlet manifold pressure is a nominal value with a tolerance of ± 5 %.

7. Exhaust temperature is a nominal value with a tolerance of (+)63°F, (-)54°F.

8. Exhaust flow value is on a "wet" basis. Flow is a nominal value with a tolerance of ± 6 %.

9. Emissions data is at engine exhaust flange prior to any after treatment.

10. Values listed are higher than nominal levels to allow for instrumentation, measurement, and engine-to-engine variations. They indicate the maximum values expected under steady state conditions. Fuel methane number cannot vary more than ± 3. THC, NMHC, and NMNEHC do not include aldehydes. An oxidation catalyst may be required to meet Federal, State or local CO or HC requirements.

11. VOCs - Volatile organic compounds as defined in US EPA40 CFR 60, subpart JJJJ.

12. Exhaust Oxygen level is the result of adjusting the engine to operate at the specified NOx level. Tolerance is ± 0.5.

13. Heat rejection values are nominal. Tolerances, based on treated water, are ±10% for jacket water circuit, ± 50% for radiation, ± 20% for lube oil circuit, and ± 5% for aftercooler circuit.

14. Aftercooler heat rejection includes an aftercooler heat rejection factor for the site elevation and inlet air temperature specified. Aftercooler heat rejection values at part load are for reference only. Do not use part load data for heat exchanger sizing.

15. Cooling system sizing criteria are maximum circuit heat rejection for the site, with applied tolerances.

WARNING(S):

1. The lower heating value of the fuel is higher than or equal to 1050 Btu/scf and lower than 1400 Btu/scf. The lower heating value of the fuel is higher than the known capabilities of the air fuel ratio control system. To achieve part load NOx emissions, manual adjustment of the air fuel ratio control settings may be required. May require on-site adjustment or tuning of the fuel system and up to two 7E-1569 valve washers per carburetor mixer to lean out part load operating points.

RECOMMENDED ACTION

For additional information please contact your Caterpillar engine dealer

GAS ENGINE SITE SPECIFIC TECHNICAL DATA
Buena Vista

Constituent	Abbrev	Mole %	Norm
Water Vapor	H2O	0.0000	0.0000
Methane	CH4	64.7125	64.7123
Ethane	C2H6	12.0347	12.0347
Propane	C3H8	11.3402	11.3402
Isobutane	iso-C4H10	1.4244	1.4244
Norbutane	nor-C4H10	3.7038	3.7038
Isopentane	iso-C5H12	0.7949	0.7949
Norpentane	nor-C5H12	0.7538	0.7538
Hexane	C6H14	0.5078	0.5078
Heptane	C7H16	0.1128	0.1128
Nitrogen	N2	4.0195	4.0195
Carbon Dioxide	CO2	0.5742	0.5742
Hydrogen Sulfide	H2S	0.0000	0.0000
Carbon Monoxide	CO	0.0000	0.0000
Hydrogen	H2	0.0000	0.0000
Oxygen	O2	0.0000	0.0000
Helium	HE	0.0000	0.0000
Neopentane	neo-C5H12	0.0000	0.0000
Octane	C8H18	0.0217	0.0217
Nonane	C9H20	0.0000	0.0000
Ethylene	C2H4	0.0000	0.0000
Propylene	C3H6	0.0000	0.0000
TOTAL (Volume %)		100.0003	100.0000

Fuel Makeup:	Buena Vista
Unit of Measure:	English

Calculated Fuel Properties

Caterpillar Methane Number:	37.1
Lower Heating Value (Btu/scf):	1293
Higher Heating Value (Btu/scf):	1420
WOBBE Index (Btu/scf):	1391
THC: Free Inert Ratio:	20.77
Total % Inerts (% N2, CO2, He):	4.59%
RPC (%) (To 905 Btu/scf Fuel):	100%
Compressibility Factor:	0.995
Stoich A/F Ratio (Vol/Vol):	13.35
Stoich A/F Ratio (Mass/Mass):	15.44
Specific Gravity (Relative to Air):	0.865
Fuel Specific Heat Ratio (K):	1.265

CONDITIONS AND DEFINITIONS

Caterpillar Methane Number represents the knock resistance of a gaseous fuel. It should be used with the Caterpillar Fuel Usage Guide for the engine and rating to determine the rating for the fuel specified. A Fuel Usage Guide for each rating is included on page 2 of its standard technical data sheet.

RPC always applies to naturally aspirated (NA) engines, and turbocharged (TA or LE) engines only when they are derated for altitude and ambient site conditions.

Project specific technical data sheets generated by the Caterpillar Gas Engine Rating Pro program take the Caterpillar Methane Number and RPC into account when generating a site rating.

Fuel properties for Btu/scf calculations are at 60F and 14.696 psia.

Caterpillar shall have no liability in law or equity, for damages, consequently or otherwise, arising from use of program and related material or any part thereof.

FUEL LIQUIDS

Field gases, well head gases, and associated gases typically contain liquid water and heavy hydrocarbons entrained in the gas. To prevent detonation and severe damage to the engine, hydrocarbon liquids must not be allowed to enter the engine fuel system. To remove liquids, a liquid separator and coalescing filter are recommended, with an automatic drain and collection tank to prevent contamination of the ground in accordance with local codes and standards.

To avoid water condensation in the engine or fuel lines, limit the relative humidity of water in the fuel to 80% at the minimum fuel operating temperature.

WARNING(S):

1. The lower heating value of the fuel is higher than or equal to 1050 Btu/scf and lower than 1400 Btu/scf. The lower heating value of the fuel is higher than the known capabilities of the air fuel ratio control system. To achieve part load NOx emissions, manual adjustment of the air fuel ratio control settings may be required. May require on-site adjustment or tuning of the fuel system and up to two 7E-1569 valve washers per carburetor mixer to lean out part load operating points.

RECOMMENDED ACTION

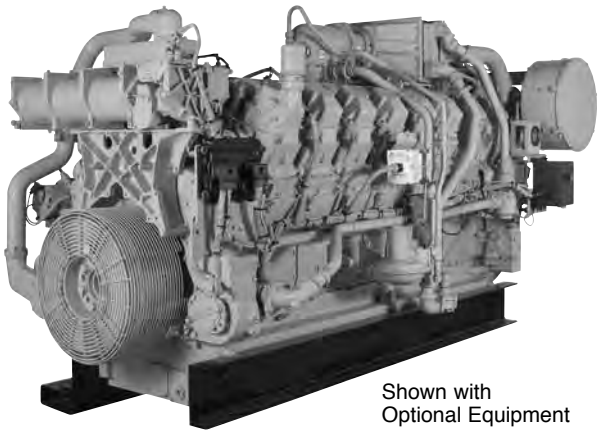
For additional information please contact your Caterpillar engine dealer

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

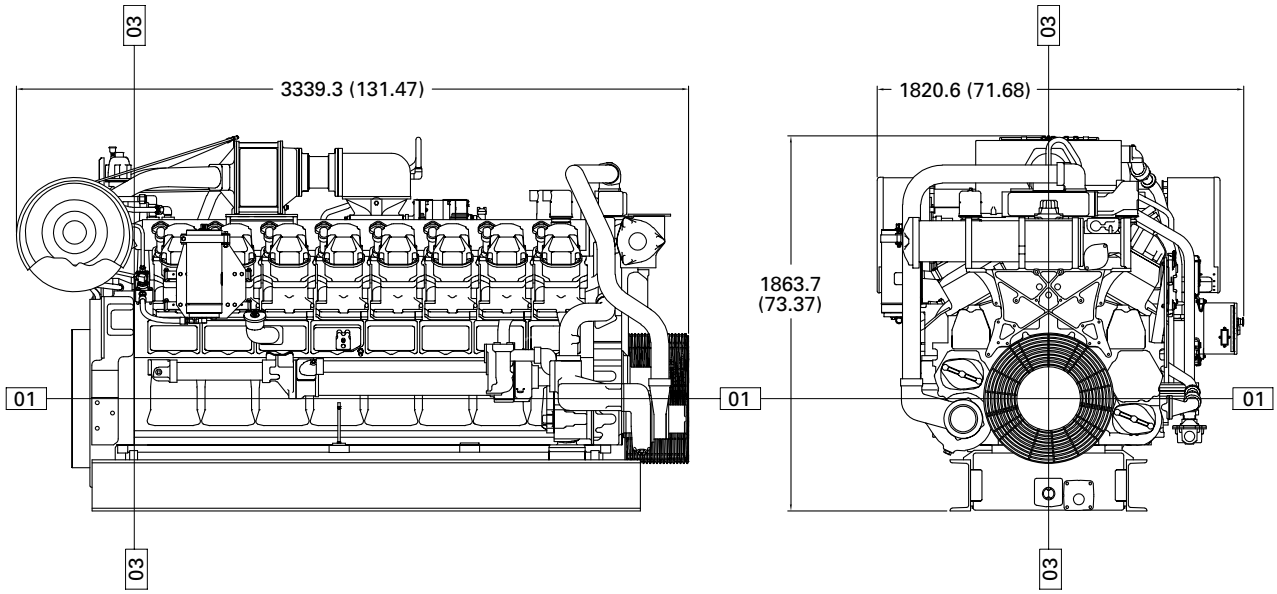
**Volatile organic compounds as defined in U.S. EPA 40 CFR 60, subpart JJJJ

***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

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

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

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2030 Afton Place
Farmington, NM 87401
(505) 325-6622

Analysis No: HM2021104
Cust No: 33700-10030

Well/Lease Information

Customer Name: HARVEST MIDSTREAM
Well Name: BUENA VISTA
County/State:
Location:
Lease/PA/CA:
Formation:
Cust. Stn. No.:

Heat Trace:
Remarks: Calculated Molecular Weight:= 25.1016

Source: METER RUN
Well Flowing:
Pressure: 56 PSIG
Flow Temp: 56 DEG. F
Ambient Temp: 56 DEG. F
Flow Rate: 13 MCF/D
Sample Method:
Sample Date: 11/29/2021
Sample Time: 10.30 AM
Sampled By: TC W.
Sampled by (CO): HARVEST

Analysis

Component:	Mole%:	Unormalized %:	**GPM:	*BTU:	*SP Gravity:
Nitrogen	4.0195	3.9895	0.4440	0.00	0.0389
CO2	0.5742	0.5699	0.0980	0.00	0.0087
Methane	64.7125	64.2299	11.0230	653.60	0.3584
Ethane	12.0347	11.9450	3.2340	212.98	0.1249
Propane	11.3402	11.2556	3.1390	285.33	0.1727
Iso-Butane	1.4244	1.4138	0.4680	46.32	0.0286
N-Butane	3.7038	3.6762	1.1730	120.83	0.0743
Neopentane 2,2 dmc3	0.0000	0.0000	0.0000	0.00	0.0000
I-Pentane	0.7949	0.7890	0.2920	31.80	0.0198
N-Pentane	0.7318	0.7263	0.2670	29.33	0.0182
Neohexane	0.0048	N/R	0.0020	0.23	0.0001
2-3-Dimethylbutane	0.0211	N/R	0.0090	1.00	0.0006
Cyclopentane	0.0220	N/R	0.0070	0.83	0.0005
2-Methylpentane	0.1422	N/R	0.0590	6.75	0.0042
3-Methylpentane	0.0540	N/R	0.0220	2.57	0.0016
C6	0.1426	0.6591	0.0590	6.78	0.0042
Methylcyclopentane	0.1025	N/R	0.0360	4.61	0.0030
Benzene	0.0090	N/R	0.0030	0.34	0.0002
Cyclohexane	0.0316	N/R	0.0110	1.42	0.0009
2-Methylhexane	0.0100	N/R	0.0050	0.55	0.0003
3-Methylhexane	0.0212	N/R	0.0100	1.16	0.0007
2-2-4-Trimethylpentane	0.0022	N/R	0.0010	0.14	0.0001
i-heptanes	0.0068	N/R	0.0030	0.36	0.0002
Heptane	0.0269	N/R	0.0120	1.48	0.0009

Methylcyclohexane	0.0409	N/R	0.0170	2.13	0.0014
Toluene	0.0067	N/R	0.0020	0.30	0.0002
2-Methylheptane	0.0057	N/R	0.0030	0.35	0.0002
4-Methylheptane	0.0032	N/R	0.0020	0.20	0.0001
i-Octanes	0.0030	N/R	0.0010	0.18	0.0001
Octane	0.0051	N/R	0.0030	0.32	0.0002
Ethylbenzene	0.0003	N/R	0.0000	0.02	0.0000
m, p Xylene	0.0013	N/R	0.0010	0.07	0.0000
o Xylene (& 2,2,4 tmc7)	0.0002	N/R	0.0000	0.01	0.0000
i-C9	0.0004	N/R	0.0000	0.03	0.0000
C9	0.0004	N/R	0.0000	0.03	0.0000
i-C10	0.0002	N/R	0.0000	0.01	0.0000
C10	0.0000	N/R	0.0000	0.00	0.0000
i-C11	0.0000	N/R	0.0000	0.00	0.0000
C11	0.0000	N/R	0.0000	0.00	0.0000
C12P	0.0000	N/R	0.0000	0.00	0.0000
Total	100.00	99.254	20.406	1412.04	0.8648

* @ 14.730 PSIA DRY & UNCORRECTED FOR COMPRESSIBILITY
**@ 14.730 PSIA & 60 DEG. F.

