December 2, 2021

Ms. Rhonda Romero
Minor Source Section Manager
New Mexico Environmental Department
Air Quality Bureau - Permitting Section
525 Camino de los Marquez, Suite 1
Santa Fe, NM 87505-1816

Submitted via Federal Express

Re: Chevron U.S.A. Inc.
Revision to NSR Permit No. 6832-M7
Salado Draw 23 CS and TB
Jal, Lea County

Dear Ms. Romero:

Chevron U.S.A. Inc. is submitting a revision to NSR Permit No. 6832-M7 for the Salado Draw 23 CS and TB facility. Attached are the signed and certified Universal Application forms along with the appropriate attachments. In this revision application, gas analyses were updated, tank working and standing emissions calculations were updated and due to the updated gas analyses, the glycol dehydrator emissions estimation and the ProMax simulation were rerun with the updated values. The site is located in a rural area approximately 27.1 miles southwest of Jal, NM.

Please contact me at (512) 255-9999 or e-mail jmechell@waid.com, or Mr. Keaton Byars at (432) 687-7448 or e-mail KBQT@chevron.com if you have any questions.

Sincerely,

Justin K. Mechell, P.E.
Senior Engineer

JKM/tvp

Attachment

cc: Mr. Keaton Byars, Chevron U.S.A. Inc., Midland, TX, w/attachment
Air Permit Leader, NMED Field Office, Las Cruces, NM, w/attachment

Austin Office
13785 Research Blvd., Suite 100, Austin, Texas 78750
512.255.9999 • 512.255.8780 FAX

Houston Office
1325 Space Park Dr., Suite D, Houston, Texas 77058
281.333.9990 • 512.255.8780 FAX

December 03, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775376977738

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	A.SOBERAD	**Delivery Location:**	525 CAMINO DE LOS MARQUEZ
Service type:	FedEx Standard Overnight		
Special Handling:	Deliver Weekday		SANTA FE, NM, 87505
		Delivery date:	Dec 3, 2021 11:11

Shipping Information:

Tracking number:	775376977738	**Ship Date:**	Dec 2, 2021
		Weight:	4.0 LB/1.82 KG

Recipient:
Ms. Rhonda Romero, NMED Air Quality Bureau
525 Camino de los Marquez, Suite 1
Permitting Section
SANTA FE, NM, US, 87505

Shipper:
Tina Purington, WAID ENVIRONMENTAL
13785 N HIGHWAY 183
Ste 100
AUSTIN, TX, US, 78750

Reference CTX14920

Thank you for choosing FedEx

December 03, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775377011872

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	A.NEVADA	**Delivery Location:**	2301 ENTRADA DEL SOL
Service type:	FedEx Standard Overnight		
Special Handling:	Deliver Weekday		LAS CRUCES, NM, 88001
		Delivery date:	Dec 3, 2021 12:03

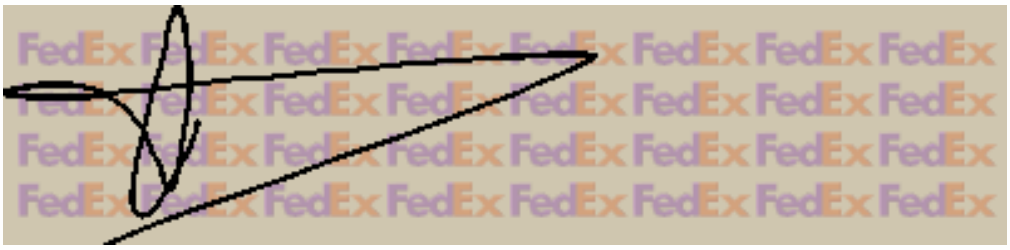
Shipping Information:

Tracking number:	775377011872	**Ship Date:**	Dec 2, 2021
		Weight:	2.0 LB/0.91 KG

Recipient:
Michael Kesler, District Mgr, NMED District 3 (Las Cruces)
2301 ENTRADA DEL SOL
LAS CRUCES, NM, US, 88001

Shipper:
Tina Purington, WAID ENVIRONMENTAL
13785 N HIGHWAY 183
Ste 100
AUSTIN, TX, US, 78750

Reference CTX14920



Thank you for choosing FedEx

New Mexico Environmental Department
NSR Permit No. 6832-M7

for

Chevron U.S.A. Inc.
Salado Draw 23 CS and TB
Jal, Lea County

December 2021

Prepared by:

Marshall B. Vandermeer, E.I.T.
Graduate Engineer

Approved by:

Justin K. Mechell, P.E.
Senior Engineer

12/2/2021

Document based on information provided by
Chevron U.S.A. Inc.
Waid Project No. CTX14920

WAID ENVIRONMENTAL
www.waid.com

Austin Office
13785 Research Blvd., Suite 100, Austin, Texas 78750
512.255.9999 • 512.255.8780 FAX

Houston Office
1325 Space Park Dr., Suite D, Houston, Texas 77058
281.333.9990 • 512.255.8780 FAX

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.: **61212** in the amount of **$500.00**

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

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

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

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

Section 1 – Facility Information

Section 1-A: Company Information

		AI # if known (see 1st 3 to 5 #s of permit IDEA ID No.): 36802	Updating Permit/NOI #: 6832-M7
1	Facility Name: Salado Draw 23 Compressor Station and Tank Battery	Plant primary SIC Code (4 digits): 1311	
		Plant NAIC code (6 digits): 21113	
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): See Section 1-D, Cell 4		
2	Plant Operator Company Name: Chevron U.S.A. Inc.	Phone/Fax: 432-687-7904	
a	Plant Operator Address: 6301 Deauville Blvd, N3203, Midland, TX 79706		
b	Plant Operator's New Mexico Corporate ID or Tax ID: 25-6527925		

3	Plant Owner(s) name(s): Chevron U.S.A. Inc.	Phone/Fax: 432-687-7904
a	Plant Owner(s) Mailing Address(s): 6301 Deauville Blvd, N3203, Midland, TX 79706	
4	Bill To (Company): Chevron U.S.A. Inc.	Phone/Fax: 432-687-7904
a	Mailing Address: 6301 Deauville Blvd, N3203, Midland, TX 79706	E-mail: KBQT@chevron.com
5	▮ Preparer: Marshall Vandermeer, Waid Environmental ▮ Consultant: Justin Mechell, Waid Environmental	Phone/Fax: (512) 255-9999
a	Mailing Address: 13785 Research Blvd., Ste 100, Austin, TX 78750	E-mail: jmechell@waid.com
6	Plant Operator Contact: Keaton Byars	Phone/Fax: (432) 687-7448
a	Address: 6301 Deauville Blvd, N3203, Midland, TX 79706	E-mail: KBQT@chevron.com
7	Air Permit Contact: Keaton Byars	Title: HSE Specialist
a	E-mail: KBQT@chevron.com	Phone/Fax: (432) 687-7448
b	Mailing Address: 6301 Deauville Blvd, N3203, Midland, TX 79706	
c	The designated Air permit Contact will receive all official correspondence (i.e. letters, permits) from the Air Quality Bureau.	

Section 1-B: Current Facility Status

1.a	Has this facility already been constructed? ■ Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? ■ Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? ☐ Yes ■ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ■ Yes ☐ No
3	Is the facility currently shut down? ☐ Yes ■ No	If yes, give month and year of shut down (MM/YY):
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes ■ No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐ Yes ☐ No ■ N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☐ Yes ■ No	If yes, the permit No. is: P-
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ■ No	If yes, the NPR No. is:
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ■ No	If yes, the NOI No. is:
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ■ Yes ☐ No	If yes, the permit No. is: 6832-M7
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes ■ 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: 937.5 bbl/hr condensate 2,312.5 bbl/hr water 3.625 MMscf/hr gas	Daily: 22,500 bbl/day condensate 55,500 bbl/day water 87 MMscf/day gas	Annually: 8,212,500 bbl/yr condensate 20,257,500 bbl/yr water 31,755 MMscf/yr gas
b	Proposed	Hourly: 937.5 bbl/hr condensate 2,312.5 bbl/hr water 3.625 MMscf/hr gas	Daily: 22,500 bbl/day condensate 55,500 bbl/day water 87 MMscf/day gas	Annually: 8,212,500 bbl/yr condensate 20,257,500 bbl/yr water 31,755 MMscf/yr gas
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: 937.5 bbl/hr condensate 2,312.5 bbl/hr water 3.625 MMscf/hr gas	Daily: 22,500 bbl/day condensate 55,500 bbl/day water 87 MMscf/day gas	Annually: 8,212,500 bbl/yr condensate 20,257,500 bbl/yr water 31,755 MMscf/yr gas
b	Proposed	Hourly: 937.5 bbl/hr condensate 2,312.5 bbl/hr water 3.625 MMscf/hr gas	Daily: 22,500 bbl/day condensate 55,500 bbl/day water 87 MMscf/day gas	Annually: 8,212,500 bbl/yr condensate 20,257,500 bbl/yr water 31,755 MMscf/yr gas

Section 1-D: Facility Location Information

1	Section: 14	Range: 32E	Township: 26S	County: Lea	Elevation (ft): 3157
2	UTM Zone: ☐ 12 or ■ 13			Datum: ☐ NAD 27 ■ NAD 83 ☐ WGS 84	
a	UTM E (in meters, to nearest 10 meters): 627889			UTM N (in meters, to nearest 10 meters): 3545246	
b	**AND** Latitude (deg., min., sec.): 32, 2, 10.7			Longitude (deg., min., sec.): -103, 38, 43.1	
3	Name and zip code of nearest New Mexico town: Jal, 88252				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): From Jal, NM intersection of S 3rd St. and NM-128W, head west on NM-128W for 29.77 mi. Turn left on Orla Rd./J-1 and continue for 12.64 miles. Turn left onto unnamed road and after 2.86 miles, the site will be on the left.				
5	The facility is 27.1 (distance) miles SW (direction) of Jal, NM (nearest town).				
6	Status of land at facility (check one): ☐ Private ☐ Indian/Pueblo ■ Federal BLM ☐ Federal Forest Service ☐ Other (specify)				
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: Lea County and Eddy County, NM and Loving County, TX				
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: Texas - 2.5 miles				
9	Name nearest Class I area: Carlsbad Caverns National Park				
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 44 miles				
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: >2 miles				
12	Method(s) used to delineate the Restricted Area: "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.				
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☐ Yes ■ No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.				
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☒ No ☐ Yes If yes, what is the name and permit number (if known) of the other facility?				

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

1	Facility **maximum** operating ($\frac{\text{hours}}{\text{day}}$): 24	($\frac{\text{days}}{\text{week}}$): 7	($\frac{\text{weeks}}{\text{year}}$): 52	($\frac{\text{hours}}{\text{year}}$): 8760			
2	Facility's maximum daily operating schedule (if less than 24 $\frac{\text{hours}}{\text{day}}$)? Start:	☐AM ☐PM	End:	☐AM ☐PM			
3	Month and year of anticipated start of construction: October 2021						
4	Month and year of anticipated construction completion: October 2021						
5	Month and year of anticipated startup of new or modified facility: October 2021						
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:		NOV Tracking No:
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:	Date:	Requirement # (or page # and paragraph #):
d	Provide the required text to be inserted in this permit:		
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: _____ 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):		Phone:
a	R.O. Title:	R.O. e-mail:	
b	R. O. Address:		
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC):		Phone:
a	A. R.O. Title:	A. R.O. e-mail:	
b	A. R. O. Address:		
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):		
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.):		
a	Address of Parent Company:		
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.):		
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations:		
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:		

Section 1-I – Submittal Requirements

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

Hard Copy Submittal Requirements:

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

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

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

Electronic files sent by (check one):

☐ CD/DVD attached to paper application

☐ secure electronic transfer. Air Permit Contact Name_____

Email_____

Phone number _____

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

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

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

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

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

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

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

2) The documents should also be submitted in Microsoft Office compatible file format (Word, Excel, etc.) allowing us to access the text and formulas in the documents (copy & paste). Any documents that cannot be submitted in a Microsoft Office compatible

format shall be saved as a PDF file from within the electronic document that created the file. If you are unable to provide Microsoft office compatible electronic files or internally generated PDF files of files (items that were not created electronically: i.e. brochures, maps, graphics, etc,), submit these items in hard copy format. We must be able to review the formulas and inputs that calculated the emissions.

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

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

Table of Contents

Table 2-A: Regulated Emission Sources

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

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufacturer's Rated Capacity[3] (Specify Units)	Requested Permitted Capacity[3] (Specify Units)	Date of Manufacture[2] / Date of Construction/ Reconstruction[2]	Controlled by Unit # / Emissions vented to Stack #	Source Classification Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
ENG-1	Compressor Engine	Caterpillar	G3606	Unknown	1875 hp	1875 hp	February-19 February-19	CAT-1 ENG-1	31000203	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced	4SLB	
ENG-2	Compressor Engine	Caterpillar	G3606	Unknown	1875 hp	1875 hp	February-19 February-19	CAT-2 ENG-2	31000203	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced	4SLB	
ENG-3	Compressor Engine	Caterpillar	G3606	Unknown	1875 hp	1875 hp	February-19 February-19	CAT-3 ENG-3	31000203	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced	4SLB	
ENG-4	Compressor Engine	Caterpillar	G3606	Unknown	1875 hp	1875 hp	February-19 February-19	CAT-4 ENG-4	31000203	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced	4SLB	
HTR-1	Heater Treater	Unknown	Unknown	UA501-004	4 MMBtu/hr	4 MMBtu/hr	Unknown Apr-16	N/A HTR-1	31000404	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
HTR-2	Heater Treater	Unknown	Unknown	112875	4 MMBtu/hr	4 MMBtu/hr	Unknown Apr-16	N/A HTR-2	31000404	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
HTR-3	Heater Treater	Unknown	Unknown	112871	4 MMBtu/hr	4 MMBtu/hr	Unknown Apr-16	N/A HTR-3	31000404	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
HTR-4	Heater Treater	Unknown	Unknown	Unknown	4 MMBtu/hr	4 MMBtu/hr	Unknown Apr-16	N/A HTR-4	31000404	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
HTR-5	Heater Treater	Unknown	Unknown	Unknown	4 MMBtu/hr	4 MMBtu/hr	Unknown Apr-16	N/A HTR-5	31000404	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
HTR-6	Heater Treater	Unknown	Unknown	Unknown	4 MMBtu/hr	4 MMBtu/hr	Unknown Apr-16	N/A HTR-6	31000404	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
REB-1	Reboiler	Unknown	Unknown	Unknown	1 MMBtu/hr	1 MMBtu/hr	Unknown Apr-16	N/A REB-1	31000404	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
DHY-1	Dehydrator	Unknown	Unknown	Unknown	87 MMscf/day		Unknown Apr-16	N/A DHY-1	31000227	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
DHY-2	Dehydrator	Unknown	Unknown	Unknown			Unknown Apr-16	N/A DHY-1	31000227	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
FLARE	Flare	Zeeco	Unknown	Unknown	60 MMSCFD	89.2 Mscf/hr	Unknown Apr-16	FLARE FLARE	31000205	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
LOAD	Water Truck Loading	Unknown	Unknown	Unknown	200 bbl/hr	200 bbl/hr	Unknown Apr-16	N/A LOAD	31088811	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
TK-1	Condensate Storage Tank	Unknown	Unknown	Unknown	750 bbl	750 bbl	Unknown Apr-16	TK-FUG1 TK-FUG1	40400312	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
TK-2	Condensate Storage Tank	Unknown	Unknown	Unknown	750 bbl	750 bbl	Unknown Apr-16	TK-FUG1 TK-FUG1	40400312	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		

Unit Number[1]	Source Description	Make	Model #	Serial #	Manufact-urer'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 Classi-fication Code (SCC)	For Each Piece of Equipment, Check One	RICE Ignition Type (CI, SI, 4SLB, 4SRB, 2SLB)[4]	Replacing Unit No.
TK-3	Condensate Storage Tank	Unknown	Unknown	Unknown	750 bbl	750 bbl	Unknown Apr-16	TK-FUG1 TK-FUG1	40400312	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
PW-1	Water Storage Tank	Unknown	Unknown	Unknown	750 bbl	750 bbl	Unknown Apr-16	TK-FUG1 TK-FUG1	40400315	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
PW-2	Water Storage Tank	Unknown	Unknown	Unknown	750 bbl	750 bbl	Unknown Apr-16	TK-FUG1 TK-FUG1	40400315	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
PW-3	Water Storage Tank	Unknown	Unknown	Unknown	750 bbl	750 bbl	Unknown Apr-16	TK-FUG1 TK-FUG1	40400315	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
PW-4	Water Storage Tank	Unknown	Unknown	Unknown	750 bbl	750 bbl	Unknown Jan-20	TK-FUG1 TK-FUG1	40400315	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
TK-S1	Water Slop Tank	Dragon	Unknown	Unknown	100 bbl	100 bbl	Unknown Apr-16	N/A TK-S1	40400315	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
TK-S2	Condensate Slop Tank	Dragon	Unknown	Unknown	750 bbl	750 bbl	Unknown Apr-16	TK-FUG2 TK-FUG2	40400312	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
TK-FUG1	Primary and Redundant Vapor Recovery Units	Unknown	Unknown	Unknown	N/A	N/A	Unknown Apr-16	N/A TK-FUG1	30600401	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
TK-FUG2	Single Vapor Recovery Unit	Unknown	Unknown	Unknown	N/A	N/A	Unknown Apr-16	N/A TK-FUG2	30600401	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
FUG	Fugitives	Unknown	Unknown	Unknown	N/A	N/A	Unknown Apr-16	N/A FUG	31088811	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
VRU-1	Vapor Recovery Unit	Flogistix	FZPV16	0086-106	600 MSCFD	N/A	Unknown Apr-16	N/A TK-FUG1	40400312	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
VRU-2	Vapor Recovery Unit	Flogistix	FZPV16	0086-97	600 MSCFD	N/A	Unknown Apr-16	N/A TK-FUG1	40400312	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
VRU-3	Vapor Recovery Unit	Flogistix	FZPV16	0086-124	600 MSCFD	N/A	Unknown Apr-16	N/A TK-FUG2	40400312	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
VRU-4	Vapor Recovery Unit	Flogistix	304-163-001	16SF14-294	1.25MMSCFD	N/A	Unknown Jan-20	N/A TK-FUG1	40400312	■ Existing (unchanged) □ To be Removed □ New/Additional □ Replacement Unit □ To Be Modified □ To be Replaced		
FGC-1	Flash Gas Compressor	Flogistix	FZPV16 & 304-163-001	0086-97 & 16SF14-294	600 MSCFD	600 MSCFD	2015 Apr-16	N/A N/A	31000107	■ 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]	
Does not apply.	Does not apply						☐ 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
CAT-1	Oxidative Catalyst	Jul-19	CO, VOC, HCHO	ENG-1	94% CO, 42% VOC, 80% CHOH	Vendor Specifications
CAT-2	Oxidative Catalyst	Jul-19	CO, VOC, HCHO	ENG-2	94% CO, 42% VOC, 80% CHOH	Vendor Specifications
CAT-3	Oxidative Catalyst	Jul-19	CO, VOC, HCHO	ENG-3	94% CO, 42% VOC, 80% CHOH	Vendor Specifications
CAT-4	Oxidative Catalyst	Jul-19	CO, VOC, HCHO	ENG-4	94% CO, 42% VOC, 80% CHOH	Vendor Specifications
FLARE	Flare	Apr-16	VOC, H2S	Various (MSS)	98%	Engineering Estimate
VRU-1	Primary and Redundant Vapor Recovery Units	Apr-16	VOC, H2S	TK-1, TK-2, TK-3 PW-1, PW-2, PW-3, PW-4	100%	Engineering Estimate
VRU-2	Primary and Redundant Vapor Recovery Units	Apr-16	VOC, H2S	TK-1, TK-2, TK-3 PW-1, PW-2, PW-3, PW-4	100%	Engineering Estimate
VRU-3	Single Vapor Recovery Unit	Apr-16	VOC, H2S	TK-S2	95%	Engineering Estimate
VRU-4	Primary and Redundant Vapor Recovery Units	Jan-20	VOC, H2S	TK-1, TK-2, TK-3 PW-1, PW-2, PW-3, PW-4	100%	Engineering Estimate
REB-1/DHY-1/DHY-2	Condenser, Re-boiler, Glowplug	Apr-16	VOC, H2S	DHY-1, DHY-2	99.6% for still vent emissions 98% for flash vent emissions	Engineering Estimate

[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		TSP[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-1	2.06	9.04	10.70	46.70	4.75	20.82	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	-	-	-	-
ENG-2	2.06	9.04	10.70	46.70	4.75	20.82	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	-	-	-	-
ENG-3	2.06	9.04	10.70	46.70	4.75	20.82	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	-	-	-	-
ENG-4	2.06	9.04	10.70	46.70	4.75	20.82	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	-	-	-	-
HTR-1	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-2	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-3	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-4	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-5	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-6	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
REB-1	0.108	0.47	0.090	0.40	0.006	0.026	0.069	0.301	0.008	0.036	0.008	0.036	0.008	0.036	-	-	-	-
DHY-1	-	-	-	-	88.28	386.7	-	-	-	-	-	-	-	-	0.000	0.000	-	-
FLARE	12.99	2.21	51.72	8.79	33.46	5.62	0.144	0.632	-	-	-	-	-	-	0.001	2.4E-04	-	-
LOAD	-	-	-	-	0.341	0.039	-	-	-	-	-	-	-	-	1.5E-04	1.7E-05	-	-
TK-FUG1	-	-	-	-	5471	23481	-	-	-	-	-	-	-	-	22.04	96.50	-	-
TK-S1	-	-	-	-	0.024	0.081	-	-	-	-	-	-	-	-	1.3E-07	4.4E-07	-	-
TK-FUG2	-	-	-	-	15.0	66	-	-	-	-	-	-	-	-	0.01	0.06	-	-
FUG	-	-	-	-	6.18	27.01	-	-	-	-	-	-	-	-	1.3E-04	0.001	-	-
SSM	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-	-	-
SITE-SSM	-	-	-	-	575.3	2.68	-	-	-	-	-	-	-	-	0.025	1.1E-04	-	-
Totals**	23.92	50.17	96.8	205.5	6209	24062	3.09	13.52	0.717	3.15	0.717	3.15	0.717	3.15	22.08	96.6	0	0

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for TSP unless TSP is set equal to PM10 and PM2.5.

**** Totals represent the hourly and annual maximum total PTEs for the various scenarios represented in Section 15**

Table 2-E: Requested Allowable Emissions

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

Unit No.	NOx		CO		VOC		SOx		TSP[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-1	2.06	9.04	0.774	3.39	3.05	13.30	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	-	-		
ENG-2	2.06	9.04	0.774	3.39	3.05	13.30	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	-	-		
ENG-3	2.06	9.04	0.774	3.39	3.05	13.30	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	-	-		
ENG-4	2.06	9.04	0.774	3.39	3.05	13.30	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	-	-		
HTR-1	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-		
HTR-2	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-		
HTR-3	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-		
HTR-4	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-		
HTR-5	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-		
HTR-6	0.431	1.89	0.362	1.59	0.024	0.104	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-		
REB-1	0.108	0.47	0.090	0.396	0.006	0.026	0.069	0.301	0.008	0.036	0.008	0.036	0.008	0.036	-	-		
DHY-1	-	-	-	-	1.40	6.13	-	-	-	-	-	-	-	-	0.000	0.000		
FLARE	12.99	2.21	51.72	8.79	33.46	5.62	0.144	0.632	-	-	-	-	-	-	0.001	2.38E-04		
LOAD	-	-	-	-	0.341	0.039	-	-	-	-	-	-	-	-	1.51E-04	1.74E-05		
TK-FUG1	-	-	-	-	0.000	0.000	-	-	-	-	-	-	-	-	0.000	0.000		
TK-S1	-	-	-	-	0.024	0.081	-	-	-	-	-	-	-	-	1.28E-07	4.43E-07		
TK-FUG2	-	-	-	-	0.75	3.3	-	-	-	-	-	-	-	-	0.000	0.000		
FUG	-	-	-	-	6.18	27.01	-	-	-	-	-	-	-	-	1.33E-04	0.001		
SSM	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-		
SITE-SSM	-	-	-	-	575.3	2.68	-	-	-	-	-	-	-	-	0.025	1.09E-04		
Totals**	23.92	50.17	57.08	32.27	629.7	108.7	3.09	13.52	0.717	3.15	0.717	3.15	0.717	3.15	0.026	0.001	0.000	0.000

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for TSP unless TSP is set equal to PM10 and PM2.5.

**** Totals represent the hourly and annual maximum total PTEs for the various scenarios represented in Section 15.**

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

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

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

Unit No.	NOx		CO		VOC		SOx		TSP[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
SSM	-	-	-	-	-	10.00	-	-	-	-	-	-	-	-	-	-	-	-
Totals	0	0	0	0	0	10.00	0	0	0	0	0	0	0	0	0	0	0	0

[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.

[1] **Condensable Particulate Matter:** Include condensable particulate matter emissions for PM10 and PM2.5 if the source is a combustion source. Do not include condensable particulate matter for TSP unless TSP is set equal to PM10 and PM2.5.

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

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

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

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

Table 2-H: Stack Exit Conditions

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

Stack Number	Serving Unit Number(s) from Table 2-A	Orientation (H-Horizontal V=Vertical)	Rain Caps (Yes or No)	Height Above Ground (ft)	Temp. (F)	Flow Rate		Moisture by Volume (%)	Velocity (ft/sec)	Inside Diameter (ft)
						(acfs)	(dscfs)			
ENG-1	ENG-1	V	No	29	831	147	130	11.8%	68.8	1.65
ENG-2	ENG-2	V	No	29	831	147	130	11.8%	68.8	1.65
ENG-3	ENG-3	V	No	29	831	147	130	11.8%	68.8	1.65
ENG-4	ENG-4	V	No	29	831	147	130	11.8%	68.8	1.65
HTR-1	HTR-1	V	No	20	1273	14.1	11.7	17.3%	14.7	1.50
HTR-2	HTR-2	V	No	20	500	14.1	11.7	17.3%	14.7	1.50
HTR-3	HTR-3	V	No	20	500	14.1	11.7	17.3%	14.7	1.50
HTR-4	HTR-4	V	No	20	500	14.1	11.7	17.3%	14.7	1.50
HTR-5	HTR-5	V	No	20	500	14.1	11.7	17.3%	14.7	1.50
HTR-6	HTR-6	V	No	20	500	14.1	11.7	17.3%	14.7	1.50
REB-1	REB-1	V	No	16	500	3.52	2.90	17.4 %	8.28	1.00
DHY-1	DHY-1	V	No	5	212	N/A	N/A	N/A	N/A	N/A
FLARE	FLARE	V	No	65	1832	0.64	0.14	N/A	1.83	0.67
LOAD	LOAD	V	No	10	Amb	N/A	N/A	N/A	N/A	N/A
TK-FUG1	TK-FUG1	V	No	20	Amb	N/A	N/A	N/A	N/A	N/A
TK-S1	TK-S1	V	No	8	Amb	N/A	N/A	N/A	N/A	N/A
TK-FUG2	TK-FUG2	V	No	20	Amb	N/A	N/A	N/A	N/A	N/A
FUG	FUG	V	No	3	Amb	N/A	N/A	N/A	N/A	N/A
SITE-SSM	SITE-SSM	V	No	10	Amb	N/A	N/A	N/A	N/A	N/A

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		Benzene ■ HAP or □ TAP		Toluene ■ HAP or □ TAP		Ethylbenzene ■ HAP or □ TAP		Xylene ■ HAP or □ TAP		n-Hexane ■ HAP or □ TAP		Formaldehyde ■ 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
ENG-1	ENG-1	0.234	1.03	0.006	0.025	0.005	0.023	5.1E-04	0.002	0.002	0.010	0.014	0.063	0.206	0.904				
ENG-2	ENG-2	0.234	1.03	0.006	0.025	0.005	0.023	5.1E-04	0.002	0.002	0.010	0.014	0.063	0.206	0.904				
ENG-3	ENG-3	0.234	1.03	0.006	0.025	0.005	0.023	5.1E-04	0.002	0.002	0.010	0.014	0.063	0.206	0.904				
ENG-4	ENG-4	0.234	1.03	0.006	0.025	0.005	0.023	5.1E-04	0.002	0.002	0.010	0.014	0.063	0.206	0.904				
HTR-1	HTR-1	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-	-				
HTR-2	HTR-2	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-	-				
HTR-3	HTR-3	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-	-				
HTR-4	HTR-4	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-	-				
HTR-5	HTR-5	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-	-				
HTR-6	HTR-6	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-	-				
REB-1	REB-1	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-	-				
DHY-1	DHY-1, DHY-2	0.117	0.512	0.028	0.125	0.039	0.170	0.005	0.023	0.015	0.067	0.029	0.126	-	-				
FLARE	FLARE	1.54	0.368	0.145	0.051	0.166	0.054	0.016	0.033	0.060	0.039	1.16	0.190	-	-				
LOAD	LOAD	0.010	0.001	0.007	0.001	0.001	0.000	0.001	0.000	0.000	0.000	0.002	0.000	-	-				
TK-FUG1	TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-				
TK-S1	TK-S1	9.2E-04	0.003	5.5E-04	0.002	5.9E-05	2.0E-04	8.9E-05	3.1E-04	9.1E-06	3.1E-05	2.1E-04	0.001	-	-				
TK-FUG2	TK-S2	0.05	0.22	0.028	0.12	0.005	0.023	0.004	0.02	0.000	0.001	0.01	0.05	-	-				
FUG	FUG	0.329	1.44	0.023	0.099	0.063	0.276	0.018	0.080	0.051	0.221	0.174	0.762	-	-				
SSM	SSM	-	-	-	-	-	-	-	-	-	-	-	-	-	-				
SITE-SSM	SITE-SSM	25.96	0.118	2.37	0.011	2.73	0.012	0.146	0.001	0.911	0.004	19.80	0.090	-	-				
Totals:		28.94	6.77	2.62	0.51	3.02	0.63	0.193	0.17	1.05	0.37	21.23	1.47	0.824	3.62	0	0	0	0

Table 2-J: Fuel

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

Unit No.	Fuel Type (low sulfur Diesel, ultra low sulfur diesel, Natural Gas, Coal, …)	Fuel Source: purchased commercial, pipeline quality natural gas, residue gas, raw/field natural gas, process gas (e.g. SRU tail gas) or other	Specify Units				
			Lower Heating Value	Hourly Usage	Annual Usage	% Sulfur	% Ash
ENG-1	Natural Gas	Sweet field gas	1205 Btu/scf	10.7 Mscf/hr	93.7 MMscf/yr	10 gr total sulfur/100 scf fuel gas	0
ENG-2	Natural Gas	Sweet field gas	1205 Btu/scf	10.7 Mscf/hr	93.7 MMscf/yr	10 gr total sulfur/100 scf fuel gas	0
ENG-3	Natural Gas	Sweet field gas	1205 Btu/scf	10.7 Mscf/hr	93.7 MMscf/yr	10 gr total sulfur/100 scf fuel gas	0
ENG-4	Natural Gas	Sweet field gas	1205 Btu/scf	10.7 Mscf/hr	93.7 MMscf/yr	10 gr total sulfur/100 scf fuel gas	0
HTR-1	Natural Gas	Sweet field gas	1206 Btu/scf	3.32 Mscf/hr	29.1 MMscf/yr	29 gr total sulfur/100 scf fuel gas	0
HTR-2	Natural Gas	Sweet field gas	1206 Btu/scf	3.32 Mscf/hr	29.1 MMscf/yr	29 gr total sulfur/100 scf fuel gas	0
HTR-3	Natural Gas	Sweet field gas	1206 Btu/scf	3.32 Mscf/hr	29.1 MMscf/yr	29 gr total sulfur/100 scf fuel gas	0
HTR-4	Natural Gas	Sweet field gas	1206 Btu/scf	3.32 Mscf/hr	29.1 MMscf/yr	29 gr total sulfur/100 scf fuel gas	0
HTR-5	Natural Gas	Sweet field gas	1206 Btu/scf	3.32 Mscf/hr	29.1 MMscf/yr	29 gr total sulfur/100 scf fuel gas	0
HTR-6	Natural Gas	Sweet field gas	1206 Btu/scf	3.32 Mscf/hr	29.1 MMscf/yr	29 gr total sulfur/100 scf fuel gas	0
REB-1	Natural Gas	Sweet field gas	1205 Btu/scf	0.83 Mscf/hr	7.27 MMscf/yr	29 gr total sulfur/100 scf fuel gas	0
FLARE	Natural Gas	Sweet field gas	1150 Btu/scf	80.8 Mscf/hr	22.2 MMscf/yr	0.00135722819593787 wt%	0

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

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

Tank No.	SCC Code	Material Name	Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb*mol)	Average Storage Conditions		Max Storage Conditions	
						Temperature (°F)	True Vapor Pressure (psia)	Temperature (°F)	True Vapor Pressure (psia)
TK-1	40400312	Condensate	Mixed Hydrocarbons	7.1	50	66.05	3.80	95	6.34
TK-2	40400312	Condensate	Mixed Hydrocarbons	7.1	50	66.05	3.80	95	6.34
TK-3	40400312	Condensate	Mixed Hydrocarbons	7.1	50	66.05	3.80	95	6.34
PW-1	40400315	Produced Water	Water and Mixed Hyrocarbons	8.3	50	66.05	3.80	95	6.34
PW-2	40400315	Produced Water	Water and Mixed Hyrocarbons	8.3	50	66.05	3.80	95	6.34
PW-3	40400315	Produced Water	Water and Mixed Hyrocarbons	8.3	50	66.05	3.80	95	6.34
PW-4	40400315	Produced Water	Water and Mixed Hyrocarbons	8.3	50	66.05	3.80	95	6.34
TK-S1	40400315	Water Slop	Water and Mixed Hyrocarbons	8.3	50	66.05	3.80	95	6.34
TK-S2	40400312	Condensate Slop	Mixed Hydrocarbons	7.1	50	66.05	3.80	95	6.34

Table 2-L: Tank Data

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

Tank No.	Date Installed	Materials Stored	Seal Type (refer to Table 2-LR below)	Roof Type (refer to Table 2-LR below)	Capacity		Diameter (M)	Vapor Space (M)	Color (from Table VI-C)		Paint Condition (from Table VI-C)	Annual Throughput (gal/yr)	Turn-overs (per year)
					(bbl)	(M^3)			Roof	Shell			
TK-1	Apr-16	Condensate		FX	750	119	4.72	3.86	Green, Dark	Green, Dark	Average	114,975,000	3702
TK-2	Apr-16	Condensate		FX	750	119	4.72	3.86	Green, Dark	Green, Dark	Average	114,975,000	3702
TK-3	Apr-16	Condensate		FX	750	119	4.72	3.86	Green, Dark	Green, Dark	Average	114,975,000	3702
PW-1	Apr-16	Produced Water		FX	750	119	4.72	3.86	Green, Dark	Green, Dark	Average	212,703,750	6849
PW-2	Apr-16	Produced Water		FX	750	119	4.72	3.86	Green, Dark	Green, Dark	Average	212,703,750	6849
PW-3	Apr-16	Produced Water		FX	750	119	4.72	3.86	Green, Dark	Green, Dark	Average	212,703,750	6849
PW-4	Jan-20	Produced Water		FX	750	119	4.72	3.86	Green, Dark	Green, Dark	Average	212,703,750	6849
TK-S1	Apr-16	Water Slop		FX	100	15.9	2.90	1.40	Green, Dark	Green, Dark	Average	3,066,000	964
TK-S2	Apr-16	Condensate Slop		FX	750	119	4.72	3.86	Green, Dark	Green, Dark	Average	1,533,000	49

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)**
Field Gas	Field Gas	Gas	40 MMscfd	Condensate	Mixed Hydrocarbons	L	22500 bbl/day

Table 2-N: CEM Equipment

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

Stack No.	Pollutant(s)	Manufacturer	Model No.	Serial No.	Sample Frequency	Averaging Time	Range	Sensitivity	Accuracy
Not Applicable									

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
Not Applicable								

Table 2-P: Greenhouse Gas Emissions

Applications submitted under 20.2.70, 20.2.72, & 20.2.74 NMAC are required to complete this Table. Power plants, Title V major sources, and PSD major sources must report and calculate all GHG emissions for each unit. Applicants must report potential emission rates in short tons per year (see Section 6.a for assistance). Include GHG emissions during Startup, Shutdown, and Scheduled Maintenance in this table. For minor source facilities that are not power plants, are not Title V, or are not PSD, there are three options for reporting GHGs 1) report GHGs for each individual piece of equipment; 2) report all GHGs from a group of unit types, for example report all combustion source GHGs as a single unit and all venting GHG as a second separate unit; OR 3) check the following box ■ By checking this box, the applicant acknowledges the total CO2e emissions are less than 75,000 tons per year.

		CO_2 ton/yr	**N_2O** ton/yr	**CH_4** ton/yr	**SF_6** ton/yr	**PFC/HFC** ton/yr[2]									**Total GHG** Mass Basis ton/yr[4]	**Total CO_2e** ton/yr[5]
Unit No.	**GWPs [1]**	**1**	**298**	**25**	**22,800**	**footnote 3**										
Total	**mass GHG**															
	CO_2e															

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

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

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

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

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

Section 3

Application Summary

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

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

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

The Salado Draw 23 Compressor Station and Tank Battery is currently authorized under NSR Permit No. 6832-M7. In this revision application, gas analyses were updated, tank working and standing emissions calculations were updated and due to the updated gas analyses, the glycol dehydrator emissions estimation and the ProMax simulation were rerun with the updated values.