COMPRESSIBLITY FACTOR (1/Z):	1.005	CYLINDER #:	11
BTU/CU.FT IDEAL:	1415.3	CYLINDER PRESSURE:	60 PSIG
BTU/CU.FT (DRY) CORRECTED FOR (1/Z):	1422.4	ANALYSIS DATE:	12/02/2021
BTU/CU.FT (WET) CORRECTED FOR (1/Z):	1397.7	ANALYIS TIME:	01:39:48 AM
DRY BTU @ 15.025:	1450.9	ANALYSIS RUN BY:	ELAINE MORRISON
REAL SPECIFIC GRAVITY:	0.8688		

GPM, BTU, and SPG calculations as shown above are based on current GPA constants.
GPA Standard: GPA 2286-14
GC: SRI Instruments 8610 **Last Cal/Verify: 12/08/2021**
GC Method: C12+BTEX Gas

HARVEST MIDSTREAM

WELL ANALYSIS COMPARISON

Lease: BUENA VISTA METER RUN 12/08/2021

Stn. No.: 33700-10030

Mtr. No.:

Smpl Date:	11/29/2021	12/01/2020	11/20/2020	11/05/2019	11/29/2018
Test Date:	12/02/2021	12/02/2020	11/23/2020	11/07/2019	12/04/2018
Run No:	HM2021104	HM200100	HM200098	HM190076	HM180007
Nitrogen:	4.0195	5.0626	4.6218	4.2055	6.7258
CO2:	0.5742	0.5160	0.4604	0.5983	0.4519
Methane:	64.7125	67.0083	67.8517	66.6787	65.8452
Ethane:	12.0347	11.1412	11.1268	11.5760	10.4523
Propane:	11.3402	10.3453	10.1835	10.6593	10.1322
I-Butane:	1.4244	1.2789	1.2039	1.3076	1.2644
N-Butane:	3.7038	3.0424	2.9754	3.2140	3.3065
2,2 dmc3:	0.0000	0.0000	0.0000	0.0014	0.0013
I-Pentane:	0.7949	0.5570	0.5720	0.6296	0.6606
N-Pentane:	0.7318	0.5110	0.5239	0.5691	0.5884
Neohexane:	0.0048	0.0031	0.0036	0.0071	0.0081
2-3-Cyclopentane:	0.0211	0.0154	0.0147	0.0155	0.0036
2-Methylpentane:	0.0220	0.0160	0.0153	0.0161	0.0038
3-Methylpentane:	0.1422	0.1038	0.0989	0.1044	0.0244
C6:	0.0540	0.0433	0.0340	0.0394	0.0499
Methylcyclopentane:	0.1426	0.1015	0.0985	0.1111	0.1387
Benzene:	0.1025	0.0746	0.0739	0.0867	0.1177
Cyclohexane:	0.0090	0.0086	0.0067	0.0075	0.0100
2-Methylhexane:	0.0316	0.0280	0.0232	0.0280	0.0370
3-Methylhexane:	0.0100	0.0095	0.0082	0.0099	0.0126
2-2-4-i-heptanes:	0.0000	0.0000	0.0000	0.0000	0.0000
Heptane:	0.0022	0.0023	0.0018	0.0029	0.0034
Methylcyclohexane:	0.0068	0.0058	0.0052	0.0066	0.0075
Toluene:	0.0269	0.0232	0.0212	0.0282	0.0365
2-Methylheptane:	0.0409	0.0391	0.0306	0.0401	0.0523
4-Methylheptane:	0.0067	0.0131	0.0069	0.0060	0.0086
i-Octanes:	0.0057	0.0079	0.0054	0.0079	0.0082
Octane:	0.0032	0.0042	0.0031	0.0048	0.0049
Ethylbenzene:	0.0030	0.0058	0.0038	0.0051	0.0038
m, p Xylene:	0.0051	0.0086	0.0059	0.0077	0.0074
o Xylene (& 2,2,4	0.0003	0.0005	0.0004	0.0017	0.0005
i-C9:	0.0013	0.0036	0.0022	0.0003	0.0018
C9:	0.0002	0.0004	0.0002	0.0002	0.0006
i-C10:	0.0004	0.0007	0.0007	0.0014	0.0011
C10:	0.0004	0.0010	0.0010	0.0012	0.0007
i-C11:	0.0002	0.0001	0.0002	0.0002	0.0006
C11:	0.0000	0.0001	0.0001	0.0001	0.0006
C12P:	0.0000	0.0000	0.0000	0.0000	0.0000
	0.0000	0.0000	0.0000	0.0000	0.0001
	0.0000	0.0000	0.0000	0.0000	0.0000
BTU:	1422.4	1353.0	1350.8	1378.7	1340.9
GPM:	20.4360	19.9240	19.9000	20.1160	19.8140
SPG:	0.8688	0.8344	0.8273	0.8431	0.8435

2030 Afton Place, Farmington, NM 87401 - (505) 325-6622

#40

GAS ANALYSIS SERVICE

C6+ ☐ C9+ ☐ C12+ BTEX ☐ Helium ☐
N2 Flowback ☐ Sulfurs ☐ Ext. Liquid ☐
Other _____ Date 11/29/2

Sampled By:(Co.) Harvest mid Stream Time 1030 ☑AM ☐PM

Sampled by:(Person) TC Whitaw Well Flowing: ☐ Yes ☐ No

Company: Harvest midstream Heat Trace: ☐ Yes ☐ No

Well Name: _____ Flow Pressure (PSIG): 56

Lease#: _____ Flow Temp (°F): 56

County: _____ Formation: _____ Ambient Temp (°F): 56

State: _____ Location: Buena vista Flow Rate (MCF/D): 13

Source: ☐ Meter Run ☐ Tubing ☐ Casing ☐ Bradenhead ☑ Other pipe rack

Sample Type: ☐ Spot ☐ Composite Sample Method: ☐ Purge & Fill ☐ Other _____

Meter Number: _____ Cylinder Number: 11

Contact: _____

Remarks: 33700-10030 HM2021104

Noble Analytical Laboratory

Client	Harvest Midstream	15444-01	
Sample Id.	Buena Vista Compressor Station	Sample Pressure (psig)	150
Sample Source	2nd Stage Scrubber Comp	Sample Temp. (°F)	91
Sample Type	Spot	Atm Temp. (°F)	48
Meter #	N/A	Sample Date	11/2/2021
Sampled By	CL	Report Date	12/9/2021
		Analysis By	A.K.

	Mol %	Vol. %	Wt. %
Nitrogen	0.0620	0.0174	0.0206
Methane	8.1057	3.5062	1.5433
Carbon Dioxide	0.0084	0.0038	0.0044
Hydrogen sulfide	0.0201	0.0050	0.0069
Ethane	2.0139	1.3748	0.7187
Propane	1.7278	1.2151	0.9042
I-Butane	2.5029	2.0909	1.7265
n-Butane	7.6539	6.1599	5.2797
I-Pentane	6.7849	6.3348	5.8098
n-Pentane	5.7449	5.3162	4.9193
Cyclopentane	0.4964	0.3765	0.4131
I-Hexanes	3.0385	3.2429	3.1078
n-Hexane	6.9365	7.3379	7.0947
Methylcyclohexane	5.3498	5.5186	6.2344
2,2,4 Trimethylpentane	0.1224	0.1637	0.1660
Benzene	1.0888	0.7827	1.0094
Cyclohexane	4.5616	3.9865	4.5563
I-Heptanes	5.6469	6.6754	6.7154
n-Heptane	6.5797	7.7993	7.8246
Toluene	0.1883	0.1619	0.2060
I-Octanes	2.9730	3.8574	4.0306
n-Octane	4.6870	6.1607	6.3543
Ethylbenzene	1.0426	1.0327	1.3137
m+P Xylenes	2.3047	2.2907	2.9038
o-Xylene	0.0210	0.0205	0.0264
I-Nonanes	1.7350	2.5377	2.6408
n-Nonane	4.0174	5.7138	6.0190
I-Decanes	0.3551	0.5830	0.5997
Decanes Plus	4.0951	6.5016	7.1467

SCF/Gal (C1-C5 Vapor)	8.9555	Molecular Weight	84.2578
Specific Gravity	0.6816	Vapor Pressure (psia)	433.58
		Specific Gravity (C10+ Fraction)	0.7452
615 North Price Road Pampa, Texas 79065 (806) 440-0699		Molecular Weight (C10+ Fraction)	146.6634

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PS Memo 09-02

To: **Stationary Sources Program, Local Agencies, and Regulated Community**

From: **Chris Laplante and Roland C. Hea, Colorado Air Pollution Control Division**

Date: **February 8, 2010**

Subject: **Oil & Gas Produced Water Tank Batteries**
Regulatory Definitions and Permitting Guidance

This guidance document is intended to answer frequently asked questions concerning oil and gas industry produced water tank batteries. This document does not address any other equipment types that may be part of a common facility with a tank battery. Nothing in this guidance should be construed regarding Air Pollution Control Division (Division) permitting of evaporation ponds or water treatment facilities. Please consult with the Division for information regarding the permitting of evaporation ponds or water treatment facilities.

Revision History

October 1, 2009	Initial issuance.
February 8, 2010	First revision. This guidance document replaces the October 1, 2009 version. Revised language to clarify APEN fee structure, definition of modification, APEN submittals, and produced water exemption.

Topic **Page**

3. EMISSION FACTORS AND SITE SPECIFIC SAMPLING Q&A

3.1. ***What are the State approved default emission factors for produced water tanks?***

County	Produced Water Tank Default Emission Factors[1] (lb/bbl)[2]		
	VOC	Benzene	n-Hexane
Adams, Arapahoe, Boulder, Broomfield, Denver, Douglas, Jefferson, Larimer, & Weld	0.262	0.007	0.022
Garfield, Mesa, Rio Blanco, & Moffat	0.178	0.004	0.010
Remainder of Colorado[3]	0.262	0.007	0.022

[1] Testing may be performed at any site to determine site-specific emissions factors. These default emission factors may be revised by the Division in the future, pending approved data and testing results.

[2] Units of lb/bbl means pounds of emissions per barrel of produced water throughput

[3] For counties not listed in this table, use the emissions factors listed as a conservative measure or perform testing to determine a site-specific emission factor

3.2. ***What type of emissions are included in the produced water tank state default emission factors?***

State default emission factors for produced water tanks include flash, working, and breathing losses.

3.3. ***Are there limits as to when produced water tank state default emission factors may be used?***

State default emission factors may be used at all oil and gas industry tank batteries. The Division intends to work with industry to refine emission factors and may develop separate emission factors for E&P and non-E&P sites.

3.4. ***When are site-specific emission factors required for tank batteries?***

Site-specific emission factors may be developed and used on a voluntary basis for any tank battery. The Division reserves the authority to require site-specific emission factors at any time. Site-specific emission factors may only be applied at the tank battery for which they were developed, unless otherwise approved by the Division.

3.5. ***How is a site-specific emission factor developed?***

A site-specific emission factor for tank batteries is developed by performing a Division approved stack test. A test protocol must be submitted and approved by the Division prior to performing the test. Once a test protocol has been approved by the Division, subsequent testing may be performed following the approved protocol without submittal to the Division.

The Division must be notified of the site specific testing at least 30-days prior to the actual test date.

Emission Factor Determination for Produced Water Storage Tanks

TCEQ Project 2010-29

Prepared for:
Texas Commission on Environmental Quality
Austin, Texas

Prepared by:
ENVIRON International Corporation
Novato, California

Date:
August 2010

ENVIRON Project Number:
06-17477T

Executive Summary

The overall purpose of this Study is to evaluate volatile organic compounds (VOC), speciated VOC and hazardous air pollutant (HAP) emissions from produced water and/or saltwater storage tanks servicing oil and gas wells and to develop appropriate VOC and HAP emission factors. The emission factors are to be used for emission inventory development purposes.

The primary source of information for this study was testing conducted by the Texas Commission on Environmental Quality (TCEQ) under Work Order 522-7-84005-FY10-25, *Upstream Oil & Gas Tank Measurements*, TCEQ Project 2010-39. As part of this referenced testing project, pressurized produced water samples were taken at seven different tank batteries located in Johnson, Wise and Tarrant Counties, Texas (all part of the Eastern Barnett Shale region) and analyzed for flash gas volume and composition. The sample collection and analysis conducted as part of TCEQ Project 2010-39 was done according to strict sampling and quality assurance procedures. In addition to TCEQ Project 2010-39 data, a thorough review of publically-available information sources identified a limited amount of data on produced water emissions. This was supplemented by data provided by two natural gas producers and one petroleum engineering services company. Other than TCEQ Project 2010-39 data, however, it could not be confirmed that any of the data had undergone a rigorous quality assurance process and therefore is considered secondary data, used to support conclusions drawn using the primary data but not used directly in deriving the produced water emission factors.

Emissions from produced water storage tanks consist of flash emissions, working losses and breathing losses. Flash emissions are determined using flash gas analysis. Working and breathing losses are estimated using EPA TANKS 4.09d software. Using this approach and the assumptions detailed within this report, it is determined that working and breathing losses associated with primary data source sites are very small compared to flash emissions and can be ignored without affecting the overall emission factor determination.

Table ES-1 presents the recommended emission factors for VOC and four HAPs – benzene, toluene, ethylbenzene and xylenes – derived from the primary data source sites. For comparative purposes, average emissions from Texas and non-Texas secondary sites are also presented in Table ES-1.

Table ES-1. Recommended Emission Factors and Comparative Data

Pollutant	Average Produced Water Emission Factor by Data Set (lb/bbl)		
	Recommended Emission Factor	Secondary Data – Texas	Secondary Data – Non-Texas
VOC	0.01	0.012	0.18
Benzene	0.0001	0.0012	0.004
Toluene	0.0003	0.0012	0.009
Ethylbenzene	0.000006	0.0001	0.0007
Xylenes	0.00006	0.0003	0.006

EPA-453/R-95-017

1995 Protocol for Equipment Leak Emission Estimates

Emission Standards Division

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

November 1995

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

Equipment Type	Service[a]	Emission Factor (kg/hr/source)[b]
Valves	Gas	4.5E-03
	Heavy Oil	8.4E-06
	Light Oil	2.5E-03
	Water/Oil	9.8E-05
Pump seals	Gas	2.4E-03
	Heavy Oil	NA
	Light Oil	1.3E-02
	Water/Oil	2.4E-05
Others[c]	Gas	8.8E-03
	Heavy Oil	3.2E-05
	Light Oil	7.5E-03
	Water/Oil	1.4E-02
Connectors	Gas	2.0E-04
	Heavy Oil	7.5E-06
	Light Oil	2.1E-04
	Water/Oil	1.1E-04
Flanges	Gas	3.9E-04
	Heavy Oil	3.9E-07
	Light Oil	1.1E-04
	Water/Oil	2.9E-06
Open-ended lines	Gas	2.0E-03
	Heavy Oil	1.4E-04
	Light Oil	1.4E-03
	Water/Oil	2.5E-04

[a]Water/Oil emission factors apply to water streams in oil service with a water content greater than 50%, from the point of origin to the point where the water content reaches 99%. For water streams with a water content greater than 99%, the emission rate is considered negligible.

[b]These factors are for total organic compound emission rates (including non-VOC's such as methane and ethane) and apply to light crude, heavy crude, gas plant, gas production, and off shore facilities. "NA" indicates that not enough data were available to develop the indicated emission factor.

[c]The "other" equipment type was derived from compressors, diaphrams, drains, dump arms, hatches, instruments, meters, pressure relief valves, polished rods, relief valves, and vents. This "other" equipment type should be applied for any equipment type other than connectors, flanges, open-ended lines, pumps, or valves.

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

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

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

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

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

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

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

where:

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

S = a saturation factor (see Table 5.2-1)
P = true vapor pressure of liquid loaded, pounds per square inch absolute (psia) (see Figure 7.1-5, Figure 7.1-6, and Table 7.1-2)
M = molecular weight of vapors, pounds per pound-mole (lb/lb-mole) (see Table 7.1-2)
T = temperature of bulk liquid loaded, °R (°F + 460)

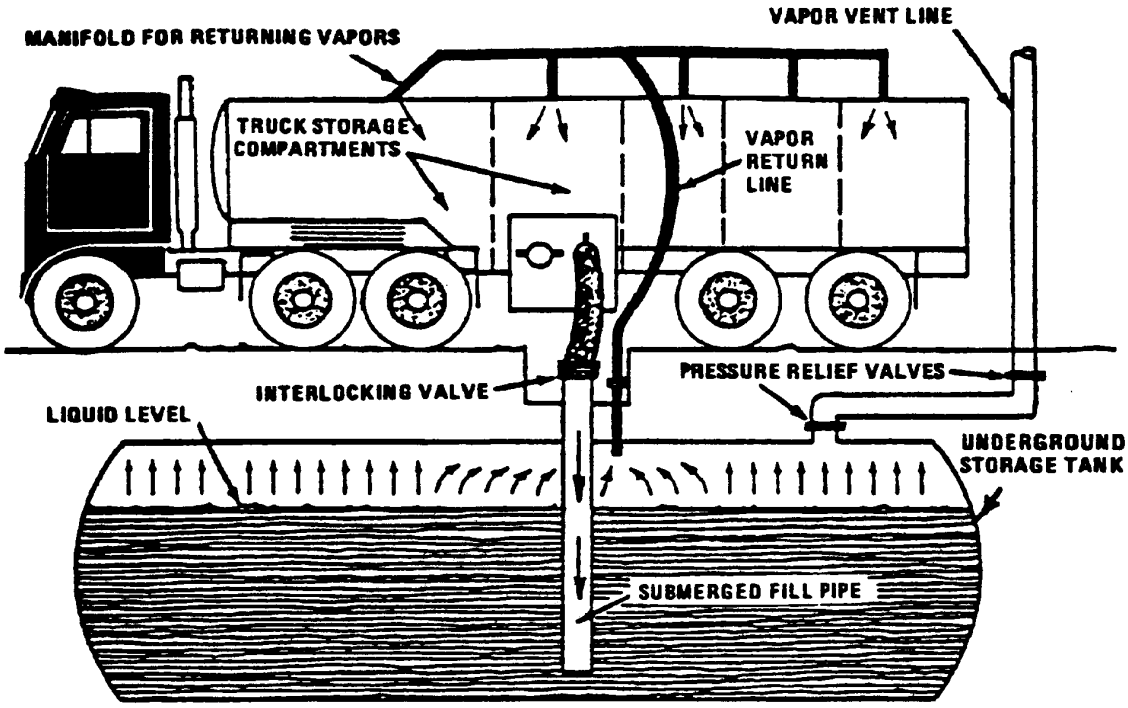

Figure 5.2-5. Tank truck unloading into a service station underground storage tank and practicing "vapor balance" form of emission control.

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

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

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

Table A–1 to Subpart A of Part 98—Global Warming Potentials

[100-Year Time Horizon]

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
Carbon dioxide	124–38–9	CO_2	1
Methane	74–82–8	CH_4	[a] 25
Nitrous oxide	10024–97–2	N_2O	[a] 298
HFC–23	75–46–7	CHF_3	[a] 14,800
HFC–32	75–10–5	CH_2F_2	[a] 675
HFC–41	593–53–3	CH_3F	[a] 92
HFC–125	354–33–6	C_2HF_5	[a] 3,500
HFC–134	359–35–3	$C_2H_2F_4$	[a] 1,100
HFC–134a	811–97–2	CH_2FCF_3	[a] 1,430
HFC–143	430–66–0	$C_2H_3F_3$	[a] 353
HFC–143a	420–46–2	$C_2H_3F_3$	[a] 4,470
HFC–152	624–72–6	CH_2FCH_2F	53
HFC–152a	75–37–6	CH_3CHF_2	[a] 124
HFC–161	353–36–6	CH_3CH_2F	12
HFC–227ea	431–89–0	C_3HF_7	[a] 3,220
HFC–236cb	677–56–5	$CH_2FCF_2CF_3$	1,340
HFC–236ea	431–63–0	CHF_2CHFCF_3	1,370
HFC–236fa	690–39–1	$C_3H_2F_6$	[a] 9,810
HFC–245ca	679–86–7	$C_3H_3F_5$	[a] 693
HFC–245fa	460–73–1	$CHF_2CH_2CF_3$	1,030
HFC–365mfc	406–58–6	$CH_3CF_2CH_2CF_3$	794
HFC–43–10mee	138495–42–8	$CF_3CFHCFHCF_2CF_3$	[a] 1,640
Sulfur hexafluoride	2551–62–4	SF_6	[a] 22,800
Trifluoromethyl sulphur pentafluoride	373–80–8	SF_5CF_3	17,700
Nitrogen trifluoride	7783–54–2	NF_3	17,200
PFC–14 (Perfluoromethane)	75–73–0	CF_4	7,390
PFC–116 (Perfluoroethane)	76–16–4	C_2F_6	[a] 12,200
PFC–218 (Perfluoropropane)	76–19–7	C_3F_8	[a] 8,830

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
Perfluorocyclopropane	931–91–9	$C\text{-}C_3F_6$	17,340
PFC–3–1–10 (Perfluorobutane)	355–25–9	C_4F_{10}	[a] 8,860
Perfluorocyclobutane	115–25–3	$C\text{-}C_4F_8$	[a] 10,300
PFC–4–1–12 (Perfluoropentane)	678–26–2	C_5F_{12}	[a] 9,160
PFC–5–1–14 (Perfluorohexane)	355–42–0	C_6F_{14}	[a] 9,300
PFC–9–1–18	306–94–5	$C_{10}F_{18}$	7,500
HCFE–235da2 (Isoflurane)	26675–46–7	$CHF_2OCHClCF_3$	350
HFE–43–10pccc (H–Galden 1040x)	E1730133	$CHF_2OCF_2OC_2F_4OCHF_2$	1,870
HFE–125	3822–68–2	CHF_2OCF_3	14,900
HFE–134	1691–17–4	CHF_2OCHF_2	6,320
HFE–143a	421–14–7	CH_3OCF_3	756
HFE–227ea	2356–62–9	$CF_3CHFOCF_3$	1,540
HFE–236ca12 (HG–10)	78522–47–1	$CHF_2OCF_2OCHF_2$	2,800
HFE–236ea2 (Desflurane)	57041–67–5	$CHF_2OCHFCF_3$	989
HFE–236fa	20193–67–3	$CF_3CH_2OCF_3$	487
HFE–245cb2	22410–44–2	$CH_3OCF_2CF_3$	708
HFE–245fa1	84011–15–4	$CHF_2CH_2OCF_3$	286
HFE–245fa2	1885–48–9	$CHF_2OCH_2CF_3$	659
HFE–254cb2	425–88–7	$CH_3OCF_2CHF_2$	359
HFE–263fb2	460–43–5	$CF_3CH_2OCH_3$	11
HFE–329mcc2	67490–36–2	$CF_3CF_2OCF_2CHF_2$	919
HFE–338mcf2	156053–88–2	$CF_3CF_2OCH_2CF_3$	552
HFE–338pcc13 (HG–01)	188690–78–0	$CHF_2OCF_2CF_2OCHF_2$	1,500
HFE–347mcc3	28523–86–6	$CH_3OCF_2CF_2CF_3$	575
HFE–347mcf2	E1730135	$CF_3CF_2OCH_2CHF_2$	374
HFE–347pcf2	406–78–0	$CHF_2CF_2OCH_2CF_3$	580
HFE–356mec3	382–34–3	$CH_3OCF_2CHFCF_3$	101
HFE–356pcc3	160620–20–2	$CH_3OCF_2CF_2CHF_2$	110
HFE–356pcf2	E1730137	$CHF_2CH_2OCF_2CHF_2$	265
HFE–356pcf3	35042–99–0	$CHF_2OCH_2CF_2CHF_2$	502

Name	CAS No.	Chemical formula	Global warming potential (100 yr.)
HFE–365mcf3	378–16–5	$CF_3CF_2CH_2OCH_3$	11
HFE–374pc2	512–51–6	$CH_3CH_2OCF_2CHF_2$	557
HFE–449sl (HFE–7100) Chemical blend	163702–07–6 163702–08–7	$C_4F_9OCH_3$ $(CF_3)_2CFCF_2OCH_3$	297
HFE–569sf2 (HFE–7200) Chemical blend	163702–05–4 163702–06–5	$C_4F_9OC_2H_5$ $(CF_3)_2CFCF_2OC_2H_5$	59
Sevoflurane	28523–86–6	$CH_2FOCH(CF_3)_2$	345
HFE–356mm1	13171–18–1	$(CF_3)_2CHOCH_3$	27
HFE–338mmz1	26103–08–2	$CHF_2OCH(CF_3)_2$	380
(Octafluorotetramethy-lene)hydroxymethyl group	NA	$X\text{-}(CF_2)_4CH(OH)\text{-}X$	73
HFE–347mmy1	22052–84–2	$CH_3OCF(CF_3)_2$	343
Bis(trifluoromethyl)-methanol	920–66–1	$(CF_3)_2CHOH$	195
2,2,3,3,3-pentafluoropropanol	422–05–9	$CF_3CF_2CH_2OH$	42
PFPMIE	NA	$CF_3OCF(CF_3)CF_2OCF_2OCF_3$	10,300

[a] The GWP for this compound is different than the GWP in the version of Table A-1 to subpart A of part 98 published on October 30, 2009.