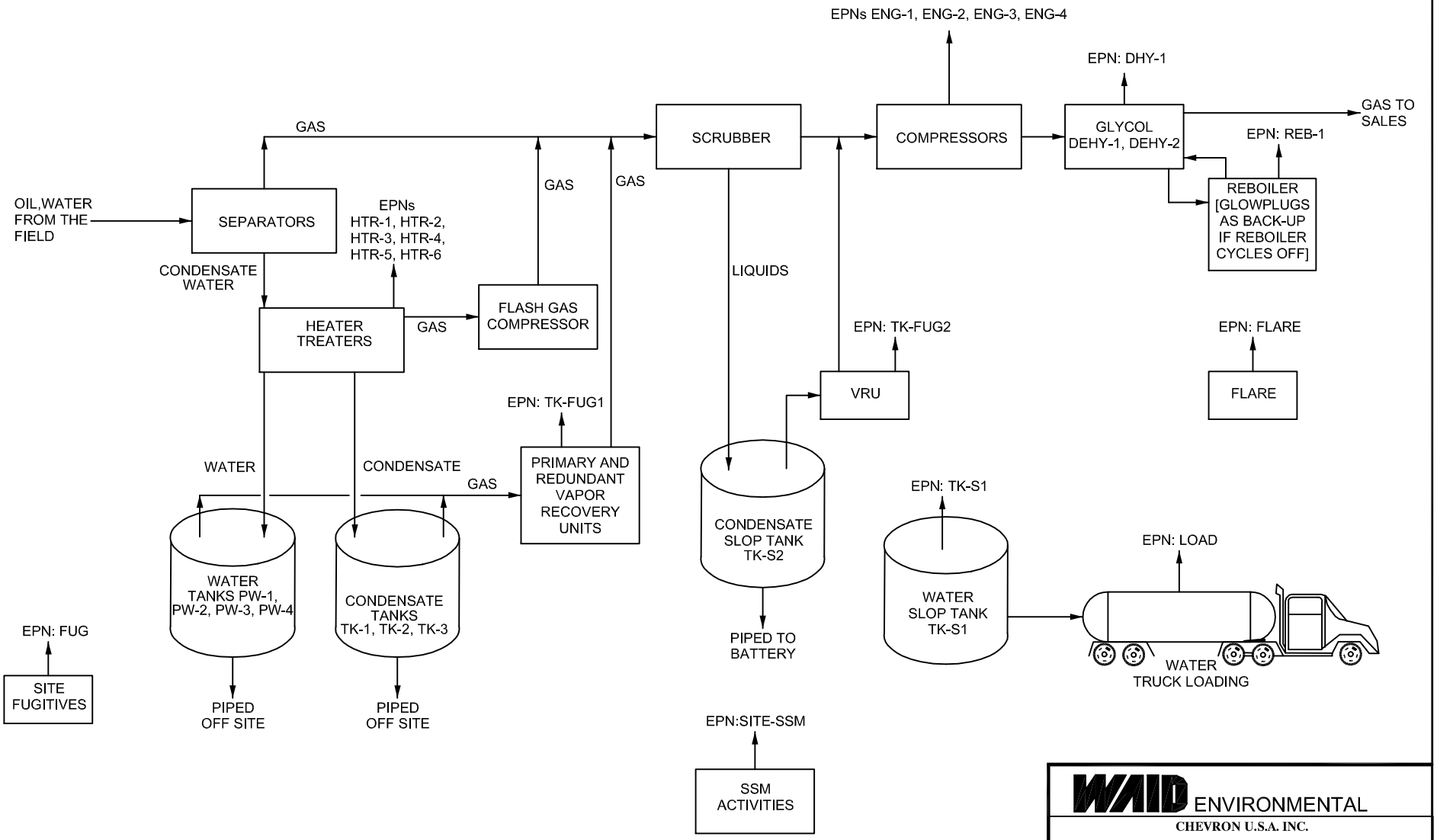
The Salado Draw 23 Compressor Station and Tank Battery is designed to remove water and hydrocarbon liquids from natural gas produced in the surrounding area, and to compress the gas into a pipeline for delivery to a processing plant. The site will include 4 compressor engines, 6 heaters, 2 dehydration units and associated condenser, reboiler, and glowplug, flare, 3 condensate tanks, 4 water tanks, 2 slop tanks, 1 flash gas compressor, water truck loading, a flare and VRU system with redundant capacity.

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.

SALADO DRAW 23 COMPRESSOR STATION AND TANK BATTERY
PROCESS FLOW DIAGRAM



WAID ENVIRONMENTAL

CHEVRON U.S.A. INC.

SALADO DRAW 23 COMPRESSOR STATION AND TANK BATTERY

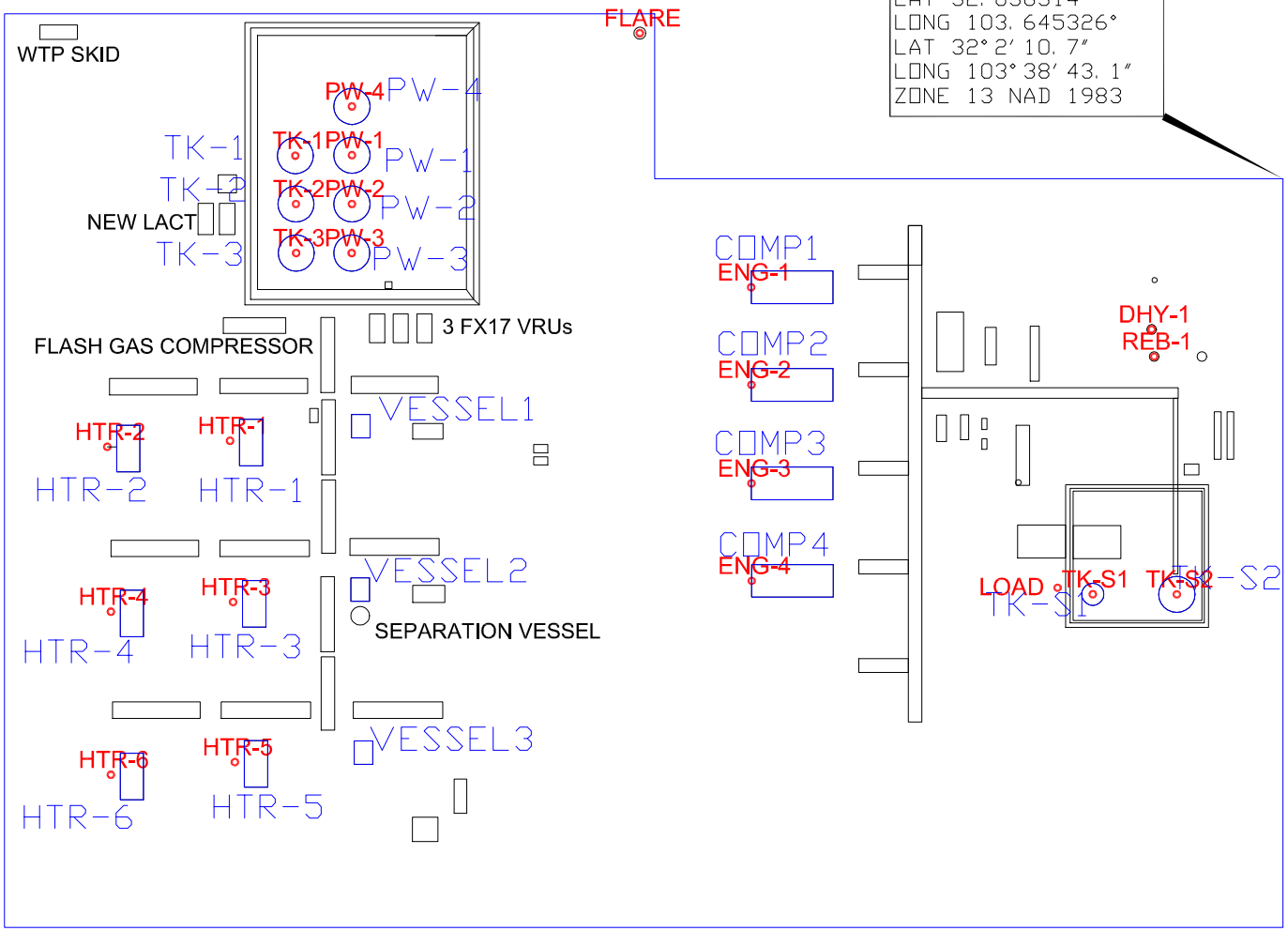
Drawn By:	Start Date:	Rev. Date:	Dwg. Name:	Rev. No.:
DWW	12/4/18	9/3/21	FLOW	10

H:\CLIENTS\CHEVRON EP\CTX14920\ACAD

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.



BENCHMARK
627911 m E
3545263 m N
LAT 32.036314°
LONG 103.645326°
LAT 32° 2′ 10.7″
LONG 103° 38′ 43.1″
ZONE 13 NAD 1983

Emission Point Number	Name	Location Easting, Northing (meters)
DHY-1	DEHY UNIT	627894, 3545243
ENG-1	ENGINE 1	627842, 3545249
ENG-2	ENGINE 2	627842, 3545236
ENG-3	ENGINE 3	627842, 3545223
ENG-4	ENGINE 4	627842, 3545211
FLARE	FLARE	627827, 3545282
HTR-1	HEATER 1	627774, 3545229
HTR-2	HEATER 2	627757, 3545228
HTR-3	HEATER 3	627774, 3545208
HTR-4	HEATER 4	627758, 3545207
HTR-5	HEATER 5	627774, 3545187
HTR-6	HEATER 6	627758, 3545185
LOAD	LOADING	627882, 3545210
PW-1	PROCESS WATER 1	627789, 3545266
PW-2	PROCESS WATER 2	627789, 3545260
PW-3	PROCESS WATER 3	627789, 3545253
PW-4	PROCESS WATER 4	627789, 3545272
REB-1	REBOILER	627894, 3545240
TK-1	TANK 1	627782, 3545266
TK-2	TANK 2	627782, 3545260
TK-3	TANK 3	627782, 3545253
TK-S1	TANK S1	627886, 3545209
TK-S2	TANK S2	627897, 3545209

Downwash Structure Name	Height (feet)	(meters)	Dimensions (meters)		
COMP1	10.0	3.05	10.60	×	4.20
COMP2	10.0	3.05	10.60	×	4.20
COMP3	10.0	3.05	10.60	×	4.20
COMP4	10.0	3.05	10.70	×	4.20
HTR-1	8.0	2.44	3.00	×	6.10
HTR-2	8.0	2.44	3.00	×	6.10
HTR-3	8.0	2.44	3.00	×	6.10
HTR-4	8.0	2.44	3.10	×	6.10
HTR-5	8.0	2.44	3.10	×	6.10
HTR-6	8.0	2.44	3.10	×	6.10
PW-1	24.0	7.32	Diameter		4.72
PW-2	24.0	7.32	Diameter		4.72
PW-3	24.0	7.32	Diameter		4.72
PW-4	24.0	7.32	Diameter		4.72
TK-1	24.0	7.32	Diameter		4.72
TK-2	24.0	7.32	Diameter		4.72
TK-3	24.0	7.32	Diameter		4.72
TK-S1	8.0	2.44	Diameter		2.90
TK-S2	24.0	7.32	Diameter		4.72
VESSEL1	5.0	1.52	2.50	×	3.00
VESSEL2	5.0	1.52	2.40	×	3.10
VESSEL3	5.0	1.52	2.40	×	3.10

0 10 20 40
SCALE IN METERS

TRUE NORTH

WAID ENVIRONMENTAL
CHEVRON U.S.A. INC.
SALADO DRAW 23 COMPRESSOR STATION AND TANK BATTERY

Drawn By	Start Date	Rev. Date	DWG Name	Rev. No.
DWW	8/24/21	9/3/21	PLOT14920	2

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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 spreadsheets are not used, provide the original formulas with defined variables. Additionally, provide subsequent formulas showing the input values for each variable in the formula. All calculations, including those calculations are imbedded in the Calc tab of the UA2 portion of the application, the printed Calc tab(s), should be submitted under this section.

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

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

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

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

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

Significant Figures:

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

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

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

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

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

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

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

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

Compressor Engines (EPNs: ENG-1, -2, -3, -4)
The Caterpillar G3606 engines are rated at 1875 hp and are equipped with oxidative catalysts with three elements. Emissions factors for CO, VOC, and formaldehyde are based on expected post-catalyst emission performance with appropriate safety factors. The NO_x emission factor is from the engine manufacturer specifications. The PM, benzene, toluene, ethylbenzene, and xylene emission factors are from AP-42, Table 3.2-2 (July 2000). Field gas is used for fuel.

Heaters/Reboiler (EPNs: HTR-1, -2, -3, -4, -5, -6, REB-1)
Emissions from the heaters/reboiler are estimated using factors from AP-42, Chapter 1.4 for natural gas combustion. Field gas is used for fuel.

Dehydration Units (EPN: DHY-1)
There are two dehydration units (FINs: DHY-1, DHY-2), but the units will not operate simultaneously, so the two units will be combined under a single EPN. The glycol dehydration unit vent emissions are calculated using the GRI-GLYCalc™ program, with a 99.6% control credit applied for the regenerator emissions routed to the condenser and reboiler and a 98% control credit applied to the flash vent emissions. The dehydration unit is equipped with a glowplug if the reboiler cycles off. The dehydration units each have a throughput of 87 MMscf/day.

Fugitives (EPN: FUG)
Fugitive emissions were estimated based on the TCEQ technical guidance document for "Equipment Fugitive Leaks" dated October 2000. The Oil and Gas Production Operations equipment leak emission factors approved by the TCEQ were used in the emissions estimations. The calculations consider each type of service and the corresponding projected source count. The emissions speciations were determined from site-specific gas analyses and ProMax backblend analyses.

Flare (EPN: FLARE)
The emission rates from the flare are based on the emission factors from the TCEQ Technical Guidance Package for Flares and Vapor Oxidizers dated October 2000. 98% destruction efficiency is assumed for the VOC and H_2S emissions. The SO_2 emissions are based on a material balance. The flare is smokeless, so no PM emissions are expected. Flows to the flare include pilot/purge gas, predictable startup and shutdown emissions resulting from power outages, operations at associated facilities that affect operations at the facility, or compressor shutdowns associated with the operations or maintenance conditions.

Truck Loading (EPN: LOAD)
Water is loaded into trucks using submerged fill. Maximum hourly emission rates are based on filling one truck (200-bbl each) in one hour. Annual emission rates are based on the annual water slop tank throughput. Emission rates are calculated according to the AP-42, Section 5.2 (dated June 2008) methodology.

Storage Vessels (EPNs: TK-FUG1, TK-FUG2, TK-S1)
Annual working and standing emission rates from the condensate, water, and slop tanks are based on the EPA's AP-42, Section 7.1. Flash emissions are calculated using the gas oil ratio (GOR) calculated from a ProMax simulation and taken from a flash gas analysis for the condensate slop tank (FIN: TK-S2, EPN: TK-FUG2). The color of the tanks are dark green, therefore a solar absorptance of 0.90 was used. Hourly condensate tank filling emissions are calculated using equations from AP-42, Section 7.1. Emissions from the condensate and water tanks (FIN: TK- 1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4) will be routed through a common vent line to a VRU system with redundant capacity (EPN: TK-FUG1). The 750-bbl condensate slop tank (FIN: TK-S2) will be routed through a common vent line to a VRU system (EPN: TK-FUG2). Emissions from the 100-bbl slop water tank (EPN: TK-S1) will vent to atmosphere. Emissions from all tanks are speciated using ProMax simulation results and the flash emissions from the condensate slop tank are speciated using the flash gas analysis.

Startup, Shutdown, and Maintenance (SSM) (EPNs: SITE-SSM, SSM)
Startup, Shutdown, and Maintenance (SSM) emissions are accounted for via individual calculations for SSM flaring, dehydrator blowdowns, VRU blowdowns, and compressor blowdowns (EPN SITE-SSM). An additional 10.0 tpy VOC buffer is included as allowed by the NMED SSM Guidance (EPN: SSM).

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)

MAXIMUM EMISSIONS (UNDER NORMAL OPERATING CONDITIONS)*

FIN	EPN	Description	VOC (includes HAPs)		CO		NO_x		SO_2		PM		PM10		PM2.5		Total HAP		H_2S	
			lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-1	ENG-1	CAT 3606	4.75	20.82	10.70	46.70	2.06	9.04	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	0.854	3.74	-	-
ENG-2	ENG-2	CAT 3606	4.75	20.82	10.70	46.70	2.06	9.04	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	0.854	3.74	-	-
ENG-3	ENG-3	CAT 3606	4.75	20.82	10.70	46.70	2.06	9.04	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	0.854	3.74	-	-
ENG-4	ENG-4	CAT 3606	4.75	20.82	10.70	46.70	2.06	9.04	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	0.854	3.74	-	-
HTR-1	HTR-1	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-2	HTR-2	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-3	HTR-3	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-4	HTR-4	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-5	HTR-5	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-6	HTR-6	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
REB-1	REB-1	TEG Reboiler	0.006	0.026	0.090	0.396	0.108	0.472	0.069	0.301	0.008	0.036	0.008	0.036	0.008	0.036	-	-	-	-
DHY-1, DHY-2	DHY-1	TEG Dehydrator	88.28	386.7	-	-	-	-	-	-	-	-	-	-	-	-	17.76	77.80	0.000	0.000
FLARE	FLARE	Pilot/Purge/Predictable SSM	33.46	5.62	51.72	8.79	12.99	2.21	0.144	0.632	-	-	-	-	-	-	1.54	0.368	0.001	2.4E-04
LOAD	LOAD	Truck Loading	0.341	0.039	-	-	-	-	-	-	-	-	-	-	-	-	0.010	0.001	1.5E-04	1.7E-05
TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4	TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4	Condensate and Water Tanks to Atmosphere	5471	23481	-	-	-	-	-	-	-	-	-	-	-	-	202.6	873.4	22.04	96.50
TK-S1	TK-S1	Water Slop Tank	0.024	0.081	-	-	-	-	-	-	-	-	-	-	-	-	7.2E-04	0.002	1.3E-07	4.4E-07
TK-S2	TK-S2	Condensate Slop Tank	15.0	66	-	-	-	-	-	-	-	-	-	-	-	-	0.78	3.4	0.01	0.06
FUG	FUG	Fugitives	6.18	27.01	-	-	-	-	-	-	-	-	-	-	-	-	0.329	1.44	1.3E-04	5.8E-04
SSM	SSM	SSM Activities	-	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SITE-SSM	SITE-SSM	SSM Activities	575.3	2.68	-	-	-	-	-	-	-	-	-	-	-	-	25.96	0.118	0.025	1.1E-04
		TOTALS	**6209**	**24062**	**96.8**	**205.5**	**23.92**	**50.17**	**3.09**	**13.52**	**0.717**	**3.15**	**0.717**	**3.15**	**0.717**	**3.15**	**252.4**	**971.6**	**22.08**	**96.56**

*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.

HAP EMISSION RATE SUMMARY

Unit ID		Description	Benzene		Toluene		Ethylbenzene		Xylene		n-Hexane		Formaldehyde		TOTAL	
			(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)
ENG-1	ENG-1	CAT 3606	0.006	0.025	0.005	0.023	5.1E-04	0.002	0.002	0.010	0.014	0.063	0.826	3.62	0.854	3.74
ENG-2	ENG-2	CAT 3606	0.006	0.025	0.005	0.023	0.001	0.002	0.002	0.010	0.014	0.063	0.826	3.620	0.854	3.74
ENG-3	ENG-3	CAT 3606	0.006	0.025	0.005	0.023	0.001	0.002	0.002	0.010	0.014	0.063	0.826	3.620	0.854	3.74
ENG-4	ENG-4	CAT 3606	0.006	0.025	0.005	0.023	0.001	0.002	0.002	0.010	0.014	0.063	0.826	3.620	0.854	3.74
HTR-1	HTR-1	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-2	HTR-2	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-3	HTR-3	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-4	HTR-4	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-5	HTR-5	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-6	HTR-6	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
REB-1	REB-1	TEG Reboiler	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
DHY-1, DHY-2	DHY-1	TEG Dehydrator	4.59	20.10	7.07	30.98	-	-	-	-	1.66	7.26	-	-	13.32	58.33
FLARE	FLARE	Pilot/Purge/Predictable SSM	0.145	0.051	0.166	0.054	0.016	0.033	0.060	0.039	1.16	0.190	-	-	1.54	0.368
LOAD	LOAD	Truck Loading	0.007	0.001	0.001	7.3E-05	0.001	8.5E-05	8.3E-05	9.5E-06	0.002	2.4E-04	-	-	0.010	0.001
TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4	TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4	Condensate and Water Tanks to Atmosphere	149.34	642.8	21.06	91.12	24.15	104.5	2.66	11.49	58.27	251.7	-	-	255.5	1102
TK-S1	TK-S1	Water Slop Tank	5.5E-04	0.002	5.9E-05	2.0E-04	8.9E-05	3.1E-04	9.1E-06	3.1E-05	2.1E-04	7.3E-04	-	-	9.2E-04	0.003
TK-S2	TK-S2	Condensate Slop Tank	0.57	2.49	0.10	0.45	0.09	0.39	0.01	0.02	0.23	1.02	-	-	1.00	4.4
FUG	FUG	Fugitives	0.023	0.099	0.063	0.276	0.018	0.080	0.051	0.221	0.174	0.762	-	-	0.329	1.44
SSM	SSM	SSM Activities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SITE-SSM	SITE-SSM	SSM Activities	2.37	0.011	2.73	0.012	0.15	0.001	0.911	0.004	19.80	0.090			25.96	0.118
		TOTALS	**157.1**	**665.6**	**31.22**	**123.0**	**24.43**	**105.0**	**3.69**	**11.82**	**81.35**	**261.3**	**3.30**	**14.48**	**301.1**	**1181**

ALLOWABLE EMISSIONS

PERMIT EMISSION RATE SUMMARY:

FIN	EPN	Description	VOC (includes HAPs)		CO		NO_x		SO_2		PM		PM10		PM2.5		Total HAP		H_2S	
			lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
ENG-1	ENG-1	CAT 3606	3.05	13.30	0.774	3.39	2.06	9.04	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	0.234	1.03	-	-
ENG-2	ENG-2	CAT 3606	3.05	13.30	0.774	3.39	2.06	9.04	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	0.234	1.03	-	-
ENG-3	ENG-3	CAT 3606	3.05	13.30	0.774	3.39	2.06	9.04	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	0.234	1.03	-	-
ENG-4	ENG-4	CAT 3606	3.05	13.30	0.774	3.39	2.06	9.04	0.306	1.34	0.128	0.564	0.128	0.564	0.128	0.564	0.234	1.03	-	-
HTR-1	HTR-1	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-2	HTR-2	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-3	HTR-3	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-4	HTR-4	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-5	HTR-5	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
HTR-6	HTR-6	Heater	0.024	0.104	0.362	1.59	0.431	1.89	0.275	1.20	0.033	0.144	0.033	0.144	0.033	0.144	-	-	-	-
REB-1	REB-1	TEG Reboiler	0.006	0.026	0.090	0.396	0.108	0.472	0.069	0.301	0.008	0.036	0.008	0.036	0.008	0.036	-	-	-	-
DHY-1, DHY-2	DHY-1	TEG Dehydrator	1.40	6.13	-	-	-	-	-	-	-	-	-	-	-	-	0.117	0.512	0.000	0.000
FLARE	FLARE	Pilot/Purge/Predictable SSM	33.46	5.62	51.72	8.79	12.99	2.21	0.144	0.632	-	-	-	-	-	-	1.54	0.368	0.001	2.4E-04
LOAD	LOAD	Truck Loading	0.341	0.039	-	-	-	-	-	-	-	-	-	-	-	-	0.010	0.001	1.5E-04	1.7E-05
TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4	TK-FUG1	Condensate and Water Tanks to Redundant VRUs	0.000	0.000	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000	0.000	0.000
TK-S1	TK-S1	Water Slop Tank Vented to Atmosphere	0.024	0.081	-	-	-	-	-	-	-	-	-	-	-	-	0.001	0.002	1.3E-07	4.4E-07
TK-S2	TK-FUG2	Condensate Slop Tank to Single VRU	0.75	3.3	-	-	-	-	-	-	-	-	-	-	-	-	0.04	0.17	0.000	0.000
FUG	FUG	Fugitives	6.18	27.01	-	-	-	-	-	-	-	-	-	-	-	-	0.329	1.44	1.3E-04	5.8E-04
SSM	SSM	SSM Activities	-	10.00	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SITE-SSM	SITE-SSM	SSM Activities	575.3	2.68	-	-	-	-	-	-	-	-	-	-	-	-	25.96	0.118	0.025	1.1E-04
		**TOTALS	**629.7**	**108.7**	**57.08**	**32.27**	**23.92**	**50.17**	**3.09**	**13.52**	**0.717**	**3.15**	**0.717**	**3.15**	**0.717**	**3.15**	**28.93**	**6.72**	**0.026**	**0.001**

**** Totals represent the hourly and annual maximum total PTEs for the various scenarios represented in Section 15.**

HAP EMISSION RATE SUMMARY

Unit ID	EPN	Description	Benzene		Toluene		Ethylbenzene		Xylene		n-Hexane		Formaldehyde		TOTAL	
			(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)	(lb/hr)	(tons/yr)
ENG-1	ENG-1	CAT 3606	0.006	0.025	0.005	0.023	5.1E-04	0.002	0.002	0.010	0.014	0.063	0.206	0.904	0.234	1.03
ENG-2	ENG-2	CAT 3606	0.006	0.025	0.005	0.023	0.001	0.002	0.002	0.010	0.014	0.063	0.206	0.904	0.234	1.03
ENG-3	ENG-3	CAT 3606	0.006	0.025	0.005	0.023	0.001	0.002	0.002	0.010	0.014	0.063	0.206	0.904	0.234	1.03
ENG-4	ENG-4	CAT 3606	0.006	0.025	0.005	0.023	0.001	0.002	0.002	0.010	0.014	0.063	0.206	0.904	0.234	1.03
HTR-1	HTR-1	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-2	HTR-2	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-3	HTR-3	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-4	HTR-4	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-5	HTR-5	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
HTR-6	HTR-6	Heater	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
REB-1	REB-1	TEG Reboiler	-	-	-	-	-	-	-	-	-	-	-	-	0.000	0.000
DHY-1, DHY-2	DHY-1	TEG Dehydrator	0.028	0.125	0.039	0.170	0.005	0.023	0.015	0.067	0.029	0.126	-	-	0.117	0.512
FLARE	FLARE	Pilot/Purge/Predictable SSM	0.145	0.051	0.166	0.054	0.016	0.033	0.060	0.039	1.16	0.190	-	-	1.54	0.368
LOAD	LOAD	Truck Loading	0.007	0.001	0.001	7.3E-05	0.001	8.5E-05	8.3E-05	9.5E-06	0.002	0.000	-	-	0.010	0.001
TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4	TK-FUG1	Condensate and Water Tanks to Redundant VRUs	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-	-	0.000	0.000
TK-S1	TK-S1	Water Slop Tank Vented to Atmosphere	5.5E-04	0.002	5.9E-05	2.0E-04	8.9E-05	3.1E-04	9.1E-06	3.1E-05	2.1E-04	7.3E-04	-	-	9.2E-04	0.003
TK-S2	TK-FUG2	Condensate Slop Tank to Single VRU	0.028	0.12	0.005	0.023	4.5E-03	0.02	0.000	0.001	0.01	0.05	-	-	0.05	0.22
FUG	FUG	Fugitives	0.023	0.099	0.063	0.276	0.018	0.080	0.051	0.221	0.174	0.762	-	-	0.329	1.44
SSM	SSM	SSM Activities	-	-	-	-	-	-	-	-	-	-	-	-	-	-
SITE-SSM	SITE-SSM	SSM Activities	2.37	0.011	2.73	0.012	0.146	0.001	0.911	0.004	19.80	0.090	-	-	25.96	0.118
		**TOTALS	**2.62**	**0.51**	**3.02**	**0.63**	**0.193**	**0.17**	**1.05**	**0.375**	**21.23**	**1.47**	**0.824**	**3.62**	**28.94**	**6.77**

**** Totals represent the hourly and annual maximum total PTEs for the various scenarios represented in Section 15.**

EMISSION ESTIMATE FOR GLYCOL SYSTEMS

The glycol still vent is routed through the condenser, reboiler, and glow plug for a total control efficiency of 99.6%. A control credit of 98% is applied to the flash tank vent emissions routed to the firebox of the reboiler equipped with a glowplug.

TEG Still Vent

Processing capacity: 87 MMSCFD
Total Control efficiency: 99.6%
Number of dehys: 2 , but only one operated at a time

Component	Uncontrolled Hourly Emissions lb/hr	Uncontrolled Annual Emissions ton/yr	Controlled Hourly Emissions lb/hr	Controlled Annual Emissions ton/yr
Hydrogen Sulfide	0.000	0.000	0.000	0.000
Methane	0.5070	2.221	0.002	0.009
Ethane	0.5053	2.213	0.002	0.009
Propane	1.1573	5.069	0.005	0.020
IsoButane	0.2982	1.306	0.001	0.005
N-Butane	1.0216	4.475	0.004	0.018
IsoPentane	0.3248	1.423	0.001	0.006
N-Pentane	0.4457	1.952	0.002	0.008
Other Hexanes	1.4142	6.194	0.006	0.025
Heptanes	0.5178	2.268	0.002	0.009
Octanes+	2.7876	12.210	0.011	0.049
n-Hexane	0.2701	1.183	0.001	0.005
Benzene	3.9564	17.329	0.016	0.069
Toluene	6.4129	28.088	0.026	0.112
Ethylbenzene	1.0338	4.5279	0.004	0.018
Xylene	3.2248	14.1246	0.013	0.056
TOTAL	**23.88**	**104.58**	**0.096**	**0.418**
TOTAL VOC	**22.87**	**100.15**	**0.091**	**0.401**
TOTAL HAP	**14.90**	**65.25**	**0.060**	**0.261**

Uncontrolled emissions based on GLYCalc simulation.

Flash Tank Vent

Processing capacity: 87 MMSCFD
Total control efficiency: 98.0%
Number of dehys: 2 , but only one operated at a time

Component	Uncontrolled Hourly Emissions lb/hr	Uncontrolled Annual Emissions ton/yr	Post-Control Hourly Emissions lb/hr	Post-Control Annual Emissions ton/yr
Hydrogen Sulfide	0.0000	0.0000	0.000	0.000
Methane	118.8903	520.7397	2.38	10.41
Ethane	35.4291	155.1794	0.709	3.10
Propane	31.1280	136.3406	0.623	2.73
Isobutane	5.2959	23.1959	0.106	0.464
n-Butane	13.6126	59.6233	0.272	1.19
Isopentane	3.8177	16.7215	0.076	0.334
n-Pentane	4.1580	18.2118	0.083	0.364
n-Hexane	1.3873	6.0762	0.028	0.122
Other Hexanes	2.5310	11.0857	0.051	0.222
Heptanes	1.2576	5.5085	0.025	0.110
Benzene	0.6326	2.7706	0.013	0.055
Toluene	0.6593	2.8876	0.013	0.058
Ethylbenzene	0.0608	0.2665	0.001	0.005
Xylenes	0.1238	0.5423	0.002	0.011
C8+ Heavies	0.7477	3.2740	0.015	0.065
TOTAL	**219.73**	**962.42**	**4.39**	**19.25**
TOTAL VOC	**65.4123**	**286.5045**	**1.31**	**5.73**
TOTAL HAP	**2.8638**	**12.5432**	**0.057**	**0.251**

Uncontrolled emissions based on GLYCalc simulation

FUGITIVE EMISSION RATE CALCULATIONS

EPN: FUG
Operating schedule (hr/yr): 8760

Fugitive Emission Calculations:

Emission Source		Source Count	Uncontrolled Emission Factor * (lb/hr-source)	Uncontrolled Hourly Emissions (lb/hr)	Uncontrolled Annual Emissions (ton/yr)	Control Factor	Hourly Emissions (lb/hr)	Annual Emissions (ton/yr)
Valves:	gas	625	0.00992	6.2	27.2	0%	6.20	27.20
	light oil	441	0.0055	2.43	10.6	0%	2.43	10.60
	heavy oil	0	0.0000185	0	0	0%	0.000	0.000
	water/light oil	577	0.000216	0.125	0.548	0%	0.125	0.548
Flanges:	gas	1085	0.00086	0.933	4.09	0%	0.933	4.09
	light oil	718	0.000243	0.174	0.762	0%	0.174	0.762
	heavy oil	0	0.00000086	0	0	0%	0.000	0.000
	water/light oil	834	0.0000064	0.00534	0.0234	0%	0.005	0.023
Connectors:	gas	1558	0.00044	0.686	3	0%	0.686	3.00
	light oil	889	0.000463	0.412	1.8	0%	0.412	1.80
	heavy oil	0	0.0000165	0	0	0%	0.000	0.000
	water/light oil	896	0.000243	0.218	0.955	0%	0.218	0.955
Open-ended Lines:	gas	0	0.00441	0	0	0%	0.000	0.000
	light oil	0	0.00309	0	0	0%	0.000	0.000
	heavy oil	0	0.000309	0	0	0%	0.000	0.000
	water/light oil	0	0.0006	0	0	0%	0.000	0.000
Pumps:	light oil	1	0.02866	0.0287	0.126	0%	0.029	0.126
	heavy oil	0	0.00113	0	0	0%	0.000	0.000
	water/light oil	6	0.000053	0.000318	0.00139	0%	3.2E-04	0.001
Other:	gas	57	0.0194	1.11	4.86	0%	1.11	4.86
	light oil	0	0.0165	0	0	0%	0.000	0.000
	heavy oil	0	0.0000683	0	0	0%	0.000	0.000
	water/light oil	0	0.031	0	0	0%	0.000	0.000

Sample Calculations:

Gas Valve Emissions = (625 valves)(0.00992 lb/hr-source)(1 - 0)
= 6.2 lb/hr

Gas Valve Annual Emissions = (6.2 lb/hr)(8760 hr/yr)(1 ton/2000 lb)
= 27.16 tons/yr

* The emission factors are from the TCEQ's 2000 "Equipment Leak Fugitives" for Oil and Gas Production Operations.

FUGITIVE EMISSION RATE SPECIATION

Gas Speciation:

Component*	Weight Percent	Uncontrolled Hourly Emissions (lb/hr)	Uncontrolled Annual Emissions (tons/yr)
Total	100.0%	8.93	39.15
Hydrogen Sulfide	0.001%	1.2E-04	0.001
Nitrogen	1.683%	0.150	0.659
Carbon Dioxide	10.709%	0.956	4.19
Methane	43.352%	3.87	16.97
Ethane	12.675%	1.13	4.96
Propane	11.850%	1.06	4.64
i-Butane	2.359%	0.211	0.924
n-Butane	6.315%	0.564	2.47
i-Pentane	2.136%	0.191	0.836
n-Pentane	2.560%	0.229	1.00
n-Hexane	1.087%	0.097	0.426
Benzene	0.130%	0.012	0.051
Toluene	0.150%	0.013	0.059
Ethylbenzene	0.008%	0.001	0.003
Xylene	0.050%	0.004	0.020
TOTAL VOC	**31.6%**	**2.82**	**12.36**
TOTAL HAP	**1.43%**	**0.127**	**0.558**

From Salado Draw 23 Compressor Station, Inlet Separator, Date Sampled 07/20/2021. 10 ppm H2S conservatively added.