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Table C–1 to Subpart C of Part 98—Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Table C–1 to Subpart C—Default CO_2 Emission Factors and High Heat Values for Various Types of Fuel

Fuel type	Default high heat value	Default CO_2 emission factor
Coal and coke	**mmBtu/short ton**	**kg CO_2/mmBtu**
Anthracite	25.09	103.69
Bituminous	24.93	93.28
Subbituminous	17.25	97.17
Lignite	14.21	97.72
Coal Coke	24.80	113.67
Mixed (Commercial sector)	21.39	94.27
Mixed (Industrial coking)	26.28	93.90
Mixed (Industrial sector)	22.35	94.67
Mixed (Electric Power sector)	19.73	95.52
Natural gas	**mmBtu/scf**	**kg CO_2/mmBtu**
(Weighted U.S. Average)	1.026×10^{-3}	53.06
Petroleum products	**mmBtu/gallon**	**kg CO_2/mmBtu**
Distillate Fuel Oil No. 1	0.139	73.25
Distillate Fuel Oil No. 2	0.138	73.96
Distillate Fuel Oil No. 4	0.146	75.04
Residual Fuel Oil No. 5	0.140	72.93
Residual Fuel Oil No. 6	0.150	75.10
Used Oil	0.138	74.00
Kerosene	0.135	75.20
Liquefied petroleum gases (LPG)[1]	0.092	61.71
Propane[1]	0.091	62.87
Propylene[2]	0.091	67.77
Ethane[1]	0.068	59.60
Ethanol	0.084	68.44
Ethylene[2]	0.058	65.96
Isobutane[1]	0.099	64.94
Isobutylene[1]	0.103	68.86
Butane[1]	0.103	64.77
Butylene[1]	0.105	68.72
Naphtha (<401 deg F)	0.125	68.02
Natural Gasoline	0.110	66.83

Fuel type	Default high heat value	Default CO_2 emission factor
Other Oil (>401 deg F)	0.139	76.22
Pentanes Plus	0.110	70.02
Petrochemical Feedstocks	0.125	71.02
Petroleum Coke	0.143	102.41
Special Naphtha	0.125	72.34
Unfinished Oils	0.139	74.54
Heavy Gas Oils	0.148	74.92
Lubricants	0.144	74.27
Motor Gasoline	0.125	70.22
Aviation Gasoline	0.120	69.25
Kerosene-Type Jet Fuel	0.135	72.22
Asphalt and Road Oil	0.158	75.36
Crude Oil	0.138	74.54
Other fuels-solid	**mmBtu/short ton**	**kg CO_2/mmBtu**
Municipal Solid Waste	9.95[3]	90.7
Tires	28.00	85.97
Plastics	38.00	75.00
Petroleum Coke	30.00	102.41
Other fuels—gaseous	**mmBtu/scf**	**kg CO_2/mmBtu**
Blast Furnace Gas	0.092×10^{-3}	274.32
Coke Oven Gas	0.599×10^{-3}	46.85
Propane Gas	2.516×10^{-3}	61.46
Fuel Gas[4]	1.388×10^{-3}	59.00
Biomass fuels—solid	**mmBtu/short ton**	**kg CO_2/mmBtu**
Wood and Wood Residuals (dry basis)5	17.48	93.80
Agricultural Byproducts	8.25	118.17
Peat	8.00	111.84
Solid Byproducts	10.39	105.51
Biomass fuels—gaseous	**mmBtu/scf**	**kg CO_2/mmBtu**
Landfill Gas	0.485×10^{-3}	52.07
Other Biomass Gases	0.655×10^{-3}	52.07
Biomass Fuels—Liquid	**mmBtu/gallon**	**kg CO_2/mmBtu**
Ethanol	0.084	68.44
Biodiesel (100%)	0.128	73.84
Rendered Animal Fat	0.125	71.06
Vegetable Oil	0.120	81.55

[1] The HHV for components of LPG determined at 60 °F and saturation pressure with the exception of ethylene.

[2] Ethylene HHV determined at 41 °F (5 °C) and saturation pressure.

[3] Use of this default HHV is allowed only for: (a) Units that combust MSW, do not generate steam, and are allowed to use Tier 1; (b) units that derive no more than 10 percent of their annual heat input from MSW and/or tires; and (c) small batch incinerators that combust no more than 1,000 tons of MSW per year.

[4] Reporters subject to subpart X of this part that are complying with § 98.243(d) or subpart Y of this part may only use the default HHV and the default CO2 emission factor for fuel gas combustion under the conditions prescribed in § 98.243(d)(2)(i) and (d)(2)(ii) and § 98.252(a)(1) and (a)(2), respectively. Otherwise, reporters subject to subpart X or subpart Y shall use either Tier 3 (Equation C-5) or Tier 4.

[5] Use the following formula to calculate a wet basis HHV for use in Equation C-1:

$$HHV_w = ((100 - M)/100)*HHV_d$$

where

HHV_w = wet basis HHV,
M = moisture content (percent) and
HHV_d = dry basis HHV from Table C-1.

[74 FR 56374, Oct. 30, 2009, as amended at 75 FR 79153, Dec. 17, 2010; 78 FR 71950, Nov. 29, 2013]

Table C–2 to Subpart C of Part 98—Default CH_4 and N_2O Emission Factors for Various Types of Fuel

Table C–2 to Subpart C—Default CH_4 and N_2O Emission Factors for Various Types of Fuel

Fuel type	Default CH_4 emission factor (kg CH_4/mmBtu)	Default N_2O emission factor (kg N_2O/mmBtu)
Coal and Coke (All fuel types in Table C–1)	1.1×10^{-02}	1.6×10^{-03}
Natural Gas	1.0×10^{-03}	1.0×10^{-04}
Petroleum (All fuel types in Table C–1)	3.0×10^{-03}	6.0×10^{-04}
Fuel Gas	3.0×10^{-03}	6.0×10^{-04}
Municipal Solid Waste	3.2×10^{-02}	4.2×10^{-03}
Tires	3.2×10^{-02}	4.2×10^{-03}
Blast Furnace Gas	2.2×10^{-05}	1.0×10^{-04}
Coke Oven Gas	4.8×10^{-04}	1.0×10^{-04}
Biomass Fuels—Solid (All fuel types in Table C–1)	3.2×10^{-02}	4.2×10^{-03}
Wood and wood residuals	7.2×10^{-03}	3.6×10^{-03}
Biomass Fuels—Gaseous (All fuel types in Table C–1)	3.2×10^{-03}	6.3×10^{-04}
Biomass Fuels—Liquid (All fuel types in Table C–1)	1.1×10^{-03}	1.1×10^{-04}

Note: Those employing this table are assumed to fall under the IPCC definitions of the "Energy Industry" or "Manufacturing Industries and Construction". In all fuels except for coal the values for these two categories are identical. For coal combustion, those who fall within the IPCC "Energy Industry" category may employ a value of 1g of CH_4/mmBtu.

[74 FR 56374, Oct. 30, 2009, as amended at 75 FR 79154, Dec. 17, 2010; 78 FR 71952, Nov. 29, 2013]

Editorial Note: At 74 FR 56374, Oct. 30, 2009, part 98 was added. The added part included two tables identified as "C–2 to Subpart C".

Table W-1A of Subpart W of Part 98—Default Whole Gas Emission Factors for Onshore Petroleum and Natural Gas Production

Onshore petroleum and natural gas production	Emission factor (scf/hour/ component)
Eastern U.S.	
Population Emission Factors—All Components, Gas Service[1]	
Valve	0.027
Connector	0.003
Open-ended Line	0.061
Pressure Relief Valve	0.040
Low Continuous Bleed Pneumatic Device Vents[2]	1.39
High Continuous Bleed Pneumatic Device Vents[2]	37.3
Intermittent Bleed Pneumatic Device Vents[2]	13.5
Pneumatic Pumps[3]	13.3
Population Emission Factors—All Components, Light Crude Service[4]	
Valve	0.05
Flange	0.003
Connector	0.007
Open-ended Line	0.05
Pump	0.01
Other[5]	0.30
Population Emission Factors—All Components, Heavy Crude Service[6]	
Valve	0.0005
Flange	0.0009
Connector (other)	0.0003
Open-ended Line	0.006
Other[5]	0.003
Western U.S.	
Population Emission Factors—All Components, Gas Service[1]	
Valve	0.121
Connector	0.017
Open-ended Line	0.031
Pressure Relief Valve	0.193
Low Continuous Bleed Pneumatic Device Vents[2]	1.39
High Continuous Bleed Pneumatic Device Vents[2]	37.3
Intermittent Bleed Pneumatic Device Vents[2]	13.5
Pneumatic Pumps[3]	13.3
Population Emission Factors—All Components, Light Crude Service[4]	
Valve	0.05
Flange	0.003

Connector (other)	0.007
Open-ended Line	0.05
Pump	0.01
Other[5]	0.30
Population Emission Factors—All Components, Heavy Crude Service[6]	
Valve	0.0005
Flange	0.0009
Connector (other)	0.0003
Open-ended Line	0.006
Other[5]	0.003

[1]For multi-phase flow that includes gas, use the gas service emissions factors.

[2]Emission Factor is in units of "scf/hour/device."

[3]Emission Factor is in units of "scf/hour/pump."

[4]Hydrocarbon liquids greater than or equal to 20°API are considered "light crude."

[5]"Others" category includes instruments, loading arms, pressure relief valves, stuffing boxes, compressor seals, dump lever arms, and vents.

[6]Hydrocarbon liquids less than 20°API are considered "heavy crude."

Section 8

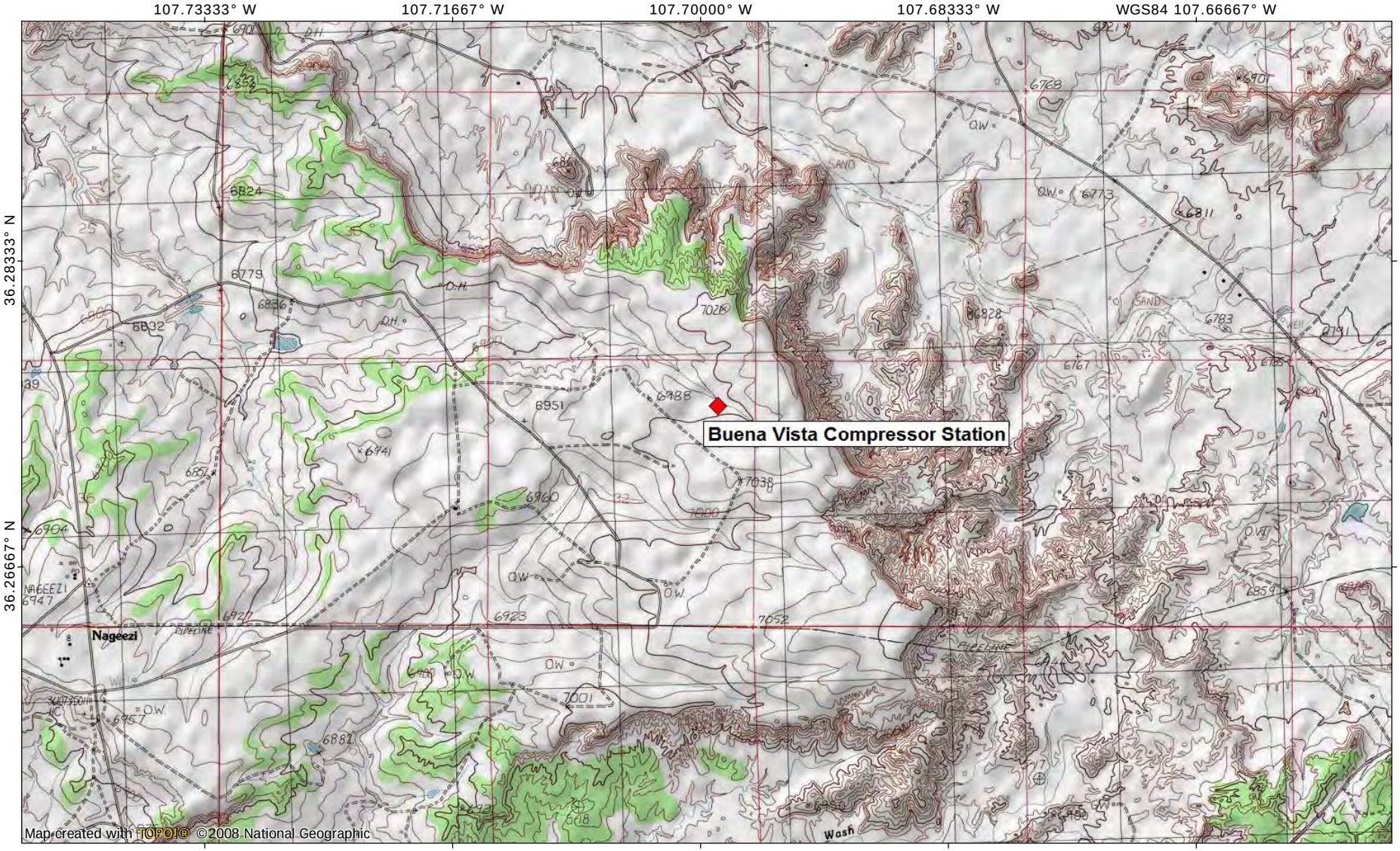
Map(s)

A map such as a 7.5 minute topographic quadrangle showing the exact location of the source. The map shall also include the following:

The UTM or Longitudinal coordinate system on both axes	An indicator showing which direction is north
A minimum radius around the plant of 0.8km (0.5 miles)	Access and haul roads
Topographic features of the area	Facility property boundaries
The name of the map	The area which will be restricted to public access
A graphical scale	

A topographic map of the area around the facility is provided in this section. Please see the following page.

HARVEST FOUR CORNERS, LLC - BUENA VISTA COMPRESSOR STATION - San Juan County, NM T 24 N, R 08 W, Section 32



Section 9

Proof of Public Notice

(for NSR applications submitting under 20.2.72 or 20.2.74 NMAC)
(This proof is required by: 20.2.72.203.A.14 NMAC "Documentary Proof of applicant's public notice")

☐ **I have read the AQB "Guidelines for Public Notification for Air Quality Permit Applications"**
This document provides detailed instructions about public notice requirements for various permitting actions. It also provides public notice examples and certification forms. Material mistakes in the public notice will require a re-notice before issuance of the permit.

Unless otherwise allowed elsewhere in this document, the following items document proof of the applicant's Public Notification. Please include this page in your proof of public notice submittal with checkmarks indicating which documents are being submitted with the application.

New Permit and **Significant Permit Revision** public notices must include all items in this list.

Technical Revision public notices require only items 1, 5, 9, and 10.

Per the Guidelines for Public Notification document mentioned above, include:

1. ☐ A copy of the certified letter receipts with post marks (20.2.72.203.B NMAC).
2. ☐ A list of the places where the public notice has been posted in at least four publicly accessible and conspicuous places, including the proposed or existing facility entrance. (e.g: post office, library, grocery, etc.).
3. ☐ A copy of the property tax record (20.2.72.203.B NMAC).
4. ☐ A sample of the letters sent to the owners of record.
5. ☐ A sample of the letters sent to counties, municipalities, and Indian tribes.
6. ☐ A sample of the public notice posted and a verification of the local postings.
7. ☐ A table of the noticed citizens, counties, municipalities and tribes and to whom the notices were sent in each group.
8. ☐ A copy of the public service announcement (PSA) sent to a local radio station and documentary proof of submittal.
9. ☐ A copy of the classified or legal ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
10. ☐ A copy of the display ad including the page header (date and newspaper title) or its affidavit of publication stating the ad date, and a copy of the ad. When appropriate, this ad shall be printed in both English and Spanish.
11. ☐ A map with a graphic scale showing the facility boundary and the surrounding area in which owners of record were notified by mail. This is necessary for verification that the correct facility boundary was used in determining distance for notifying land owners of record.

Not applicable, since this is a Title V application.

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Section 10

Written Description of the Routine Operations of the Facility

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A written description of the routine operations of the facility. Include a description of how each piece of equipment will be operated, how controls will be used, and the fate of both the products and waste generated. For modifications and/or revisions, explain how the changes will affect the existing process. In a separate paragraph describe the major process bottlenecks that limit production. The purpose of this description is to provide sufficient information about plant operations for the permit writer to determine appropriate emission sources.

The Buena Vista Compressor Station compresses and dehydrates natural gas for midstream pipeline transmission (i.e., prior to entering a fractionating gas plant) using natural gas-fired reciprocating engines to power gas compressors.

Natural gas, mixed hydrocarbon (condensate) and produced water streams are received from the gathering fields through pipelines from independent producers. The natural gas and condensate-produced water mixture passes through a facility inlet separator as it enters the facility. Within the separator, an internal pressure drop allows the natural gas to separate from the liquids. The natural gas is routed to the compressors. The pressurized gas then exits the facility for transport via pipeline to a downstream processing facility. A portion of the gas is used as fuel for the compressor engines.

The mixed condensate and produced water liquid is piped to a vertical fixed roof liquid storage tank. Upon the initial entry of the mixed condensate-produced water liquid into the tank, the entrained gas (including VOC) expands rapidly, “flashing” the gas upon depressurization. In the condensate storage tank, the mixture of post-flashed “stable” condensate and produced water separates, with the condensate floating to the top of the column and the produced water settling to the bottom of the column. The stabilized condensate is stored in the condensate tank until it is transported offsite via a tank truck. Produced water is drawn off the bottom of the liquid column in the condensate storage tank and piped to the produced water storage tank, where it is stored until it is transported offsite via a tank truck.

A waste water storage tank collects storm water runoff and small amounts of heavy hydrocarbon residues resulting from any drips or spills that may occur from machinery, where it is stored until transport offsite via tank truck. The hydrocarbon residues are of low volatility. The lube oil and used lube oil tanks store heavy hydrocarbon machinery oils, also with low volatility.

Other emission sources include: startups, shutdowns and routine maintenance (SSM) from the compressors and piping (Unit SSM), and fugitive emissions from process piping (valves, flanges, seals, etc.).

The facility is authorized to operate continuously.

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Section 11

Source Determination

(Source submitting under 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC)

Sources applying for a construction permit, PSD permit, or operating permit shall evaluate surrounding and/or associated sources (including those sources directly connected to this source for business reasons) and complete this section. Responses to the following questions shall be consistent with the Air Quality Bureau's permitting guidance, Single Source Determination Guidance, which may be found on the Applications Page in the Permitting Section of the Air Quality Bureau website.

Typically, buildings, structures, installations, or facilities that have the same SIC code, that are under common ownership or control, and that are contiguous or adjacent constitute a single stationary source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes. Submission of your analysis of these factors in support of the responses below is optional, unless requested by NMED.

A. Identify the emission sources evaluated in this section (list and describe)**:**

Buena Vista Compressor Station (a production field natural gas gathering and boosting station)

B. Apply the 3 criteria for determining a single source:

SIC Code: Surrounding or associated sources belong to the same 2-digit industrial grouping (2-digit SIC code) as this facility, OR surrounding or associated sources that belong to different 2-digit SIC codes are support facilities for this source.

☑ **Yes** ☐ **No**

Common Ownership or Control: Surrounding or associated sources are under common ownership or control as this source.

☑ **Yes** ☐ **No**

Contiguous or Adjacent: Surrounding or associated sources are contiguous or adjacent with this source.

☑ **Yes** ☐ **No**

C. Make a determination:

☑ The source, as described in this application, constitutes the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes. If in "A" above you evaluated only the source that is the subject of this application, all "**YES**" boxes should be checked. If in "A" above you evaluated other sources as well, you must check **AT LEAST ONE** of the boxes "**NO**" to conclude that the source, as described in the application, is the entire source for 20.2.70, 20.2.72, 20.2.73, and 20.2.74 NMAC applicability purposes.

☐ The source, as described in this application, **does not** constitute the entire source for 20.2.70, 20.2.72, 20.2.73, or 20.2.74 NMAC applicability purposes (A permit may be issued for a portion of a source). The entire source consists of the following facilities or emissions sources (list and describe):

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Section 12.A

PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

A PSD applicability determination for all sources. For sources applying for a significant permit revision, apply the applicable requirements of 20.2.74.AG and 20.2.74.200 NMAC and to determine whether this facility is a major or minor PSD source, and whether this modification is a major or a minor PSD modification. It may be helpful to refer to the procedures for Determining the Net Emissions Change at a Source as specified by Table A-5 (Page A.45) of the EPA New Source Review Workshop Manual to determine if the revision is subject to PSD review.

A. This facility is:

- ☐ a minor PSD source before and after this modification (if so, delete C and D below).
- ☐ a major PSD source before this modification. This modification will make this a PSD minor source.
- ☐ an existing PSD Major Source that has never had a major modification requiring a BACT analysis.
- ☐ an existing PSD Major Source that has had a major modification requiring a BACT analysis
- ☐ a new PSD Major Source after this modification.

B. This facility [is or is not] one of the listed 20.2.74.501 Table I – PSD Source Categories. The "project" emissions for this modification are [significant or not significant]. [Discuss why.] The "project" emissions listed below [do or do not] only result from changes described in this permit application, thus no emissions from other [revisions or modifications, past or future] to this facility. Also, specifically discuss whether this project results in "de-bottlenecking", or other associated emissions resulting in higher emissions. The project emissions (before netting) for this project are as follows [see Table 2 in 20.2.74.502 NMAC for a complete list of significance levels]:

a. NOx: XX.X TPY
b. CO: XX.X TPY
c. VOC: XX.X TPY
d. SOx: XX.X TPY
e. PM: XX.X TPY
f. PM10: XX.X TPY
g. PM2.5: XX.X TPY
h. Fluorides: XX.X TPY
i. Lead: XX.X TPY
j. Sulfur compounds (listed in Table 2): XX.X TPY
k. GHG: XX.X TPY

C. Netting [is required, and analysis is attached to this document.] OR [is not required (project is not significant)] OR [Applicant is submitting a PSD Major Modification and chooses not to net.]

D. BACT is [not required for this modification, as this application is a minor modification.] OR [required, as this application is a major modification. List pollutants subject to BACT review and provide a full top down BACT determination.]

E. If this is an existing PSD major source, or any facility with emissions greater than 250 TPY (or 100 TPY for 20.2.74.501 Table 1 – PSD Source Categories), determine whether any permit modifications are related, or could be considered a single project with this action, and provide an explanation for your determination whether a PSD modification is triggered.

Not applicable, since this is a Title V application.

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Section 12.B

Special Requirements for a PSD Application

(Submitting under 20.2.74 NMAC)

Prior *to Submitting a PSD application,* **the permittee shall:**

- ☐ Submit the BACT analysis for review prior to submittal of the application. No application will be ruled complete until the final determination regarding BACT is made, as this determination can ultimately affect information to be provided in the application. A pre-application meeting is recommended to discuss the requirements of the BACT analysis.
- ☐ Submit a modeling protocol prior to submitting the permit application. **[Except for GHG]**
- ☐ Submit the monitoring exemption analysis protocol prior to submitting the application. **[Except for GHG]**

For PSD applications, the permittee shall also include the following:

- ☐ Documentation containing an analysis on the impact on visibility. **[Except for GHG]**
- ☐ Documentation containing an analysis on the impact on soil. **[Except for GHG]**
- ☐ Documentation containing an analysis on the impact on vegetation, including state and federal threatened and endangered species. **[Except for GHG]**
- ☐ Documentation containing an analysis on the impact on water consumption and quality. **[Except for GHG]**
- ☐ Documentation that the federal land manager of a Class I area within 100 km of the site has been notified and provided a copy of the application, including the BACT and modeling results. The name of any Class I Federal area located within one hundred (100) kilometers of the facility.

Not applicable, since this is a Title V application.

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Section 13

Determination of State & Federal Air Quality Regulations

This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants. Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

Required Information for Specific Equipment:

For regulations that apply to specific source types, in the 'Justification' column **provide any information needed to determine if the regulation does or does not apply**. **For example**, to determine if emissions standards at 40 CFR 60, Subpart IIII apply to your three identical stationary engines, we need to know the construction date as defined in that regulation; the manufacturer date; the date of reconstruction or modification, if any; if they are or are not fire pump engines; if they are or are not emergency engines as defined in that regulation; their site ratings; and the cylinder displacement.

Required Information for Regulations that Apply to the Entire Facility:

See instructions in the 'Justification' column for the information that is needed to determine if an 'Entire Facility' type of regulation applies (e.g. 20.2.70 or 20.2.73 NMAC).