Light Oil Speciation:

Component	Weight Percent	Uncontrolled Hourly Emissions (lb/hr)	Uncontrolled Annual Emissions (tons/yr)
Total	100%	3.04	13.29
Hydrogen Sulfide	0.000%	1.1E-05	4.8E-05
Nitrogen	0.008%	2.4E-04	0.001
Carbon Dioxide	0.176%	0.005	0.023
Methane	0.366%	0.011	0.049
Ethane	0.521%	0.016	0.069
Propane	1.368%	0.042	0.182
i-Butane	0.542%	0.017	0.072
n-Butane	1.968%	0.060	0.262
i-Pentane	1.565%	0.048	0.208
n-Pentane	2.213%	0.067	0.294
Hexanes	2.453%	0.075	0.326
Heptanes	5.124%	0.156	0.681
Octanes plus	77.747%	2.37	10.33
n-Hexane	2.274%	0.069	0.302
Benzene	0.326%	0.010	0.043
Toluene	1.468%	0.045	0.195
Ethylbenzene	0.518%	0.016	0.069
Xylene	1.361%	0.041	0.181
TOTAL VOC	**98.9%**	**3.01**	**13.15**
TOTAL HAP	**5.95%**	**0.181**	**0.79**

From Salado Draw 23 Central Tank Battery, Train 3 Inlet Separator Hydrocarbon Liquid, Date Sampled 07/20/2021. 10 ppm H2S conservatively add

Heavy Oil Speciation:

Component	Weight Percent	Uncontrolled Hourly Emissions (lb/hr)	Uncontrolled Annual Emissions (tons/yr)
TOTAL	100.00%	0.000	0.000
TEG	100.00%	0.000	0.000
LUBE OILS	100.00%	0.000	0.000
Antifreeze (EG)	100.00%	0.000	0.000

Water/Light Oil Speciation:

Component	Weight Percent	Uncontrolled Hourly Emissions (lb/hr)	Uncontrolled Annual Emissions (tons/yr)
Total	100.0%	0.349	1.53
Hydrogen Sulfide	0.000%	1.3E-06	5.5E-06
Nitrogen	0.008%	2.8E-05	1.2E-04
Carbon Dioxide	0.176%	0.001	0.003
Methane	0.366%	0.001	0.006
Ethane	0.521%	0.002	0.008
Propane	1.368%	0.005	0.021
i-Butane	0.542%	0.002	0.008
n-Butane	1.968%	0.007	0.030
i-Pentane	1.565%	0.005	0.024
n-Pentane	2.213%	0.008	0.034
Hexanes	2.453%	0.009	0.037
Heptanes	5.124%	0.018	0.078
Octanes plus	77.747%	0.271	1.19
n-Hexane	2.274%	0.008	0.035
Benzene	0.326%	0.001	0.005
Toluene	1.468%	0.005	0.022
Ethylbenzene	0.518%	0.002	0.008
Xylene	1.361%	0.005	0.021
Water	0.000%	0.000	0.000
TOTAL VOC	**98.9%**	**0.345**	**1.51**
TOTAL HAP	**5.95%**	**0.021**	**0.091**

From Salado Draw 23 Central Tank Battery, Train 3 Inlet Separator Hydrocarbon Liquid, Date Sampled 07/20/2021. 10 ppm H2S conservatively add

Total Fugitive Speciated Emissions:

Component	Uncontrolled Hourly Emissions (lb/hr)	Uncontrolled Annual Emissions (ton/yr)
Total	12.32	53.97
Hydrogen Sulfide	1.3E-04	0.001
Nitrogen	0.151	0.660
Carbon Dioxide	0.962	4.22
Methane	3.88	17.03
Ethane	1.15	5.04
Propane	1.10	4.84
i-Butane	0.229	1.00
n-Butane	0.631	2.76
i-Pentane	0.244	1.07
n-Pentane	0.304	1.33
Hexanes	0.262	1.15
Heptanes	0.435	1.90
Octanes plus	2.64	11.52
n-Hexane	0.174	0.762
Benzene	0.023	0.099
Toluene	0.063	0.276
Ethylbenzene	0.018	0.080
Xylene	0.051	0.221
Water	0.000	0.000
TEG	0.000	0.000
TOTAL VOC	**6.18**	**27.01**
TOTAL HAP	**0.329**	**1.44**

EMISSION ESTIMATES FOR FLARE

Pilot/Sweep Flare Flows, EPN: FLARE

Flare Control Efficiency:	98%	
Standard Gas Volume:	385	scf/lb-mol
Pilot/Sweep Gas Flow Rate:	570	scf/hr
Gas Flow Rate:	33.73	lb/hr

	Pilot/Sweep Gas		Total Stream
Component*	lb/hr	ton/yr	Wt%
Hydrogen Sulfide	0.0005	0.002	0.001%
Nitrogen	0.5666	2.48	1.680%
Carbon Dioxide	3.61	15.81	10.70%
Methane	14.62	64.04	43.35%
Ethane	4.25	18.61	12.600%
Propane	4.00	17.50	11.850%
IsoButane	0.793	3.47	2.350%
N-Butane	2.125	9.31	6.300%
IsoPentane	0.708	3.10	2.100%
N-Pentane	0.863	3.78	2.560%
n-Hexane	0.367	1.61	1.087%
Benzene	0.367	1.61	0.130%
Toluene	0.367	1.61	0.150%
Ethylbenzene	0.367	1.61	0.008%
Xylene	0.367	1.61	0.050%
Total	**35.0**	**153.3**	**99.8%**
Total VOC	**11.96**	**52.37**	**31.45%**
Total H2S	**0.0005**	**0.002**	**0.001%**
Total HAP	**1.833**	**8.03**	**1.43%**

	MW	LHV	Total Emissions to Flare				Total Emissions from Flare	
Component	lb/lb-mol	Btu/scf	scf/hr	scf/yr	MMBtu/hr	MMBtu/yr	lb/hr	ton/yr
Hydrogen Sulfide	34.08	637	0.005	45.3	3.3E-06	0.029	9.2E-06	4.0E-05
Nitrogen	28.01	0	7.8	6.8E+04	0.0E+00	0.0E+00	0.011	0.050
Carbon Dioxide	44.01	0	31.6	2.8E+05	0.0E+00	0.0E+00	0.072	0.316
Methane	16.04	909	351	3070000	0.319	2790	0.292	1.28
Ethane	30.07	1618	54.4	477000	0.088	770	0.085	0.372
Propane	44.1	2316	34.90	306000	0.080	710	0.080	0.350
IsoButane	58.12	3011	5.25	46000	0.016	140	0.016	0.069
N-Butane	58.12	3011	14.10	123000	0.040	370	0.042	0.186
IsoPentane	72.15	3707	3.78	33100	0.014	120	0.014	0.062
N-Pentane	72.15	3707	4.61	40400	0.017	150	0.017	0.076
n-Hexane	86.18	4404	1.64	14300	0.007	63	0.007	0.032
Benzene	78.11	3591	1.810	15800	0.007	57.0	0.007	0.032
Toluene	92.14	4274	1.530	13400	0.007	57.0	0.007	0.032
Ethylbenzene	106.17	4971	1.330	11600	0.007	58.0	0.007	0.032
Xylene	106.17	4957	1.330	11600	0.007	58.0	0.007	0.032
Total	--	**1150**	**521.8**	**4507445**	**0.600**	**5343**	**0.700**	**3.07**
Total VOC	--	--	--	--	--	--	**0.239**	**1.05**
Total H2S	--	--	--	--	--	--	**9.2E-06**	**4.0E-05**
Total HAP	--	--	--	--	--	--	**0.037**	**0.161**

			Emissions from Flare	
Component	Emission Factor		lb/hr	ton/yr
NOx	0.138	lb/MMBtu*	0.083	0.369
CO	0.5496	lb/MMBtu*	0.330	1.468
SO2	Material balance		0.001	0.004

* Most conservative of the high- or low-Btu emission factors for non-steam assisted flares from TCEQ's October 2000 "Flares and Vapor Oxidizers" guidance document.

Flare Parameters

LHV of Flared Gas	1150	**Btu/scf**
Flared Gas Flow Rate	521.8	**scf/hr**
Flared Gas Vapor Molecular Weight	25.1	**lb/lb-mol**
H2S in Flared Gas	4.6E-04	**lb/hr**

Flare Heat Release

[(1150 Btu/scf)(522scfh)]
= 600,000 Btu/hr

EMISSION ESTIMATES FOR FLARE

Predictable SSM Flare Flows, EPN: FLARE

Flare Control Efficiency:	98%	
Standard Gas Volume:	385	scf/lb-mol
Hourly SSM Gas Flow Rate:	89200	scf/hr
Hourly SSM Gas Flow Rate:	5282	lb/hr
Annual SSM Gas Flow Rate:	25.08	MMscf/yr

Component*	SSM Gas Rate lb/hr	SSM Gas Rate ton/yr	Total Stream Wt%
Hydrogen Sulfide	0.072	0.010	0.001%
Nitrogen	88.746	12.220	1.68%
Carbon Dioxide	565.227	77.832	10.70%
Methane	2289.961	315.328	43.35%
Ethane	665.594	91.652	12.60%
Propane	625.975	86.197	11.85%
IsoButane	124.139	17.094	2.35%
N-Butane	332.797	45.826	6.30%
IsoPentane	110.932	15.275	2.10%
N-Pentane	135.232	18.621	2.56%
n-Hexane	57.42	7.907	1.09%
Benzene	6.87	0.946	0.13%
Toluene	7.92	1.091	0.15%
Ethylbenzene	0.42	0.058	0.01%
Xylene	2.64	0.364	0.05%
Total	**5270.68**	**725.77**	**99.8%**
Total VOC	**1661**	**228.731**	**31.45%**
Total H2S	**0.072**	**0.010**	**0.001%**
Total HAP	**75**	**10.365**	**1.43%**

Component	MW lb/lb-mol	LHV Btu/scf	Total Emissions to Flare scf/hr	scf/yr	MMBtu/hr	MMBtu/yr	Total Emissions from Flare lb/hr	ton/yr
Hydrogen Sulfide	34.08	637	0.810	223	5.16E-04	0.142	0.001	2.0E-04
Nitrogen	28.01	0	1220	336000	0.00E+00	0.0E+00	1.77	0.244
Carbon Dioxide	44.01	0	4940	1360000	0.00E+00	0.0E+00	11.30	1.56
Methane	16.04	909	55000	15100000	50.000	13700	45.80	6.31
Ethane	30.07	1618	8500	2350000	13.750	3800	13.31	1.83
Propane	44.1	2316	5460	1510000	12.600	3500	12.52	1.72
IsoButane	58.12	3011	822	226000	2.470	680	2.48	0.342
N-Butane	58.12	3011	2205	607000	6.640	1830	6.66	0.92
IsoPentane	72.15	3707	592	163000	2.200	604	2.22	0.306
N-Pentane	72.15	3707	722	199000	2.680	738	2.70	0.372
n-Hexane	86.18	4404	257	70600	1.100	311	1.15	0.158
Benzene	78.11	3591	33.80	9320.00	0.12	33.50	0.137	0.019
Toluene	92.14	4274	33.00	9120.00	0.14	39.00	0.158	0.022
Ethylbenzene	106.17	4971	1.50	422.00	0.01	2.10	0.008	0.001
Xylene	106.17	4957	9.58	2640.00	0.05	13.10	0.053	0.007
Total	--	**1156**	**80848.7**	**22233325**	**93.50**	**26639**	**105.4**	**14.52**
Total VOC	--	--	--	--	--	--	**33.22**	**4.57**
Total H2S	--	--	--	--	--	--	**0.001**	**2.0E-04**
Total HAP	--	--	--	--	--	--	**1.51**	**0.207**

Component	Emission Factor		Emissions from Flare lb/hr	ton/yr
NOx	0.138	lb/MMBtu*	12.90	1.84
CO	0.5496	lb/MMBtu*	51.39	7.32
SO2	Material balance		0.143	0.628

* Most conservative of the high- or low-Btu emission factors for non-steam assisted flares from TCEQ's October 2000 "Flares and Vapor Oxidizers" guidance document.

Flare Parameters

LHV of Flared Gas	1156	**Btu/scf**
Flared Gas Flow Rate	80848.7	**scf/hr**
Flared Gas Vapor Molecular Weight	25.1	**lb/lb-mol**
H2S in Flared Gas	7.2E-02	**lb/hr**

Flare Heat Release

[(1156 Btu/scf)(80800scfh)]
= 93,500,000 Btu/hr

Engine Emissions Calculator

CAT 3606, EPN ENG-1 thru ENG-4

INPUT DATA

Engine Manufacturer and Model No.	CAT 3606	(Uncontrolled)
Facility Identification Number (FIN)	ENG-1 thru ENG-4	
Emission Point Number (EPN)	ENG-1 thru ENG-4	
Control Identification Number (CIN)		
UTM Zone		
UTM Easting (m)		
UTM Northing (m)		

ENGINE DATA

Design Horsepower (hp)	1875
Operating Horsepower (hp)	1875
Fuel Consumption (Btu/hp-hr)	6875
Stack Diameter (ft)	1.65
Stack Height (ft)	29
Exit Temperature °F	831
Operating Schedule (hr/yr)	8760
Engine Type (2 cycle or 4 cycle)	4 cycle
Rich or Lean Burn (rich/lean)	Lean
NO_x Catalytic Converter (yes/no)	No
Oxidative Catalytic Converter (CO, VOC, Formaldehyde Control) (yes/no)	Yes

EMISSION FACTORS

Source of Emission Factors			
Emission Factor Basis (% load)	100		
NO_x Emission Factor (g/hp-hr)	0.50		
CO Emission Factor (g/hp-hr)	2.58		
VOC Emission Factor (g/hp-hr)	0.95		
SO_2 Emission Factor (gr total sulfur/100 scf fuel gas)	10		
PM Emission Factor (g/hp-hr)	0.031		
n-Hexane Emission Factor (g/hp-hr)	0.003		
Formaldehyde Emission Factor (g/hp-hr)	0.200		
Benzene Emission Factor (g/hp-hr)	0.001		
Toluene Emission Factor (g/hp-hr)	0.001		
Ethylbenzene Emission Factor (g/hp-hr)	0.0001		
Xylene Emission Factor (g/hp-hr)	0.0006		

PROCESS AIR DATA

Air-to-Fuel Ratio (lb/lb): 21.5

If no air-to-fuel ratio is entered, the calculated stoichiometric air-to-fuel ratio will be used in the calculations.

FUEL GAS BASIS

Basis of Heating Value Specified for Firing Capacity (LHV/HHV): LHV

(LHV - Lower Heating Value, HHV - Higher Heating Value)

MISCELLANEOUS BASIS

Horsepower (hp) is the same as brake horsepower (bhp).

All calculations are based on the standard conditions of 60°F and 1 atm.

NOTES

NOx, CO, VOC, and Formaldehyde emission factors are from the Gas Engine Rating Pro engine spec sheet.
VOC emission factor does not include Formaldehyde.
The PM, n-Hexane, Benzene, Toluene, Ethylbenzene, and Xylene emission factors are from AP-42, Table 3.2-2, July 2000.
Example calculation:
PM factor from AP-42, Table 3.2-2 for filterable and cond. condition [(.0000771+.00991 lb/MMBtu)*(6875 Btu/hp-hr)*(454 g/lb)/(10^6) = 0.031 g/hp-hr]
SO2 emission factor conservatively estimated as 10 gr/100 dscf.

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INPUT DATA CONTINUED (CAT 3606, EPN ENG-1 thru ENG-4)

NATURAL GAS FIRING FUEL DATA

Fuel Gas Composition				Pure Component Data			Fuel Gas Component Data		
			(A)	(B) Molecular	(C)	(D)	(A) X (B)	(A) X (C) Btu (HHV)	(A) X (D) Btu (LHV)
Formula	Name	Mole %	Mole Fraction	Weight (lb/lb-mol)	HHV * (Btu/scf)	LHV * (Btu/scf)	lb/lb-mol Fuel Gas	per scf Fuel Gas	per scf Fuel Gas
CH4	Methane	67.91	0.6791	16.04	1012	911	10.89	687.25	618.66
C2H6	Ethane	10.59	0.1059	30.07	1773	1622	3.18	187.76	171.77
C3H8	Propane	6.75	0.0675	44.09	2524	2322	2.98	170.37	156.74
C4H10	n-Butane	2.72	0.0272	58.12	3271	3018	1.58	88.97	82.09
i-C4H10	Isobutane	1.02	0.0102	58.12	3261	3009	0.59	33.26	30.69
n-C5H12	n-Pentane	0.890	0.0089	72.15	4020	3717	0.64	35.78	33.08
i-C5H12	Isopentane	0.744	0.0074	72.15	4011	3708	0.53	29.68	27.44
C6H14	n-Hexane	0.317	0.0032	86.17	4768	4415	0.28	15.26	14.13
C7H16	n-Heptane	1.309	0.0131	100.20	5503	5100	1.31	72.09	66.81
C6H6	Benzene	0.043	0.0004	78.11	3752	3601	0.03	1.50	1.44
C7H8	Toluene	0.042	0.0004	92.13	4486	4285	0.04	1.79	1.71
C8H10	Xylene	0.012	0.0001	106.16	5230	4980	0.01	0.52	0.50
H2S	Hydrogen Sulfide	0.001	0.0000	34.08	646	595	0.00	0.00	0.00
H2O	Water Vapor	0.000	0.0000	18.02	0	0	0.00	0.00	0.00
N2	Nitrogen	1.51	0.0151	28.01	0	0	0.42	0.00	0.00
CO2	Carbon Dioxide	6.11	0.0611	44.01	0	0	2.69	0.00	0.00
TOTAL		100	0.9996				25.17	1324	1205

Fuel Gas From Salado Draw 23 Compressor Station, Inlet

* HHV/LHV data are from *Steam, Its Generation and Use* (Babcock & Wilcox, 1972); HHV/LHV data for C7H16 are from Engineering *Data Book* (Gas Processors Suppliers Association, Ninth Edition, as revised 1979).

FUEL FLOW RATE CALCULATIONS

Using the fuel gas molecular weight of 25.17 lb/lb-mol and a heating value of 1205.06 Btu/scf (based on LHV), the fuel flow rate is calculated as follows:

$$\text{Fuel Flow} = \frac{(1875\ \text{hp})(6875\ \text{Btu/hp-hr})(25.17\ \text{lb/lb-mol})}{(379\ \text{scf fuel/lb-mol})(1205.06\ \text{Btu/scf fuel})} = 710\ \text{lb fuel/hr}$$

$$= \frac{(710\ \text{lb fuel/hr})}{(25.17\ \text{lb fuel/lb-mol})} = 28.2\ \text{lbmol/hr}$$

$$= \frac{(710\ \text{lb fuel/hr})(379\ \text{scf/lb-mol})}{(25.17\ \text{lb fuel/lb-mol})} = 10700\ \text{scf/hr}$$

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

STOICHIOMETRIC CALCULATIONS

Assuming complete combustion, the combustion products are determined as follows:

Fuel Composition and Flow Rate				Stoichiometric Oxygen Requirement		Stoichiometric Carbon Dioxide Production		Stoichiometric Water Production	
Formula	Mole %	(A) Mole Fraction	(B)* Flow Rate lb-mol/hr	(C) lb-mol/ lb-mol fuel	(B) X (C) lb-mol/hr	(D) lb-mol/ lb-mol fuel	(B) X (D) lb-mol/hr	(E) lb-mol/ lb-mol fuel	(B) X (E) lb-mol/hr
CH4	67.91	0.6791	19.151	2.0	38.302	1.0	19.151	2.0	38.302
C2H6	10.59	0.1059	2.986	3.5	10.451	2.0	5.972	3.0	8.958
C3H8	6.75	0.0675	1.904	5.0	9.520	3.0	5.712	4.0	7.616
C4H10	2.72	0.0272	0.767	6.5	4.986	4.0	3.068	5.0	3.835
i-C4H10	1.02	0.0102	0.288	6.5	1.872	4.0	1.152	5.0	1.440
n-C5H12	0.89	0.0089	0.251	8.0	2.008	5.0	1.255	6.0	1.506
i-C5H12	0.74	0.0074	0.209	8.0	1.672	5.0	1.045	6.0	1.254
C6H14	0.32	0.0032	0.090	9.5	0.855	6.0	0.540	7.0	0.630
N2	1.51	0.0151	0.426	0.0	0.000	0.0	0.000	0.0	0.000
CO2	6.11	0.0611	1.723	0.0	0.000	0.0	0.000	0.0	0.000
TOTAL	100	0.9996	28.19		73.94		40.6		66.6

* (B) = (A) X (28.2 lb-mol/hr)

Sample calculation for CH4 fuel flow rate:

CH4 Fuel Flow Rate = (28.2 lb-mol fuel/hr)(0.6791 lb-mol CH4/lb-mol fuel) = 19.2 lb-mol/hr

The stoichiometric air-to-fuel ratio can be determined as follows:

$$\text{Air/Fuel (by weight)} = \frac{(73.94 \text{ lb-mol } O_2/\text{hr})(29 \text{ lb/lb-mol air})}{(28.2 \text{ lb-mol fuel/hr})(0.21 \text{ lb-mol } O_2/\text{lb-mol air})(25.17 \text{ lb/lb-mol fuel})} = 14.4 \text{ lb air/ lb fuel}$$

The air-to-fuel ratio data supplied by the manufacturer will be used in the remaining calculations unless the calculated stoichiometric air-to-fuel ratio is higher. If the calculated stoichiometric air-to-fuel ratio is higher, it will be used in the remaining calculations.

Air Flow (Total) = (710 lb/hr fuel) (21.5 lb air/lb fuel) = 15300 lb/hr air

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

EXHAUST FLOW CALCULATION

From the total fuel combustion products (with excess air), the total exhaust flow rate is determined to be:

N2 Flow (In/Out) = $\frac{(15300 \text{ lb/hr air})(0.79 \text{ lb-mol N2/lb-mol air})}{(29 \text{ lb/lb-mol air})}$ = 417 lb-mol N2/hr

O2 Flow (In) = $\frac{(15300 \text{ lb/hr air})(0.21 \text{ lb-mol O2/lb-mol air})}{(29 \text{ lb/lb-mol air})}$ = 111 lb-mol O2/hr

O2 Flow (Out) = (111 lb-mol/hr O2) - (73.94 lb-mol/hr O2) = 37.1 lb-mol O2/hr

Exhaust Components	From Air (lb-mol/hr)	From Fuel (lb-mol/hr)	From Combustion (lb-mol/hr)	Total (lb-mol/hr)	(A) Mole Fraction Wet Basis	(B) Component MW (lb/lb-mol)	(A) X (B) Exhaust MW (lb/lb-mol)	Mole Fraction Dry Basis
Nitrogen	417.00	0.426	0.00	417.43	0.741	28.01	20.76	0.840
Oxygen	111.00	0.000	- 73.94	37.06	0.066	32.00	2.11	0.075
Carbon Dioxide	0.00	1.723	40.65	42.37	0.075	44.01	3.3	0.085
Water	0.00	0.000	66.59	66.59	0.118	18.02	2.13	0.000
TOTAL				563.5	1.000		28.3	1.000

Total Flow = (563.45 lb-mol/hr) (28.3 lb/lb-mol) = 15900 lb/hr

Exhaust Flow = $\frac{(563.45 \text{ lb-mol/hr})(379 \text{ scf/lb-mol})(1291°R \text{ (actual)})}{(60 \text{ min/hr})(520°R \text{ (standard)})}$ = 8840 acfm @ 831°F

STACK EXIT VELOCITY CALCULATION

Area of Stack = $\frac{\pi D^2}{4} = \frac{(3.1416)(1.65 \text{ ft})^2}{4}$ = 2.14 ft²

Stack Velocity = $\frac{(8840 \text{ ft}^3/\text{min})}{(2.14 \text{ ft}^2)(60 \text{ sec/min})}$ = 68.8 ft/sec

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

EMISSION RATE CALCULATIONS

The short-term emission rates are based on a combination of the emission factor and corresponding load that provides the peak emission rate. The long-term emission rates are based on the emission factors for 100% load.

	Short-Term		Long-Term	
Component	Factors	Basis	Factors	Basis
NOx	0.5 g/hp-hr	100 % load	0.5 g/hp-hr	100 % load
CO	2.58 g/hp-hr	100 % load	2.58 g/hp-hr	100 % load
VOC	0.95 g/hp-hr	100 % load	0.95 g/hp-hr	100 % load
SO2	10 gr S/100 scf	100 % load	10 gr S/100 scf	100 % load
PM	0.031 g/hp-hr	100 % load	0.031 g/hp-hr	100 % load
n-Hexane	0.00346 g/hp-hr	100 % load	0.00346 g/hp-hr	100 % load
Formaldehyde	0.2 g/hp-hr	100 % load	0.2 g/hp-hr	100 % load
Benzene	0.0014 g/hp-hr	100 % load	0.0014 g/hp-hr	100 % load
Toluene	0.00127 g/hp-hr	100 % load	0.00127 g/hp-hr	100 % load
Ethylbenzene	0.0001239 g/hp-hr	100 % load	0.0001239 g/hp-hr	100 % load
Xylene	0.000574 g/hp-hr	100 % load	0.000574 g/hp-hr	100 % load

The following emission rate calculations are based on the operating hp data.

NOx :

Short-term = $\frac{(1875\ hp)(0.5\ g\ NOx/hp\text{-}hr)(100\%\ load)}{(100\%)(454\ g/lb)}$ = 2.06 lb/hr

Long-term = $\frac{(1875\ hp)(0.5\ g\ NOx/hp\text{-}hr)(100\%\ load)(8760\ hr/yr)}{(100\%)(454\ g/lb)(2{,}000\ lb/ton)}$ = 9.04 tons/yr

CO:

Short-term = $\frac{(1875\ hp)(2.58\ g\ CO/hp\text{-}hr)(100\%\ load)}{(100\%)(454\ g/lb)}$ = 10.7 lb/hr

Long-term = $\frac{(1875\ hp)(2.58\ g\ CO/hp\text{-}hr)(100\%\ load)(8760\ hr/yr)}{(100\%)(454\ g/lb)(2{,}000\ lb/ton)}$ = 46.7 tons/yr

VOC:

Short-term = $\frac{(1875\ hp)(0.95\ g\ VOC/hp\text{-}hr)(100\%\ load)}{(100\%)(454\ g/lb)}$ = 3.92 lb/hr

Long-term = $\frac{(1875\ hp)(0.95\ g\ VOC/hp\text{-}hr)(100\%\ load)(8760\ hr/yr)}{(100\%)(454\ g/lb)(2{,}000\ lb/ton)}$ = 17.2 tons/yr

SO2 : Based on SO2 emission factor

Short-term = $\frac{(10\ gr\ S/100\ scf)(2\ lb\ SO2/lb\ S)(10700\ scf/hr\ fuel)}{(7{,}000\ gr/lb)}$ = 0.306 lb/hr

Long-term = $\frac{(0.306\ lb/hr\ SO2)(8760\ hr/yr)}{(2{,}000\ lb/ton)}$ = 1.34 tons/yr

SO2: Based on H2S content in fuel

Short-term = $\frac{(0\ lb\text{-}mol/hr\ H2S)(34.08\ lb/lb\text{-}mol\ H2S)(64.1\ lb/lb\text{-}mol\ SO2)}{(34.08\ lb/lb\text{-}mol\ H2S)(1\ lb\text{-}mol\ H2S/1\ lb\text{-}mol\ SO2)}$ = 0 lb/hr

Long-term = $\frac{(0\ lb/hr\ SO2)(8760\ hr/yr)}{(2{,}000\ lb/ton)}$ = 0 ton/yr

Since the emission estimates from the SO2 emission factor are greater, they will represent the SO2 emission rates from this source.

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

EMISSION RATE CALCULATIONS CONTINUED

PM :

Short-term = (1875 hp) (0.031 g PM/hp-hr) (100% load) / (100%) (454 g/lb) = 0.128 lb/hr

Long-term = (1875 hp) (0.031 g PM/hp-hr) (100% load) (8760 hr/yr) / (100%) (454 g/lb)(2,000 lb/ton) = 0.564 ton/yr

n-Hexane :

Short-term = (1875 hp × 0.00346 g/hp-hr × 100 % load × lb/454 g) / 100 % = 0.0143 lb/hr

Long-term = (1875 hp × 0.00346 g/hp-hr × 100 % load × lb/454 g × ton/2000 lb × 8760 hr/yr) / 100 % = 0.0626 ton/yr

Formaldehyde :

Short-term = (1875 hp) (0.2 g formaldehyde/hp-hr) (100% load) / (100%) (454 g/lb) = 0.826 lb/hr

Long-term = (1875 hp)(0.2 g formaldehyde/hp-hr)(100% load)(8760 hr/yr) / (100%) (454 g/lb)(2,000 lb/ton) = 3.62 tons/yr

Benzene :

Short-term = (1875 hp × 0.0014 g/hp-hr × 100 % load × lb/454 g) / 100 % = 0.0058 lb/hr

Long-term = (1875 hp × 0.0014 g/hp-hr × 100 % load × lb/454 g × ton/2000 lb × 8760 hr/yr) / 100 % = 0.0253 ton/yr

Toluene :

Short-term = (1875 hp × 0.00127 g/hp-hr × 100 % load × lb/454 g) / 100 % = 0.00525 lb/hr

Long-term = (1875 hp × 0.00127 g/hp-hr × 100 % load × lb/454 g × ton/2000 lb × 8760 hr/yr) / 100 % = 0.023 ton/yr

Ethylbenzene :

Short-term = (1875 hp × 0.0001239 g/hp-hr × 100 % load × lb/454 g) / 100 % = 0.000512 lb/hr

Long-term = (1875 hp × 0.0001239 g/hp-hr × 100 % load × lb/454 g × ton/2000 lb × 8760 hr/yr) / 100 % = 0.00224 ton/yr

Xylene :

Short-term = (1875 hp × 0.000574 g/hp-hr × 100 % load × lb/454 g) / 100 % = 0.00237 lb/hr

Long-term = (1875 hp × 0.000574 g/hp-hr × 100 % load × lb/454 g × ton/2000 lb × 8760 hr/yr) / 100 % = 0.0104 ton/yr

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

METRIC EMISSION RATES AND STACK PARAMETERS FOR USE IN AIR DISPERSION MODELING

SUMMARY OF EMISSION RATES AND STACK PARAMETERS

	Short-term Emission Rates		Long-term Emission Rates	
Component	(lb/hr)	(g/s)	(tons/yr)	(g/s)
NOx	2.06	0.26	9.04	0.26
NO2	0.824	0.104	3.62	0.104
CO	10.7	1.35	46.7	1.34
VOC	3.92	0.494	17.2	0.495
SO2	0.306	0.0386	1.34	0.0386

SAMPLE CALCULATIONS FOR NOx

Short-term = $\frac{(2.06 \text{ lb NOx/hr})(454 \text{ g/lb})}{(3{,}600 \text{ sec/hr})}$ = 0.26 g/s NOx

Long-term = $\frac{(9.04 \text{ tons/yr})(2{,}000 \text{ lb/ton})(454 \text{ g/lb})}{(8{,}760 \text{ hr/yr})(3{,}600 \text{ sec/hr})}$ = 0.26 g/s NOx

SAMPLE CALCULATIONS FOR NO2
The NOx/NO2 ratio is from §106.512.

Short-term = $\frac{(2.06 \text{ lb NOx/hr})(454 \text{ g/lb})(0.4 \text{ g NO2/g NOx})}{(3{,}600 \text{ sec/hr})}$ = 0.104 g/s NO2

Long-term = $\frac{(9.04 \text{ tons NOx/yr})(2{,}000 \text{ lb/ton})(454 \text{ g/lb})(0.4 \text{ g NO2/g NOx})}{(8{,}760 \text{ hr/yr})(3{,}600 \text{ sec/hr})}$ = 0.104 g/s NO2

CONVERSION CALCULATIONS TO METRIC

Stack Height = (29 ft)(0.3048 m/ft) = 8.84 m

Stack Diameter = (1.65 ft)(0.3048 m/ft) = 0.503 m

Stack Exit Vel. = (68.8 ft/sec) (0.3048 m/ft) = 21 m/s

Stack Exit Temp. = $\frac{(831 - 32)°F \ (1\ \Delta K / 1\ \Delta °C)}{1.8°F/°C}$ + 273.16 K = 717 K

PROPERTIES USED IN EMISSIONS INVENTORIES

Engine Design Capacity = $\frac{(1875 \text{ hp})(6875 \text{ Btu/hp-hr})}{(1{,}000{,}000/\text{MM})}$ = 12.90 MM Btu/hr

Annual Process Rate = $\frac{(10700 \text{ scf/hr})(8760 \text{ hr/yr})}{(1{,}000{,}000/\text{MM})}$ = 93.7 MM scf/yr

Percentage of Max. Emissions Potential = $\frac{(1875 \text{ hp-operating})(8760 \text{ hr/yr-operating})(100\%)}{(1875 \text{ hp-design})(8760 \text{ hr/yr-potential})}$ = 100 %

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Engine Emissions Calculator
CAT 3606, EPN ENG-1 thru ENG-4

INPUT DATA

Engine Manufacturer and Model No.	CAT 3606	Controlled
Facility Identification Number (FIN)	ENG-1 thru ENG-4	
Emission Point Number (EPN)	ENG-1 thru ENG-4	
Control Identification Number (CIN)		
UTM Zone		
UTM Easting (m)		
UTM Northing (m)		

ENGINE DATA

Design Horsepower (hp)	1875
Operating Horsepower (hp)	1875
Fuel Consumption (Btu/hp-hr)	6875
Stack Diameter (ft)	1.65
Stack Height (ft)	29
Exit Temperature °F	831
Operating Schedule (hr/yr)	8760
Engine Type (2 cycle or 4 cycle)	4 cycle
Rich or Lean Burn (rich/lean)	Lean
NO_x Catalytic Converter (yes/no)	No
Oxidative Catalytic Converter (CO, VOC, Formaldehyde Control) (yes/no)	Yes

EMISSION FACTORS

Source of Emission Factors			
Emission Factor Basis (% load)	100		
NO_x Emission Factor (g/hp-hr)	0.50		
CO Emission Factor (g/hp-hr)	0.19		
VOC Emission Factor (g/hp-hr)	0.6875		
SO_2 Emission Factor (gr total sulfur/100 scf fuel gas)	10		
PM Emission Factor (g/hp-hr)	0.031		
n-Hexane Emission Factor (g/hp-hr)	0.003		
Formaldehyde Emission Factor (g/hp-hr)	0.050		
Benzene Emission Factor (g/hp-hr)	0.001		
Toluene Emission Factor (g/hp-hr)	0.001		
Ethylbenzene Emission Factor (g/hp-hr)	0.0001		
Xylene Emission Factor (g/hp-hr)	0.0006		

PROCESS AIR DATA

Air-to-Fuel Ratio (lb/lb): 21.5

If no air-to-fuel ratio is entered, the calculated stoichiometric air-to-fuel ratio will be used in the calculations.

FUEL GAS BASIS

Basis of Heating Value Specified for Firing Capacity (LHV/HHV): LHV
(LHV - Lower Heating Value, HHV - Higher Heating Value)

MISCELLANEOUS BASIS

Horsepower (hp) is the same as brake horsepower (bhp).
All calculations are based on the standard conditions of 60°F and 1 atm.

NOTES

The NOx emission factor is from the engine specifications, and it is within NSPS JJJJ requirements.
The VOC, CO, and formaldehyde emission factors are from the catalyst specification sheet with an additional 25% safety factor or NSPS JJJJ emission factor requirements, whichever was lower. For VOC, the safety factor was capped at the NSPS JJJJ emission factor requirement.
VOC emission factor does not include formaldehyde.
The PM, n-Hexane, Benzene, Toluene, Ethylbenzene, and Xylene emission factors are from AP-42, Table 3.2-2, July 2000.
Example calculation:
PM factor from AP-42, Table 3.2-2 for filterable+cond. condition [(.0000771+.00991 lb/MMBtu)*(6875 Btu/hp-hr)*(454 g/lb)/(10^6) = 0.031 g/hp-hr]
SO2 emission factor conservatively estimated as 29 gr/100 dscf.

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INPUT DATA CONTINUED (CAT 3606, EPN ENG-1 thru ENG-4)

NATURAL GAS FIRING FUEL DATA

Fuel Gas Composition				Pure Component Data			Fuel Gas Component Data		
			(A)	(B)				(A) X (C)	(A) X (D)
			Mole	Molecular Weight	(C) HHV *	(D) LHV *	(A) X (B) lb/lb-mol	Btu (HHV) per scf	Btu (LHV) per scf
Formula	Name	Mole %	Fraction	(lb/lb-mol)	(Btu/scf)	(Btu/scf)	Fuel Gas	Fuel Gas	Fuel Gas
CH4	Methane	67.91	0.6791	16.04	1012	911	10.89	687.25	618.66
C2H6	Ethane	10.59	0.1059	30.07	1773	1622	3.18	187.76	171.77
C3H8	Propane	6.75	0.0675	44.09	2524	2322	2.98	170.37	156.74
C4H10	n-Butane	2.72	0.0272	58.12	3271	3018	1.58	88.97	82.09
i-C4H10	Isobutane	1.02	0.0102	58.12	3261	3009	0.59	33.26	30.69
n-C5H12	n-Pentane	0.89	0.0089	72.15	4020	3717	0.64	35.78	33.08
i-C5H12	Isopentane	0.74	0.0074	72.15	4011	3708	0.53	29.68	27.44
C6H14	n-Hexane	0.32	0.0032	86.17	4768	4415	0.28	15.26	14.13
C7H16	n-Heptane	1.31	0.0131	100.20	5503	5100	1.31	72.09	66.81
C6H6	Benzene	0.04	0.0004	78.11	3752	3601	0.03	1.50	1.44
C7H8	Toluene	0.04	0.0004	92.13	4486	4285	0.04	1.79	1.71
C8H10	Xylene	0.01	0.0001	106.16	5230	4980	0.01	0.52	0.50
H2S	Hydrogen Sulfide	0.00	0.0000	34.08	646	595	0.00	0.00	0.00
H2O	Water Vapor	0.00	0.0000	18.02	0	0	0.00	0.00	0.00
N2	Nitrogen	1.51	0.0151	28.01	0	0	0.42	0.00	0.00
CO	Carbon Monoxide	0.00	0.0000	28.01	321	321	0.00	0.00	0.00
CO2	Carbon Dioxide	6.11	0.0611	44.01	0	0	2.69	0.00	0.00
TOTAL		100	0.9996				25.17	1324	1205

Fuel Gas From Salado Draw 23 Compressor Station, Inlet

* HHV/LHV data are from *Steam, Its Generation and Use* (Babcock & Wilcox, 1972); HHV/LHV data for C7H16 are from Engineering *Data Book* (Gas Processors Suppliers Association, Ninth Edition, as revised 1979).