Regulatory Citations for Regulations That Do Not, but Could Apply:

If there is a state or federal air quality regulation that does not apply, but you have a piece of equipment in a source category for which a regulation has been promulgated, you must **provide the low level regulatory citation showing why your piece of equipment is not subject to or exempt from the regulation. For example** if you have a stationary internal combustion engine that is not subject to 40 CFR 63, Subpart ZZZZ because it is an existing 2 stroke lean burn stationary RICE with a site rating of more than 500 brake HP located at a major source of HAP emissions, your citation would be 40 CFR 63.6590(b)(3)(i). **We don't want a discussion of every non-applicable regulation, but if it is possible a regulation could apply, explain why it does not. For example,** if your facility is a power plant, you do not need to include a citation to show that 40 CFR 60, Subpart OOO does not apply to your non-existent rock crusher.

Regulatory Citations for Emission Standards:

For each unit that is subject to an emission standard in a source specific regulation, such as 40 CFR 60, Subpart OOO or 40 CFR 63, Subpart HH, include the low level regulatory citation of that emission standard. Emission standards can be numerical emission limits, work practice standards, or other requirements such as maintenance. **Here are examples:** a glycol dehydrator is subject to the general standards at 63.764C(1)(i) through (iii); an engine is subject to 63.6601, Tables 2a and 2b; a crusher is subject to 60.672(b), Table 3 and all transfer points are subject to 60.672(e)(1)

Federally Enforceable Conditions:

All federal regulations are federally enforceable. All Air Quality Bureau State regulations are federally enforceable except for the following: affirmative defense portions at 20.2.7.6.B, 20.2.7.110(B)(15), 20.2.7.11 through 20.2.7.113, 20.2.7.115, and 20.2.7.116; 20.2.37; 20.2.42; 20.2.43; 20.2.62; 20.2.63; 20.2.86; 20.2.89; and 20.2.90 NMAC. Federally enforceable means that EPA can enforce the regulation as well as the Air Quality Bureau and federally enforceable regulations can count toward determining a facility's potential to emit (PTE) for the Title V, PSD, and nonattainment permit regulations.

INCLUDE ANY OTHER INFORMATION NEEDED TO COMPLETE AN APPLICABILITY DETERMINATION OR THAT IS RELEVENT TO YOUR FACILITY'S NOTICE OF INTENT OR PERMIT.

EPA Applicability Determination Index for 40 CFR 60, 61, 63, etc: http://cfpub.epa.gov/adi/

State Regulations

Applicable state requirements are embodied in the New Mexico SIP, the New Mexico Administrative Code (NMAC), and the terms and conditions of any preconstruction permits issued pursuant to regulations promulgated through rulemaking under Title I of the CAA.

Table for STATE REGULATIONS:

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
20.2.1 NMAC	General Provisions	Yes	Facility	This regulation is applicable because it establishes procedures for protecting confidential information, procedures for seeking a variance, NMAQB's authority to require sampling equipment, severability, and the effective date for conformance with the NMACs, and prohibits the violation of other requirements in attempting to comply with the NMACs. Although this regulation is applicable, it does not impose any specific requirements.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	This is a State Implementation Plan (SIP) approved regulation that limits the maximum allowable concentrations of Total Suspended Particulates, Sulfur Compounds, Carbon Monoxide and Nitrogen Dioxide.
20.2.7 NMAC	Excess Emissions	Yes	Facility	This regulation is applicable because it prohibits excess emissions unless proper notification procedures are followed.
20.2.8 NMAC	Emissions Leaving New Mexico	Yes	Facility	This regulation is applicable because it establishes prohibitions on the release of pollutants that cross New Mexico State boundaries.
20.2.14 NMAC	Particulate Emissions from Coal Burning Equipment	No	N/A	This regulation is not applicable because the facility does not burn coal (see 20.2.14.5 NMAC).
20.2.18 NMAC	Oil Burning Equipment - Particulate Matter	No	N/A	This regulation is not applicable because the facility does not burn oil (see 20.2.18.5 NMAC).
20.2.31 NMAC	Coal Burning Equipment – Sulfur Dioxide	No	N/A	This regulation is not applicable because the facility does not burn coal (see 20.2.31.6 NMAC).
20.2.32 NMAC	Coal Burning Equipment – Nitrogen Dioxide,	No	N/A	This regulation is not applicable because the facility does not burn coal (see 20.2.32.6 NMAC).
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide	No	N/A	This regulation is not applicable because the facility is not equipped with external gas burning equipment which have heat input rates exceeding the trigger level (one million MMBtu/year) established by the regulation (see 20.2.33.108 NMAC).
20.2.34 NMAC	Oil Burning Equipment: NO_2	No	N/A	This regulation is not applicable because the facility does not burn oil (see 20.2.34.6 NMAC).
20.2.35 NMAC	Natural Gas Processing Plant – Sulfur	No	N/A	This regulation is not applicable because the facility is not a natural gas processing plant (see 20.2.35.6 NMAC).
20.2.38 NMAC	Hydrocarbon Storage Facility	No	N/A	This regulation is not applicable because the facility does not store hydrocarbons containing hydrogen sulfide, nor is there a tank battery storing hydrocarbon liquids with a capacity greater than or equal to 65,000 gallons (see 20.2.38.112 NMAC).
20.2.39 NMAC	Sulfur Recovery Plant - Sulfur	No	N/A	This regulation is not applicable because the facility is not equipped with a sulfur recovery plant (see 20.2.39.6 NMAC).

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
20.2.50 NMAC	Oil and Gas Sector – Ozone Precursor Pollutants	Yes	Engines 1a/1b, 2a/2b, & 3a/3b; Reciprocating compressor seals; F1 Fugitive emissions; Storage vessels T1 & T2; Hydrocarbon liquid transfers; and Pneumatic controllers & pumps	This regulation establishes emission standards for volatile organic compounds (VOC) and oxides of nitrogen (NOx) for oil and gas production, processing, compression, and transmission sources. 20.2.50 NMAC subparts: 113 – Engines and Turbines 114 – Compressor Seals 115 – Control Devices and Closed Vent Systems 116 – Equipment Leaks and Fugitive Emissions 117 – Natural Gas Well Liquid Unloading 118 – Glycol Dehydrators 119 – Heaters 120 – Hydrocarbon Liquid Transfers 121 – Pig Launching and Receiving 122 – Pneumatic Controllers and Pumps 123 – Storage Vessels 124 – Well Workovers 125 – Small Business Facilities 126 – Produced Water Management Units 127 – Flowback Vessels and Preproduction Operations This regulation is applicable because the facility is equipped with affected equipment as defined by the regulation, including engines, reciprocating compressor seals, equipment leaks and fugitive emissions, glycol dehydrators, and pneumatic controllers & pumps.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	RICE 1a/1b, 2a/2b, & 3a/3b	This regulation is applicable because the facility is equipped with stationary combustion sources. Emissions from these combustion sources are limited to less than 20% opacity (see 20.2.61.109 NMAC). Note the regulation is not applicable to Title V insignificant activities (see 20.2.61.111.D NMAC).
20.2.70 NMAC	Operating Permits	Yes	Facility	This regulation is applicable because the facility is a major source of CO and VOC emissions (see 20.2.70.200 NMAC).
20.2.71 NMAC	Operating Permit Fees	Yes	Facility	This regulation is applicable because the facility is subject to 20.2.70 NMAC (see 20.2.71.6 NMAC).
20.2.72 NMAC	Construction Permits	Yes	Facility	This regulation is applicable because the facility has potential emission rates (PER) greater than 10 pph or 25 tpy for pollutants subject to a state or federal ambient air quality standards (does not include VOCs or HAPs).
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	The Notice of Intent requirements of this regulation were fulfilled with the construction permit application. The emissions inventory portion of this regulation is applicable since the facility is a Title V major source (see 20.2.73.300.B(1) & (2)).
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	No	N/A	This regulation is not applicable because the facility is not a PSD major source.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	This regulation is applicable because the facility is subject to 20.2.72 NMAC and it establishes the fee schedule associated with the filing of construction permits (see 20.2.75.6 NMAC).
20.2.77 NMAC	New Source Performance	Yes	Fugitive emissions components	This regulation is applicable because it adopts by reference the federal NSPS codified in 40 CFR 60 (see 20.2.77.6 NMAC). The facility is subject to 40 CFR 60, subparts A and OOOOa.
20.2.78 NMAC	Emission Standards for HAPS	No	N/A	This regulation is not applicable because it incorporates by reference the NESHAPs codified under 40 CFR 61 (see 20.2.78.6 NMAC). The facility is not subject to 40 CFR 61.

STATE REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
20.2.79 NMAC	Permits – Nonattainment Areas	No	N/A	This regulation is not applicable because the facility is neither located in nor has a significant impact on a nonattainment area (see 20.2.79.6 NMAC).
20.2.80 NMAC	Stack Heights	No	N/A	This regulation is not applicable because it establishes guidelines for the selection of an appropriate stack height for the purpose of atmospheric dispersion modeling (see 20.2.80.6 NMAC); however, it only imposes those requirements when modeling is required as a part of the application. This application does not require modeling.
20.2.82 NMAC	MACT Standards for Source Categories of HAPS	Yes	RICE 1a & 3a; Potentially applies to RICE 1b, 2a, 2b, & 3b)	This regulation is applicable because it adopts by reference the federal MACT Standards for source categories codified in 40 CFR 63 (see 20.2.82.6 NMAC). The facility RICE are subject to 40 CFR 63, subparts A and ZZZZ.

Federal Regulations

Federal standards and requirements are embodied in Title 40 (Protection of the Environment), Subchapter C (Air Programs) of the CFR, Parts 50 through 99.

FEDERAL REGULATIONS APPLICABILITY CHECKLIST

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
40 CFR 50	NAAQS	Yes	Facility	This regulation is applicable because it applies to all sources in the state of New Mexico.
40 CFR 52	Approval and Promulgation of Implementation Plans	No	N/A	40 CFR 52.21 *Prevention of Significant Deterioration of Air Quality* is not applicable because the facility is not a major Prevention of Significant Deterioration source. The remainder of 40 CFR 52 is not applicable because it addresses approval and promulgation of implementation plans.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	Fugitive emissions components	This regulation is applicable because another 40 CFR Part 60 subpart applies to the fugitive emissions at the facility (NSPS subpart OOOOa).
NSPS 40 CFR 60, Subpart K	Standards of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced After June 11, 1973, and Prior to May 19, 1978	No	N/A	This regulation is not applicable because the petroleum liquids storage tanks at the facility have capacities less than the minimum applicability threshold capacity of 40,000 gallons (see §60.110(a)).
NSPS 40 CFR 60, Subpart Ka	Standards of Performance for Storage Vessels for Petroleum Liquids for which Construction, Reconstruction, or Modification Commenced After May 18, 1978, and Prior to July 23, 1984	No	N/A	This regulation is not applicable because the storage tanks at the facility have capacities less than the minimum applicability threshold capacity of 40,000 gallons (see §60.110a(a)).
NSPS 40 CFR 60, Subpart Kb	Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced After July 23, 1984	No	N/A	This regulation is not applicable because all storage tanks at the facility have capacities less than the minimum applicability threshold capacity of 75 cubic meters (19,812 gallons) or they have a capacity between 75 and 151 cubic meters (40,000 gallons) and store a liquid with a maximum true vapor pressure less than 15.0 kPa (2.2 psi) (see §60.110b(a) & §60.110b(b))).

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
NSPS 40 CFR 60, Subpart KKK	Standards of Performance for Equipment Leaks of VOC from Onshore Gas Plants	No	N/A	This regulation is not applicable because the facility is not an onshore natural gas processing plant as defined by the subpart (see §60.630(a)(1)). Natural gas processing plant (gas plant) means any processing site engaged in the extraction of natural gas liquids from field gas, fractionation of mixed natural gas liquids to natural gas products, or both (see §60.631).
NSPS 40 CFR 60, Subpart LLL	Standards of Performance for Onshore Natural Gas Processing: SO_2 Emissions	No	N/A	This regulation is not applicable because the facility is not a natural gas processing plant as defined by the subpart. It is not equipped with a sweetening unit (see §60.640(a)).
NSPS 40 CFR 60, Subpart IIII	Standards of Performance for Stationary Compression Ignition Internal Combustion Engines	No	N/A	This regulation is not applicable because the facility is not equipped with stationary compression ignition (CI) internal combustion engines (ICE) that commenced construction after July 11, 2005 and were manufactured after April 1, 2006 (see §60.4200(a)(2)(i)). For the purpose of this subpart, construction commences on the date the engine is ordered by the owner or operator (see §60.4200(a)).
NSPS 40 CFR 60, Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	No	N/A	This regulation is not applicable because the facility is not equipped with spark ignition (SI) internal combustion engines (ICE) constructed, modified, or reconstructed after June 12, 2006. Installed units 1b, 2a and 3a were constructed prior to the applicability date and have not been modified or reconstructed. The regulatory applicability to units 1a, 2b and 3b will be evaluated upon their installation. See the definitions of construction, modification, and reconstruction referenced in Subpart OOOO below.
NSPS 40 CFR 60, Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which Construction, Modification or Reconstruction Commenced After August 23, 2011 and On or Before September 18, 2015	No	N/A	This regulation is not applicable because the facility is not equipped with "affected" sources that commenced construction, modification or reconstruction after August 23, 2011 and on or before September 18, 2015: gas wells, centrifugal or reciprocating compressors, pneumatic controllers, and storage vessels (see §60.5365). Note that the facility is not a natural gas processing plant as defined by the subpart (see §60.5430). Commenced construction means a continuous program of fabrication, erection or installation (see §60.2). Modification means any physical change in or change in the method of operation of an existing facility which increases emissions or results in new emissions (see §60.2). The following, by themselves, are not modifications: routine maintenance, repair or replacement, production increase without capital expenditure, increase in hours of operation, addition of emission controls, or the relocation or change in ownership of an existing facility (see §60.14). Reconstruction means the replacement of components of an existing facility such that the fixed capital cost of the new components exceeds 50 % of the fixed capital cost required to construct a comparable entirely new facility. Fixed capital cost means the capital needed to provide all the depreciable components (see §60.15).

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
NSPS 40 CFR 60, Subpart OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015	Yes	Fugitive emissions components	The regulation is applicable because the facility is equipped with one or more "affected" sources that commenced construction, modification or reconstruction after September 18, 2015: gas wells, centrifugal or reciprocating compressors, pneumatic controllers, storage vessels, pneumatic pumps, and equipment leaks (see §60.5365a). In general, this regulation may apply if existing affected equipment is replaced or new affected equipment is installed. Affected sources at the facility were permitted and installed after the September 18, 2015 regulatory applicability date; therefore, the applicability of the subpart was triggered. The applicability of the regulation includes the fugitive emissions components at the facility. For the purpose of the fugitive components monitoring requirements specified by the regulation, "modification" of a compressor station includes the addition of (or replacement of) a compressor with a larger unit (greater total horsepower) (see §60.5365a(j)). Note that the facility is not a natural gas processing plant as defined by the subpart (see §60.5430a). See the definitions of construction, modification, and reconstruction referenced in Subpart OOOO above.
NESHAP 40 CFR 61, Subpart A	General Provisions	No	N/A	This regulation is not applicable because no other 40 CFR Part 61 subparts apply (see §61.01(c)).
NESHAP 40 CFR 61, Subpart V	National Emission Standards for Equipment Leaks (Fugitive Emission Sources)	No	N/A	This regulation is not applicable because none of the listed equipment at the facility is in VHAP service. The provisions of this subpart apply to each of the following sources that are intended to operate in volatile hazardous air pollutant (VHAP) service: pumps, compressors, pressure relief devices, sampling connection systems, open-ended valves or lines, valves, connectors, surge control vessels, bottoms receivers, and control devices or systems required by this subpart (see §61.240(a)). VHAP service means a piece of equipment either contains or contacts a fluid (liquid or gas) that is at least 10 percent by weight of VHAP. VHAP means a substance regulated under this subpart for which a standard for equipment leaks of the substance has been promulgated (see §61.241).
MACT 40 CFR 63, Subpart A	General Provisions	Yes	RICE 1a & 3a; Potentially applies to RICE 1b, 2a, 2b, & 3b)	This regulation applies because 40 CFR 63 subpart ZZZZ is applicable.
MACT 40 CFR 63, Subpart HH	National Emission Standards for Hazardous Air Pollutants For Oil and Natural Gas Production Facilities	No	N/A	This regulation is not applicable because the facility is not equipped with affected equipment, as defined under the regulation. The facility is a production field facility located prior to the point of custody transfer, and an area source of HAP. Only aggregated HAP emissions from glycol dehydration units and storage vessels are included in a major or area HAP source determination. Storage vessels include crude oil tanks, condensate tanks, intermediate hydrocarbon liquid tanks, and produced water tanks (see §63.761). The regulation only applies to dehydrators at an area source of HAP (see §63.760(b)(2)). There are no dehydrators at the facility.
MACT 40 CFR 63, Subpart HHH	National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities	No	N/A	This regulation is not applicable because the facility is not a natural gas transmission and storage facility as defined by the subpart. A compressor station that transports natural gas prior to the point of custody transfer or to a natural gas processing plant (if present) are not considered a part of the natural gas transmission and storage source category (see §63.1270(a)).

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION:
MACT 40 CFR 63, Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE MACT)	Yes	RICE 1a & 3a; Potentially applies to RICE 1b, 2a, 2b, & 3b)	This regulation is applicable because the facility is equipped with affected sources under the regulation. The station is an area source of HAP as defined by the subpart. For production field facilities, only aggregated HAP emissions from engines, turbines, dehydrators, and storage vessels with the potential for flash emissions are taken into consideration in determining the HAP area/major source determination (see §63.6675). As defined at §63.6585(c), the station is an **area** source of HAP. Under §63.6590(a)(1)(iii), a stationary RICE located at an area source of HAP is considered an "existing" unit if construction or reconstruction commenced before June 12, 2006. ("Construction" does not include the reinstallation of an existing engine at another location.) Installed RICE units 1a and 3a are each a 4-stroke, lean burn (4SLB) spark ignition (SI) RICE with a site rating of more than 500 hp, constructed prior to December 19, 2002. Therefore, they are each an "existing" engine under the regulation. They are non-emergency, non-black start engines, sited at a remote location. Under the provisions of §63.6603(a) for existing RICE, the maintenance and operating standards in Table 2d, row #8 are applicable, including oil and filter change and inspection of spark plugs, all hoses and belts every 2,160 hours of operating time or annually, whichever comes first. Engine startups and idle times are minimized in accordance with the regulation. The applicability of the regulation to RICE units 1b, 2a, 2b, and 3b will be evaluated upon their installation.
MACT 40 CFR 63, Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Major Industrial, Commercial, and Institutional Boilers & Process Heaters	No	N/A	This regulation is not applicable both because the facility is an area HAP source as defined by the subpart (see §63.7480) and is not equipped with boilers and process heaters. For natural gas production facilities, only the HAP emissions from dehydrators and storage vessels with the potential for flash emissions are aggregated for a major source determination (see §63.7575).
MACT 40 CFR 63, Subpart JJJJJJ	National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers at Area Sources	No	N/A	This regulation is not applicable because the facility is not equipped with industrial, commercial, or institutional boilers.
40 CFR 64	Compliance Assurance Monitoring	No	N/A	This regulation is not applicable because no equipment at the facility requires a control device to achieve compliance with emission limits or standards where pre control emissions equal or exceed the major source threshold (100 tons per year). (see §64.2(a)).
40 CFR 68	Chemical Accident Prevention	No	N/A	This regulation is not applicable because the facility does not store any of the identified toxic and flammable substances in quantities exceeding the applicability thresholds (see §68.10(a), §68.115(a), and §68.130 Tables 1-4).
40 CFR 70	State Operating Permit Programs	No	N/A	This regulation is not applicable, as the requirements associated with Title V are delegated to the State of New Mexico and implemented under 20 NMAC 2.70.
40 CFR 82	Protection of Stratospheric Ozone	No	N/A	This regulation is not applicable because the facility does not produce, transform, destroy, import, or export ozone-depleting substances (see §82.1(b),); does not service motor vehicle air conditioning units (see §82.30(b)); and does not sell, distribute, or offer for sale or distribution any product that contains ozone-depleting substances (see §82.64).

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Section 14

Operational Plan to Mitigate Emissions

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

☑ **Title V Sources** (20.2.70 NMAC)**:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Emissions During Startups, Shutdowns, and Emergencies** defining the measures to be taken to mitigate source emissions during startups, shutdowns, and emergencies as required by 20.2.70.300.D.5(f) and (g) NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☑ **NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has developed an **Operational Plan to Mitigate Source Emissions During Malfunction, Startup, or Shutdown** defining the measures to be taken to mitigate source emissions during malfunction, startup, or shutdown as required by 20.2.72.203.A.5 NMAC. This plan shall be kept on site to be made available to the Department upon request. This plan should not be submitted with this application.

☑ **Title V** (20.2.70 NMAC)**, NSR** (20.2.72 NMAC)**, PSD** (20.2.74 NMAC) **& Nonattainment** (20.2.79 NMAC) **Sources:** By checking this box and certifying this application the permittee certifies that it has established and implemented a Plan to Minimize Emissions During Routine or Predictable Startup, Shutdown, and Scheduled Maintenance through work practice standards and good air pollution control practices as required by 20.2.7.14.A and B NMAC. This plan shall be kept on site or at the nearest field office to be made available to the Department upon request. This plan should not be submitted with this application.

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Section 15

Alternative Operating Scenarios

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

Alternative Operating Scenarios: Provide all information required by the department to define alternative operating scenarios. This includes process, material and product changes; facility emissions information; air pollution control equipment requirements; any applicable requirements; monitoring, recordkeeping, and reporting requirements; and compliance certification requirements. Please ensure applicable Tables in this application are clearly marked to show alternative operating scenario.

Construction Scenarios: When a permit is modified authorizing new construction to an existing facility, NMED includes a condition to clearly address which permit condition(s) (from the previous permit and the new permit) govern during the interval between the date of issuance of the modification permit and the completion of construction of the modification(s). There are many possible variables that need to be addressed such as: Is simultaneous operation of the old and new units permitted and, if so for example, for how long and under what restraints? In general, these types of requirements will be addressed in Section A100 of the permit, but additional requirements may be added elsewhere. Look in A100 of our NSR and/or TV permit template for sample language dealing with these requirements. Find these permit templates at: https://www.env.nm.gov/aqb/permit/aqb_pol.html. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

In this section, under the bolded title "Construction Scenarios", specify any information necessary to write these conditions, such as: conservative-realistic estimated time for completion of construction of the various units, whether simultaneous operation of old and new units is being requested (and, if so, modeled), whether the old units will be removed or decommissioned, any PSD ramifications, any temporary limits requested during phased construction, whether any increase in emissions is being requested as SSM emissions or will instead be handled as a separate Construction Scenario (with corresponding emission limits and conditions, etc.

Not applicable, as there are no alternative operating scenarios at this facility.

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Section 16

Air Dispersion Modeling

1) Minor Source Construction (20.2.72 NMAC) and Prevention of Significant Deterioration (PSD) (20.2.74 NMAC) ambient impact analysis (modeling): Provide an ambient impact analysis as required at 20.2.72.203.A(4) and/or 20.2.74.303 NMAC and as outlined in the Air Quality Bureau's Dispersion Modeling Guidelines found on the Planning Section's modeling website. If air dispersion modeling has been waived for one or more pollutants, attach the AQB Modeling Section modeling waiver approval documentation.
2) SSM Modeling: Applicants must conduct dispersion modeling for the total short term emissions during routine or predictable startup, shutdown, or maintenance (SSM) using realistic worst case scenarios following guidance from the Air Quality Bureau's dispersion modeling section. Refer to "Guidance for Submittal of Startup, Shutdown, Maintenance Emissions in Permit Applications (http://www.env.nm.gov/aqb/permit/app_form.html) for more detailed instructions on SSM emissions modeling requirements.
3) Title V (20.2.70 NMAC) ambient impact analysis: Title V applications must specify the construction permit and/or Title V Permit number(s) for which air quality dispersion modeling was last approved. Facilities that have only a Title V permit, such as landfills and air curtain incinerators, are subject to the same modeling required for preconstruction permits required by 20.2.72 and 20.2.74 NMAC.

What is the purpose of this application?	Enter an X for each purpose that applies
New PSD major source or PSD major modification (20.2.74 NMAC). See #1 above.	
New Minor Source or significant permit revision under 20.2.72 NMAC (20.2.72.219.D NMAC). See #1 above. **Note:** Neither modeling nor a modeling waiver is required for VOC emissions.	
Reporting existing pollutants that were not previously reported.	
Reporting existing pollutants where the ambient impact is being addressed for the first time.	
Title V application (new, renewal, significant, or minor modification. 20.2.70 NMAC). See #3 above.	**X**
Relocation (20.2.72.202.B.4 or 72.202.D.3.c NMAC)	
Minor Source Technical Permit Revision 20.2.72.219.B.1.d.vi NMAC for like-kind unit replacements.	
Other: i.e. SSM modeling. See #2 above.	
This application does not require modeling since this is a No Permit Required (NPR) application.	
This application does not require modeling since this is a Notice of Intent (NOI) application (20.2.73 NMAC).	
This application does not require modeling according to 20.2.70.7.E(11), 20.2.72.203.A(4), 20.2.74.303, 20.2.79.109.D NMAC and in accordance with the Air Quality Bureau's Modeling Guidelines.	