FUEL FLOW RATE CALCULATIONS

Using the fuel gas molecular weight of 25.17 lb/lb-mol and a heating value of 1205.06 Btu/scf (based on LHV), the fuel flow rate is calculated as follows:

$$\text{Fuel Flow} = \frac{(1875\ \text{hp})(6875\ \text{Btu/hp-hr})(25.17\ \text{lb/lb-mol})}{(379\ \text{scf fuel/lb-mol})(1205.06\ \text{Btu/scf fuel})} = 710\ \text{lb fuel/hr}$$

$$= \frac{(710\ \text{lb fuel/hr})}{(25.17\ \text{lb fuel/lb-mol})} = 28.2\ \text{lbmol/hr}$$

$$= \frac{(710\ \text{lb fuel/hr})(379\ \text{scf/lb-mol})}{(25.17\ \text{lb fuel/lb-mol})} = 10700\ \text{scf/hr}$$

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

STOICHIOMETRIC CALCULATIONS

Assuming complete combustion, the combustion products are determined as follows:

Fuel Composition and Flow Rate				Stoichiometric Oxygen Requirement		Stoichiometric Carbon Dioxide Production		Stoichiometric Water Production	
Formula	Mole %	(A) Mole Fraction	(B)* Flow Rate lb-mol/hr	(C) lb-mol/ lb-mol fuel	(B) X (C) lb-mol/hr	(D) lb-mol/ lb-mol fuel	(B) X (D) lb-mol/hr	(E) lb-mol/ lb-mol fuel	(B) X (E) lb-mol/hr
CH4	67.91	0.6791	19.151	2.0	38.302	1.0	19.151	2.0	38.302
C2H6	10.59	0.1059	2.986	3.5	10.451	2.0	5.972	3.0	8.958
C3H8	6.75	0.0675	1.904	5.0	9.520	3.0	5.712	4.0	7.616
C4H10	2.72	0.0272	0.767	6.5	4.986	4.0	3.068	5.0	3.835
i-C4H10	1.02	0.0102	0.288	6.5	1.872	4.0	1.152	5.0	1.440
n-C5H12	0.89	0.0089	0.251	8.0	2.008	5.0	1.255	6.0	1.506
i-C5H12	0.74	0.0074	0.209	8.0	1.672	5.0	1.045	6.0	1.254
C6H14	0.32	0.0032	0.090	9.5	0.855	6.0	0.540	7.0	0.630
N2	1.51	0.0151	0.426	0.0	0.000	0.0	0.000	0.0	0.000
CO2	6.11	0.0611	1.723	0.0	0.000	0.0	0.000	0.0	0.000
TOTAL	100	0.9996	28.19		73.94		40.6		66.6

* (B) = (A) X (28.2 lb-mol/hr)

Sample calculation for CH4 fuel flow rate:

CH4 Fuel Flow Rate = (28.2 lb-mol fuel/hr)(0.6791 lb-mol CH4/lb-mol fuel) = 19.2 lb-mol/hr

The stoichiometric air-to-fuel ratio can be determined as follows:

$$\text{Air/Fuel (by weight)} = \frac{(73.94 \text{ lb-mol O2/hr})(29 \text{ lb/lb-mol air})}{(28.2 \text{ lb-mol fuel/hr})\,(0.21 \text{ lb-mol O2/lb-mol air})(25.17 \text{ lb/lb-mol fuel})} = 14.4 \text{ lb air/ lb fuel}$$

The air-to-fuel ratio data supplied by the manufacturer will be used in the remaining calculations unless the calculated stoichiometric air-to-fuel ratio is higher. If the calculated stoichiometric air-to-fuel ratio is higher, it will be used in the remaining calculations.

Air Flow (Total) = (710 lb/hr fuel) (21.5 lb air/lb fuel) = 15300 lb/hr air

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

EXHAUST FLOW CALCULATION

From the total fuel combustion products (with excess air), the total exhaust flow rate is determined to be:

N2 Flow (In/Out) = $\frac{(15300 \text{ lb/hr air})(0.79 \text{ lb-mol N2/lb-mol air})}{(29 \text{ lb/lb-mol air})}$ = 417 lb-mol N2/hr

O2 Flow (In) = $\frac{(15300 \text{ lb/hr air})(0.21 \text{ lb-mol O2/lb-mol air})}{(29 \text{ lb/lb-mol air})}$ = 111 lb-mol O2/hr

O2 Flow (Out) = (111 lb-mol/hr O2) - (73.94 lb-mol/hr O2) = 37.1 lb-mol O2/hr

Exhaust Components	From Air (lb-mol/hr)	From Fuel (lb-mol/hr)	From Combustion (lb-mol/hr)	Total (lb-mol/hr)	(A) Mole Fraction Wet Basis	(B) Component MW (lb/lb-mol)	(A) X (B) Exhaust MW (lb/lb-mol)	Mole Fraction Dry Basis
Nitrogen	417.00	0.426	0.00	417.43	0.741	28.01	20.76	0.840
Oxygen	111.00	0.000	- 73.94	37.06	0.066	32.00	2.11	0.075
Carbon Dioxide	0.00	1.723	40.65	42.37	0.075	44.01	3.3	0.085
Water	0.00	0.000	66.59	66.59	0.118	18.02	2.13	0.000
TOTAL				563.5	1.000		28.3	1.000

Total Flow = (563.45 lb-mol/hr) (28.3 lb/lb-mol) = 15900 lb/hr

Exhaust Flow = $\frac{(563.45 \text{ lb-mol/hr})(379 \text{ scf/lb-mol})(1291°R \text{ (actual)})}{(60 \text{ min/hr})(520°R \text{ (standard)})}$ = 8840 acfm @ 831°F

STACK EXIT VELOCITY CALCULATION

Area of Stack = $\frac{\pi D^2}{4}$ = $\frac{(3.1416)(1.65 \text{ ft})^2}{4}$ = 2.14 ft²

Stack Velocity = $\frac{(8840 \text{ ft}^3/\text{min})}{(2.14 \text{ ft}^2)(60 \text{ sec/min})}$ = 68.8 ft/sec

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

EMISSION RATE CALCULATIONS

The short-term emission rates are based on a combination of the emission factor and corresponding load that provides the peak emission rate. The long-term emission rates are based on the emission factors for 100% load.

	Short-Term		Long-Term	
Component	Factors	Basis	Factors	Basis
NOx	0.5 g/hp-hr	100 % load	0.5 g/hp-hr	100 % load
CO	0.1875 g/hp-hr	100 % load	0.1875 g/hp-hr	100 % load
VOC	0.6875 g/hp-hr	100 % load	0.6875 g/hp-hr	100 % load
SO2	10 gr S/100 scf	100 % load	10 gr S/100 scf	100 % load
PM	0.031 g/hp-hr	100 % load	0.031 g/hp-hr	100 % load
Formaldehyde	0.05 g/hp-hr	100 % load	0.05 g/hp-hr	100 % load
Benzene	0.0014 g/hp-hr	100 % load	0.0014 g/hp-hr	100 % load
Toluene	0.00127 g/hp-hr	100 % load	0.00127 g/hp-hr	100 % load
Ethylbenzene	0.0001239 g/hp-hr	100 % load	0.0001239 g/hp-hr	100 % load
Xylene	0.000574 g/hp-hr	100 % load	0.000574 g/hp-hr	100 % load

The following emission rate calculations are based on the operating hp data.

NOx :

Short-term = $\frac{(1875\ hp)(0.5\ g\ NOx/hp\text{-}hr)(100\%\ load)}{(100\%)(454\ g/lb)}$ = 2.06 lb/hr

Long-term = $\frac{(1875\ hp)(0.5\ g\ NOx/hp\text{-}hr)(100\%\ load)(8760\ hr/yr)}{(100\%)(454\ g/lb)(2{,}000\ lb/ton)}$ = 9.04 tons/yr

CO:

Short-term = $\frac{(1875\ hp)(0.1875\ g\ CO/hp\text{-}hr)(100\%\ load)}{(100\%)(454\ g/lb)}$ = 0.774 lb/hr

Long-term = $\frac{(1875\ hp)(0.1875\ g\ CO/hp\text{-}hr)(100\%\ load)(8760\ hr/yr)}{(100\%)(454\ g/lb)(2{,}000\ lb/ton)}$ = 3.39 tons/yr

VOC:

Short-term = $\frac{(1875\ hp)(0.6875\ g\ VOC/hp\text{-}hr)(100\%\ load)}{(100\%)(454\ g/lb)}$ = 2.84 lb/hr

Long-term = $\frac{(1875\ hp)(0.6875\ g\ VOC/hp\text{-}hr)(100\%\ load)(8760\ hr/yr)}{(100\%)(454\ g/lb)(2{,}000\ lb/ton)}$ = 12.4 tons/yr

SO2 : Based on SO2 emission factor

Short-term = $\frac{(10\ gr\ S/100\ scf)(2\ lb\ SO2/lb\ S)(10700\ scf/hr\ fuel)}{(7{,}000\ gr/lb)}$ = 0.306 lb/hr

Long-term = $\frac{(0.306\ lb/hr\ SO2)(8760\ hr/yr)}{(2{,}000\ lb/ton)}$ = 1.34 tons/yr

SO2: Based on H2S content in fuel

Short-term = $\frac{(0\ lb\text{-}mol/hr\ H2S)(34.08\ lb/lb\text{-}mol\ H2S)(64.1\ lb/lb\text{-}mol\ SO2)}{(34.08\ lb/lb\text{-}mol\ H2S)(1\ lb\text{-}mol\ H2S/1\ lb\text{-}mol\ SO2)}$ = 0 lb/hr

Long-term = $\frac{(0\ lb/hr\ SO2)(8760\ hr/yr)}{(2{,}000\ lb/ton)}$ = 0 ton/yr

Since the emission estimates from the SO2 emission factor are greater, they will represent the SO2 emission rates from this source.

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

EMISSION RATE CALCULATIONS CONTINUED

PM :

Short-term = (1875 hp) (0.031 g PM/hp-hr) (100% load) / (100%) (454 g/lb) = 0.128 lb/hr

Long-term = (1875 hp) (0.031 g PM/hp-hr) (100% load) (8760 hr/yr) / (100%) (454 g/lb)(2,000 lb/ton) = 0.564 ton/yr

n-Hexane :

Short-term = 1875 hp × 0.00346 g / hp-hr × 100 % load / 100 % × lb / 454 g = 0.0143 lb/hr

Long-term = 1875 hp × 0.00346 g / hp-hr × 100 % load / 100 % × lb / 454 g × ton / 2000 lb × 8760 hr / yr = 0.0626 ton/yr

Formaldehyde :

Short-term = (1875 hp) (0.05 g formaldehyde/hp-hr) (100% load) / (100%) (454 g/lb) = 0.206 lb/hr

Long-term = (1875 hp)(0.05 g formaldehyde/hp-hr)(100% load)(8760 hr/yr) / (100%) (454 g/lb)(2,000 lb/ton) = 0.904 ton/yr

Benzene :

Short-term = 1875 hp × 0.0014 g / hp-hr × 100 % load / 100 % × lb / 454 g = 0.0058 lb/hr

Long-term = 1875 hp × 0.0014 g / hp-hr × 100 % load / 100 % × lb / 454 g × ton / 2000 lb × 8760 hr / yr = 0.0253 ton/yr

Toluene :

Short-term = 1875 hp × 0.00127 g / hp-hr × 100 % load / 100 % × lb / 454 g = 0.00525 lb/hr

Long-term = 1875 hp × 0.00127 g / hp-hr × 100 % load / 100 % × lb / 454 g × ton / 2000 lb × 8760 hr / yr = 0.023 ton/yr

Ethylbenzene :

Short-term = 1875 hp × 0.0001239 g / hp-hr × 100 % load / 100 % × lb / 454 g = 0.000512 lb/hr

Long-term = 1875 hp × 0.0001239 g / hp-hr × 100 % load / 100 % × lb / 454 g × ton / 2000 lb × 8760 hr / yr = 0.00224 ton/yr

Xylene :

Short-term = 1875 hp × 0.000574 g / hp-hr × 100 % load / 100 % × lb / 454 g = 0.00237 lb/hr

Long-term = 1875 hp × 0.000574 g / hp-hr × 100 % load / 100 % × lb / 454 g × ton / 2000 lb × 8760 hr / yr = 0.0104 ton/yr

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ENGINE CALCULATIONS (CAT 3606, EPN ENG-1 thru ENG-4)

METRIC EMISSION RATES AND STACK PARAMETERS FOR USE IN AIR DISPERSION MODELING

SUMMARY OF EMISSION RATES AND STACK PARAMETERS

Component	Short-term Emission Rates (lb/hr)	(g/s)	Long-term Emission Rates (tons/yr)	(g/s)
NOx	2.06	0.26	9.04	0.260
NO2	0.824	0.104	3.62	0.104
CO	0.77	0.0976	3.4	0.098
VOC	2.84	0.358	12.4	0.357
SO2	0.306	0.0386	1.34	0.039

SAMPLE CALCULATIONS FOR NOx

Short-term = (2.06 lb NOx/hr) (454 g/lb) / (3,600 sec/hr) = 0.26 g/s NOx

Long-term = (9.04 tons/yr) (2,000 lb/ton) (454 g/lb) / (8,760 hr/yr) (3,600 sec/hr) = 0.26 g/s NOx

SAMPLE CALCULATIONS FOR NO2
The NOx/NO2 ratio is from §106.512.

Short-term = (2.06 lb NOx/hr) (454 g/lb)(0.4 g NO2/g NOx) / (3,600 sec/hr) = 0.104 g/s NO2

Long-term = (9.04 tons NOx/yr)(2,000 lb/ton) (454 g/lb) (0.4 g NO2/g NOx) / (8,760 hr/yr) (3,600 sec/hr) = 0.104 g/s NO2

CONVERSION CALCULATIONS TO METRIC

Stack Height = (29 ft)(0.3048 m/ft) = 8.84 m

Stack Diameter = (1.65 ft)(0.3048 m/ft) = 0.503 m

Stack Exit Vel. = (68.8 ft/sec) (0.3048 m/ft) = 21 m/s

Stack Exit Temp. = (831 - 32)°F (1 ΔK/1 Δ°C) / 1.8°F/°C + 273.16 K = 717 K

PROPERTIES USED IN EMISSIONS INVENTORIES

Engine Design Capacity = (1875 hp)(6875 Btu/hp-hr) / (1,000,000/MM) = 12.90 MM Btu/hr

Annual Process Rate = (10700 scf/hr) (8760 hr/yr) / (1,000,000/MM) = 93.7 MM scf/yr

Percentage of Max. Emissions Potential = (1875 hp-operating) (8760 hr/yr-operating) (100%) / (1875 hp-design) (8760 hr/yr-potential) = 100 %

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Gas Combustion Emissions Calculator

TEG Reboiler, EPN REB-1

INPUT DATA

Combustion Unit Description:	TEG Reboiler
Facility Identification Number (FIN):	REB-1
Emission Point Number (EPN):	REB-1
Control Identification Number (CIN):	
UTM Zone:	
UTM Easting (m):	
UTM Northing (m):	

COMBUSTION UNIT DATA

Fuel Gas Firing Capacity, MM Btu/hr:	1	
Basis of Heating Value Specified for Firing Capacity (LHV or HHV):	LHV	
Excess Air, % (default to 10% if unknown):	10	
Stack Exit Temperature, °F:	500	
Stack Diameter, ft:	1.0	estimated
Stack Height, ft:	16	
Annual Operating Schedule, hr/yr (default to 8760 hr/yr if unknown):	8760	
Average Firing Rate, % (as percent of firing capacity; default to 100% if unknown):	100	
Ambient Temperature, °F (default to 80°F if unknown):	80	
Barometric Pressure, psia (default to 14.7 psia if unknown):	14.7	
Relative Humidity, % (default to 60% if unknown):	60	

EMISSION FACTORS

ENTER ONLY ONE EMISSION FACTOR FOR EACH POLLUTANT FOR EACH TERM

If multiple factors are entered for a pollutant, the leftmost nonzero factor will be used in emission calculations.

Short-Term Emission Factors				ppmvd in Stack Gas @		Grains Sulfur per 100 dscf Fuel Gas @	Grains per 100 dscf	lb/MM scf AP-42 Fuel Gas @	Weight
		lb/MM	lb/MM	5		1205		1020	% VOC
Pollutant	Formula	Btu (HHV)	Btu (LHV)	% O2	lb/hr	Btu/scf (LHV)	Stack Gas	Btu/scf (HHV)	in TOC
Sulfur Dioxide	SO2					29			
Nitrogen Oxides	NOx							100	
Particulate Matter	PM							7.6	
Carbon Monoxide	CO							84	
Total Organics	TOC								
Volatile Organics	VOC							5.5	

Long-Term Emission Factors				ppmvd in Stack Gas @		Grains Sulfur per 100 dscf Fuel Gas @	Grains per 100 dscf	lb/MM scf AP-42 Fuel Gas @	Weight
		lb/MM	lb/MM	5		1205		1020	% VOC
Pollutant	Formula	Btu (HHV)	Btu (LHV)	% O2	lb/hr	Btu/scf (LHV)	Stack Gas	Btu/scf (HHV)	in TOC
Sulfur Dioxide	SO2					29			
Nitrogen Oxides	NOx							100	
Particulate Matter	PM							7.6	
Carbon Monoxide	CO							84	
Total Organics	TOC								
Volatile Organics	VOC							5.5	

Note: When entering values in ppmvd for nitrogen oxides and volatile organics, the subsequent calculations presume molecular weights of 46.01 for nitrogen oxides (NO2) and 44.09 for volatile organics (C3H8). The molecular weight for VOC can be changed on Rows 127 and 128. Also, note that the factors in terms of scf presume standard conditions of 1 atm and 60°F. These standard conditions are presumed throughout the calculations

EMISSION FACTOR BASIS

Pollutant	Formula	Source of Short-Term Emission Factors	Source of Long-Term Emission Factors
Sulfur Dioxide	SO2	Sweet gas threshold	Sweet gas threshold
Nitrogen Oxides	NOx	Table 1.4-1, AP-42 (July 1998)	Table 1.4-1, AP-42 (July 1998)
Particulate Matter	PM	Table 1.4-2, AP-42 (July 1998)	Table 1.4-2, AP-42 (July 1998)
Carbon Monoxide	CO	Table 1.4-1, AP-42 (July 1998)	Table 1.4-1, AP-42 (July 1998)
Total Organics	TOC		
Volatile Organics	VOC	Table 1.4-2, AP-42 (July 1998)	Table 1.4-2, AP-42 (July 1998)

Volatile Organics Calculated-As Basis

Compound:	C3H8	(CH4, C2H6, C3H8, etc.)
Molecular Weight	44.09	(lb / lb-mol)

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INPUT DATA CONTINUED (TEG Reboiler, EPN REB-1)

FUEL DATA

Fuel Gas Composition				Pure Component Data			Fuel Gas Component Data		
Formula	Name	Mole %	(A) Mole Fraction	(B) Molecular Weight (lb/lb-mol)	(C) HHV * (Btu/scf)	(D) LHV * (Btu/scf)	(A) X (B) lb/lb-mol Fuel Gas	(A) X (C) Btu (HHV) per scf Fuel Gas	(A) X (D) Btu (LHV) per scf Fuel Gas
CH4	Methane	67.91	0.6791	16.04	1012	911	10.89	687.25	618.66
C2H6	Ethane	10.59	0.1059	30.07	1773	1622	3.18	187.76	171.77
C3H8	Propane	6.75	0.0675	44.09	2524	2322	2.98	170.37	156.74
C4H10	n-Butane	2.72	0.0272	58.12	3271	3018	1.58	88.97	82.09
i-C4H10	Isobutane	1.02	0.0102	58.12	3261	3009	0.59	33.26	30.69
n-C5H12	n-Pentane	0.89	0.0089	72.15	4020	3717	0.64	35.78	33.08
i-C5H12	Isopentane	0.74	0.0074	72.15	4011	3708	0.53	29.68	27.44
C5H12	Neopentane	0.00	0.0000	72.15	3994	3692	0.00	0.00	0.00
C6H14	n-Hexane	0.32	0.0032	86.17	4768	4415	0.28	15.26	14.13
C7H16	n-Heptane	1.31	0.0131	100.20	5503	5100	1.31	72.09	66.81
C6H6	Benzene	0.04	0.0004	78.11	3752	3601	0.03	1.50	1.44
C7H8	Toluene	0.04	0.0004	92.13	4486	4285	0.04	1.79	1.71
C8H10	Xylene	0.01	0.0001	106.16	5230	4980	0.01	0.52	0.50
N2	Nitrogen	1.51	0.0151	28.01	0	0	0.42	0.00	0.00
CO2	Carbon Dioxide	6.11	0.0611	44.01	0	0	2.69	0.00	0.00
TOTAL		100	0.9996				25.2	1324.	1205.

* HHV/LHV data are from *Steam, Its Generation and Use* (Babcock & Wilcox, 1972); HHV/LHV data for C7H16 are from Engineering *Data Book* (Gas Processors Suppliers Association, Ninth Edition, as revised 1979).

NOTES

Fuel Gas From Salado Draw 23 Compressor Station, Inlet Separator, Date Sampled 07/20/2021. 10 ppm H2S conservatively added.

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GAS COMBUSTION CALCULATIONS (TEG Reboiler, EPN REB-1)

FUEL FLOW RATE CALCULATIONS

	LHV	HHV
Fuel Gas Firing Capacity, MM Btu/hr:	1	1.1

(1 MM Btu/hr) (1,000,000 Btu/MM Btu) (1 scf/1205 Btu) (lb-mol/379 scf) = 2.19 lb-mol/hr
(2.19 lb-mol/hr) (25.2 lb/lb-mol) = 55.2 lb/hr
(2.19 lb-mol/hr) (379 scf/lb-mol) = 830 scfh @ 60°F
(830 scfh) (hr/60 min) = 13.8 scfm @ 60°F
(830 scfh) (100% - 0% dscf) / (100% scf) = 830 dscfh @ 60°F
(2.19 lb-mol/hr) (387 scf @ 70°F/lb-mol) = 848 scfh @ 70°F
(848 scfh) (hr/60 min) = 14.1 scfm @ 70°F

STOICHIOMETRIC CALCULATIONS

Assuming complete combustion, the combustion products are determined as follows:

Fuel Composition and Flow Rate				Stoichiometric Oxygen Requirement		Stoichiometric Carbon Dioxide Production		Stoichiometric Water Production	
Formula	Mole %	(A) Mole Fraction	(B)* Flow Rate lb-mol/hr	(C) lb-mol/ lb-mol fuel	(B) X (C) lb-mol/hr	(D) lb-mol/ lb-mol fuel	(B) X (D) lb-mol/hr	(E) lb-mol/ lb-mol fuel	(B) X (E) lb-mol/hr
CH4	67.91	0.6791	1.487	2.0	2.974	1.0	1.487	2.0	2.974
C2H6	10.59	0.1059	0.232	3.5	0.812	2.0	0.464	3.0	0.696
C3H8	6.75	0.0675	0.148	5.0	0.740	3.0	0.444	4.0	0.592
C4H10	2.72	0.0272	0.060	6.5	0.390	4.0	0.240	5.0	0.300
i-C4H10	1.02	0.0102	0.022	6.5	0.143	4.0	0.088	5.0	0.110
n-C5H12	0.89	0.0089	0.019	8.0	0.152	5.0	0.095	6.0	0.114
i-C5H12	0.74	0.0074	0.016	8.0	0.128	5.0	0.080	6.0	0.096
C6H14	0.32	0.0032	0.007	9.5	0.067	6.0	0.042	7.0	0.049
N2	1.51	0.0151	0.033	0.0	0.000	0.0	0.000	0.0	0.000
CO2	6.11	0.0611	0.134	0.0	0.000	0.0	0.000	0.0	0.000
TOTAL	100	0.9996	2.19		5.74		3.16		5.17

* (B) = (A) X (2.19 lb-mol/hr)
Note that for the molar calculations, SO2 is grouped with CO2. This will have a negligible impact on MW and other calculations.

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GAS COMBUSTION CALCULATIONS (TEG Reboiler, EPN REB-1)

AIR SUPPLY CALCULATION

Oxygen in Supplied Air: (5.74 lb-mol stoichiometric O2/hr) (1.1) = 6.31 lb-mol total O2/hr
= (6.31 lb-mol O2/hr) (32.00 lb/lb-mol) = 202 lb O2/hr

Nitrogen in Supplied Air: (6.31 lb-mol O2/hr) (3.76 lb-mol N2/lb-mol O2 in air) = 23.7 lb-mol total N2/hr
= (23.7 lb-mol N2/hr) (28.01 lb/lb-mol) = 664 lb N2/hr

Bone-dry (BD) Supplied Air: (6.31 lb-mol O2/hr) + (23.7 lb-mol N2/hr) = 30 lb-mol BD air/hr
= (202 lb O2/hr) + (664 lb N2/hr) = 866 lb BD air/hr

Moisture in Supplied Air: (866 lb BD air/hr) (0.0132 lb water/lb BD air) = 11.4 lb water/hr
= (11.4 lb water/hr) (lb-mol water/18.02 lb water) = 0.633 lb-mol water/hr

Note: The specific humidity of 0.0132 lb water/lb BD air was determined from the relative humidity (60%), the atmospheric pressure (14.7 psia), the ambient temperature (80°F), and a DIPPR correlation of water vapor pressure data.

Total Air: (6.31 lb-mol O2/hr) + (23.7 lb-mol N2/hr) + (0.633 lb-mol water/hr) = 30.6 lb-mol/hr
= (202 lb O2/hr) + (664 lb N2/hr) + (11.4 lb water/hr) = 877 lb/hr
= (30.6 lb-mol/hr) (379 scf/lb-mol) (hr/60 min) = 193 scfm @ 60°F
= (30.6 lb-mol/hr) (387 scf @ 70°F/lb-mol) (hr/60 min) = 197 scfm @ 70°F

EXHAUST FLOW CALCULATION

Exhaust Components	From Air (lb-mol/hr)	From Fuel (lb-mol/hr)	From Combustion (lb-mol/hr)	Total (lb-mol/hr)	(A) Mole Fraction Wet Basis	(B) Component MW (lb/lb-mol)	(A) X (B) Exhaust MW (lb/lb-mol)	Mole Fraction Dry Basis
Nitrogen	23.70	0.033	0.000	23.73	0.710	28.01	19.89	0.860
Oxygen	6.31	0.000	-5.740	0.57	0.017	32.00	0.54	0.021
Carbon Dioxide	0.00	0.134	3.160	3.29	0.099	44.01	4.36	0.119
Water	0.63	0.000	5.170	5.80	0.174	18.02	3.14	0.000
TOTAL				33.4	1.00		27.9	1.00

Exhaust gas flow rate = 33.4 lb-mol/hr
= (33.4 lb-mol/hr) (27.93 lb/lb-mol) = 933 lb/hr
= (33.4 lb-mol/hr) (379 scf/lb-mol) (hr/60 min) = 211 scfm @ 60°F
= (33.4 lb-mol/hr) (387 scf @ 70°F/lb-mol) (hr/60 min) = 215 scfm @ 70°F
= (211 scfm) [(500 + 460)°R] acf / [(60 + 460)°R] scf = 390 acfm @ 500°F
= (33.4 total lb-mol/hr) - (5.8 water lb-mol/hr) = 27.6 lb-mol/hr dry
= (27.6 lb-mol/hr dry) (379 scf/lb-mol) (hr/60 min) = 174 scfm (dry) @ 60°F

STACK EXIT VELOCITY CALCULATION

Stack Cross-sectional Area = pi D^2 / 4 = (3.1416) (1 ft)^2 / 4 = 0.785 ft^2

Stack Exit Velocity = (390 acfm) (min/60 sec) / (0.785 ft^2) = 8.28 ft/sec
= (8.28 ft/sec) (0.3048 m/ft) = 2.52 m/sec

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GAS COMBUSTION CALCULATIONS (TEG Reboiler, EPN REB-1)

SHORT-TERM EMISSION RATE CALCULATIONS

SO2: (29 grains sulfur/100 dscf fuel) (lb/7000 grains) (2 lb SO2/lb sulfur) (100 dscf fuel/100 scf fuel) (scf fuel/1205 Btu) (1 MM Btu/hr) = 0.0687611144042679 lb/hr

NOx: (100 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1324 Btu/scf fuel) (830 scf fuel/hr) = 0.107737254901961 lb/hr

PM: (7.6 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1324 Btu/scf fuel) (830 scf fuel/hr) = 0.00818803137254902 lb/hr

CO: (84 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1324 Btu/scf fuel) (830 scf fuel/hr) = 0.0904992941176471 lb/hr

VOC: (5.5 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1324 Btu/scf fuel) (830 scf fuel/hr) = 0.00592554901960784 lb/hr

LONG-TERM EMISSION RATE CALCULATIONS

SO2: (29 grains sulfur/100 dscf fuel) (lb/7000 grains) (2 lb SO2/lb sulfur) (100 dscf fuel/100 scf fuel) (scf fuel/1205 Btu) (1 MM Btu/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 0.301173681090693 tons/yr

NOx: (100 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1324 Btu/scf fuel) (830 scf fuel/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 0.471889176470588 tons/yr

PM: (7.6 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1324 Btu/scf fuel) (830 scf fuel/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 0.0358635774117647 tons/yr

CO: (84 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1324 Btu/scf fuel) (830 scf fuel/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 0.396386908235294 tons/yr

VOC: (5.5 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1324 Btu/scf fuel) (830 scf fuel/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 0.0259539047058823 tons/yr

POLLUTANT CONCENTRATIONS (BASED ON SHORT-TERM EMISSION FACTORS)

		(B)		Pollutant Concentration			
	(A)	Molecular Weight	(A) / (B)	Mole	Dry Mole		
Pollutant	lb/hr	lb/lb-mol	lb-mol/hr	Comp., %	Comp., %	ppmv	ppmvd
SO2	0.069	64.06	0.001	0.003	0.004	32.	38.8
NOx	0.108	46.01	0.002	0.007	0.008	70.1	84.8
PM	0.008	NA	NA	NA	NA	NA	NA
CO	0.09	28.01	0.003	0.0097	0.012	96.7	117.
VOC	0.006	44.09	0.0001	0.0004	0.0005	4.01	4.86

Sample Calculations for NOx: (0.107737254901961 lb/hr) / (46.01 lb/lb-mol) = 0.00234 lb-mol/hr
(0.00234 lb-mol/hr) / (33.4 lb-mol/hr exhaust gas) (100%) = 0.00701% mole composition
(0.00234 lb-mol/hr) / (27.6 lb-mol/hr dry exhaust gas) (100%) = 0.00848% mole composition (dry)

Note that the molecular weight for NOx is that of NO2, and the molecular weight for VOC is that of C3H8. The resultant compositions are thus in terms of NOx as NO2 and VOC as C3H8.

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GAS COMBUSTION CALCULATIONS (TEG Reboiler, EPN REB-1)

SUMMARY OF EMISSION RATES AND CONVERSION TO METRIC UNITS

	Short-term Emission Rate		Long-term Emission Rate	
Pollutant	(lb/hr)	(g/sec)	(tons/yr)	(g/sec)
SO2	0.069	0.0087	0.301	0.0087
NOx	0.108	0.014	0.472	0.014
PM	0.008	0.001	0.036	0.001
CO	0.09	0.011	0.396	0.011
VOC	0.006	0.001	0.026	0.001

Sample Calculations for NOx: (0.108 lb/hr) (454 g/lb) (hr/3600 sec) = 0.0136 g/sec
(0.471889176470588 tons/yr) (2000 lb/ton) (454 g/lb) (yr/8760 hr) (hr/3600 sec) = 0.0136 g/sec

CONVERSION OF STACK PARAMETERS TO METRIC UNITS

Stack Height = 16 ft = (16 ft) (0.3048 m/ft) = 4.88 m

Stack Diameter = 1 ft = (1 ft) (0.3048 m/ft) = 0.305 m

Stack Exit Velocity = (8.28 ft/sec) (0.3048 m/ft) = 2.52 m/sec

Stack Exit Temperature = 500°F = (500 - 32) / 1.8 = 260°C = 260 + 273.16 = 533 K

PROPERTIES USED IN EMISSIONS INVENTORIES

Annual Process Rate: (830 scf/hr) (MM scf/1,000,000 scf) (8760 hr/yr) (100% firing rate) = 7.27 MMscf/yr

Percentage of Maximum Emissions Potential: (8760 hr/yr) (yr/8760 hr) (100% firing rate) = 100.0%

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Gas Combustion Emissions Calculator: Summary Report

TEG Reboiler, EPN REB-1

COMBUSTION UNIT DATA

Combustion Unit Description:	TEG Reboiler	
Facility Identification Number (FIN):	REB-1	
Emission Point Number (EPN):	REB-1	
Control Identification Number (CIN):		
Fuel Gas Firing Capacity, MM Btu/hr:	1	
Basis of Heating Value Specified for Firing Capacity (LHV or HHV):	LHV	
Average Fuel Heating Value (LHV):	1205	
Excess Air, % (default to 10% if unknown):	10	
Annual Operating Schedule, hr/yr (default to 8760 hr/yr if unknown):	8760	
Average Firing Rate, % (as percent of firing capacity; default to 100% if unknown):	100	
Ambient Temperature, °F (default to 80°F if unknown):	80	
Barometric Pressure, psia (default to 14.7 psia if unknown):	14.7	
Relative Humidity, % (default to 60% if unknown):	60	
UTM Zone:		
UTM Easting (m):		
UTM Northing (m):		
Stack Diameter:	1 ft	(0.305 m)
Stack Height:	16 ft	(4.88 m)
Stack Exit Temperature:	500° F	(533 K)
Stack Exit Velocity:	8.28 ft/sec	(2.52 m/sec)

SHORT-TERM EMISSIONS DATA

Pollutant	Short-Term Emission Factor	Source of Short-Term Emission Factor	Short-term Emission Rate (lb/hr)	(g/sec)
SO2	29 Grains Sulfur per 100 dscf Fuel Gas @ 1205 Btu/scf (LHV)	Sweet gas threshold	0.068761114	0.00867
NOx	100 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-1, AP-42 (July 1998)	0.107737255	0.0136
PM	7.6 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-2, AP-42 (July 1998)	0.008188031	0.00103
CO	84 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-1, AP-42 (July 1998)	0.090499294	0.0114
TOC	None		-	-
VOC	5.5 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-2, AP-42 (July 1998)	0.005925549	0.000747

LONG-TERM EMISSIONS DATA

Pollutant	Long-Term Emission Factor	Source of Long-Term Emission Factor	Long-Term Emission Rate (ton/yr)	(g/sec)
SO2	29 Grains Sulfur per 100 dscf Fuel Gas @ 1205 Btu/scf (LHV)	Sweet gas threshold	0.301173681	0.00867
NOx	100 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-1, AP-42 (July 1998)	0.471889176	0.0136
PM	7.6 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-2, AP-42 (July 1998)	0.035863577	0.00103
CO	84 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-1, AP-42 (July 1998)	0.396386908	0.0114
TOC	None		-	-
VOC	5.5 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-2, AP-42 (July 1998)	0.025953905	0.000747

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Gas Combustion Emissions Calculator

Heater Treaters, EPN HTR-1 thru HTR-6

INPUT DATA

Combustion Unit Description:	Heater Treaters
Facility Identification Number (FIN):	HTR-1 thru HTR-6
Emission Point Number (EPN):	HTR-1 thru HTR-6
Control Identification Number (CIN):	
UTM Zone:	
UTM Easting (m):	
UTM Northing (m):	

COMBUSTION UNIT DATA

Fuel Gas Firing Capacity, MM Btu/hr:	4	
Basis of Heating Value Specified for Firing Capacity (LHV or HHV):	LHV	
Excess Air, % (default to 10% if unknown):	10	
Stack Exit Temperature, °F:	500	
Stack Diameter, ft:	1.5	estimated
Stack Height, ft:	20	estimated
Annual Operating Schedule, hr/yr (default to 8760 hr/yr if unknown):	8760	
Average Firing Rate, % (as percent of firing capacity; default to 100% if unknown):	100	
Ambient Temperature, °F (default to 80°F if unknown):	80	
Barometric Pressure, psia (default to 14.7 psia if unknown):	14.7	
Relative Humidity, % (default to 60% if unknown):	60	

EMISSION FACTORS

ENTER ONLY ONE EMISSION FACTOR FOR EACH POLLUTANT FOR EACH TERM

If multiple factors are entered for a pollutant, the leftmost nonzero factor will be used in emission calculations.

Short-Term Emission Factors				ppmvd in Stack Gas @		Grains Sulfur per 100 dscf Fuel Gas @	Grains per 100 dscf	lb/MM scf AP-42 Fuel Gas @	Weight
		lb/MM	lb/MM	5		1206		1020	% VOC
Pollutant	Formula	Btu (HHV)	Btu (LHV)	% O2	lb/hr	Btu/scf (LHV)	Stack Gas	Btu/scf (HHV)	in TOC
Sulfur Dioxide	SO2					29			
Nitrogen Oxides	NOx							100	
Particulate Matter	PM							7.6	
Carbon Monoxide	CO							84	
Total Organics	TOC								
Volatile Organics	VOC							5.5	

Long-Term Emission Factors				ppmvd in Stack Gas @		Grains Sulfur per 100 dscf Fuel Gas @	Grains per 100 dscf	lb/MM scf AP-42 Fuel Gas @	Weight
		lb/MM	lb/MM	5		1206		1020	% VOC
Pollutant	Formula	Btu (HHV)	Btu (LHV)	% O2	lb/hr	Btu/scf (LHV)	Stack Gas	Btu/scf (HHV)	in TOC
Sulfur Dioxide	SO2					29			
Nitrogen Oxides	NOx							100	
Particulate Matter	PM							7.6	
Carbon Monoxide	CO							84	
Total Organics	TOC								
Volatile Organics	VOC							5.5	

Note: When entering values in ppmvd for nitrogen oxides and volatile organics, the subsequent calculations presume molecular weights of 46.01 for nitrogen oxides (NO2) and 44.09 for volatile organics (C3H8). The molecular weight for VOC can be changed on Rows 127 and 128. Also, note that the factors in terms of scf presume standard conditions of 1 atm and 60°F. These standard conditions are presumed throughout the calculations

EMISSION FACTOR BASIS

Pollutant	Formula	Source of Short-Term Emission Factors	Source of Long-Term Emission Factors
Sulfur Dioxide	SO2	Sweet gas threshold	Sweet gas threshold
Nitrogen Oxides	NOx	Table 1.4-1, AP-42 (July 1998)	Table 1.4-1, AP-42 (July 1998)
Particulate Matter	PM	Table 1.4-2, AP-42 (July 1998)	Table 1.4-2, AP-42 (July 1998)
Carbon Monoxide	CO	Table 1.4-1, AP-42 (July 1998)	Table 1.4-1, AP-42 (July 1998)
Total Organics	TOC		
Volatile Organics	VOC	Table 1.4-2, AP-42 (July 1998)	Table 1.4-2, AP-42 (July 1998)

Volatile Organics Calculated-As Basis

Compound:	C3H8	(CH4, C2H6, C3H8, etc.)
Molecular Weight	44.09	(lb / lb-mol)

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INPUT DATA CONTINUED (Heater Treaters, EPN HTR-1 thru HTR-6)

FUEL DATA

Fuel Gas Composition				Pure Component Data			Fuel Gas Component Data		
Formula	Name	Mole %	(A) Mole Fraction	(B) Molecular Weight (lb/lb-mol)	(C) HHV * (Btu/scf)	(D) LHV * (Btu/scf)	(A) X (B) lb/lb-mol Fuel Gas	(A) X (C) Btu (HHV) per scf Fuel Gas	(A) X (D) Btu (LHV) per scf Fuel Gas
CH4	Methane	67.91	0.6791	16.04	1012	911	10.89	687.25	618.66
C2H6	Ethane	10.59	0.1059	30.07	1773	1622	3.18	187.76	171.77
C3H8	Propane	6.75	0.0675	44.09	2524	2322	2.98	170.37	156.74
C4H10	n-Butane	2.73	0.0273	58.12	3271	3018	1.59	89.30	82.39
i-C4H10	Isobutane	1.02	0.0102	58.12	3261	3009	0.59	33.26	30.69
n-C5H12	n-Pentane	0.89	0.0089	72.15	4020	3717	0.64	35.78	33.08
i-C5H12	Isopentane	0.74	0.0074	72.15	4011	3708	0.53	29.68	27.44
C5H12	Neopentane	0.00	0.0000	72.15	3994	3692	0.00	0.00	0.00
C6H14	n-Hexane	0.32	0.0032	86.17	4768	4415	0.28	15.26	14.13
C7H16	n-Heptane	1.32	0.0132	100.20	5503	5100	1.32	72.64	67.32
C6H6	Benzene	0.04	0.0004	78.11	3752	3601	0.03	1.50	1.44
C7H8	Toluene	0.04	0.0004	92.13	4486	4285	0.04	1.79	1.71
C8H10	Xylene	0.01	0.0001	106.16	5230	4980	0.01	0.52	0.50
N2	Nitrogen	1.51	0.0151	28.01	0	0	0.42	0.00	0.00
CO	Carbon Monoxide	0.00	0.0000	28.01	321	321	0.00	0.00	0.00
CO2	Carbon Dioxide	6.12	0.0612	44.01	0	0	2.69	0.00	0.00
TOTAL		100	0.9999				25.2	1325.	1206.

* HHV/LHV data are from *Steam, Its Generation and Use* (Babcock & Wilcox, 1972); HHV/LHV data for C7H16 are from Engineering *Data Book* (Gas Processors Suppliers Association, Ninth Edition, as revised 1979).

NOTES

From Salado Draw 23 Compressor Station, Inlet Separator, Date Sampled 07/20/2021. 10 ppm H2S conservatively added.

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GAS COMBUSTION CALCULATIONS (Heater Treaters, EPN HTR-1 thru HTR-6)

FUEL FLOW RATE CALCULATIONS

	LHV	HHV
Fuel Gas Firing Capacity, MM Btu/hr:	4	4.4

(4 MM Btu/hr) (1,000,000 Btu/MM Btu) (1 scf/1206 Btu) (lb-mol/379 scf) = 8.75 lb-mol/hr
(8.75 lb-mol/hr) (25.2 lb/lb-mol) = 221 lb/hr
(8.75 lb-mol/hr) (379 scf/lb-mol) = 3320 scfh @ 60°F
(3320 scfh) (hr/60 min) = 55.3 scfm @ 60°F
(3320 scfh) (100% - 0% dscf) / (100% scf) = 3320 dscfh @ 60°F
(8.75 lb-mol/hr) (387 scf @ 70°F/lb-mol) = 3390 scfh @ 70°F
(3390 scfh) (hr/60 min) = 56.5 scfm @ 70°F

STOICHIOMETRIC CALCULATIONS

Assuming complete combustion, the combustion products are determined as follows:

Fuel Composition and Flow Rate				Stoichiometric Oxygen Requirement		Stoichiometric Carbon Dioxide Production		Stoichiometric Water Production	
Formula	Mole %	(A) Mole Fraction	(B)* Flow Rate lb-mol/hr	(C) lb-mol/ lb-mol fuel	(B) X (C) lb-mol/hr	(D) lb-mol/ lb-mol fuel	(B) X (D) lb-mol/hr	(E) lb-mol/ lb-mol fuel	(B) X (E) lb-mol/hr
CH4	67.91	0.6791	5.942	2.0	11.884	1.0	5.942	2.0	11.884
C2H6	10.59	0.1059	0.927	3.5	3.245	2.0	1.854	3.0	2.781
C3H8	6.75	0.0675	0.591	5.0	2.955	3.0	1.773	4.0	2.364
C4H10	2.73	0.0273	0.239	6.5	1.554	4.0	0.956	5.0	1.195
i-C4H10	1.02	0.0102	0.089	6.5	0.579	4.0	0.356	5.0	0.445
n-C5H12	0.89	0.0089	0.078	8.0	0.624	5.0	0.390	6.0	0.468
i-C5H12	0.74	0.0074	0.065	8.0	0.520	5.0	0.325	6.0	0.390
C6H14	0.32	0.0032	0.028	9.5	0.266	6.0	0.168	7.0	0.196
N2	1.51	0.0151	0.132	0.0	0.000	0.0	0.000	0.0	0.000
CO2	6.12	0.0612	0.536	0.0	0.000	0.0	0.000	0.0	0.000
TOTAL	100.00	0.9999	8.75		23.		12.6		20.7

* (B) = (A) X (8.75 lb-mol/hr)
Note that for the molar calculations, SO2 is grouped with CO2. This will have a negligible impact on MW and other calculations.

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GAS COMBUSTION CALCULATIONS (Heater Treaters, EPN HTR-1 thru HTR-6)

AIR SUPPLY CALCULATION

Oxygen in Supplied Air: (23 lb-mol stoichiometric O2/hr) (1.1) = 25.3 lb-mol total O2/hr
= (25.3 lb-mol O2/hr) (32.00 lb/lb-mol) = 810 lb O2/hr

Nitrogen in Supplied Air: (25.3 lb-mol O2/hr) (3.76 lb-mol N2/lb-mol O2 in air) = 95.1 lb-mol total N2/hr
= (95.1 lb-mol N2/hr) (28.01 lb/lb-mol) = 2660 lb N2/hr

Bone-dry (BD) Supplied Air: (25.3 lb-mol O2/hr) + (95.1 lb-mol N2/hr) = 120 lb-mol BD air/hr
= (810 lb O2/hr) + (2660 lb N2/hr) = 3470 lb BD air/hr

Moisture in Supplied Air: (3470 lb BD air/hr) (0.0132 lb water/lb BD air) = 45.8 lb water/hr
= (45.8 lb water/hr) (lb-mol water/18.02 lb water) = 2.54 lb-mol water/hr

Note: The specific humidity of 0.0132 lb water/lb BD air was determined from the relative humidity (60%), the atmospheric pressure (14.7 psia), the ambient temperature (80°F), and a DIPPR correlation of water vapor pressure data.

Total Air: (25.3 lb-mol O2/hr) + (95.1 lb-mol N2/hr) + (2.54 lb-mol water/hr) = 123 lb-mol/hr
= (810 lb O2/hr) + (2660 lb N2/hr) + (45.8 lb water/hr) = 3520 lb/hr
= (123 lb-mol/hr) (379 scf/lb-mol) (hr/60 min) = 777 scfm @ 60°F
= (123 lb-mol/hr) (387 scf @ 70°F/lb-mol) (hr/60 min) = 793 scfm @ 70°F

EXHAUST FLOW CALCULATION

Exhaust Components	From Air (lb-mol/hr)	From Fuel (lb-mol/hr)	From Combustion (lb-mol/hr)	Total (lb-mol/hr)	(A) Mole Fraction Wet Basis	(B) Component MW (lb/lb-mol)	(A) X (B) Exhaust MW (lb/lb-mol)	Mole Fraction Dry Basis
Nitrogen	95.10	0.132	0.000	95.23	0.711	28.01	19.92	0.860
Oxygen	25.30	0.000	-23.000	2.30	0.017	32.00	0.54	0.021
Carbon Dioxide	0.00	0.536	12.600	13.14	0.098	44.01	4.31	0.119
Water	2.54	0.000	20.700	23.24	0.173	18.02	3.12	0.000
TOTAL				134.	1.00		27.9	1.00

Exhaust gas flow rate = 134 lb-mol/hr
= (134 lb-mol/hr) (27.89 lb/lb-mol) = 3740 lb/hr
= (134 lb-mol/hr) (379 scf/lb-mol) (hr/60 min) = 846 scfm @ 60°F
= (134 lb-mol/hr) (387 scf @ 70°F/lb-mol) (hr/60 min) = 864 scfm @ 70°F
= (846 scfm) [(500 + 460)°R] acf / [(60 + 460)°R] scf = 1560 acfm @ 500°F
= (134 total lb-mol/hr) - (23.24 water lb-mol/hr) = 111 lb-mol/hr dry
= (111 lb-mol/hr dry) (379 scf/lb-mol) (hr/60 min) = 701 scfm (dry) @ 60°F

STACK EXIT VELOCITY CALCULATION

Stack Cross-sectional Area = pi D^2 / 4 = (3.1416) (1.5 ft)^2 / 4 = 1.77 ft^2

Stack Exit Velocity = (1560 acfm) (min/60 sec) / (1.77 ft^2) = 14.7 ft/sec
= (14.7 ft/sec) (0.3048 m/ft) = 4.48 m/sec

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GAS COMBUSTION CALCULATIONS (Heater Treaters, EPN HTR-1 thru HTR-6)

SHORT-TERM EMISSION RATE CALCULATIONS

SO2: (29 grains sulfur/100 dscf fuel) (lb/7000 grains) (2 lb SO2/lb sulfur) (100 dscf fuel/100 scf fuel) (scf fuel/1206 Btu) (4 MM Btu/hr) = 0.274816394219379 lb/hr

NOx: (100 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1325 Btu/scf fuel) (3320 scf fuel/hr) = 0.431274509803922 lb/hr

PM: (7.6 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1325 Btu/scf fuel) (3320 scf fuel/hr) = 0.032776862745098 lb/hr

CO: (84 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1325 Btu/scf fuel) (3320 scf fuel/hr) = 0.362270588235294 lb/hr

VOC: (5.5 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1325 Btu/scf fuel) (3320 scf fuel/hr) = 0.0237200980392157 lb/hr

LONG-TERM EMISSION RATE CALCULATIONS

SO2: (29 grains sulfur/100 dscf fuel) (lb/7000 grains) (2 lb SO2/lb sulfur) (100 dscf fuel/100 scf fuel) (scf fuel/1206 Btu) (4 MM Btu/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 1.20369580668088 tons/yr

NOx: (100 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1325 Btu/scf fuel) (3320 scf fuel/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 1.88898235294118 tons/yr

PM: (7.6 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1325 Btu/scf fuel) (3320 scf fuel/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 0.143562658823529 tons/yr

CO: (84 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1325 Btu/scf fuel) (3320 scf fuel/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 1.58674517647059 tons/yr

VOC: (5.5 lb/MMscf AP-42 fuel) (scf AP-42 fuel/1020 Btu) (1325 Btu/scf fuel) (3320 scf fuel/hr) (8760 hr/yr) (100% firing rate) (ton/2000 lb) = 0.103894029411765 tons/yr

POLLUTANT CONCENTRATIONS (BASED ON SHORT-TERM EMISSION FACTORS)

		(B)		Pollutant Concentration			
	(A)	Molecular Weight	(A) / (B)	Mole	Dry Mole		
Pollutant	lb/hr	lb/lb-mol	lb-mol/hr	Comp., %	Comp., %	ppmv	ppmvd
SO2	0.27482	64.06	0.00429	0.0032	0.00386	32.	38.6
NOx	0.43127	46.01	0.00937	0.00699	0.00844	69.9	84.4
PM	0.03278	NA	NA	NA	NA	NA	NA
CO	0.36227	28.01	0.0129	0.00963	0.0116	96.3	116.
VOC	0.02372	44.09	0.000538	0.000401	0.000485	4.01	4.85

Sample Calculations for NOx: (0.431274509803922 lb/hr) / (46.01 lb/lb-mol) = 0.00937 lb-mol/hr
(0.00937 lb-mol/hr) / (134 lb-mol/hr exhaust gas) (100%) = 0.00699% mole composition
(0.00937 lb-mol/hr) / (111 lb-mol/hr dry exhaust gas) (100%) = 0.00844% mole composition (dry)

Note that the molecular weight for NOx is that of NO2, and the molecular weight for VOC is that of C3H8. The resultant compositions are thus in terms of NOx as NO2 and VOC as C3H8.

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GAS COMBUSTION CALCULATIONS (Heater Treaters, EPN HTR-1 thru HTR-6)

SUMMARY OF EMISSION RATES AND CONVERSION TO METRIC UNITS

	Short-term Emission Rate		Long-term Emission Rate	
Pollutant	(lb/hr)	(g/sec)	(tons/yr)	(g/sec)
SO2	0.275	0.035	1.204	0.035
NOx	0.431	0.054	1.889	0.054
PM	0.033	0.004	0.144	0.004
CO	0.362	0.046	1.587	0.046
VOC	0.024	0.003	0.104	0.003

Sample Calculations for NOx: (0.431274509803922 lb/hr) (454 g/lb) (hr/3600 sec) = 0.0544 g/sec
(1.88898235294118 tons/yr) (2000 lb/ton) (454 g/lb) (yr/8760 hr) (hr/3600 sec) = 0.0544 g/sec

CONVERSION OF STACK PARAMETERS TO METRIC UNITS

Stack Height = 20 ft = (20 ft) (0.3048 m/ft) = 6.1 m

Stack Diameter = 1.5 ft = (1.5 ft) (0.3048 m/ft) = 0.457 m

Stack Exit Velocity = (14.7 ft/sec) (0.3048 m/ft) = 4.48 m/sec

Stack Exit Temperature = 500°F = (500 - 32) / 1.8 = 260°C = 260 + 273.16 = 533 K

PROPERTIES USED IN EMISSIONS INVENTORIES

Annual Process Rate: (3320 scf/hr) (MM scf/1,000,000 scf) (8760 hr/yr) (100% firing rate) = 29.1 MMscf/yr

Percentage of Maximum Emissions Potential: (8760 hr/yr) (yr/8760 hr) (100% firing rate) = 100.0%

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Gas Combustion Emissions Calculator: Summary Report

Heater Treaters, EPN HTR-1 thru HTR-6

COMBUSTION UNIT DATA

Combustion Unit Description:	Heater Treaters	
Facility Identification Number (FIN):	HTR-1 thru HTR-6	
Emission Point Number (EPN):	HTR-1 thru HTR-6	
Control Identification Number (CIN):		
Fuel Gas Firing Capacity, MM Btu/hr:	4	
Basis of Heating Value Specified for Firing Capacity (LHV or HHV):	LHV	
Average Fuel Heating Value (LHV):	1206	
Excess Air, % (default to 10% if unknown):	10	
Annual Operating Schedule, hr/yr (default to 8760 hr/yr if unknown):	8760	
Average Firing Rate, % (as percent of firing capacity; default to 100% if unknown):	100	
Ambient Temperature, °F (default to 80°F if unknown):	80	
Barometric Pressure, psia (default to 14.7 psia if unknown):	14.7	
Relative Humidity, % (default to 60% if unknown):	60	
UTM Zone:		
UTM Easting (m):		
UTM Northing (m):		
Stack Diameter:	1.5 ft	(0.457 m)
Stack Height:	20 ft	(6.1 m)
Stack Exit Temperature:	500° F	(533 K)
Stack Exit Velocity:	14.7 ft/sec	(4.48 m/sec)

SHORT-TERM EMISSIONS DATA

Pollutant	Short-Term Emission Factor	Source of Short-Term Emission Factor	Short-term Emission Rate (lb/hr)	(g/sec)
SO2	29 Grains Sulfur per 100 dscf Fuel Gas @ 1206 Btu/scf (LHV)	Sweet gas threshold	0.274816394	0.0347
NOx	100 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-1, AP-42 (July 1998)	0.43127451	0.0544
PM	7.6 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-2, AP-42 (July 1998)	0.032776863	0.00413
CO	84 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-1, AP-42 (July 1998)	0.362270588	0.0457
TOC	None		-	-
VOC	5.5 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-2, AP-42 (July 1998)	0.023720098	0.00299

LONG-TERM EMISSIONS DATA

Pollutant	Long-Term Emission Factor	Source of Long-Term Emission Factor	Long-Term Emission Rate (ton/yr)	(g/sec)
SO2	29 Grains Sulfur per 100 dscf Fuel Gas @ 1206 Btu/scf (LHV)	Sweet gas threshold	1.203695807	0.0347
NOx	100 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-1, AP-42 (July 1998)	1.888982353	0.0544
PM	7.6 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-2, AP-42 (July 1998)	0.143562659	0.00413
CO	84 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-1, AP-42 (July 1998)	1.586745176	0.0457
TOC	None		-	-
VOC	5.5 lb/MM scf AP-42 Fuel Gas @ 1020 Btu/scf (HHV)	Table 1.4-2, AP-42 (July 1998)	0.103894029	0.00299

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EMISSION ESTIMATE FOR ATMOSPHERIC LOADING OPERATIONS

EMISSION FACTOR EQUATION

$$L = \frac{12.46\ S\ P\ M}{T}$$

(AP-42, Fifth Edition, Equation 5.2-1, January 1995)

where: L = Loading loss (lb/1000 gal liquid loaded)
M = Vapor molecular weight of liquid loaded (lb/lb-mol)
P = True vapor pressure of liquid loaded (psia)
T = Temperature of bulk liquid loaded (°R)
S = Saturation factor (1.45 for splash loading, 1 for vapor-balanced loading, 0.6 for submerged from Table 5.2-1)

HOURLY EMISSIONS ESTIMATES

EPN	Loading Vessel	Liquid Loaded	Type of Loading	Saturation Factor, S	Max. Temp. (°F)	Max. Temp. (°R)	Mol. Wt. (lb/lb-mol)	Vapor Pressure [1] (psia)	Loading Loss (lb/1000 gal)	Capture Efficiency (%)	Maximum Loading Rate [2] (gal/hr)	Uncontrolled Loading Emissions (lb/hr)	Uncontrolled Loading HAPs Emissions (lb/hr)	Uncontrolled Loading H_2S Emissions (lb/hr)
LOAD	Truck	Water	submerged	0.6	95.0	555	50	6.34	4.27	0	8400	0.359	1.7E-05	2.3E-05
											Total	0.359	1.7E-05	2.3E-05

ANNUAL EMISSIONS ESTIMATES

EPN	Loading Vessel	Liquid Loaded	Type of Loading	Saturation Factor, S	Average Temp. (°F)	Average Temp. (°R)	Mol. Wt. (lb/lb-mol)	Vapor Pressure [1] (psia)	Loading Loss (lb/1000 gal)	Capture Efficiency (%)	Annual Loading Rate [3] (gal/yr)	Uncontrolled Loading Emissions (tons/yr)	Uncontrolled Loading HAPs Emissions (tons/yr)	Uncontrolled Loading H_2S Emissions (tons/yr)
LOAD	Truck	Water	submerged	0.6	66.0	526	50	3.80	2.70	0	3,066,000	0.041	2.0E-06	2.6E-06
											Total	0.041	2.0E-06	2.6E-06

SAMPLE CALCULATIONS:

Condensate Annual Emissions

Loading loss = $\frac{(12.46)\ (0.6)\ (3.80088765687673\ \text{psia})\ (50\ \text{lb/lb-mol})}{(526\ °\text{R})}$ = 2.7 lb/1000 gal condensate loaded
(annual basis)

Loading estimates = (Loading loss emission factor) (Annual loading rate) (VOC Content) / 100
= (2.7 lb/1000 gal) (3066000 gal/yr) (100%) / 100% = 8280 lb/yr
= 4.14 tons/yr

NOTES:

(0) Water truck loading emissions calculated using 1% of condensate properties, except for H_2S.

(1) Values for RVP=5.64537 from API Correlation.

(2) The hourly loading rate is based on loading one **200** -bbl water truck in one hour.

(3) The annual loading rate of water is based on **200** -bbl water/day.

Speciated Loading Emissions

Component	Weight %	lb/hr	tpy
Carbon Dioxide	0.001	2.6E-06	3.0E-07
Nitrogen	0.001	2.0E-06	2.3E-07
Methane	4.116	0.015	0.002
Ethane	0.908	0.003	3.8E-04
Propane	16.361	0.059	0.007
i-Butane	33.847	0.121	0.014
n-Butane	7.289	0.026	0.003
i-Pentane	18.969	0.068	0.008
n-Pentane	6.047	0.022	0.003
Hexanes	6.977	0.025	0.003
Heptanes plus	1.219	0.004	0.001
n-Octane	1.404	0.005	0.001
n-Hexane	0.572	0.002	2.4E-04
Benzene	1.843	0.007	0.001
Toluene	0.177	0.001	7.3E-05
Ethylbenzene	0.206	7.4E-04	8.5E-05
Xylene	0.023	8.3E-05	9.5E-06
Hydrogen sulfide	0.042	1.5E-04	1.7E-05
TOTAL	**100.0**	**0.359**	**0.041**
TOTAL VOC	**94.9**	**0.341**	**0.039**
TOTAL HAP	**2.82**	**0.010**	**0.001**

From ProMax Oil Tank Breathing Losses using CTB Analyses

EMISSION ESTIMATES FOR CONDENSATE STORAGE TANKS

Description: Condensate Storage Tanks

Condensate Throughput: **22500** bbl/day
VRU Capture efficiency: **100%**
Number of Tanks: **3**

Emission Rate

FIN	EPN	Description	Throughput	Working & Standing Losses		Flash Losses		Pre-VRU Reduction Emissions		Post-VRU Reduction Emissions	
			bbl/day	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-1	TK-FUG1	Condensate Storage	7500.0	93.78	208.9	2215	9703	2309	9912	0.000	0.000
TK-2	TK-FUG1	Condensate Storage	7500.0	93.78	208.9	2215	9703	2309	9912	0.000	0.000
TK-3	TK-FUG1	Condensate Storage	7500.0	93.78	208.9	2215	9703	2309	9912	0.000	0.000
TOTAL				**281.0**	**627.0**	**6646**	**29100**	**6927**	**29700**	**0.000**	**0.000**

Notes:
Condensate tanks are arranged in parallel.

Speciated Condensate Tank Emissions

Component	Condensate Tank W&S Emissions			Condensate Tank Flash Emissions			Pre-VRU Reduction Emissions		Post-VRU Reduction Emissions	
	Weight %*	lb/hr	tpy	Weight %**	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Hydrogen Sulfide (H2S)	0.001	0.002	0.005	0.00	0.0	0.2	0.052	0.222	0.000	0.000
Nitrogen (N2)	0.001	0.002	0.003	0.01	0.6	2.6	0.605	2.64	0.000	0.000
Carbon Dioxide (CO2)	4.116	11.565	25.805	5.04	335.1	1467.3	346.7	1493	0.000	0.000
Methane (CH4)	0.908	2.552	5.694	3.29	218.5	956.9	221.1	962.6	0.000	0.000
Ethane (C2H6)	16.361	45.973	102.581	12.92	858.3	3758.3	904.3	3861	0.000	0.000
Propane (C3H8)	33.847	95.110	212.220	30.48	2025.6	8869.2	2121	9081	0.000	0.000
IsoButane (i-C4H10)	7.289	20.482	45.702	7.34	487.5	2134.7	508.0	2180	0.000	0.000
N-Butane (n-C4H10)	18.969	53.303	118.936	19.34	1285.3	5628.0	1339	5747	0.000	0.000
IsoPentane (i-C5H12)	6.047	16.991	37.912	6.44	427.7	1872.6	444.7	1911	0.000	0.000
N-Pentane (n-C5H12)	6.977	19.607	43.749	7.59	504.5	2208.8	524.1	2253	0.000	0.000
Other Hexanes	1.219	3.426	7.643	1.69	112.4	492.1	115.8	499.7	0.000	0.000
Heptanes (less BTEX)	1.404	3.944	8.801	1.78	118.2	517.4	122.1	526.2	0.000	0.000
Octanes+	0.572	1.607	3.586	0.85	56.6	248.0	58.25	251.6	0.000	0.000
n-Hexane (n-C6H14)	1.843	5.178	11.553	2.17	144.0	630.5	149.2	642.0	0.000	0.000
Benzene (C6H6)	0.177	0.498	1.111	0.30	19.7	86.1	20.16	87.18	0.000	0.000
Toluene (C7H8)	0.206	0.580	1.293	0.34	22.6	98.8	23.14	100.1	0.000	0.000
Ethylbenzene (C8H10)	0.023	0.065	0.145	0.04	2.5	10.9	2.55	11.01	0.000	0.000
Xylenes (C8H10)	0.042	0.118	0.264	0.08	5.1	22.3	5.21	22.56	0.000	0.000
Water (H2O)	0.000	0.001	0.001	0.33	21.8	95.5	21.81	95.49	0.000	0.000
TOTAL	**100.0**	**281.0**	**627.0**	**100.0**	**6646**	**29100**	**6927**	**29727**	**0.000**	**0.000**
TOTAL VOC	**78.6**	**220.9**	**492.9**	**78.4**	**5211.6**	**22819.3**	**5432**	**23312**	**0.000**	**0.000**
TOTAL HAP	**2.29**	**6.44**	**14.36**	**2.92**	**193.79**	**848.51**	**200.2**	**862.9**	**0.000**	**0.000**

From ProMax Oil Tank Breathing Losses using CTB Analyses
From ProMax Oil Tank Flash Losses using CTB Analyses

EMISSION ESTIMATE FOR CONDENSATE TANK FLASH

Flash Losses per Tank

GOR	**58.81**	**scf/bbl**
Mol Weight	**45.69**	**lb/lb-mol**

Condensate Storage Tank Flash Emissions		
Throughput	**7500**	**bbl/day**
	441056	**scf/day**
	18377	**scf/hr**
Total Hourly Flash Loss	**2215**	**lb/hr**
Total Annual Flash Loss	**9703**	**tpy**

Throughput (scf/day) = (58.80742763918 scf/bbl) * (7500 bbl/day) = (441056 scf/day)
Total Hourly Flash Loss = (18400 scf/hr) / (379 scf/lbmol) * (45.6853025589096 lb/lbmol) = (2215 lb/hr)

Flash Gas Speciation

Component	**Weight %**	**Condensate Tank Flash**	
		Hourly Emissions (lb/hr)	**Annual Emissions (tpy)**
Hydrogen Sulfide (H2S)	**0.001**	0.0165	0.072
Nitrogen (N2)	**0.009**	0.201	0.880
Carbon Dioxide (CO2)	**5.042**	111.7	489.2
Methane (CH4)	**3.288**	72.84	319.1
Ethane (C2H6)	**12.915**	286.1	1253
Propane (C3H8)	**30.478**	675.2	2957
IsoButane (i-C4H10)	**7.336**	162.5	711.8
N-Butane (n-C4H10)	**19.340**	428.4	1877
IsoPentane (i-C5H12)	**6.435**	142.6	624.4
N-Pentane (n-C5H12)	**7.590**	168.1	736.5
Other Hexanes	**1.691**	37.46	164.1
Heptanes (C7H16)	**1.778**	39.39	172.5
Octanes +	**0.852**	18.88	82.70
n-Hexane (n-C6H14)	**2.167**	47.99	210.2
2,2,4 Trimethylpentane (C8H18)	**0.000**	0.000	0.000
Benzene (C6H6)	**0.296**	6.55	28.70
Toluene (C7H8)	**0.340**	7.52	32.94
Ethylbenzene (C8H10)	**0.037**	0.827	3.62
Xylenes (C8H10)	**0.077**	1.70	7.43
TOTAL	99.7	2208	9671
TOTAL HAP	2.92	64.59	282.92
TOTAL VOC	78.4	1737	7609

Flash Gas Speciation From Salado Draw 23 CTB, Gas Evolved from Hydrocarbon Liquid Flashed, Date Sampled 10/16/2018

W&S EMISSION ESTIMATE FOR TK-1 thru TK-3

Tank FIN	TK-1 thru TK-3	
Description	Condensate Tank	
Days per year	365	days/year

Tank Parameters

Material Stored	Crude Oil	
Flash in vessel (Yes/No)	Yes	
Vapor Balanced Loading (Yes/No)	No	*Yes = truck loading vapors are vented to tank.*
Tank Max/Min levels client specified (Yes/No)	No	
Annual sum of liquid level increases client specified (Yes/No)	No	
Tanks construction	Welded	
Insulated Tank (Yes/No)	No	
Heated Tank (Yes/No)	No	
Tank Diameter (D)	15.5	ft
Tank Shell Height (Hs)	24	ft
Maximum Liquid Height (Hlx)	23	ft
Minimum Liquid Height (Hln)	1	ft
Annual Sum of the Increases in Liquid Level (ΣHqi)	81447	ft/yr
Roof Type	Cone	
Cone Roof Slope (Sr)	0.0625	ft/ft
Roof Paint Color	Green, Dark	
Roof Paint Condition	Average	
Tank Roof Surface Solar Absorptance (αr)	0.9	dimensionless (AP-42 Table 7.1-6)
Shell Paint Color	Green, Dark	
Shell Paint Condition	Average	
Tank Shell Surface Solar Absorptance (αs)	0.9	dimensionless (AP-42 Table 7.1-6)
Breather Vent Pressure Setting (PBp)	0.03	psig
Breather Vent Vacuum Setting (PBV)	-0.03	psig
Vent Setting Correction Factor (Kb)	1.00	dimensionless

Stored Material Properties

Vapor Molecular Weight (Mv)	50	lb/lb-mol
API Gravity (API)	41.03	° API
Reid Vapor Pressure (RVP)	5.645	psi
Working Loss Product Factor (Kp)	0.75	dimensionless

Environment Properties - (AP-42, CH. 7 - Table 7.1-7)

Met Data Location	Roswell, NM	
Met Data Period	Annual Average	
Average Daily Max Ambient Temperature	75.8	°F
Average Daily Min Ambient Temperature	47.6	°F
Solar Insolation (I)	1722	Btu/ft² d
Atmospheric Pressure (Pa)	12.88	psia

Operational Parameters

Actual Throughput (BBL/day)	7500	BBL/day
Actual Throughput (BBL/year)	2737500	BBL/year
Actual Throughput (Gal/year)	114975000	Gal/year
Max Fill Rate (FRm) (BBL/hr)	313	BBL/hr

Constants

Universal Gas Constant (R)	10.731	psia ft³/lb-mol °R

Standing and Working Loss Calculations

Average Daily Max Ambient Temperature (Tax)	535.5	°R
Average Daily Min Ambient Temperature (Tan)	507.3	°R
Shell Radius (Rs)	7.75	ft
Liquid Height (Hl)	11.5	ft
Roof Height (Hr)	0.484	ft
Roof Outage (Hro)	0.161	ft
Vapor Space Outage (Hvo)	12.7	ft
Vapor Space Volume (Vv)	2389	ft^3
Net Working Loss Throughput (Vq)	15368325	ft^3/year
Tank Shell Height to Tank Diameter (Hs/D)	1.55	dimensionless
Average Daily Ambient Temperature (Taa)	521.4	°R
Liquid Bulk Temperature (Tb)	526.0	°R
Average Daily Liquid Surface Temperature (Tla)	530.1	°R
Daily Max Liquid Surface Temperature (Tlx)	542.1	°R
Daily Min Liquid Surface Temperature (Tln)	518.1	°R
Average Vapor Temperature (Tv)	534.1	°R
Vapor Pressure at TLA (Pva)	4.13	psia
Vapor Pressure at TLX (Pvx)	5.12	psia
Vapor Pressure at TLN (Pvn)	3.29	psia
Vapor Pressure at Tb	3.83	psia
Vapor Density (Wv)	0.036	lb/ft^3
Average Daily Ambient Temperature Range (dTa)	28.2	°R
Average Daily Vapor Temperature Range (dTv)	48.0	°R
Average Daily Vapor Pressure Range (dPv)	1.83	psia
Breather Vent Pressure Range (dPb)	0.060	psia
Vapor Space Expansion Factor (Ke)	0.293	per day
Vented Vapor Saturation Factor (Ks)	0.265	dimensionless
Standing Losses (Ls)	2439	lb/year
Turnovers per Period (N)	3702	turnovers/year
Turnover Factor (Kn)	1.00	dimensionless
Working Losses (Lw)	415274	lb/year
Total Routine Losses (Lt)	417700	lb/year
Max Hourly Working Loss (lb/hr)	**93.8**	**lb/hr**
Uncontrolled Annual total (Lt - tons/year)	**209**	**tpy**

Sample Calculations

From AP-42 Chapter 7.1 Organic Liquid Storage Tanks (11/2019)

Standing Loss

$Ls = 365(Vv)(Wv)(Ke)(Ks)$ Equation (1-2)

$= 365 \text{ days/year } (2389 \text{ ft}^3)(0.036 \text{ lb/ft}^3)\ (0.293/\text{day})(0.265)$

$= 2439 \text{ lb/year}$

$Vv = [(\pi/4)D^2](Hvo)$ Equation (1-3)

$= [(\pi/4)(15.5 \text{ ft})^2](12.66 \text{ ft})$

$Vv = 2389 \text{ ft}^3$

$Hvo = Hs - Hl + Hro$ Equation (1-16)

$= 24 \text{ ft} - 11.5 \text{ ft} + 0.161 \text{ ft}$

$Hvo = 12.66 \text{ ft}$

If cone roof, $Hro = 1/3(Hr)$ Equation (1-17)

If dome roof, $Hro = 0.137(Rs)$ Equation (1-19)

$Hro = 1/3(Hr)$

$= 1/3(0.484 \text{ ft})$

$Hro = 0.161 \text{ ft}$

If cone roof, $Hr = (Sr)(Rs)$ Equation (1-18)

If dome roof, $Hr = 0.268(Rs)$ Equation (1-20)

$Hr = (Sr)(Rs)$

$= (0.0625 \text{ ft/ft})*[(15.5 \text{ ft})/2]$

$Hr = 0.484 \text{ ft}$

$Rs = D/2$

$= (15.5 \text{ ft})/2$

$Rs = 7.75 \text{ ft}$

$Wv = [(Mv)(Pva)]/[(R)(Tv)]$ Equation (1-22)

$= [(50 \text{ lb/lb-mol})(4.13 \text{ psia})]/[(10.731 \text{ psia ft}^3/\text{lb-mol °R})(534.1 \text{ °R})]$

$Wv = 0.036 \text{ lb/ft}^3$

$Pva = \exp\{[2799/(Tla + 459.7) - 2.227]\log_{10}(RVP) - (7261/(Tla + 459.7) + 12.82\}$ Equation (Figure 7.1-13b)

$= \exp\{[2799/(530.1°R) - 2.227]\log(5.65 \text{ psia}) - (7261/(530.1°R) + 12.82\}$

$Pva = 4.13 \text{ psia}$

$Tla = [0.5 - (0.8/(4.4*(Hs/D) + 3.8))]*Taa$ Equation (1-27)

$+ [0.5 + (0.8/(4.4*(Hs/D) + 3.8))]*Tb$

$+ [0.021*(\alpha r)*(I) + 0.013*(Hs/D)*(\alpha s)*(I)]/[4.4*(Hs/D) + 3.8]$

$= [0.5 - (0.8/(4.4*(1.55) + 3.8))]*521.4°R$

$+ [0.5 + (0.8/(4.4*(1.55) + 3.8))]*526°R$

$+ 0.021*(0.9)*(1722 \text{ Btu/ft}^2 \text{ d}) + 0.013*(1.55)*(0.9)*(1722 \text{ Btu/ft}^2 \text{ d})]/[4.4*(1.55) + 3.8]$

$Tla = 530.1°R$

$Hs/D = 24 \text{ ft} / 15.5 \text{ ft}$

$Hs/D = 1.55$

$Taa = (Tax + Tan)/2$ Equation (1-30)

$= (535.5°R + 507.3°R)/2$

$= 521.4°R$

$Tb = Taa + 0.003*(\alpha s)*(I)$ Equation (1-31)

$= 521.4°R + 0.003*(0.9)*(1722 \text{ Btu/ft}^2 \text{ d})$

$= 526°R$

$Tv = \{[2.2*(Hs/D) + 1.1]*Taa + 0.8*Tb$ Equation (1-32)

$+ 0.021*(\alpha r)*(I) + 0.013*(Hs/D)*(\alpha s)*(I)\}/[2.2*(Hs/D) + 1.9]$

$= \{[2.2*(1.55) + 1.1]*521.4°R + 0.8*526°R$

$+ 0.021*(0.9)*(1722 \text{ Btu/ft}^2 \text{ d}) + 0.013*(1.55)*(0.9)*(1722 \text{ Btu/ft}^2 \text{ d})\}/[2.2*(1.55) + 1.9]$

$Tv = 534.1°R$

Sample Calculations (continued)

$Ke = (dTv/Tla) + [(dPv - dPb)]/[(Pa - Pva)]$ Equation (1-5)

$= (48°R)/(530.1°R) + [(1.83\ psia - 0.06\ psia)/(12.9 - 4.13\ psia)]$

$Ke = 0.293$

$dTv = [1 - (0.8/(2.2*(Hs/D) + 1.9))]*dTa + [0.042*(\alpha r)*(I) + 0.026*(Hs/D)*(\alpha s)*(I)]/[2.2*(Hs/D) + 1.9]$ Equation (1-6)

$= [1 - (0.8/(2.2*(1.55) + 1.9))]*28.2°R$

$+ [0.042*(0.9)*(1722\ Btu/ft^2\ d)$

$+ 0.026*(1.55)*(0.9)*(1722\ Btu/ft^2\ d)]/[2.2*(1.55) + 1.9]$

$dTv = 48°R$

$dTa = Tax - Tan$ Equation (1-11)

$dTa = 535.5°R - 507.3°R$

$dTa = 28.2°R$

$dPv = Pvx - Pvn$ Equation (1-9)