Check each box that applies:

☐ See attached, approved modeling **waiver for all** pollutants from the facility.
☐ See attached, approved modeling **waiver for some** pollutants from the facility.
☐ Attached in Universal Application Form 4 (UA4) is a **modeling report for all** pollutants from the facility.
☐ Attached in UA4 is a **modeling report for some** pollutants from the facility.
☑ No modeling is required.

Modeling was last conducted in 2015 for construction permit number 6362-R1.

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Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

To show compliance with existing NSR permit conditions, you must submit a compliance test history. The table below provides an example.

Compliance Test History Table

Unit No.	Test Description	Test Date
1b	Compliance test for NO_X and CO, in accordance with Operating Permit condition A201.B	December 6, 2021
2a	Compliance test for NO_X and CO, in accordance with Operating Permit condition A201.B	Did Not Operate in 2021
3a	Compliance test for NO_X and CO, in accordance with Operating Permit condition A201.B	December 6, 2021

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Section 18

Addendum for Streamline Applications

Streamline Applications do not require a complete application. Submit Sections 1-A, 1-B, 1-D, 1-F, 1-G, 2-A, 2-C thru L, Sections 3 thru 8, Section 13, Section 18, Section 22, and Section 23 (Certification). Other sections may be required at the discretion of the Department. 20.2.72.202 NMAC Exemptions do not apply to Streamline sources. 20.2.72.219 NMAC revisions and modifications do not apply to Streamline sources, thus 20.2.72.219 type actions require a complete new application submittal. Please do not print sections of a streamline application that are not required.

Not applicable, as this is not a streamline application.

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Section 19

Requirements for Title V Program

Who Must Use this Attachment:

* Any major source as defined in 20.2.70 NMAC.
* Any source, including an area source, subject to a standard or other requirement promulgated under Section 111 - Standards of Performance for New Stationary Sources, or Section 112 Hazardous Air Pollutants, of the 1990 federal Clean Air Act ("federal Act"). Non-major sources subject to Sections 111 or 112 of the federal Act are exempt from the obligation to obtain an 20.2.70 NMAC operating permit until such time that the EPA Administrator completes rulemakings that require such sources to obtain operating permits. In addition, sources that would be required to obtain an operating permit solely because they are subject to regulations or requirements under Section 112(r) of the federal Act are exempt from the requirement to obtain an Operating Permit.
* Any Acid Rain source as defined under title IV of the federal Act. The Acid Rain program has additional forms. See http://www.env.nm.gov/aqb/index.html. Sources that are subject to both the Title V and Acid Rain regulations are encouraged to submit both applications simultaneously.
* Any source in a source category designated by the EPA Administrator ("Administrator"), in whole or in part, by regulation, after notice and comment.

19.1 - 40 CFR 64, Compliance Assurance Monitoring (CAM) (20.2.70.300.D.10.e NMAC)

Any source subject to 40CFR, Part 64 (Compliance Assurance Monitoring) must submit all the information required by section 64.7 with the operating permit application. The applicant must prepare a separate section of the application package for this purpose; if the information is already listed elsewhere in the application package, make reference to that location. Facilities not subject to Part 64 are invited to submit periodic monitoring protocols with the application to help the AQB to comply with 20.2.70 NMAC. Sources subject to 40 CFR Part 64, must submit a statement indicating your source's compliance status with any enhanced monitoring and compliance certification requirements of the federal Act.

The facility is not subject to 40 CFR, Part 64, Compliance Assurance Monitoring (CAM); consequently, a monitoring protocol is not required with this application.

19.2 - Compliance Status (20.2.70.300.D.10.a & 10.b NMAC)

Describe the facility's compliance status with each applicable requirement at the time this permit application is submitted. This statement should include descriptions of or references to all methods used for determining compliance. This statement should include descriptions of monitoring, recordkeeping and reporting requirements and test methods used to determine compliance with all applicable requirements. Refer to Section 2, Tables 2-N and 2-O of the Application Form as necessary. (20.2.70.300.D.11 NMAC) For facilities with existing Title V permits, refer to most recent Compliance Certification for existing requirements. Address new requirements such as CAM, here, including steps being taken to achieve compliance.

The facility is in compliance with all applicable requirements, as has been demonstrated by the most recent semi-annual monitoring reports and annual compliance certification. It is assumed that compliance with the Title V operating permit ensures compliance with the construction permit and New Mexico regulations.

19.3 - Continued Compliance (20.2.70.300.D.10.c NMAC)

Provide a statement that your facility will continue to be in compliance with requirements for which it is in compliance at the time of permit application. This statement must also include a commitment to comply with other applicable requirements as they come into effect during the permit term. This compliance must occur in a timely manner or be consistent with such schedule expressly required by the applicable requirement.

The facility will continue to be in compliance with applicable requirements for which it is in compliance at the time of this permit application. In addition, Harvest will, in a timely manner or consistent with such schedule expressly required by the applicable requirement, comply with other applicable requirements as they come into effect during the permit term.

19.4 - Schedule for Submission of Compliance (20.2.70.300.D.10.d NMAC)

You must provide a proposed schedule for submission to the department of compliance certifications during the permit term. This certification must be submitted annually unless the applicable requirement or the department specifies a more frequent period. A sample form for these certifications will be attached to the permit.

The submittal of compliance certifications during the five-year term of the operating permit will occur annually.

19.5 - Stratospheric Ozone and Climate Protection

In addition to completing the four (4) questions below, you must submit a statement indicating your source's compliance status with requirements of Title VI, Section 608 (National Recycling and Emissions Reduction Program) and Section 609 (Servicing of Motor Vehicle Air Conditioners).

---

1. Does your facility have any air conditioners or refrigeration equipment that uses CFCs, HCFCs or other ozone-depleting substances? ☐ **Yes** ☑ **No**

2. Does any air conditioner(s) or any piece(s) of refrigeration equipment contain a refrigeration charge greater than 50 lbs? ☐ **Yes** ☑ **No**

   (If the answer is yes, describe the type of equipment and how many units are at the facility.)

3. Do your facility personnel maintain, service, repair, or dispose of any motor vehicle air conditioners (MVACs) or appliances ("appliance" and "MVAC" as defined at 82. 152)? ☐ **Yes** ☑ **No**

4. Cite and describe which Title VI requirements are applicable to your facility (i.e. 40 CFR Part 82, Subpart A through G). **None**

The facility does not produce, manufacture, transform, destroy, import, or export any stratospheric ozone-depleting substances (CFCs, HCFCs); does not maintain or service motor vehicle air conditioning units or refrigeration equipment; and does not sell, distribute, or offer for sale any product that may contain stratospheric ozone-depleting substances.

Harvest shall continue to maintain compliance with the conditions stipulated in 40 CFR 82, Subparts A-G of the Stratospheric Ozone Protection Program (Title VI of the Clean Air Act Amendments).

19.6 - Compliance Plan and Schedule

Applications for sources, which are not in compliance with all applicable requirements at the time the permit application is submitted to the department, must include a proposed compliance plan as part of the permit application package. This plan shall include the information requested below:

A. Description of Compliance Status: (20.2.70.300.D.11.a NMAC)
A narrative description of your facility's compliance status with respect to all applicable requirements (as defined in 20.2.70 NMAC) at the time this permit application is submitted to the department.

B. Compliance plan: (20.2.70.300.D.11.B NMAC)
A narrative description of the means by which your facility will achieve compliance with applicable requirements with which it is not in compliance at the time you submit your permit application package.

C. Compliance schedule: (20.2.70.300D.11.c NMAC)
A schedule of remedial measures that you plan to take, including an enforceable sequence of actions with milestones, which will lead to compliance with all applicable requirements for your source. This schedule of compliance must be at least as stringent as that contained in any consent decree or administrative order to which your source is subject. The obligations of any consent decree or administrative order are not in any way diminished by the schedule of compliance.

D. Schedule of Certified Progress Reports: (20.2.70.300.D.11.d NMAC)
A proposed schedule for submission to the department of certified progress reports must also be included in the compliance schedule. The proposed schedule must call for these reports to be submitted at least every six (6) months.

E. Acid Rain Sources: (20.2.70.300.D.11.e NMAC)
If your source is an acid rain source as defined by EPA, the following applies to you. For the portion of your acid rain source subject to the acid rain provisions of title IV of the federal Act, the compliance plan must also include any additional requirements under the acid rain provisions of title IV of the federal Act. Some requirements of title IV regarding the schedule and methods the source will use to achieve compliance with the acid rain emissions limitations may supersede the requirements of title V and 20.2.70 NMAC. You will need to consult with the Air Quality Bureau permitting staff concerning how to properly meet this requirement.

NOTE: The Acid Rain program has additional forms. See http://www.env.nm.gov/aqb/index.html. Sources that are subject to both the Title V and Acid Rain regulations are **encouraged** to submit both applications **simultaneously**.

The facility is in compliance with all applicable requirements; consequently, a compliance plan, a compliance schedule, and a schedule of certified progress reports is not required.

The facility is not equipped with any acid rain sources; consequently, compliance with the acid rain provisions is not required as a part of this permit application.

19.7 - 112(r) Risk Management Plan (RMP)

Any major sources subject to section 112(r) of the Clean Air Act must list all substances that cause the source to be subject to section 112(r) in the application. The permittee must state when the RMP was submitted to and approved by EPA.

The facility is not subject to 40 CFR 68, Chemical Accident Prevention Provisions; consequently, a Risk Management Plan is not required.

19.8 - Distance to Other States, Bernalillo, Indian Tribes and Pueblos

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 NMAC)?

(If the answer is yes, state which apply and provide the distances.)

The facility is located within 80 kilometers of the following states, local pollution control programs, Indian tribes and pueblos:

Neighboring States, Class I Areas, and Indian Lands

States, local pollution control programs, and Indian tribes and pueblos within 80 km	Approximate Distance to Station (km)
States	
Colorado	80
Indian Tribes	
Southern Ute Tribe	80
Jicarilla Apache Tribe	25.9
Ute Mountain Ute Tribe	80
Navajo Nation Tribal Lands (checkerboard)	1.25

19.9 - Responsible Official

Provide the Responsible Official as defined in 20.2.70.7.AD NMAC:

The responsible official is Travis Jones, EH&S Manager.

Section 20

Other Relevant Information

Other relevant information. Use this attachment to clarify any part in the application that you think needs explaining. Reference the section, table, column, and/or field. Include any additional text, tables, calculations or clarifying information.

Additionally, the applicant may propose specific permit language for AQB consideration. In the case of a revision to an existing permit, the applicant should provide the old language and the new language in track changes format to highlight the proposed changes. If proposing language for a new facility or language for a new unit, submit the proposed operating condition(s), along with the associated monitoring, recordkeeping, and reporting conditions. In either case, please limit the proposed language to the affected portion of the permit.

This section contains the NMAQB *Compliance History Disclosure Form* required for all permit applications submitted on or after October 24, 2022.

Air Permit Application
Compliance History Disclosure Form

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

Permittee/Applicant Company Name		**Expected Application Submittal Date**
Harvest Four Corners, LLC		June, 2023
Permittee/Company Contact	**Phone**	**Email**
Monica Smith	505-632-4625	MSmith@harvestmidstream.com

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

Section 21

Addendum for Landfill Applications

Landfill Applications are not required to complete Sections 1-C Input Capacity and Production Rate, 1-E Operating Schedule, 17 Compliance Test History, and 18 Streamline Applications. Section 12 – PSD Applicability is required only for Landfills with Gas Collection and Control Systems and/or landfills with other non-fugitive stationary sources of air emissions such as engines, turbines, boilers, heaters. All other Sections of the Universal Application Form are required.

EPA Background Information for MSW Landfill Air Quality Regulations:
https://www3.epa.gov/airtoxics/landfill/landflpg.html

NM Solid Waste Bureau Website: https://www.env.nm.gov/swb/

Not applicable, as the facility is not a landfill.

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Section 22: Certification

Company Name: Harvest Four Corners, LLC

I, Travis Jones, hereby certify that the information and data submitted in this application are true and as accurate as possible, to the best of my knowledge and professional expertise and experience.

Signed this 11th day of May, 2022, upon my oath or affirmation, before a notary of the State of

_____.

*Signature 5/11/2022 Date

Travis Jones Printed Name

EHS Manager Title

Scribed and sworn before me on this 11th day of May, 2022.

My authorization as a notary of the State of New Mexico expires on the

20th day of December, 2025.

STATE OF NEW MEXICO
NOTARY PUBLIC
MONICA SMITH
COMMISSION # 1061356
COMMISSION EXPIRES 12/27/2025

Monica Smith Notary's Signature 5/11/2022 Date

Monica Smith Notary's Printed Name

*For Title V applications, the signature must be of the Responsible Official as defined in 20.2.70.7.AE NMAC.