$= 5.12\ psia - 3.29\ psia$

$dPv = 1.83\ psia$

$Pvx = \exp\{[2799/(Tlx + 459.7) - 2.227]\log_{10}(RVP) - (7261/(Tlx + 459.7) + 12.82\}$ Equation (Figure 7.1-13b)

$= \exp\{[(2799/542.1°R) - 2.227]\log(5.65) - (7261/542.1°R) + 12.82\}$

$Pvx = 5.12\ psia$

$Pvn = \exp\{[2799/(Tln + 459.7) - 2.227]\log10(RVP) - (7261/(Tln + 459.7) + 12.82\}$ Equation (Figure 7.1-13b)

$= \exp\{[(2799/518.1°R) - 2.227]\log(5.65) - (7261/518.1°R) + 12.82\}$

$Pvn = 3.29\ psia$

$dPb = PBp - PBv$ Equation (1-10)

$= 0.03\ psig - (-0.03\ psig)$

$dPb = 0.06\ psia$

$Ks = 1/[1 + (0.053)(Pva)(Hvo)]$ Equation (1-21)

$= 1/[1 + (0.053)(4.13\ psia)(12.66\ ft)]$

$Ks = 0.265$

Working Loss

$Lw = (Vq)(Kn)(Kp)(Wv)(Kb)$ Equation (1-35)

$= (15368325\ ft^3/year)(1)(0.75)(0.036\ lb/ft^3)(1)$

$Lw = 415300\ lb/year$

$Vq = (\Sigma Hqi)(\pi/4)D^2$ Equation (1-38)

$= (81400\ ft/yr)(\pi/4)*(15.5\ ft)^2$

$Vq = 15368300\ ft^3/year$

If turnovers > 36, Kn = (180 + N)/6N Equation (1-35)

If turnovers ≤ 36 or flash occurs in the vessel, Kn = 1 Equation (1-35)

$Kn = 1$

$N = \Sigma Hqi / (Hlx - Hln)$ Equation (1-36)

$= (81400\ ft/yr)/(23\ ft - 1\ ft)$

$N = 3700\ turnovers/year$

$\Sigma Hqi = (5.614\ Q) / ((\pi/4)\ D^2)$ Equation (1-37) or provided by client

$= (5.614\ ft3/bbl)*(2737500\ BBL/year)/((\pi/4)*(15.5ft)^2)$

$\Sigma Hqi = 81400\ ft/yr$

$Kp = 0.75$ Equation (1-35)

$Kb = 1.00$ Equation (1-37)

Total Working and Standing Losses

$Lt = Ls + Lw$ Equation (1-1)

$= 2439\ lb/year + 415300\ lb/year$

$= 417700\ lb/year$

$= 209\ tpy$

Maximum Hourly Working Loss - Pvx based on 95°F or Tlx, whichever is greater

$Lmax = \{(Mv)(Pvx)/[(R)(95+459.7))]\}(5.614)(FRm)(Kn)(Kp)$, where Kn = 1 and Kp = 1 for worst case

$= \{(50\ lb/lbmol)(6.35\ psia)/[(10.731\ psia\ ft^3/lb\text{-}mol\ °R)(95+459.7)°R)]\}(5.614\ ft3/bbl)(313\ bbl/hr)(1)(1)$

$Lmax = 93.78\ lb/hr$

EMISSION ESTIMATES FOR WATER STORAGE TANKS

Description: Water Storage Tanks

Water Throughput: **55500** bbl/day

VRU Capture efficiency: **100%**

Number of Tanks: **4**

Emission Rate

FIN	EPN	Description	Throughput	Working & Standing Losses		Flash Losses		Pre-VRU Reduction Emissions		Post-VRU Reduction Emissions	
			bbl/day	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
PW-1	TK-FUG1	Water Storage	13875	173.5	513.5	59.32	259.8	232.8	773.3	0.000	0.000
PW-2	TK-FUG1	Water Storage	13875	173.5	513.5	59.32	259.8	232.8	773.3	0.000	0.000
PW-3	TK-FUG1	Water Storage	13875	173.5	513.5	59.32	259.8	232.8	773.3	0.000	0.000
PW-4	TK-FUG1	Water Storage	13875	173.5	513.5	59.32	259.8	232.8	773.3	0.000	0.000
TOTAL				**693.9**	**2054**	**237.3**	**1039**	**931.2**	**3093.4**	**0.000**	**0.000**

Speciated Water Tank Emissions

Component	Water Tank W&S Emissions			Water Tank Flash Emissions			Pre-VRU Reduction Emissions		Post-VRU Reduction Emissions	
	Weight %*	lb/hr	tpy	Weight %**	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Hydrogen Sulfide (H2S)	0.001	0.0095	0.028	0.001	0.002	0.011	0.012	0.039	0.000	0.000
Nitrogen (N2)	0.002	0.0119	0.035	0.137	0.326	1.427	0.338	1.46	0.000	0.000
Carbon Dioxide (CO2)	46.935	325.6930	964.047	53.640	127.287	557.518	453.0	1522	0.000	0.000
Methane (CH4)	0.548	3.8048	11.262	15.717	37.297	163.361	41.10	174.6	0.000	0.000
Ethane (C2H6)	0.486	3.3748	9.989	12.101	28.716	125.777	32.09	135.8	0.000	0.000
Propane (C3H8)	0.061	0.4210	1.246	8.822	20.934	91.692	21.36	92.94	0.000	0.000
IsoButane (i-C4H10)	0.002	0.0114	0.034	1.006	2.387	10.453	2.40	10.49	0.000	0.000
N-Butane (n-C4H10)	0.005	0.0357	0.106	3.398	8.064	35.322	8.10	35.43	0.000	0.000
IsoPentane (i-C5H12)	0.000	0.0019	0.006	0.695	1.650	7.226	1.65	7.23	0.000	0.000
N-Pentane (n-C5H12)	0.000	0.0003	0.001	0.412	0.978	4.283	0.978	4.28	0.000	0.000
Other Hexanes	0.000	0.0013	0.004	0.655	1.555	6.812	1.56	6.82	0.000	0.000
Heptanes (less BTEX)	0.000	0.0000	0.000	0.050	0.1191	0.522	0.119	0.522	0.000	0.000
Octanes+	0.000	0.0000	0.000	0.009	0.022	0.095	0.022	0.095	0.000	0.000
n-Hexane (n-C6H14)	0.000	0.0000	0.000	0.071	0.167	0.733	0.167	0.733	0.000	0.000
Benzene (C6H6)	0.004	0.0258	0.076	0.371	0.880	3.854	0.906	3.93	0.000	0.000
Toluene (C7H8)	0.001	0.0065	0.019	0.423	1.0E+00	4.4E+00	1.01	4.41	0.000	0.000
Ethylbenzene (C8H10)	0.000	0.0002	0.001	0.046	1.1E-01	4.7E-01	0.108	0.474	0.000	0.000
Xylenes (C8H10)	0.000	0.0004	0.001	0.097	2.3E-01	1.0E+00	0.231	1.01	0.000	0.000
Water (H2O)	51.956	360.5329	1067.173	2.349	5.6E+00	2.4E+01	366.1	1092	0.000	0.000
TOTAL	**100.0**	**693.931**	**2054.028**	**100.001**	**237.301**	**1039.377**	**931.2**	**3093**	**0.000**	**0.000**
TOTAL VOC	**0.1**	**0.5**	**1.5**	**16.1**	**38.1**	**166.9**	**38.60**	**168.4**	**0.000**	**0.000**
TOTAL HAP	**0.00**	**0.03**	**0.10**	**1.01**	**2.39**	**10.46**	**2.42**	**10.56**	**0.000**	**0.000**

*From ProMax Water Tank Breathing Losses using CTB Analyses

**From ProMax Water Tank Flash Losses using CTB Analyses

EMISSION ESTIMATE FOR WATER TANK FLASH

Flash Losses per Tank

GOR	**1.19**	**scf/bbl**
Mol Weight	**32.82**	**lb/lb-mol**

Water Storage Tank Flash Emissions		
Water Throughput	**13875**	**bbl/day**
	16443	**scf/day**
	685.1	**scf/hr**
Hourly Flash Loss	**59.32**	**lb/hr**
Annual Flash Loss	**259.8**	**tpy**

Throughput (scf/day) = (1.1850904472891 scf/bbl) * (13900 bbl/day) = (16400 scf/day)
Total Hourly Flash Loss = (685 scf/hr) / (379 scf/lbmol) * (32.8171156669387 lb/lbmol) = (59.3 lb/hr)

Flash Gas Speciation

Component	**Weight %**	**Water Flash**	
		Hourly Emissions (lb/hr)	**Annual Emissions (tpy)**
Hydrogen Sulfide (H2S)	0.001	0.044	0.194
Nitrogen (N2)	0.009	0.005	0.024
Carbon Dioxide (CO2)	5.042	2.99	13.10
Methane (CH4)	3.288	1.95	8.54
Ethane (C2H6)	12.915	7.66	33.56
Propane (C3H8)	30.478	18.08	79.20
IsoButane (i-C4H10)	7.336	4.35	19.06
N-Butane (n-C4H10)	19.340	11.47	50.25
IsoPentane (i-C5H12)	6.435	3.82	16.72
N-Pentane (n-C5H12)	7.590	4.50	19.72
Other Hexanes	1.691	1.00	4.39
Heptanes (C7H16)	1.778	1.05	4.62
Octanes +	0.852	0.506	2.21
n-Hexane (n-C6H14)	2.167	1.29	5.63
2,2,4 Trimethylpentane (C8H18)	0.000	0.000	0.000
Benzene (C6H6)	0.296	0.175	0.769
Toluene (C7H8)	0.340	0.201	0.882
Ethylbenzene (C8H10)	0.037	0.022	0.097
Xylenes (C8H10)	0.077	0.045	0.199
TOTAL	99.7	59.17	259.2
TOTAL HAP	2.92	1.73	7.58
TOTAL VOC	78.4	46.52	203.8

From ProMax Oil Tank Flash Losses using CTB Analyses

W&S EMISSION ESTIMATE FOR PW-1 thru PW-4

Tank FIN	PW-1 thru PW-4	
Description	Produced Water Tank	
Days per year	365	days/year

Tank Parameters

Material Stored	Produced Water	
Flash in vessel (Yes/No)	Yes	
Vapor Balanced Loading (Yes/No)	No	*Yes = truck loading vapors are vented to tank.*
Tank Max/Min levels client specified (Yes/No)	No	
Annual sum of liquid level increases client specified (Yes/No)	No	
Tanks construction	Welded	
Insulated Tank (Yes/No)	No	
Heated Tank (Yes/No)	No	
Tank Diameter (D)	15.5	ft
Tank Shell Height (Hs)	24	ft
Maximum Liquid Height (Hlx)	23	ft
Minimum Liquid Height (Hln)	1	ft
Annual Sum of the Increases in Liquid Level (ΣHqi)	150676	ft/yr
Roof Type	Cone	
Cone Roof Slope (Sr)	0.0625	ft/ft
Roof Paint Color	Green, Dark	
Roof Paint Condition	Average	
Tank Roof Surface Solar Absorptance (αr)	0.9	dimensionless (AP-42 Table 7.1-6)
Shell Paint Color	Green, Dark	
Shell Paint Condition	Average	
Tank Shell Surface Solar Absorptance (αs)	0.9	dimensionless (AP-42 Table 7.1-6)
Breather Vent Pressure Setting (PBp)	0.03	psig
Breather Vent Vacuum Setting (PBV)	-0.03	psig
Vent Setting Correction Factor (Kb)	1.00	dimensionless

Stored Material Properties

Vapor Molecular Weight (Mv)	50	lb/lb-mol
API Gravity (API)	41.03	° API
Reid Vapor Pressure (RVP)	5.64537	psi
Working Loss Product Factor (Kp)	1	dimensionless

Environment Properties - (AP-42, CH. 7 - Table 7.1-7)

Met Data Location	Roswell, NM	
Met Data Period	Annual Average	
Average Daily Max Ambient Temperature	75.8	°F
Average Daily Min Ambient Temperature	47.6	°F
Solar Insolation (I)	1722	Btu/ft² d
Atmospheric Pressure (Pa)	12.88	psia

Operational Parameters

Actual Throughput (BBL/day)	13875	BBL/day
Actual Throughput (BBL/year)	5064375	BBL/year
Actual Throughput (Gal/year)	212703750	Gal/year
Max Fill Rate (FRm) (BBL/hr)	579	BBL/hr

Constants

Universal Gas Constant (R)	10.731	psia ft³/lb-mol °R

Standing and Working Loss Calculations

Average Daily Max Ambient Temperature (Tax)	535.5	°R
Average Daily Min Ambient Temperature (Tan)	507.3	°R
Shell Radius (Rs)	7.75	ft
Liquid Height (Hl)	11.5	ft
Roof Height (Hr)	0.484	ft
Roof Outage (Hro)	0.161	ft
Vapor Space Outage (Hvo)	12.7	ft
Vapor Space Volume (Vv)	2389	ft^3
Net Working Loss Throughput (Vq)	28431401	ft^3/year
Tank Shell Height to Tank Diameter (Hs/D)	1.55	dimensionless
Average Daily Ambient Temperature (Taa)	521.4	°R
Liquid Bulk Temperature (Tb)	526.0	°R
Average Daily Liquid Surface Temperature (Tla)	530.1	°R
Daily Max Liquid Surface Temperature (Tlx)	542.1	°R
Daily Min Liquid Surface Temperature (Tln)	518.1	°R
Average Vapor Temperature (Tv)	534.1	°R
Vapor Pressure at TLA (Pva)	4.13	psia
Vapor Pressure at TLX (Pvx)	5.12	psia
Vapor Pressure at TLN (Pvn)	3.29	psia
Vapor Pressure at Tb	3.83	psia
Vapor Density (Wv)	0.036	lb/ft^3
Average Daily Ambient Temperature Range (dTa)	28.2	°R
Average Daily Vapor Temperature Range (dTv)	48.0	°R
Average Daily Vapor Pressure Range (dPv)	1.83	psia
Breather Vent Pressure Range (dPb)	0.060	psia
Vapor Space Expansion Factor (Ke)	0.293	per day
Vented Vapor Saturation Factor (Ks)	0.265	dimensionless
Standing Losses (Ls)	2439	lb/year
Turnovers per Period (N)	6849	turnovers/year
Turnover Factor (Kn)	1.00	dimensionless
Working Losses (Lw)	1024342	lb/year
Total Routine Losses (Lt)	1027000	lb/year
Max Hourly Working Loss (lb/hr)	**173**	**lb/hr**
Uncontrolled Annual total (Lt - tons/year)	**514**	**tpy**

EMISSION ESTIMATES FOR SLOP TANK

Description: Slop Storage Tanks
Number of Tanks: **2**
Total Slop Water Throughput: **300.0** bbl/day

TK-S1 100-bbl water slop tank is uncontrolled.
TK-S2 750-bbl condensate slop tank is routed to VRU for 95% capture efficiency.

Emission Rate

FIN	EPN	Description	Throughput	Working & Standing Losses		Flash Losses		Total TK-S2 Post-VRU Reduction Emissions		Total PTE Emissions (Non-speciated)	
			bbl/day	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TK-S1	TK-S1	Slop Tank, 100-bbl, Water	200.0	0.065	0.225	0.000	0.000	-	-	0.065	0.225
TK-S2	TK-FUG2	Slop Tank, 750-bbl, Condensate	100.0	3.62	16.55	19.54	85.60	1.16	5.11	1.16	5.11
TOTAL				**3.68**	**16.77**	**19.54**	**85.60**	**1.16**	**5.11**	**1.22**	**5.33**

Notes:
For TK-S1, W&S emissions based on 1% of the emissions calculated based on condensate properties.

Speciated Slop Water Tank (EPN: TK-S1) Emissions

Component	Weight %	Slop Water Tank W&S Emissions		Total Emissions	
		lb/hr	tpy	lb/hr	tpy
Hydrogen Sulfide (H2S)	0.001	7.3E-07	2.5E-06	7.3E-07	2.5E-06
Nitrogen (N2)	0.203	1.3E-04	4.6E-04	1.3E-04	4.6E-04
Carbon Dioxide (CO2)	16.062	0.010	0.036	0.010	0.036
Methane (CH4)	22.061	0.014	0.050	0.014	0.050
Ethane (C2H6)	25.546	0.017	0.057	0.017	0.057
Propane (C3H8)	18.781	0.012	0.042	0.012	0.042
IsoButane (i-C4H10)	2.838	0.002	0.006	0.002	0.006
N-Butane (n-C4H10)	6.819	0.004	0.015	0.004	0.015
IsoPentane (i-C5H12)	2.165	0.001	0.005	0.001	0.005
N-Pentane (n-C5H12)	2.592	0.002	0.006	0.002	0.006
Other Hexanes	0.636	4.1E-04	0.001	4.1E-04	0.001
Heptanes (less BTEX)	0.863	5.6E-04	0.002	5.6E-04	0.002
Octanes+	0.326	2.1E-04	0.001	2.1E-04	0.001
n-Hexane (n-C6H14)	0.845	5.5E-04	0.002	5.5E-04	0.002
Benzene (C6H6)	0.090	5.9E-05	2.0E-04	5.9E-05	2.0E-04
Toluene (C7H8)	0.136	8.9E-05	3.1E-04	8.9E-05	3.1E-04
Ethylbenzene (C8H10)	0.014	9.1E-06	3.1E-05	9.1E-06	3.1E-05
Xylenes (C8H10)	0.024	1.6E-05	5.4E-05	1.6E-05	5.4E-05
Water (H2O)	0.000	1.3E-07	4.4E-07	1.3E-07	4.4E-07
TOTAL	**100.0**	**0.065**	**0.225**	**0.065**	**0.225**
TOTAL VOC	**36.13**	**0.024**	**0.081**	**0.024**	**0.081**
TOTAL HAP	**1.11**	**0.001**	**0.002**	**0.001**	**0.002**

From ProMax Slop Tank Breathing Losses using CTB Analyses

Speciated Slop Condensate Tank (EPN: TK-FUG2, FIN: TK-S2) Emissions Routed to VRU

Component	Slop Condensate Tank W&S Emissions			Slop Condensate Tank Flash Emissions			Pre-VRU Reduction Emissions (FIN: TK-S2)		Post-VRU Reduction Emissions (EPN: TK-FUG2)	
	Weight %*	lb/hr	tpy	Weight %**	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Hydrogen Sulfide (H2S)	0.001	0.000	0.000	0.001	0.00	0.00	2.0E-04	0.001	1.0E-05	4.5E-05
Nitrogen (N2)	0.203	0.007	0.034	0.166	0.03	0.14	0.040	0.176	0.002	0.009
Carbon Dioxide (CO2)	16.062	0.581	2.658	4.795	0.94	4.10	1.52	6.76	0.076	0.338
Methane (CH4)	22.061	0.798	3.651	10.436	2.04	8.93	2.84	12.58	0.142	0.629
Ethane (C2H6)	25.546	0.924	4.228	14.762	2.89	12.64	3.81	16.86	0.190	0.843
Propane (C3H8)	18.781	0.679	3.108	23.966	4.68	20.52	5.36	23.62	0.268	1.18
IsoButane (i-C4H10)	2.838	0.103	0.470	5.378	1.05	4.60	1.15	5.07	0.058	0.254
N-Butane (n-C4H10)	6.819	0.247	1.129	13.994	2.73	11.98	2.98	13.11	0.149	0.655
IsoPentane (i-C5H12)	2.165	0.078	0.358	6.103	1.19	5.22	1.27	5.58	0.064	0.279
N-Pentane (n-C5H12)	2.592	0.094	0.429	6.619	1.29	5.67	1.39	6.09	0.069	0.305
Other Hexanes	0.636	0.023	0.105	5.696	1.11	4.88	1.14	4.98	0.057	0.249
Heptanes (less BTEX)	0.863	0.031	0.143	3.185	0.62	2.73	0.654	2.87	0.033	0.143
Octanes+	0.326	0.012	0.054	1.123	0.22	0.96	0.231	1.02	0.012	0.051
n-Hexane (n-C6H14)	0.845	0.031	0.140	2.743	0.54	2.35	0.567	2.49	0.028	0.124
Benzene (C6H6)	0.090	0.003	0.015	0.513	0.100	0.439	0.104	0.454	0.005	0.023
Toluene (C7H8)	0.136	0.005	0.023	0.435	0.085	0.372	0.090	0.395	0.004	0.020
Ethylbenzene (C8H10)	0.014	0.001	0.002	0.026	0.005	0.022	0.006	0.025	2.8E-04	0.001
Xylenes (C8H10)	0.024	0.001	0.004	0.060	0.012	0.051	0.013	0.055	0.001	0.003
Water (H2O)	0.000	7.1E-06	3.3E-05	0.000	0.000	0.000	7.1E-06	3.3E-05	3.6E-07	1.6E-06
TOTAL	**100.0**	**3.6**	**16.6**	**100.0**	**19.5**	**85.6**	**23.16**	**102.2**	**1.16**	**5.11**
TOTAL VOC	**36.1**	**1.3**	**6.0**	**69.8**	**13.6**	**59.8**	**14.96**	**65.76**	**0.748**	**3.29**
TOTAL HAP	**1.11**	**0.04**	**0.18**	**3.78**	**0.74**	**3.23**	**0.778**	**3.42**	**0.039**	**0.171**

*From ProMax Slop Tank Breathing Losses using CTB Analyses
**From Salado Draw 23 Compressor Station, Gas Evolved from Hydrocarbon Liquid Flashed, Date Sampled 10/16/2018. 10 ppm H2S conservatively added.

W&S EMISSION ESTIMATE FOR TK-S1

Tank FIN	TK-S1	
Description	100-bbl Slop Water Tank (Vented to Atmosphere)	
Days per year	365	days/year

Tank Parameters

Material Stored	Produced Water	
Flash in vessel (Yes/No)	Yes	
Vapor Balanced Loading (Yes/No)	No	*Yes = truck loading vapors are vented to tank.*
Tank Max/Min levels client specified (Yes/No)	No	
Annual sum of liquid level increases client specified (Yes/No)	No	
Tanks construction	Welded	
Insulated Tank (Yes/No)	No	
Heated Tank (Yes/No)	No	
Tank Diameter (D)	9.5	ft
Tank Shell Height (Hs)	8	ft
Maximum Liquid Height (Hlx)	7	ft
Minimum Liquid Height (Hln)	1	ft
Annual Sum of the Increases in Liquid Level (ΣHqi)	5782	ft/yr
Roof Type	Cone	
Cone Roof Slope (Sr)	0.0625	ft/ft
Roof Paint Color	Green, Dark	
Roof Paint Condition	Average	
Tank Roof Surface Solar Absorptance (αr)	0.9	dimensionless (AP-42 Table 7.1-6)
Shell Paint Color	Green, Dark	
Shell Paint Condition	Average	
Tank Shell Surface Solar Absorptance (αs)	0.9	dimensionless (AP-42 Table 7.1-6)
Breather Vent Pressure Setting (PBp)	0.03	psig
Breather Vent Vacuum Setting (PBV)	-0.03	psig
Vent Setting Correction Factor (Kb)	1.00	dimensionless

Stored Material Properties

Vapor Molecular Weight (Mv)	50	lb/lb-mol
API Gravity (API)	74.28	° API
Reid Vapor Pressure (RVP)	11.60	psi
Working Loss Product Factor (Kp)	1	dimensionless

Environment Properties - (AP-42, CH. 7 - Table 7.1-7)

Met Data Location	Roswell, NM	
Met Data Period	Annual Average	
Average Daily Max Ambient Temperature	75.8	°F
Average Daily Min Ambient Temperature	47.6	°F
Solar Insolation (I)	1722	Btu/ft² d
Atmospheric Pressure (Pa)	12.88	psia

Operational Parameters

Actual Throughput (BBL/day)	200	BBL/day
Actual Throughput (BBL/year)	73000	BBL/year
Actual Throughput (Gal/year)	3066000	Gal/year
Max Fill Rate (FRm) (BBL/hr)	9	BBL/hr

Constants

Universal Gas Constant (R)	10.731	psia ft³/lb-mol °R

Standing and Working Loss Calculations

Average Daily Max Ambient Temperature (Tax)	535.5	°R
Average Daily Min Ambient Temperature (Tan)	507.3	°R
Shell Radius (Rs)	4.75	ft
Liquid Height (Hl)	3.50	ft
Roof Height (Hr)	0.297	ft
Roof Outage (Hro)	0.099	ft
Vapor Space Outage (Hvo)	4.60	ft
Vapor Space Volume (Vv)	326	ft^3
Net Working Loss Throughput (Vq)	409822	ft^3/year
Tank Shell Height to Tank Diameter (Hs/D)	0.842	dimensionless
Average Daily Ambient Temperature (Taa)	521.4	°R
Liquid Bulk Temperature (Tb)	526.0	°R
Average Daily Liquid Surface Temperature (Tla)	530.8	°R
Daily Max Liquid Surface Temperature (Tlx)	543.0	°R
Daily Min Liquid Surface Temperature (Tln)	518.7	°R
Average Vapor Temperature (Tv)	535.6	°R
Vapor Pressure at TLA (Pva)	10.8	psia
Vapor Pressure at TLX (Pvx)	13.0	psia
Vapor Pressure at TLN (Pvn)	8.97	psia
Vapor Pressure at Tb	10.1	psia
Vapor Density (Wv)	0.094	lb/ft^3
Average Daily Ambient Temperature Range (dTa)	28.2	°R
Average Daily Vapor Temperature Range (dTv)	48.6	°R
Average Daily Vapor Pressure Range (dPv)	4.01	psia
Breather Vent Pressure Range (dPb)	0.060	psia
Vapor Space Expansion Factor (Ke)	2.03	per day
Vented Vapor Saturation Factor (Ks)	0.275	dimensionless
Standing Losses (Ls)	6247	lb/year
Turnovers per Period (N)	964	turnovers/year
Turnover Factor (Kn)	1.00	dimensionless
Working Losses (Lw)	38648	lb/year
Total Routine Losses (Lt)	44900	lb/year
Max Hourly Working Loss (lb/hr)	**6.51**	**lb/hr**
Uncontrolled Annual total (Lt - tons/year)	**22.5**	**tpy**

Assuming W&S Emissions from the slop tank are 1% of the emissions calculated based on condensate properties.

Max Hourly Working Loss (lb/hr)	**0.065**	**lb/hr**
Pre-VRU Reduction Annual total (tons/year)	**0.225**	**tpy**

W&S EMISSION ESTIMATE FOR TK-S2

Tank FIN	TK-S2	
Description	Slop Condensate Tank, 750-bbl	
Days per year	365	days/year

Tank Parameters

Material Stored	Crude Oil	
Flash in vessel (Yes/No)	Yes	
Vapor Balanced Loading (Yes/No)	No	*Yes = truck loading vapors are vented to tank.*
Tank Max/Min levels client specified (Yes/No)	No	
Annual sum of liquid level increases client specified (Yes/No)	No	
Tanks construction	Welded	
Insulated Tank (Yes/No)	No	
Heated Tank (Yes/No)	No	
Tank Diameter (D)	15.5	ft
Tank Shell Height (Hs)	24	ft
Maximum Liquid Height (Hlx)	23	ft
Minimum Liquid Height (Hln)	1	ft
Annual Sum of the Increases in Liquid Level (ΣHqi)	1086	ft/yr
Roof Type	Cone	
Cone Roof Slope (Sr)	0.0625	ft/ft
Roof Paint Color	Green, Dark	
Roof Paint Condition	Average	
Tank Roof Surface Solar Absorptance (αr)	0.9	dimensionless (AP-42 Table 7.1-6)
Shell Paint Color	Green, Dark	
Shell Paint Condition	Average	
Tank Shell Surface Solar Absorptance (αs)	0.9	dimensionless (AP-42 Table 7.1-6)
Breather Vent Pressure Setting (PBp)	0.03	psig
Breather Vent Vacuum Setting (PBV)	-0.03	psig
Vent Setting Correction Factor (Kb)	1.00	dimensionless

Stored Material Properties

Vapor Molecular Weight (Mv)	50	lb/lb-mol
API Gravity (API)	74.282	° API
Reid Vapor Pressure (RVP)	11.597	psi
Working Loss Product Factor (Kp)	0.75	dimensionless

Environment Properties - (AP-42, CH. 7 - Table 7.1-7)

Met Data Location	Roswell, NM	
Met Data Period	Annual Average	
Average Daily Max Ambient Temperature	75.8	°F
Average Daily Min Ambient Temperature	47.6	°F
Solar Insolation (I)	1722	Btu/ft² d
Atmospheric Pressure (Pa)	12.88	psia

Operational Parameters

Actual Throughput (BBL/day)	100	BBL/day
Actual Throughput (BBL/year)	36500	BBL/year
Actual Throughput (Gal/year)	1533000	Gal/year
Max Fill Rate (FRm) (BBL/hr)	5	BBL/hr

Constants

Universal Gas Constant (R)	10.731	psia ft³/lb-mol °R

Standing and Working Loss Calculations

Average Daily Max Ambient Temperature (Tax)	535.5	°R
Average Daily Min Ambient Temperature (Tan)	507.3	°R
Shell Radius (Rs)	7.75	ft
Liquid Height (Hl)	11.5	ft
Roof Height (Hr)	0.484	ft
Roof Outage (Hro)	0.161	ft
Vapor Space Outage (Hvo)	12.7	ft
Vapor Space Volume (Vv)	2389	ft^3
Net Working Loss Throughput (Vq)	204911	ft^3/year
Tank Shell Height to Tank Diameter (Hs/D)	1.55	dimensionless
Average Daily Ambient Temperature (Taa)	521.4	°R
Liquid Bulk Temperature (Tb)	526.0	°R
Average Daily Liquid Surface Temperature (Tla)	530.1	°R
Daily Max Liquid Surface Temperature (Tlx)	542.1	°R
Daily Min Liquid Surface Temperature (Tln)	518.1	°R
Average Vapor Temperature (Tv)	534.1	°R
Vapor Pressure at TLA (Pva)	10.7	psia
Vapor Pressure at TLX (Pvx)	12.8	psia
Vapor Pressure at TLN (Pvn)	8.89	psia
Vapor Pressure at Tb	10.1	psia
Vapor Density (Wv)	0.094	lb/ft^3
Average Daily Ambient Temperature Range (dTa)	28.2	°R
Average Daily Vapor Temperature Range (dTv)	48.0	°R
Average Daily Vapor Pressure Range (dPv)	3.93	psia
Breather Vent Pressure Range (dPb)	0.060	psia
Vapor Space Expansion Factor (Ke)	1.88	per day
Vented Vapor Saturation Factor (Ks)	0.122	dimensionless
Standing Losses (Ls)	18733	lb/year
Turnovers per Period (N)	49.4	turnovers/year
Turnover Factor (Kn)	1.00	dimensionless
Working Losses (Lw)	14372	lb/year
Total Routine Losses (Lt)	33100	lb/year
Max Hourly Working Loss (lb/hr)	**3.62**	**lb/hr**
Uncontrolled Annual total (Lt - tons/year)	**16.6**	**tpy**

EMISSION ESTIMATE FOR SLOP CONDENSATE TANK FLASH

(EPN: TK-FUG2, FIN: TK-S2)

Flash Losses per Tank

GOR	**75.5**	**scf/bbl**
Mol Weight	**23.55**	**lb/lb-mol**

Condensate Storage Tank Flash Emissions		
Throughput	**100**	**bbl/day**
	7550	**scf/day**
	315	**scf/hr**
Total Hourly Flash Loss	**19.54**	**lb/hr**
Total Annual Flash Loss	**85.60**	**tpy**

Throughput (scf/day) = (75.5 scf/bbl) * (100 bbl/day) = (7550 scf/day)
Total Hourly Flash Loss = (315 scf/hr) / (379 scf/lbmol) * (23.55 lb/lbmol) = (19.54 lb/hr)

Flash Gas Speciation

Component	**Weight %**	**Slop Condensate Tank Flash**	
		Hourly Emissions (lb/hr)	**Annual Emissions (tpy)**
Hydrogen Sulfide (H2S)	**0.001**	1.6E-04	0.001
Nitrogen (N2)	**0.166**	0.032	0.142
Carbon Dioxide (CO2)	**4.795**	0.937	4.10
Methane (CH4)	**10.436**	2.04	8.93
Ethane (C2H6)	**14.762**	2.89	12.64
Propane (C3H8)	**23.966**	4.68	20.52
IsoButane (i-C4H10)	**5.378**	1.05	4.60
N-Butane (n-C4H10)	**13.994**	2.73	11.98
IsoPentane (i-C5H12)	**6.103**	1.19	5.22
N-Pentane (n-C5H12)	**6.619**	1.29	5.67
Other Hexanes	**5.696**	1.11	4.88
Heptanes (C7H16)	**3.185**	0.622	2.73
Octanes +	**1.123**	0.219	0.96
n-Hexane (n-C6H14)	**2.743**	0.536	2.35
2,2,4 Trimethylpentane (C8H18)	**0.513**	0.100	0.439
Benzene (C6H6)	**0.435**	0.085	0.372
Toluene (C7H8)	**0.026**	0.005	0.022
Ethylbenzene (C8H10)	**0.060**	0.012	0.051
Xylenes (C8H10)	**0.000**	0.000	0.000
TOTAL	100.0	19.54	85.60
TOTAL HAP	3.78	0.738	3.23
TOTAL VOC	69.8	13.65	59.78

From Salado Draw 23 Compressor Station, Gas Evolved from Hydrocarbon Liquid Flashed, Date Sampled 10/16/2018. 10 ppm H2S conservatively added.

STARTUP, SHUTDOWN, AND MAINTENANCE EMISSIONS

Summary of SSM Emissions

EPN SITE-SSM

	VOC		H2S		Benzene		Toluene		Ethylbenzene		Xylene		n-Hexane		Total HAP	
Activity	**lb/hr***	**tpy**	**lb/hr***	**tpy**	**lb/hr***	**tpy**	**lb/hr***	**tpy**	**lb/hr***	**tpy**	**lb/hr***	**tpy**	**lb/hr***	**tpy**	**lb/hr***	**tpy**
Dehydrator Blowdowns	575	1.15	0.025	5.0E-05	2.37	0.005	2.73	0.005	0.146	0.000	0.911	0.002	19.80	0.040	25.96	0.052
VRU Blowdowns	7.71	0.185	7.2E-05	1.7E-06	0.017	4.2E-04	0.020	4.9E-04	0.002	5.4E-05	0.004	9.9E-05	0.181	0.004	0.225	0.005
Compressor Blowdowns	95.90	1.34	0.004	5.8E-05	0.395	0.006	0.456	0.006	0.024	3.4E-04	0.152	0.002	3.30	0.046	4.33	0.061
SSM Total	**575.3**	**2.68**	**0.025**	**1.1E-04**	**2.37**	**0.011**	**2.73**	**0.012**	**0.146**	**0.001**	**0.911**	**0.004**	**19.80**	**0.090**	**25.96**	**0.118**

*The lb/hr values have not been summed. These activities do not occur simultaneously; therefore, summing these values for the purpose of demonstrating short-term emission limits is inappropriate. Instead, the highest lb/hr value is given as the total.

Glycol Dehydration Unit Blowdowns

Accounts for depressuring process vessels and equipment for maintenance.

Calculation Inputs

Piping Allowance:	10%			
Volume (cu.ft.):	829			
Pressure (psig):	1000		Atmospheric Pressure:	14.7 psia
Temperature (°F):	80		Temperature:	540 °R
R Value (psia-cu.ft./lb-mol/R):	10.732			
Event Duration:	2	hrs		
Events per Year:	2			
Natural Gas MW:	25.1	lb/lb-mol		

Calculation

n = P*V/(R*T)

Natural Gas Vented, n:	145.2	lb-mol/activity
Natural Gas Vented:	3645	lb/activity
	1823	lb/hr
	3.65	ton/yr

EPN: SITE-MSS

Component	Composition* (wt %)	Max Hourly Rate (lb/hr)	Annual Rate (ton/yr)
Hydrogen Sulfide	0.001	0.025	5.0E-05
Nitrogen	1.683	30.70	0.061
Carbon Dioxide	10.709	195.0	0.390
Methane	43.352	790.0	1.58
Ethane	12.675	231.0	0.462
Propane	11.850	216.0	0.432
IsoButane	2.359	43.00	0.086
N-Butane	6.315	115.0	0.230
IsoPentane	2.136	38.90	0.078
N-Pentane	2.560	46.70	0.093
Other Hexanes	1.997	36.40	0.073
Heptanes	2.922	53.30	0.107
n-Hexane	1.087	19.80	0.040
Benzene	0.130	2.37	0.005
Toluene	0.150	2.73	0.005
Ethylbenzene	0.008	0.146	2.9E-04
Xylene	0.050	0.911	0.002
Total	**100.0**	**1820**	**3.64**
Total VOC	**31.56**	**575.3**	**1.15**
Total H2S	**0.001**	**0.025**	**5.0E-05**
Total HAP	**1.425**	**25.96**	**0.052**

*From Salado Draw 23 Compressor Station, Inlet Separator, Date Sampled 07/20/2021. 10 ppm H2S conservatively added.

VRU Blowdowns

Accounts for depressuring compressor and associated equipment for maintenance.

Number of VRUs:	4	
Physical blowdown Volume:	10	ft^3
Piping/Restart Allowance:	20%	
R Value:	10.732	psia-cu.ft./lb-mol/°R
Event Duration:	1	hr or less
Events per Compressor:	12	(monthly)
Events per Year:	48	

Total Piping and Equipment Volume for One Compressor =	12	ft^3
Temperature =	80	°F
Starting Pressure =	80	psig
=	95	psia
Atmospheric pressure =	14.7	psia
R value =	10.732	$psia\text{-}ft^3/lbmol\text{-}R$
Standard gas volume =	379.5	scf/lbmol

Moles of gas (n) = P*V / (R*T) = (94.7 psia) (12 ft3) / [(10.73159 psia-ft3/lbmol-R) (540 R)]

Moles of gas (n) = 0.20 lbmol

Standard Gas Volume = (0.196 lbmol) (379.5 scf/lbmol)

= 74 scf

Vapor MW: 50

Calculated Emission Rates

Natural Gas Vented, n:	0.196	lb-mol/activity
Natural Gas Vented:	9.80	lb/activity
	9.80	lb/hr
	0.235	ton/yr

EPN: SITE-MSS

Component	Composition* (wt %)	Max Hourly Rate (lb/hr)	Annual Rate (ton/yr)
Hydrogen Sulfide	0.001	7.2E-05	1.7E-06
Carbon Dioxide	4.116	0.403	0.010
Methane	0.908	0.089	0.002
Ethane	16.361	1.60	0.039
Propane	33.847	3.32	0.080
IsoButane	7.289	0.714	0.017
N-Butane	18.969	1.86	0.045
IsoPentane	6.047	0.593	0.014
N-Pentane	6.977	0.684	0.016
Other Hexanes	1.219	0.119	0.003
Heptanes	1.404	0.138	0.003
Octanes +	0.572	0.056	0.001
n-Hexane	1.843	0.181	0.004
Benzene	0.177	0.017	4.2E-04
Toluene	0.206	0.020	4.9E-04
Ethylbenzene	0.023	0.002	5.4E-05
Xylene	0.042	0.004	9.9E-05
Total	**100.001**	**9.80**	**0.235**
Total VOC	**78.615**	**7.71**	**0.185**
Total H2S	**0.001**	**7.2E-05**	**1.7E-06**
Total HAP	**2.291**	**0.225**	**0.005**

*From ProMax Oil Tank Breathing Losses using CTB Analyses

Compressor Blowdowns

Accounts for depressuring compressor and associated equipment for maintenance.

Compressor Type:	Various	
Number of Compressors:	4	
Physical blowdown Volume:	3896	ft^3
Piping/Restart Allowance:	20%	
R Value:	10.732	psia-cu.ft./lb-mol/°R
Event Duration:	1	hr or less
Events per Compressor:	7	
Events per Year:	28	

Total Piping and Equipment Volume for One Compressor =	4,675	ft^3
Temperature =	68	°F
Starting Pressure =	0	psig
=	15	psia
Atmospheric pressure =	14.7	psia
R value =	10.732	psia-ft^3/lbmol-R
Standard gas volume =	379.5	scf/lbmol

Moles of gas (n) = P*V / (R*T) = (14.7 psia) (4675 ft3) / [(10.73159 psia-ft3/lbmol-R) (528 R)]

Moles of gas (n) =	12.10	lbmol
Standard Gas Volume =	(12.1 lbmol) (379.5 scf/lbmol)	
=	4592	scf

Vapor MW:	25.1	lb/lb-mol

Calculated Emission Rates

Natural Gas Vented, n:	12.100	lb-mol/activity
Natural Gas Vented:	303.7	lb/activity
	303.7	lb/hr
	4.252	ton/yr

EPN: SITE-MSS

Component	Vapor Weight %*	Max Hourly Rate (lb/hr)	Annual Rate (ton/yr)
Hydrogen Sulfide	0.001	0.004	5.8E-05
Carbon Dioxide	10.709	32.50	0.455
Methane	43.352	132.0	1.84
Ethane	12.675	38.50	0.539
Propane	11.850	36.00	0.504
IsoButane	2.359	7.16	0.100
N-Butane	6.315	19.20	0.269
IsoPentane	2.136	6.49	0.091
N-Pentane	2.560	7.78	0.109
Other Hexanes	1.997	6.07	0.085
Heptanes	2.922	8.87	0.124
n-Hexane	1.087	3.30	0.046
Benzene	0.130	0.395	0.006
Toluene	0.150	0.456	0.006
Ethylbenzene	0.008	0.024	3.4E-04
Xylene	0.050	0.152	0.002
Total	**99.984**	**304.0**	**4.25**
Total VOC	**31.6**	**95.90**	**1.34**
Total H2S	**0.001**	**0.004**	**5.8E-05**
Total HAP	**1.425**	**4.33**	**0.061**

*From Salado Draw 23 Compressor Station, Inlet Separator, Date Sampled 07/20/2021. 10 ppm H2S conservatively added.

Mass Fraction Conversion
Sales Gas

Basis: 1 lb-mol

Component	Mol %	MW (lb/lb-mol)	Fraction*MW (lb/lb-mol)	Weight %
Hydrogen Sulfide (H2S)	0.001	34.08	0.0003	0.001
Nitrogen (N2)	1.510	28.01	0.420	1.68
Carbon Dioxide (CO2)	6.115	44.01	2.69	10.71
Methane (CH4)	67.911	16.04	10.89	43.35
Ethane (C2H6)	10.593	30.07	3.19	12.68
Propane (C3H8)	6.754	44.09	2.98	11.85
IsoButane (i-C4H10)	1.020	58.12	0.59	2.36
N-Butane (n-C4H10)	2.728	58.12	1.59	6.32
IsoPentane (i-C5H12)	0.744	72.15	0.54	2.14
N-Pentane (n-C5H12)	0.893	72.15	0.64	2.56
Other Hexanes	0.586	86.17	0.50	2.00
Heptanes+ (less BTEX)	0.730	100.20	0.73	2.92
n-Hexane (n-C6H14)	0.317	86.17	0.27	1.09
Benzene (C6H6)	0.043	78.11	0.030	0.13
Toluene (C7H8)	0.042	92.14	0.040	0.15
Ethylbenzene (C8H10)	0.002	106.17	0.000	0.008
Xylenes (C8H10)	0.012	106.17	0.010	0.050
Water (H2O)	0.000	18.02	0	0.000
TOTAL	100.0		25.1	100.0

From Salado Draw 23 Compressor Station, Inlet Separator, Date Sampled 07/20/2021. 10 ppm H2S conservatively added.

Total HC	87.591
Total VOC	31.564
Total HAP	1.425

Mass Fraction Conversion
Fuel Gas for Heater, Engines, and Reboiler

Basis: 1 lb-mol

Component	Mol %	MW (lb/lb-mol)	Fraction*MW (lb/lb-mol)	Weight %
Hydrogen Sulfide (H2S)	0.001	34.08	0.00	0.001
Nitrogen (N2)	1.51	28.01	0.42	1.68
Carbon Dioxide (CO2)	6.11	44.01	2.690	10.7
Methane (CH4)	67.91	16.04	10.90	43.35
Ethane (C2H6)	10.59	30.07	3.19	12.60
Propane (C3H8)	6.75	44.09	2.98	11.85
IsoButane (i-C4H10)	1.02	58.12	0.590	2.35
N-Butane (n-C4H10)	2.72	58.12	1.58	6.30
IsoPentane (i-C5H12)	0.74	72.15	0.540	2.10
N-Pentane (n-C5H12)	0.89	72.15	0.640	2.56
Other Hexanes	0.58	86.17	0.50	1.980
Heptanes+ (less BTEX)	0.73	100.2	0.73	2.880
n-Hexane (n-C6H14)	0.317	86.17	0.27	1.087
Benzene (C6H6)	0.043	78.11	0.03	0.130
Toluene (C7H8)	0.042	92.14	0.04	0.150
Ethylbenzene (C8H10)	0.002	106.17	0.00	0.008
Xylenes (C8H10)	0.012	106.17	0.01	0.050
Water (H2O)	0.000	18.02	0.00	0.000
TOTAL	100.0		25.1	100

From Salado Draw 23 Compressor Station, Inlet Separator, Date Sampled 07/20/2021. 10 ppm H2S conservatively added.

Total HC	87.395
Total VOC	31.445
Total HAP	1.425

Mass Fraction Conversion
Light Oil and Water/Light Oil Fugitives

Basis: 1 lb-mol

Component	Mol %	MW (lb/lb-mol)	Fraction*MW (lb/lb-mol)	Weight %
Hydrogen Sulfide (H2S)	0.001	34.08	0.00	0.000
Nitrogen (N2)	0.042	28.01	0.01	0.008
Carbon Dioxide (CO2)	0.568	44.01	0.25	0.176
Methane (CH4)	3.237	16.04	0.52	0.366
Ethane (C2H6)	2.459	30.07	0.740	0.521
Propane (C3H8)	4.399	44.09	1.940	1.368
IsoButane (i-C4H10)	1.321	58.12	0.770	0.542
N-Butane (n-C4H10)	4.792	58.12	2.79	1.968
IsoPentane (i-C5H12)	3.075	72.15	2.22	1.565
N-Pentane (n-C5H12)	4.350	72.15	3.14	2.213
Other Hexanes	4.036	86.17	3.48	2.453
Heptanes (less BTEX)	7.641	100.20	7.66	5.124
Octanes+	54.980	114.23	62.8	77.747
n-Hexane (n-C6H14)	3.741	86.17	3.22	2.274
Benzene (C6H6)	0.592	78.11	0.460	0.326
Toluene (C7H8)	2.259	92.14	2.08	1.468
Ethylbenzene (C8H10)	0.692	106.17	0.730	0.518
Xylenes (C8H10)	1.817	106.17	1.93	1.361
Water (H2O)	0	18.02	0.000	0
TOTAL	100.0		94.7	100.0

From Salado Draw 23 Central Tank Battery, Train 3 Inlet Separator Hydrocarbon Liquid, Date Sampled 07/20/2021. 10 ppm H2S conservatively added.

Total HC	99.814
Total VOC	98.927
Total HAP	5.947

Mass Fraction Conversion
Condensate Flash Gas for CTB tanks
(TK-1, TK-2, TK-3)

Basis: 1 lb-mol

Component	Mol %	MW	Mol Frac * MW (lb/lb-mol)	Weight %
Hydrogen Sulfide (H2S)	0.001	34.08	0.0003	0.001
Nitrogen (N2)	0.015	28.01	0.0041	0.009
Carbon Dioxide (CO2)	5.234	44.01	2.3036	5.042
Methane (CH4)	9.364	16.04	1.5020	3.288
Ethane (C2H6)	19.623	30.07	5.9005	12.915
Propane (C3H8)	31.577	44.09	13.9223	30.478
IsoButane (i-C4H10)	5.766	58.12	3.3511	7.336
N-Butane (n-C4H10)	15.195	58.12	8.8313	19.340
IsoPentane (i-C5H12)	4.075	72.15	2.9400	6.435
N-Pentane (n-C5H12)	4.724	72.15	3.4083	7.590
Other Hexanes	0.918	86.17	0.7909	1.691
Heptanes (less BTEX)	0.803	100.2	0.8050	1.778
Octanes+	0.334	114.23	0.3818	0.852
n-Hexane (n-C6H14)	1.149	86.17	0.9897	2.167
Benzene (C6H6)	0.173	78.11	0.1351	0.296
Toluene (C7H8)	0.168	92.14	0.1551	0.340
Ethylbenzene (C8H10)	0.016	106.17	0.0171	0.037
Xylenes (C8H10)	0.033	106.17	0.0350	0.077
Water (H2O)	0.832	18.015	0.1499	0.328
TOTAL	100.0		45.6	100.0

From ProMax Oil Tank Flash Losses using CTB Analyses

Total HC	94.620
Total VOC	78.417
Total HAP	2.916

Mass Fraction Conversion
Condensate Tank Breathing Losses for CTB tanks
(TK-1, TK-2, TK-3)

Basis: 1 lb-mol

Component	Mol %	MW	Mol Frac * MW (lb/lb-mol)	Weight %
Hydrogen Sulfide (H2S)	0.001	34.08	0.0003	0.001
Nitrogen (N2)	0.001	28.01	0.0003	0.001
Carbon Dioxide (CO2)	4.345	44.01	1.9122	4.116
Methane (CH4)	2.630	16.04	0.4219	0.908
Ethane (C2H6)	25.281	30.07	7.6018	16.361
Propane (C3H8)	35.664	44.09	15.7241	33.847
IsoButane (i-C4H10)	5.827	58.12	3.3865	7.289
N-Butane (n-C4H10)	15.158	58.12	8.8095	18.969
IsoPentane (i-C5H12)	3.894	72.15	2.8094	6.047
N-Pentane (n-C5H12)	4.423	72.15	3.1908	6.977
Other Hexanes	0.673	86.17	0.5799	1.219
Heptanes (less BTEX)	0.645	100.2	0.6462	1.404
Octanes+	0.229	114.23	0.2613	0.572
n-Hexane (n-C6H14)	0.993	86.17	0.8560	1.843
Benzene (C6H6)	0.105	78.11	0.0823	0.177
Toluene (C7H8)	0.104	92.14	0.0958	0.206
Ethylbenzene (C8H10)	0.010	106.17	0.0107	0.023
Xylenes (C8H10)	0.018	106.17	0.0195	0.042
Water (H2O)	0.001	18.015	0.0001	0.000
TOTAL	100.0		46.4	100.0

From ProMax Oil Tank Breathing Losses using CTB Analyses

Total HC	95.884
Total VOC	78.615
Total HAP	2.291

Mass Fraction Conversion
Water Flash Gas for CTB tanks
(PW-1, PW-2, PW-3, PW-4)

Basis: 1 lb-mol

Component	Mol %	MW	Mol Frac * MW (lb/lb-mol)	Weight %
Hydrogen Sulfide (H2S)	0.001	34.08	0.0003	0.001
Nitrogen (N2)	0.161	28.01	0.0450	0.137
Carbon Dioxide (CO2)	39.999	44.01	17.6032	53.640
Methane (CH4)	32.152	16.04	5.1571	15.717
Ethane (C2H6)	13.207	30.07	3.9714	12.101
Propane (C3H8)	6.566	44.09	2.8947	8.822
IsoButane (i-C4H10)	0.568	58.12	0.3300	1.006
N-Butane (n-C4H10)	1.918	58.12	1.1150	3.398
IsoPentane (i-C5H12)	0.316	72.15	0.2281	0.695
N-Pentane (n-C5H12)	0.182	72.15	0.1315	0.412
Other Hexanes	0.256	86.17	0.2202	0.655
Heptanes (less BTEX)	0.016	100.2	0.0164	0.050
Octanes+	0.003	114.23	0.0029	0.009
n-Hexane (n-C6H14)	0.027	86.17	0.0231	0.071
Benzene (C6H6)	0.156	78.11	0.1217	0.371
Toluene (C7H8)	0.151	92.14	0.1387	0.423
Ethylbenzene (C8H10)	0.014	106.17	0.0150	0.046
Xylenes (C8H10)	0.030	106.17	0.0319	0.097
Water (H2O)	4.279	18.015	0.7709	2.349
TOTAL	100.0		32.8	100.0

From ProMax Water Tank Flash Losses using CTB Analyses

Total HC	43.873
Total VOC	16.055
Total HAP	1.007

Mass Fraction Conversion
Water Tank Breathing Losses for CTB tanks
(PW-1, PW-2, PW-3, PW-4)

Basis: 1 lb-mol

Component	Mol %	MW	Mol Frac * MW (lb/lb-mol)	Weight %
Hydrogen Sulfide (H2S)	0.001	34.08	0.0003	0.001
Nitrogen (N2)	0.002	28.01	0.0004	0.002
Carbon Dioxide (CO2)	26.646	44.01	11.7267	46.935
Methane (CH4)	0.854	16.04	0.1370	0.548
Ethane (C2H6)	0.404	30.07	0.1215	0.486
Propane (C3H8)	0.034	44.09	0.0152	0.061
IsoButane (i-C4H10)	0.001	58.12	0.0004	0.002
N-Butane (n-C4H10)	0.002	58.12	0.0013	0.005
IsoPentane (i-C5H12)	0.000	72.15	0.0001	0.000
N-Pentane (n-C5H12)	0.000	72.15	0.0000	0.000
Other Hexanes	0.000	86.17	0.0000	0.000
Heptanes (less BTEX)	0.000	100.2	0.0000	0.000
Octanes+	0.000	114.23	0.0000	0.000
n-Hexane (n-C6H14)	0.000	86.17	0.0000	0.000
Benzene (C6H6)	0.001	78.11	0.0009	0.004
Toluene (C7H8)	0.000	92.14	0.0002	0.001
Ethylbenzene (C8H10)	0.000	106.17	0.0000	0.000
Xylenes (C8H10)	0.000	106.17	0.0000	0.000
Water (H2O)	72.056	18.015	12.9807	51.956
TOTAL	100.0		25.0	100.0

From ProMax Water Tank Breathing Losses using CTB Analyses

Total HC	1.107
Total VOC	0.073
Total HAP	0.005

Mass Fraction Conversion
Slop Flash Gas for Slop Tanks
(TK-S1, TK-S2)

Basis: 1 lb-mol

Component	Mol %	MW	Mol Frac * MW (lb/lb-mol)	Weight %
Hydrogen Sulfide (H2S)	0.001	34.08	0.0003	0.001
Nitrogen (N2)	0.240	28.01	0.0672	0.166
Carbon Dioxide (CO2)	4.426	44.01	1.9479	4.795
Methane (CH4)	26.421	16.04	4.2380	10.436
Ethane (C2H6)	19.943	30.07	5.9970	14.762
Propane (C3H8)	22.079	44.09	9.7348	23.966
IsoButane (i-C4H10)	3.759	58.12	2.1848	5.378
N-Butane (n-C4H10)	9.781	58.12	5.6848	13.994
IsoPentane (i-C5H12)	3.436	72.15	2.4791	6.103
N-Pentane (n-C5H12)	3.727	72.15	2.6891	6.619
Other Hexanes	2.702	86.17	2.3284	5.696
Heptanes (less BTEX)	1.300	100.2	1.3026	3.185
Octanes+	0.398	114.23	0.4546	1.123
n-Hexane (n-C6H14)	1.293	86.17	1.1142	2.743
Benzene (C6H6)	0.267	78.11	0.2086	0.513
Toluene (C7H8)	0.192	92.14	0.1769	0.435
Ethylbenzene (C8H10)	0.010	106.17	0.0110	0.026
Xylenes (C8H10)	0.023	106.17	0.0244	0.060
Water (H2O)	0.000	18.015	0.0000	0.000
TOTAL	100.0		40.6	100.0

From Salado Draw 23 Compressor Station, Gas Evolved from Hydrocarbon Liquid Flashed, Date Sampled 10/16/2018. 10 ppm H2S conservatively added.

Total HC	95.039
Total VOC	69.841
Total HAP	3.777

Mass Fraction Conversion
Slop Tank Breathing Losses
(TK-S1, TK-S2)

Basis: 1 lb-mol

Component	Mol %	MW	Mol Frac * MW (lb/lb-mol)	Weight %
Hydrogen Sulfide (H2S)	0.001	34.08	0.0003	0.001
Nitrogen (N2)	0.220	28.01	0.0617	0.203
Carbon Dioxide (CO2)	11.107	44.01	4.8880	16.062
Methane (CH4)	41.850	16.04	6.7126	22.061
Ethane (C2H6)	25.855	30.07	7.7744	25.546
Propane (C3H8)	12.962	44.09	5.7147	18.781
IsoButane (i-C4H10)	1.486	58.12	0.8636	2.838
N-Butane (n-C4H10)	3.569	58.12	2.0744	6.819
IsoPentane (i-C5H12)	0.913	72.15	0.6588	2.165
N-Pentane (n-C5H12)	1.074	72.15	0.7748	2.592
Other Hexanes	0.230	86.17	0.1983	0.636
Heptanes (less BTEX)	0.260	100.2	0.2602	0.863
Octanes+	0.086	114.23	0.0979	0.326
n-Hexane (n-C6H14)	0.298	86.17	0.2572	0.845
Benzene (C6H6)	0.035	78.11	0.0274	0.090
Toluene (C7H8)	0.045	92.14	0.0415	0.136
Ethylbenzene (C8H10)	0.004	106.17	0.0043	0.014
Xylenes (C8H10)	0.007	106.17	0.0073	0.024
Water (H2O)	0.000	18.015	0.0001	0.000
TOTAL	100.0		30.4	100.0

From ProMax Slop Tank Breathing Losses using CTB Analyses

Total HC	83.735
Total VOC	36.129
Total HAP	1.110

Section 7

Information Used To Determine Emissions

Information Used to Determine Emissions shall include the following:

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

The most current version of AP-42 Section 7.1 (dated June 2020) is used to calculate storage tank emissions. This section of AP-42 is not included here except Page 3-11, which contains Equation 3-29 used to calculated short-term condensate tank emissions during filling.

The most current version of AP-42 Tables 1.4-1 and 1.4-2 (dated July 1998) is attached.

The most current version of AP-42 Section 5.2 (dated July 2008) is used to calculate loading VOC emissions

The most current version of Table 4 from the TCEQ “Flares and Vapor Oxidizers” technical guidance (dated October 2000) is used to calculate flare CO and NOx emissions.

VOC emissions from equipment leak fugitives are calculated using emission factors from the TCEQ document “Air Permit Technical Guidance for Chemical Sources: Fugitive Guidance” dated June 2018. A copy of the page containing the emissions factors is attached.

The Salado Draw 23 CTB and Salado Draw 23 CS analyses are attached.

Engine and catalyst specification sheets are attached.

The ProMax simulation results are attached.

ambient air, heat gain to the bulk liquid from insolation is almost entirely through the tank shell; thus the liquid bulk temperature is not sensitive to H_S/D and may be calculated using the following equation:

$$T_B = T_{AA} + 0.003\ \alpha_S\ I \quad (1\text{-}31)$$

where:

T_B = liquid bulk temperature, °R
T_{AA} = average daily ambient temperature, °R, as calculated in Note 4
α_S = tank shell surface solar absorptance, dimensionless; see Table 7.1-6
I = average daily total insolation factor, Btu/(ft^2 day); see Table 7.1-7.

6. The average vapor temperature, T_V, for an uninsulated tank may be calculated using the following equation:

$$T_V = \frac{[2.2\ (H_S/D)+1.1]\ T_{AA} + 0.8\ T_B + 0.021 \alpha_R I + 0.013 (H_S/D) \alpha_S I}{2.2\ (H_S/D) + 1.9} \quad (1\text{-}32)$$

where:

H_S = tank shell height, ft
D = tank diameter, ft,
T_{AA} = average daily ambient temperature, °R
T_B = liquid bulk temperature, °R
α_R = tank roof surface solar absorptance, dimensionless
α_S = tank shell surface solar absorptance, dimensionless
I = average daily total insolation factor, Btu/(ft^2 day).

API assigns a default value of $H_s/D = 0.5$ and an assumption of $\alpha_R = \alpha_S$, resulting in the simplified equation shown below for an uninsulated tank:[22]

$$T_V = 0.7T_{AA} + 0.3T_B + 0.009\ \alpha\ I \quad (1\text{-}33)$$

where:

α = average tank surface solar absorptance, dimensionless

When the shell is insulated, but not the roof, the temperature equations are independent of H_s/D.

$$T_V = 0.6T_{AA} + 0.4T_B + 0.01\ \alpha_R\ I \quad (1\text{-}34)$$

When the tank shell and roof are fully insulated, the temperatures of the vapor space and the liquid surface are taken as equal to the temperature of the bulk liquid.

7.1.3.1.2 Working Loss

The fixed roof tank working loss, L_W, refers to the loss of stock vapors as a result of tank filling operations. Fixed roof tank working losses can be estimated from:

$$L_W = V_Q K_N K_P W_V K_B \quad \textbf{(1-35)}$$

where:

L_W = working loss, lb/yr

V_Q = net working loss throughput, ft^3/yr, see Note 1

K_N = working loss turnover (saturation) factor, dimensionless

for turnovers > 36, $K_N = (180 + N)/6N$

for turnovers ≤ 36, $K_N = 1$

for tanks that are vapor balanced and tanks in which flashing occurs, $K_N = 1$ regardless of the number of turnovers; further adjustment of K_N may be appropriate in the case of splash loading into a tank.

N = number of turnovers per year, dimensionless:

$$N = \Sigma H_{QI} / (H_{LX} - H_{LN}) \quad \textbf{(1-36)}$$

ΣH_{QI} = the annual sum of the increases in liquid level, ft/yr

If ΣH_{QI} is unknown, it can be estimated from pump utilization records. Over the course of a year, the sum of increases in liquid level, ΣH_{QI}, and the sum of decreases in liquid level, ΣH_{QD}, will be approximately the same. Alternatively, ΣH_{QI} may be approximated as follows:

$$\Sigma H_{QI} = (5.614\ Q) / ((\pi/4)\ D^2) \quad (1\text{-}37)$$

5.614 =the conversion of barrels to cubic feet, ft^3/bbl

Q = annual net throughput, bbl/yr

For horizontal tanks, use D_E (Equation 1-14) in place of D in Equation 1-37

H_{LX} = maximum liquid height, ft

If the maximum liquid height is unknown, for vertical tanks use one foot less than the shell height and for horizontal tanks use (π/4) D where D is the diameter of a vertical cross-section of the horizontal tank

H_{LN} = minimum liquid height, ft

If the minimum liquid height is unknown, for vertical tanks use 1 and for horizontal tanks use 0

K_P = working loss product factor, dimensionless

for crude oils, $K_P = 0.75$; adjustment of K_P may be appropriate in the case of splash loading into a tank

for all other organic liquids, $K_P = 1$

W_V = vapor density, lb/ft^3, see Equation 1-22

K_B = vent setting correction factor, dimensionless, see Note 2 for open vents and for a vent setting range up to ± 0.03 psig, $K_B = 1$

1. Net Working Loss Throughput.

The net working loss throughput, V_Q, is the volume associated with increases in the liquid level, and is calculated as follows:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

where:

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

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

Table II: Facility/Compound Specific Fugitive Emission Factors

Equipment/Service	Compound Specific See Section I for more information			Facility Specific[1]					
	Ethylene Oxide[2] w/LDAR	Phosgene[3] w/LDAR	Butadiene w/LDAR[4]	Petroleum Marketing Terminal[5, 6] w/28PET	Oil and Gas ProductionOperation[6]				Refinery[6]
					Gas	Heavy Oil < 20 API	Light Oil	Water/ Light Oil	
Valves					0.00992	0.0000185	0.0055	0.000216	
Gas/Vapor	0.000444	0.00000216	0.001105	0.0000287					0.059
Light Liquid	0.00055	0.00000199	0.00314	0.0000948					0.024
Heavy Liquid				0.0000948					0.00051
Pumps	0.042651	0.0000201	0.05634		0.00529	0.00113[7]	0.02866	0.000052	
Light Liquid				0.00119					0.251
Heavy Liquid				0.00119					0.046
Flanges/Connectors[11]	0.000555	0.00000011	0.000307		0.00086	0.00000086	0.000243	0.000006	0.00055
					0.00044	0.0000165	0.000463	0.000243	
Gas/Vapor				0.000092604					
Light Liquid				0.00001762					
Heavy Liquid				0.0000176					
Compressors	0.000767		0.000004		0.0194	0.0000683	0.0165	0.0309	1.399
Relief Valve	0.000165	0.0000162	0.02996		0.0194	0.0000683	0.0165	0.0309	0.35
Open-ended Lines[8]	0.001078	0.00000007	0.00012		0.00441	0.000309	0.00309	0.00055	0.0051
Sampling[9]	0.000088		0.00012						0.033
Other[10]					0.0194	0.0000683	0.0165	0.0309	
Gas/Vapor				0.000265					
Light/Heavy Liquid				0.000287					
Process Drains					0.0194	0.0000683	0.0165	0.0309	0.07

Endnotes Table II

1. **Factors give the total organic compound emission rate. Multiply by the weight percent of non-methane, non-ethane organics to get the VOC emission rate.**
2. **These emission factors require the use of the 28MID fugitive program. Monitoring must occur at a leak definition of 500 ppmv. No additional control credit can be applied to these factors except 28CNTQ and 28CNTA. Emission factors are from EOIC Fugitive Emission Study, summer 1988.**
3. **These emission factors require the use of the 28MID fugitive program. Monitoring must occur at a leak definition of 50 ppmv. No additional control credit can be applied to these factors. Emission factors are from Phosgene Panel Study, summer 1988.**
4. **These emission factors require the use of the 28MID fugitive program. Monitoring must occur at a leak definition of 100 ppmv. No additional control credit can be applied to these factors. Emission factors are from Randall, J. L., et al., Radian Corporation. Fugitive Emissions from the 1,3-butadiene Production Industry: A Field Study. Final Report. Prepared for the 1,3-Butadiene Panel for the Chemical Manufacturers Association. April 1989.**
5. **Control credit is included in the factor; no additional control credit can be applied to these factors. Monthly 28 PET inspection is required.**
6. **Factors are taken from EPA Document EPA-453/R-95-017, November 1995, pages 2-13, 2-14, and 2-15.**
7. **Heavy liquid oil – Pump factor was not derived during the API study. The factor is the SOCMI without C_2 Heavy Liquid – Pump factor with a 93% reduction credit for the physical inspection.**

GRI-GLYCalc VERSION 4.0 - SUMMARY OF INPUT VALUES

Case Name: Salado Draw 23 (EPN DHY-1)
File Name: H:\Clients\Chevron EP\CTX14920-NSR Permit 6832M6 Rev-Salado Draw 23\Salado Draw 23 CTB.ddf
Date: September 01, 2021

DESCRIPTION:

Description: 87 MMScf/day maximum throughput

Annual Hours of Operation: 8760.0 hours/yr

WET GAS:

Temperature: 120.00 deg. F
Pressure: 1000.00 psig
Wet Gas Water Content: Saturated

Component	Conc. (vol %)
Carbon Dioxide	6.9328
Nitrogen	1.7189
Methane	72.3895
Ethane	9.9316
Propane	5.4229
Isobutane	0.6672
n-Butane	1.5888
Isopentane	0.3774
n-Pentane	0.3826
n-Hexane	0.0979
Cyclohexane	0.0725
Other Hexanes	0.0430
Heptanes	0.0659
Methylcyclohexane	0.0016
2,2,4-Trimethylpentane	0.0050
Benzene	0.0148
Toluene	0.0155
Ethylbenzene	0.0018
Xylenes	0.0039
C8+ Heavies	0.0376

DRY GAS:

Flow Rate: 87.0 MMSCF/day
Water Content: 7.0 lbs. H2O/MMSCF

LEAN GLYCOL:

Glycol Type: TEG
Water Content: 1.5 wt% H2O
Flow Rate: 9.2 gpm

PUMP:

Glycol Pump Type: Gas Injection
Gas Injection Pump Volume Ratio: 0.080 acfm gas/gpm glycol

FLASH TANK:

Flash Control: Recycle/recompression
Temperature: 115.0 deg. F
Pressure: 30.0 psig

GRI-GLYCalc VERSION 4.0 - AGGREGATE CALCULATIONS REPORT

Case Name: Salado Draw 23 (EPN DHY-1)
File Name: H:\Clients\Chevron EP\CTX14920-NSR Permit 6832M6 Rev-Salado Draw 23\Salado Draw 23 CTB.ddf
Date: September 01, 2021

DESCRIPTION:

Description: 87 MMScf/day maximum throughput

Annual Hours of Operation: 8760.0 hours/yr

EMISSIONS REPORTS:

UNCONTROLLED REGENERATOR EMISSIONS

Component	lbs/hr	lbs/day	tons/yr
Methane	0.5070	12.169	2.2208
Ethane	0.5053	12.126	2.2131
Propane	1.1573	27.776	5.0691
Isobutane	0.2982	7.158	1.3063
n-Butane	1.0216	24.518	4.4746
Isopentane	0.3248	7.795	1.4226
n-Pentane	0.4457	10.696	1.9521
n-Hexane	0.2701	6.483	1.1831
Cyclohexane	1.3327	31.984	5.8370
Other Hexanes	0.0815	1.957	0.3572
Heptanes	0.4782	11.477	2.0945
Methylcyclohexane	0.0396	0.950	0.1733
2,2,4-Trimethylpentane	0.0148	0.356	0.0650
Benzene	3.9564	94.953	17.3289
Toluene	6.4129	153.909	28.0884
Ethylbenzene	1.0338	24.811	4.5279
Xylenes	3.2248	77.395	14.1246
C8+ Heavies	2.7728	66.546	12.1447
Total Emissions	23.8774	573.058	104.5830
Total Hydrocarbon Emissions	23.8774	573.058	104.5830
Total VOC Emissions	22.8651	548.763	100.1492
Total HAP Emissions	14.9128	357.906	65.3178
Total BTEX Emissions	14.6278	351.067	64.0697

FLASH GAS EMISSIONS

Note: Flash Gas Emissions are zero with the Recycle/recompression control option.

FLASH TANK OFF GAS

Component	lbs/hr	lbs/day	tons/yr
Methane	118.8903	2853.368	520.7397
Ethane	35.4291	850.298	155.1794
Propane	31.1280	747.072	136.3406

Isobutane	5.2959	127.101	23.1959
n-Butane	13.6126	326.703	59.6233
Isopentane	3.8177	91.625	16.7215
n-Pentane	4.1580	99.791	18.2118
n-Hexane	1.3873	33.294	6.0762
Cyclohexane	1.9643	47.143	8.6037
Other Hexanes	0.5667	13.600	2.4820
Heptanes	1.2133	29.120	5.3144
Methylcyclohexane	0.0443	1.063	0.1941
2,2,4-Trimethylpentane	0.0779	1.869	0.3412
Benzene	0.6326	15.181	2.7706
Toluene	0.6593	15.822	2.8876
Ethylbenzene	0.0608	1.460	0.2665
Xylenes	0.1238	2.972	0.5423
C8+ Heavies	0.6696	16.070	2.9328
Total Emissions	219.7314	5273.552	962.4233
Total Hydrocarbon Emissions	219.7314	5273.552	962.4233
Total VOC Emissions	65.4119	1569.886	286.5043
Total HAP Emissions	2.9416	70.599	12.8843
Total BTEX Emissions	1.4765	35.435	6.4669

EQUIPMENT REPORTS:

ABSORBER

Calculated Absorber Stages:	1.79	
Specified Dry Gas Dew Point:	7.00	lbs. H2O/MMSCF
Temperature:	120.0	deg. F
Pressure:	1000.0	psig
Dry Gas Flow Rate:	87.0000	MMSCF/day
Glycol Losses with Dry Gas:	4.9571	lb/hr
Wet Gas Water Content:	Saturated	
Calculated Wet Gas Water Content:	104.01	lbs. H2O/MMSCF
Calculated Lean Glycol Recirc. Ratio:	1.57	gal/lb H2O

Component	Remaining in Dry Gas	Absorbed in Glycol
Water	6.71%	93.29%
Carbon Dioxide	99.87%	0.13%
Nitrogen	99.99%	0.01%
Methane	99.99%	0.01%
Ethane	99.97%	0.03%
Propane	99.96%	0.04%
Isobutane	99.95%	0.05%
n-Butane	99.93%	0.07%
Isopentane	99.94%	0.06%
n-Pentane	99.92%	0.08%
n-Hexane	99.89%	0.11%
Cyclohexane	99.53%	0.47%
Other Hexanes	99.91%	0.09%
Heptanes	99.83%	0.17%
Methylcyclohexane	99.54%	0.46%
2,2,4-Trimethylpentane	99.93%	0.07%
Benzene	95.96%	4.04%

Toluene	94.92%	5.08%
Ethylbenzene	94.08%	5.92%
Xylenes	91.62%	8.38%
C8+ Heavies	99.53%	0.47%

FLASH TANK

Flash Control: Recycle/recompression
Flash Temperature: 115.0 deg. F
Flash Pressure: 30.0 psig

Component	Left in Glycol	Removed in Flash Gas
Water	99.70%	0.30%
Carbon Dioxide	5.47%	94.53%
Nitrogen	0.39%	99.61%
Methane	0.42%	99.58%
Ethane	1.41%	98.59%
Propane	3.58%	96.42%
Isobutane	5.33%	94.67%
n-Butane	6.98%	93.02%
Isopentane	8.02%	91.98%
n-Pentane	9.88%	90.12%
n-Hexane	16.52%	83.48%
Cyclohexane	42.01%	57.99%
Other Hexanes	13.00%	87.00%
Heptanes	28.50%	71.50%
Methylcyclohexane	48.93%	51.07%
2,2,4-Trimethylpentane	16.56%	83.44%
Benzene	86.89%	13.11%
Toluene	91.40%	8.60%
Ethylbenzene	95.01%	4.99%
Xylenes	96.78%	3.22%
C8+ Heavies	82.53%	17.47%

REGENERATOR

No Stripping Gas used in regenerator.

Component	Remaining in Glycol	Distilled Overhead
Water	18.10%	81.90%
Carbon Dioxide	0.00%	100.00%
Nitrogen	0.00%	100.00%
Methane	0.00%	100.00%
Ethane	0.00%	100.00%
Propane	0.00%	100.00%
Isobutane	0.00%	100.00%
n-Butane	0.00%	100.00%
Isopentane	2.46%	97.54%
n-Pentane	2.27%	97.73%
n-Hexane	1.61%	98.39%
Cyclohexane	6.35%	93.65%
Other Hexanes	3.66%	96.34%
Heptanes	1.13%	98.87%

Methylcyclohexane	6.81%	93.19%
2,2,4-Trimethylpentane	3.95%	96.05%
Benzene	5.63%	94.37%
Toluene	8.51%	91.49%
Ethylbenzene	10.82%	89.18%
Xylenes	13.27%	86.73%
C8+ Heavies	12.37%	87.63%

STREAM REPORTS:

WET GAS STREAM

Temperature: 120.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 3.63e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	2.19e-001	3.78e+002
Carbon Dioxide	6.93e+000	2.92e+004
Nitrogen	1.72e+000	4.61e+003
Methane	7.24e+001	1.11e+005
Ethane	9.93e+000	2.86e+004
Propane	5.42e+000	2.29e+004
Isobutane	6.67e-001	3.71e+003
n-Butane	1.59e+000	8.84e+003
Isopentane	3.77e-001	2.61e+003
n-Pentane	3.83e-001	2.64e+003
n-Hexane	9.79e-002	8.08e+002
Cyclohexane	7.25e-002	5.85e+002
Other Hexanes	4.30e-002	3.55e+002
Heptanes	6.59e-002	6.32e+002
Methylcyclohexane	1.60e-003	1.51e+001
2,2,4-Trimethylpentane	5.00e-003	5.47e+001
Benzene	1.48e-002	1.11e+002
Toluene	1.55e-002	1.37e+002
Ethylbenzene	1.79e-003	1.82e+001
Xylenes	3.89e-003	3.96e+001
C8+ Heavies	3.76e-002	6.14e+002
Total Components	100.00	2.18e+005

DRY GAS STREAM

Temperature: 120.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 3.63e+006 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	1.47e-002	2.54e+001
Carbon Dioxide	6.94e+000	2.92e+004
Nitrogen	1.72e+000	4.61e+003
Methane	7.26e+001	1.11e+005

Ethane	9.95e+000	2.86e+004
Propane	5.43e+000	2.29e+004
Isobutane	6.68e-001	3.71e+003
n-Butane	1.59e+000	8.84e+003
Isopentane	3.78e-001	2.61e+003
n-Pentane	3.83e-001	2.64e+003
n-Hexane	9.80e-002	8.07e+002
Cyclohexane	7.24e-002	5.82e+002
Other Hexanes	4.31e-002	3.55e+002
Heptanes	6.59e-002	6.31e+002
Methylcyclohexane	1.60e-003	1.50e+001
2,2,4-Trimethylpentane	5.01e-003	5.47e+001
Benzene	1.43e-002	1.07e+002
Toluene	1.47e-002	1.30e+002
Ethylbenzene	1.69e-003	1.71e+001
Xylenes	3.57e-003	3.62e+001
C8+ Heavies	3.75e-002	6.11e+002
Total Components	100.00	2.18e+005

LEAN GLYCOL STREAM

Temperature: 120.00 deg. F
Flow Rate: 9.20e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.85e+001	5.10e+003
Water	1.50e+000	7.77e+001
Carbon Dioxide	7.10e-011	3.68e-009
Nitrogen	1.12e-012	5.82e-011
Methane	7.98e-018	4.13e-016
Ethane	7.65e-008	3.96e-006
Propane	8.04e-009	4.16e-007
Isobutane	1.17e-009	6.06e-008
n-Butane	2.93e-009	1.52e-007
Isopentane	1.58e-004	8.20e-003
n-Pentane	2.00e-004	1.03e-002
n-Hexane	8.54e-005	4.42e-003
Cyclohexane	1.75e-003	9.04e-002
Other Hexanes	5.98e-005	3.10e-003
Heptanes	1.05e-004	5.44e-003
Methylcyclohexane	5.58e-005	2.89e-003
2,2,4-Trimethylpentane	1.18e-005	6.10e-004
Benzene	4.56e-003	2.36e-001
Toluene	1.15e-002	5.96e-001
Ethylbenzene	2.42e-003	1.25e-001
Xylenes	9.53e-003	4.94e-001
C8+ Heavies	7.56e-003	3.91e-001
Total Components	100.00	5.18e+003

RICH GLYCOL AND PUMP GAS STREAM

Temperature: 120.00 deg. F
Pressure: 1014.70 psia
Flow Rate: 1.06e+001 gpm

NOTE: Stream has more than one phase.

Component	Conc. (wt%)	Loading (lb/hr)
TEG	8.72e+001	5.10e+003
Water	7.37e+000	4.31e+002
Carbon Dioxide	1.11e+000	6.49e+001
Nitrogen	8.59e-002	5.02e+000
Methane	2.04e+000	1.19e+002
Ethane	6.15e-001	3.59e+001
Propane	5.52e-001	3.23e+001
Isobutane	9.57e-002	5.59e+000
n-Butane	2.50e-001	1.46e+001
Isopentane	7.10e-002	4.15e+000
n-Pentane	7.89e-002	4.61e+000
n-Hexane	2.84e-002	1.66e+000
Cyclohexane	5.79e-002	3.39e+000
Other Hexanes	1.11e-002	6.51e-001
Heptanes	2.90e-002	1.70e+000
Methylcyclohexane	1.48e-003	8.68e-002
2,2,4-Trimethylpentane	1.60e-003	9.33e-002
Benzene	8.25e-002	4.82e+000
Toluene	1.31e-001	7.67e+000
Ethylbenzene	2.09e-002	1.22e+000
Xylenes	6.57e-002	3.84e+000
C8+ Heavies	6.56e-002	3.83e+000
Total Components	100.00	5.85e+003

FLASH TANK OFF GAS STREAM

Temperature: 115.00 deg. F
Pressure: 44.70 psia
Flow Rate: 4.35e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	6.25e-001	1.29e+000
Carbon Dioxide	1.22e+001	6.13e+001
Nitrogen	1.56e+000	5.00e+000
Methane	6.47e+001	1.19e+002
Ethane	1.03e+001	3.54e+001
Propane	6.16e+000	3.11e+001
Isobutane	7.95e-001	5.30e+000
n-Butane	2.04e+000	1.36e+001
Isopentane	4.62e-001	3.82e+000
n-Pentane	5.03e-001	4.16e+000
n-Hexane	1.41e-001	1.39e+000
Cyclohexane	2.04e-001	1.96e+000
Other Hexanes	5.74e-002	5.67e-001
Heptanes	1.06e-001	1.21e+000
Methylcyclohexane	3.94e-003	4.43e-002
2,2,4-Trimethylpentane	5.95e-003	7.79e-002
Benzene	7.07e-002	6.33e-001
Toluene	6.25e-002	6.59e-001
Ethylbenzene	5.00e-003	6.08e-002
Xylenes	1.02e-002	1.24e-001
C8+ Heavies	3.43e-002	6.70e-001

Component	Conc. (wt%)	Loading (lb/hr)
Total Components	100.00	2.87e+002

FLASH TANK GLYCOL STREAM

Temperature: 115.00 deg. F
Flow Rate: 9.95e+000 gpm

Component	Conc. (wt%)	Loading (lb/hr)
TEG	9.17e+001	5.10e+003
Water	7.72e+000	4.29e+002
Carbon Dioxide	6.39e-002	3.55e+000
Nitrogen	3.50e-004	1.95e-002
Methane	9.12e-003	5.07e-001
Ethane	9.09e-003	5.05e-001
Propane	2.08e-002	1.16e+000
Isobutane	5.37e-003	2.98e-001
n-Butane	1.84e-002	1.02e+000
Isopentane	5.99e-003	3.33e-001
n-Pentane	8.20e-003	4.56e-001
n-Hexane	4.94e-003	2.75e-001
Cyclohexane	2.56e-002	1.42e+000
Other Hexanes	1.52e-003	8.46e-002
Heptanes	8.70e-003	4.84e-001
Methylcyclohexane	7.64e-004	4.25e-002
2,2,4-Trimethylpentane	2.78e-004	1.55e-002
Benzene	7.54e-002	4.19e+000
Toluene	1.26e-001	7.01e+000
Ethylbenzene	2.09e-002	1.16e+000
Xylenes	6.69e-002	3.72e+000
C8+ Heavies	5.69e-002	3.16e+000
Total Components	100.00	5.56e+003

FLASH GAS EMISSIONS

Control Method: Recycle/recompression
Control Efficiency: 100.00

Note: Flash Gas Emissions are zero with the Recycle/recompression control option.

REGENERATOR OVERHEADS STREAM

Temperature: 212.00 deg. F
Pressure: 14.70 psia
Flow Rate: 7.56e+003 scfh

Component	Conc. (vol%)	Loading (lb/hr)
Water	9.80e+001	3.52e+002
Carbon Dioxide	4.05e-001	3.55e+000
Nitrogen	3.49e-003	1.95e-002
Methane	1.59e-001	5.07e-001
Ethane	8.44e-002	5.05e-001
Propane	1.32e-001	1.16e+000

Isobutane	2.58e-002	2.98e-001
n-Butane	8.83e-002	1.02e+000
Isopentane	2.26e-002	3.25e-001
n-Pentane	3.10e-002	4.46e-001
n-Hexane	1.57e-002	2.70e-001
Cyclohexane	7.95e-002	1.33e+000
Other Hexanes	4.75e-003	8.15e-002
Heptanes	2.40e-002	4.78e-001
Methylcyclohexane	2.02e-003	3.96e-002
2,2,4-Trimethylpentane	6.53e-004	1.48e-002
Benzene	2.54e-001	3.96e+000
Toluene	3.49e-001	6.41e+000
Ethylbenzene	4.89e-002	1.03e+000
Xylenes	1.52e-001	3.22e+000
C8+ Heavies	8.17e-002	2.77e+000
Total Components	100.00	3.79e+002

August 4, 2021

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: Chevron North America Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

Sample: Salado Draw 23 Compressor Station
Inlet Separator
Spot Gas Sampled @ 92 psig & 91 °F

Date Sampled: 07/20/2021 Job Number: 212291.001

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	1.510	
Carbon Dioxide	6.115	
Methane	67.911	
Ethane	10.593	2.903
Propane	6.754	1.907
Isobutane	1.020	0.342
n-Butane	2.718	0.878
2-2 Dimethylpropane	0.010	0.004
Isopentane	0.744	0.279
n-Pentane	0.893	0.332
Hexanes	0.754	0.318
Heptanes Plus	0.978	0.410
Totals	100.000	7.373

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.362	(Air=1)
Molecular Weight	96.90	
Gross Heating Value	5242	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	0.872	(Air=1)
Compressibility (Z)	0.9951	
Molecular Weight	25.13	
Gross Heating Value		
Dry Basis	1353	BTU/CF
Saturated Basis	1330	BTU/CF

*Hydrogen Sulfide tested on location by: Stain Tube Method (GPA 2377)
Results: 0.094 Gr/100 CF, 1.5 PPMV or 0.0002 Mol%

Base Conditions: 15.025 PSI & 60 Deg F

Sampled By: (14) LAT
Analyst: RG
Processor: KV
Cylinder ID: T-2921

Certified: FESCO, Ltd. - Alice, Texas

Conan Pierce 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	1.510		1.683
Carbon Dioxide	6.115		10.709
Methane	67.911		43.352
Ethane	10.593	2.903	12.675
Propane	6.754	1.907	11.851
Isobutane	1.020	0.342	2.359
n-Butane	2.718	0.878	6.286
2,2 Dimethylpropane	0.010	0.004	0.029
Isopentane	0.744	0.279	2.136
n-Pentane	0.893	0.332	2.564
2,2 Dimethylbutane	0.009	0.004	0.031
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.068	0.029	0.233
2 Methylpentane	0.233	0.099	0.799
3 Methylpentane	0.127	0.053	0.435
n-Hexane	0.317	0.134	1.087
Methylcyclopentane	0.125	0.045	0.419
Benzene	0.043	0.012	0.134
Cyclohexane	0.149	0.052	0.499
2-Methylhexane	0.041	0.020	0.163
3-Methylhexane	0.047	0.022	0.187
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.118	0.053	0.466
n-Heptane	0.099	0.047	0.395
Methylcyclohexane	0.124	0.051	0.484
Toluene	0.042	0.014	0.154
Other C8's	0.103	0.049	0.452
n-Octane	0.028	0.015	0.127
Ethylbenzene	0.002	0.001	0.008
M & P Xylenes	0.010	0.004	0.042
O-Xylene	0.002	0.001	0.008
Other C9's	0.032	0.017	0.161
n-Nonane	0.005	0.003	0.026
Other C10's	0.006	0.004	0.034
n-Decane	0.001	0.001	0.006
Undecanes (11)	0.001	0.001	0.006
Totals	100.000	7.373	100.000

Computed Real Characteristics of Total Sample		
Specific Gravity	0.872	(Air=1)
Compressibility (Z)	0.9951	
Molecular Weight	25.13	
Gross Heating Value		
Dry Basis	1353	BTU/CF
Saturated Basis	1330	BTU/CF

August 4, 2021

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

Sample: Salado Draw 23 Compressor Station
Inlet Separator
Spot Gas Sampled @ 92 psig & 91 °F

Date Sampled: 07/20/2021 Job Number: 212291.001

GLYCALC FORMAT

COMPONENT	MOL%	GPM	Wt %
Carbon Dioxide	6.115		10.709
Hydrogen Sulfide	< 0.001		< 0.001
Nitrogen	1.510		1.683
Methane	67.911		43.352
Ethane	10.593	2.903	12.675
Propane	6.754	1.907	11.851
Isobutane	1.020	0.342	2.359
n-Butane	2.728	0.882	6.315
Isopentane	0.744	0.279	2.136
n-Pentane	0.893	0.332	2.564
Cyclopentane	0.000	0.000	0.000
n-Hexane	0.317	0.134	1.087
Cyclohexane	0.149	0.052	0.499
Other C6's	0.437	0.185	1.498
Heptanes	0.430	0.186	1.630
Methylcyclohexane	0.124	0.051	0.484
2,2,4 Trimethylpentane	0.000	0.000	0.000
Benzene	0.043	0.012	0.134
Toluene	0.042	0.014	0.154
Ethylbenzene	0.002	0.001	0.008
Xylenes	0.012	0.005	0.050
Octanes Plus	0.176	0.088	0.812
Totals	100.000	7.373	100.000

Real Characteristics Of Octanes Plus:

Specific Gravity	4.017	(Air=1)
Molecular Weight	115.78	
Gross Heating Value	6067	BTU/CF

Real Characteristics Of Total Sample:

Specific Gravity	0.872	(Air=1)
Compressibility (Z)	0.9951	
Molecular Weight	25.13	
Gross Heating Value		
Dry Basis	1353	BTU/CF
Saturated Basis	1330	BTU/CF

August 4, 2021

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: Chevron North America Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

Sample: Salado Draw 23 Compressor Station
VRU
Spot Gas Sampled @ 90 psig & 103 °F

Date Sampled: 07/20/2021 Job Number: 212291.011

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	1.344	
Carbon Dioxide	4.550	
Methane	68.049	
Ethane	11.434	3.134
Propane	7.209	2.036
Isobutane	1.073	0.360
n-Butane	2.846	0.920
2-2 Dimethylpropane	0.007	0.003
Isopentane	0.740	0.277
n-Pentane	0.864	0.321
Hexanes	0.710	0.300
Heptanes Plus	1.174	0.502
Totals	100.000	7.853

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.438	(Air=1)
Molecular Weight	99.08	
Gross Heating Value	5350	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	0.872	(Air=1)
Compressibility (Z)	0.9949	
Molecular Weight	25.13	
Gross Heating Value		
Dry Basis	1396	BTU/CF
Saturated Basis	1372	BTU/CF

*Hydrogen Sulfide tested on location by: Stain Tube Method (GPA 2377)
Results: 0.094 Gr/100 CF, 1.5 PPMV or 0.0002 Mol%

Base Conditions: 15.025 PSI & 60 Deg F

Sampled By: (14) LAT
Analyst: RG
Processor: KV
Cylinder ID: A-0282

Certified: FESCO, Ltd. - Alice, Texas

Conan Pierce 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	1.344		1.498
Carbon Dioxide	4.550		7.969
Methane	68.049		43.447
Ethane	11.434	3.134	13.682
Propane	7.209	2.036	12.651
Isobutane	1.073	0.360	2.482
n-Butane	2.846	0.920	6.583
2,2 Dimethylpropane	0.007	0.003	0.020
Isopentane	0.740	0.277	2.125
n-Pentane	0.864	0.321	2.481
2,2 Dimethylbutane	0.008	0.003	0.027
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.060	0.025	0.206
2 Methylpentane	0.217	0.092	0.744
3 Methylpentane	0.117	0.049	0.401
n-Hexane	0.308	0.130	1.056
Methylcyclopentane	0.121	0.044	0.405
Benzene	0.038	0.011	0.118
Cyclohexane	0.159	0.055	0.533
2-Methylhexane	0.045	0.021	0.179
3-Methylhexane	0.052	0.024	0.207
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.128	0.057	0.505
n-Heptane	0.121	0.057	0.483
Methylcyclohexane	0.158	0.065	0.617
Toluene	0.059	0.020	0.216
Other C8's	0.137	0.065	0.601
n-Octane	0.039	0.020	0.177
Ethylbenzene	0.004	0.002	0.017
M & P Xylenes	0.020	0.008	0.085
O-Xylene	0.005	0.002	0.021
Other C9's	0.049	0.025	0.246
n-Nonane	0.010	0.006	0.051
Other C10's	0.019	0.011	0.107
n-Decane	0.004	0.003	0.023
Undecanes (11)	0.006	0.004	0.037
Totals	100.000	7.853	100.000

Computed Real Characteristics of Total Sample		
Specific Gravity	0.872	(Air=1)
Compressibility (Z)	0.9949	
Molecular Weight	25.13	
Gross Heating Value		
Dry Basis	1396	BTU/CF
Saturated Basis	1372	BTU/CF

August 4, 2021

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

Sample: Salado Draw 23 Compressor Station
VRU
Spot Gas Sampled @ 90 psig & 103 °F

Date Sampled: 07/20/2021 Job Number: 212291.011

GLYCALC FORMAT

COMPONENT	MOL%	GPM	Wt %
Carbon Dioxide	4.550		7.969
Hydrogen Sulfide	< 0.001		< 0.001
Nitrogen	1.344		1.498
Methane	68.049		43.447
Ethane	11.434	3.134	13.682
Propane	7.209	2.036	12.651
Isobutane	1.073	0.360	2.482
n-Butane	2.853	0.922	6.603
Isopentane	0.740	0.277	2.125
n-Pentane	0.864	0.321	2.481
Cyclopentane	0.000	0.000	0.000
n-Hexane	0.308	0.130	1.056
Cyclohexane	0.159	0.055	0.533
Other C6's	0.402	0.170	1.378
Heptanes	0.467	0.204	1.779
Methylcyclohexane	0.158	0.065	0.617
2,2,4 Trimethylpentane	0.000	0.000	0.000
Benzene	0.038	0.011	0.118
Toluene	0.059	0.020	0.216
Ethylbenzene	0.004	0.002	0.017
Xylenes	0.025	0.010	0.106
Octanes Plus	0.264	0.135	1.242
Totals	100.000	7.853	100.000

Real Characteristics Of Octanes Plus:

Specific Gravity	4.103	(Air=1)
Molecular Weight	118.24	
Gross Heating Value	6231	BTU/CF

Real Characteristics Of Total Sample:

Specific Gravity	0.872	(Air=1)
Compressibility (Z)	0.9949	
Molecular Weight	25.13	
Gross Heating Value		
Dry Basis	1396	BTU/CF
Saturated Basis	1372	BTU/CF

August 9, 2021

FESCO, Ltd.
1100 FESCO Avenue - Alice, Texas 78332

For: Chevron North America Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

Sample: Salado Draw 23 Compressor Station
Inlet Separator Hydrocarbon Liquid
Sampled @ 92 psig & 91 °F

Date Sampled: 07/20/2021 Job Number: 212291.002

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2186-M

COMPONENT	MOL %	LIQ VOL %	WT %
Nitrogen	0.025	0.007	0.008
Carbon Dioxide	0.413	0.179	0.214
Methane	2.177	0.935	0.411
Ethane	2.273	1.541	0.804
Propane	5.511	3.848	2.857
Isobutane	2.186	1.813	1.494
n-Butane	8.539	6.823	5.835
2,2 Dimethylpropane	0.161	0.157	0.137
Isopentane	6.076	5.632	5.154
n-Pentane	9.411	8.646	7.982
2,2 Dimethylbutane	0.102	0.108	0.103
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.747	0.776	0.757
2 Methylpentane	4.475	4.708	4.534
3 Methylpentane	2.337	2.418	2.368
n-Hexane	6.531	6.806	6.616
Heptanes Plus	49.035	55.604	60.728
Totals:	100.000	100.000	100.000

Characteristics of Heptanes Plus:

Specific Gravity	0.7461	(Water=1)
°API Gravity	58.16	@ 60°F
Molecular Weight	105.3	
Vapor Volume	21.92	CF/Gal
Weight	6.22	Lbs/Gal

Characteristics of Total Sample:

Specific Gravity	0.6831	(Water=1)
°API Gravity	75.63	@ 60°F
Molecular Weight	85.1	
Vapor Volume	24.85	CF/Gal
Weight	5.69	Lbs/Gal

Base Conditions: 15.025 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

Sampled By: (14) L. Turner
Analyst: JL
Processor: ANBdjv
Cylinder ID: W-0974

Conan Pierce 361-661-7015

FESCO, Ltd. Job Number: 212291.002

TANKS DATA INPUT REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Carbon Dioxide	0.413	0.179	0.214
Nitrogen	0.025	0.007	0.008
Methane	2.177	0.935	0.411
Ethane	2.273	1.541	0.804
Propane	5.511	3.848	2.857
Isobutane	2.186	1.813	1.494
n-Butane	8.700	6.979	5.971
Isopentane	6.076	5.632	5.154
n-Pentane	9.411	8.646	7.982
Other C-6's	7.661	8.009	7.761
Heptanes	18.845	19.804	20.833
Octanes	16.844	19.304	21.056
Nonanes	4.788	6.481	7.126
Decanes Plus	3.166	4.805	5.449
Benzene	0.734	0.521	0.674
Toluene	2.012	1.708	2.180
E-Benzene	0.232	0.227	0.290
Xylenes	1.253	1.227	1.564
n-Hexane	6.531	6.806	6.616
2,2,4 Trimethylpentane	1.159	1.527	1.556
Totals:	100.000	100.000	100.000

Characteristics of Total Sample:

Specific Gravity	0.6831	(Water=1)
°API Gravity	75.63	@ 60°F
Molecular Weight	85.1	
Vapor Volume	24.85	CF/Gal
Weight	5.69	Lbs/Gal

Characteristics of Decanes (C10) Plus:

Specific Gravity	0.7747	(Water=1)
Molecular Weight	146.4	

Characteristics of Atmospheric Sample:

°API Gravity	68.87	@ 60°F
Reid Vapor Pressure Equivalent (D-6377)	14.14	psi

QUALITY CONTROL CHECK			
	Sampling Conditions	Test Samples	
Cylinder Number	------	W-0974*	------
Pressure, PSIG	92	92	------
Skin Temperature, °F	91	91	------

* Sample used for analysis

FESCO, Ltd. Job Number: 212291.002

TOTAL EXTENDED REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Nitrogen	0.025	0.007	0.008
Carbon Dioxide	0.413	0.179	0.214
Methane	2.177	0.935	0.411
Ethane	2.273	1.541	0.804
Propane	5.511	3.848	2.857
Isobutane	2.186	1.813	1.494
n-Butane	8.539	6.823	5.835
2,2 Dimethylpropane	0.161	0.157	0.137
Isopentane	6.076	5.632	5.154
n-Pentane	9.411	8.646	7.982
2,2 Dimethylbutane	0.102	0.108	0.103
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.747	0.776	0.757
2 Methylpentane	4.475	4.708	4.534
3 Methylpentane	2.337	2.418	2.368
n-Hexane	6.531	6.806	6.616
Methylcyclopentane	2.818	2.528	2.789
Benzene	0.734	0.521	0.674
Cyclohexane	4.248	3.665	4.203
2-Methylhexane	1.900	2.238	2.238
3-Methylhexane	1.977	2.300	2.329
2,2,4 Trimethylpentane	1.159	1.527	1.556
Other C-7's	2.943	3.274	3.432
n-Heptane	4.959	5.798	5.842
Methylcyclohexane	6.272	6.390	7.240
Toluene	2.012	1.708	2.180
Other C-8's	8.081	9.681	10.471
n-Octane	2.490	3.233	3.344
E-Benzene	0.232	0.227	0.290
M & P Xylenes	0.988	0.972	1.234
O-Xylene	0.265	0.255	0.331
Other C-9's	3.943	5.275	5.851
n-Nonane	0.846	1.206	1.275
Other C-10's	1.843	2.710	3.061
n-decane	0.295	0.459	0.493
Undecanes(11)	0.683	1.031	1.181
Dodecanes(12)	0.206	0.336	0.390
Tridecanes(13)	0.080	0.139	0.164
Tetradecanes(14)	0.025	0.047	0.056
Pentadecanes(15)	0.012	0.023	0.028
Hexadecanes(16)	0.004	0.010	0.012
Heptadecanes(17)	0.003	0.007	0.009
Octadecanes(18)	0.003	0.006	0.008
Nonadecanes(19)	0.002	0.006	0.007
Eicosanes(20)	0.002	0.004	0.005
Heneicosanes(21)	0.001	0.004	0.005
Docosanes(22)	0.001	0.004	0.005
Tricosanes(23)	0.001	0.004	0.005
Tetracosanes(24)	0.001	0.002	0.003
Pentacosanes(25)	0.001	0.002	0.003
Hexacosanes(26)	0.000	0.001	0.001
Heptacosanes(27)	0.000	0.001	0.001
Octacosanes(28)	0.000	0.001	0.001
Nonacosanes(29)	0.000	0.001	0.001
Triacontanes(30)	0.000	0.000	0.001
Hentriacontanes Plus(31+)	0.001	0.007	0.009
Total	100.000	100.000	100.000

August 3, 2021

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: Chevron North America Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

Sample: Salado Draw 23 Central Tank Battery
Train 3 Inlet Separator
Spot Gas Sampled @ 128 psig & 85 °F

Date Sampled: 07/20/2021 Job Number: 212292.011

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	1.727	
Carbon Dioxide	6.975	
Methane	72.464	
Ethane	9.651	2.642
Propane	5.170	1.458
Isobutane	0.668	0.224
n-Butane	1.635	0.528
2-2 Dimethylpropane	0.005	0.002
Isopentane	0.435	0.163
n-Pentane	0.464	0.172
Hexanes	0.393	0.166
Heptanes Plus	0.413	0.170
Totals	100.000	5.525

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.326	(Air=1)
Molecular Weight	95.94	
Gross Heating Value	5169	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	0.800	(Air=1)
Compressibility (Z)	0.9961	
Molecular Weight	23.09	
Gross Heating Value		
Dry Basis	1215	BTU/CF
Saturated Basis	1194	BTU/CF

*Hydrogen Sulfide tested on location by: Stain Tube Method (GPA 2377)
Results: 0.094 Gr/100 CF, 1.5 PPMV or 0.0002 Mol%

Base Conditions: 15.025 PSI & 60 Deg F

Sampled By: (14) LAT
Analyst: RG
Processor: KV
Cylinder ID: U-0124

Certified: FESCO, Ltd. - Alice, Texas

Conan Pierce 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	1.727		2.096
Carbon Dioxide	6.975		13.297
Methane	72.464		50.358
Ethane	9.651	2.642	12.570
Propane	5.170	1.458	9.875
Isobutane	0.668	0.224	1.682
n-Butane	1.635	0.528	4.116
2,2 Dimethylpropane	0.005	0.002	0.016
Isopentane	0.435	0.163	1.359
n-Pentane	0.464	0.172	1.450
2,2 Dimethylbutane	0.004	0.002	0.015
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.037	0.016	0.138
2 Methylpentane	0.126	0.054	0.470
3 Methylpentane	0.071	0.030	0.265
n-Hexane	0.155	0.065	0.579
Methylcyclopentane	0.058	0.021	0.211
Benzene	0.035	0.010	0.118
Cyclohexane	0.045	0.016	0.164
2-Methylhexane	0.019	0.009	0.082
3-Methylhexane	0.023	0.011	0.100
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.053	0.024	0.228
n-Heptane	0.042	0.020	0.182
Methylcyclohexane	0.037	0.015	0.157
Toluene	0.029	0.010	0.116
Other C8's	0.039	0.019	0.186
n-Octane	0.011	0.006	0.054
Ethylbenzene	0.002	0.001	0.009
M & P Xylenes	0.004	0.002	0.018
O-Xylene	0.001	0.000	0.005
Other C9's	0.010	0.005	0.055
n-Nonane	0.002	0.001	0.011
Other C10's	0.002	0.001	0.012
n-Decane	0.001	0.001	0.006
Undecanes (11)	0.000	0.000	0.000
Totals	100.000	5.525	100.000

Computed Real Characteristics of Total Sample		
Specific Gravity	0.800	(Air=1)
Compressibility (Z)	0.9961	
Molecular Weight	23.09	
Gross Heating Value		
Dry Basis	1215	BTU/CF
Saturated Basis	1194	BTU/CF

August 3, 2021

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

Sample: Salado Draw 23 Central Tank Battery
Train 3 Inlet Separator
Spot Gas Sampled @ 128 psig & 85 °F

Date Sampled: 07/20/2021 Job Number: 212292.011

GLYCALC FORMAT

COMPONENT	MOL%	GPM	Wt %
Carbon Dioxide	6.975		13.297
Hydrogen Sulfide	< 0.001		< 0.001
Nitrogen	1.727		2.096
Methane	72.464		50.358
Ethane	9.651	2.642	12.570
Propane	5.170	1.458	9.875
Isobutane	0.668	0.224	1.682
n-Butane	1.640	0.530	4.132
Isopentane	0.435	0.163	1.359
n-Pentane	0.464	0.172	1.450
Cyclopentane	0.000	0.000	0.000
n-Hexane	0.155	0.065	0.579
Cyclohexane	0.045	0.016	0.164
Other C6's	0.238	0.100	0.888
Heptanes	0.195	0.084	0.803
Methylcyclohexane	0.037	0.015	0.157
2,2,4 Trimethylpentane	0.000	0.000	0.000
Benzene	0.035	0.010	0.118
Toluene	0.029	0.010	0.116
Ethylbenzene	0.002	0.001	0.009
Xylenes	0.005	0.002	0.023
Octanes Plus	0.065	0.033	0.324
Totals	100.000	5.525	100.000

Real Characteristics Of Octanes Plus:

Specific Gravity	3.999	(Air=1)
Molecular Weight	115.37	
Gross Heating Value	6044	BTU/CF

Real Characteristics Of Total Sample:

Specific Gravity	0.800	(Air=1)
Compressibility (Z)	0.9961	
Molecular Weight	23.09	
Gross Heating Value		
Dry Basis	1215	BTU/CF
Saturated Basis	1194	BTU/CF

August 3, 2021

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: Chevron North America Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

Sample: Salado Draw 23 Central Tank Battery
K-710C VRU
Spot Gas Sampled @ 128 psig & 203 °F

Date Sampled: 07/20/2021 Job Number: 212292.001

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	0.119	
Carbon Dioxide	5.704	
Methane	19.109	
Ethane	17.652	4.899
Propane	24.714	7.066
Isobutane	4.917	1.670
n-Butane	14.181	4.640
2-2 Dimethylpropane	0.069	0.028
Isopentane	3.908	1.483
n-Pentane	4.622	1.739
Hexanes	2.679	1.145
Heptanes Plus	2.326	0.954
Totals	100.000	23.623

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.287	(Air=1)
Molecular Weight	93.54	
Gross Heating Value	5093	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.532	(Air=1)
Compressibility (Z)	0.9827	
Molecular Weight	43.60	
Gross Heating Value		
Dry Basis	2432	BTU/CF
Saturated Basis	2390	BTU/CF

*Hydrogen Sulfide tested on location by: Stain Tube Method (GPA 2377)
Results: 0.063 Gr/100 CF, 1.0 PPMV or 0.0001 Mol%

Base Conditions: 15.025 PSI & 60 Deg F

Sampled By: (14) LAT
Analyst: RG
Processor: KV
Cylinder ID: T-2958

Certified: FESCO, Ltd. - Alice, Texas

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Conan Pierce 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	0.119		0.076
Carbon Dioxide	5.704		5.757
Methane	19.109		7.032
Ethane	17.652	4.899	12.173
Propane	24.714	7.066	24.993
Isobutane	4.917	1.670	6.554
n-Butane	14.181	4.640	18.903
2,2 Dimethylpropane	0.069	0.028	0.114
Isopentane	3.908	1.483	6.466
n-Pentane	4.622	1.739	7.648
2,2 Dimethylbutane	0.034	0.015	0.067
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.254	0.108	0.502
2 Methylpentane	0.845	0.364	1.670
3 Methylpentane	0.443	0.188	0.876
n-Hexane	1.103	0.471	2.180
Methylcyclopentane	0.424	0.156	0.818
Benzene	0.101	0.029	0.181
Cyclohexane	0.510	0.180	0.984
2-Methylhexane	0.104	0.050	0.239
3-Methylhexane	0.114	0.054	0.262
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.310	0.140	0.705
n-Heptane	0.209	0.100	0.480
Methylcyclohexane	0.281	0.117	0.633
Toluene	0.057	0.020	0.120
Other C8's	0.142	0.069	0.359
n-Octane	0.026	0.014	0.068
Ethylbenzene	0.001	0.000	0.002
M & P Xylenes	0.008	0.003	0.019
O-Xylene	0.002	0.001	0.005
Other C9's	0.022	0.012	0.064
n-Nonane	0.002	0.001	0.006
Other C10's	0.008	0.005	0.026
n-Decane	0.002	0.001	0.007
Undecanes (11)	0.003	0.002	0.011
Totals	100.000	23.623	100.000

Computed Real Characteristics of Total Sample		
Specific Gravity	1.532	(Air=1)
Compressibility (Z)	0.9827	
Molecular Weight	43.60	
Gross Heating Value		
Dry Basis	2432	BTU/CF
Saturated Basis	2390	BTU/CF

August 3, 2021

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

Sample: Salado Draw 23 Central Tank Battery
K-710C VRU
Spot Gas Sampled @ 128 psig & 203 °F

Date Sampled: 07/20/2021 Job Number: 212292.001

GLYCALC FORMAT

COMPONENT	MOL%	GPM	Wt %
Carbon Dioxide	5.704		5.757
Hydrogen Sulfide	< 0.001		< 0.001
Nitrogen	0.119		0.076
Methane	19.109		7.032
Ethane	17.652	4.899	12.173
Propane	24.714	7.066	24.993
Isobutane	4.917	1.670	6.554
n-Butane	14.250	4.667	19.017
Isopentane	3.908	1.483	6.466
n-Pentane	4.622	1.739	7.648
Cyclopentane	0.000	0.000	0.000
n-Hexane	1.103	0.471	2.180
Cyclohexane	0.510	0.180	0.984
Other C6's	1.576	0.674	3.115
Heptanes	1.161	0.500	2.504
Methylcyclohexane	0.281	0.117	0.633
2,2,4 Trimethylpentane	0.000	0.000	0.000
Benzene	0.101	0.029	0.181
Toluene	0.057	0.020	0.120
Ethylbenzene	0.001	0.000	0.002
Xylenes	0.010	0.004	0.024
Octanes Plus	0.205	0.103	0.541
Totals	100.000	23.623	100.000

Real Characteristics Of Octanes Plus:

Specific Gravity	4.034	(Air=1)
Molecular Weight	114.82	
Gross Heating Value	5970	BTU/CF

Real Characteristics Of Total Sample:

Specific Gravity	1.532	(Air=1)
Compressibility (Z)	0.9827	
Molecular Weight	43.60	
Gross Heating Value		
Dry Basis	2432	BTU/CF
Saturated Basis	2390	BTU/CF

August 9, 2021

FESCO, Ltd.
1100 FESCO Avenue - Alice, Texas 78332

For: Chevron North America Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

Sample: Salado Draw 23 Central Tank Battery
Train 3 Inlet Separator Hydrocarbon Liquid
Sampled @ 128 psig & 85 °F

Date Sampled: 07/20/2021 Job Number: 212292.002

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2186-M

COMPONENT	MOL %	LIQ VOL %	WT %
Nitrogen	0.042	0.008	0.008
Carbon Dioxide	0.568	0.168	0.176
Methane	3.237	0.949	0.366
Ethane	2.459	1.138	0.521
Propane	4.399	2.097	1.368
Isobutane	1.321	0.748	0.542
n-Butane	4.754	2.594	1.949
2,2 Dimethylpropane	0.038	0.025	0.019
Isopentane	3.075	1.946	1.565
n-Pentane	4.350	2.729	2.213
2,2 Dimethylbutane	0.055	0.040	0.034
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.357	0.253	0.217
2 Methylpentane	2.313	1.661	1.406
3 Methylpentane	1.311	0.926	0.797
n-Hexane	3.741	2.662	2.274
Heptanes Plus	67.981	82.053	86.545
Totals:	100.000	100.000	100.000

Characteristics of Heptanes Plus:

Specific Gravity	0.8201	(Water=1)
°API Gravity	41.03	@ 60°F
Molecular Weight	180.5	
Vapor Volume	14.06	CF/Gal
Weight	6.83	Lbs/Gal

Characteristics of Total Sample:

Specific Gravity	0.7776	(Water=1)
°API Gravity	50.48	@ 60°F
Molecular Weight	141.8	
Vapor Volume	16.97	CF/Gal
Weight	6.48	Lbs/Gal

Base Conditions: 15.025 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

Sampled By: (14) L. Turner
Analyst: ANB
Processor: ANBdjv
Cylinder ID: W-2916

Conan Pierce 361-661-7015

FESCO, Ltd. Job Number: 212292.002

TANKS DATA INPUT REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Carbon Dioxide	0.568	0.168	0.176
Nitrogen	0.042	0.008	0.008
Methane	3.237	0.949	0.366
Ethane	2.459	1.138	0.521
Propane	4.399	2.097	1.368
Isobutane	1.321	0.748	0.542
n-Butane	4.792	2.619	1.968
Isopentane	3.075	1.946	1.565
n-Pentane	4.350	2.729	2.213
Other C-6's	4.036	2.881	2.453
Heptanes	7.641	5.585	5.124
Octanes	9.805	7.850	7.474
Nonanes	5.981	5.541	5.347
Decanes Plus	38.600	59.271	64.448
Benzene	0.592	0.287	0.326
Toluene	2.259	1.310	1.468
E-Benzene	0.692	0.462	0.518
Xylenes	1.817	1.214	1.361
n-Hexane	3.741	2.662	2.274
2,2,4 Trimethylpentane	0.594	0.534	0.478
Totals:	100.000	100.000	100.000

Characteristics of Total Sample:

Specific Gravity	0.7776	(Water=1)
°API Gravity	50.48	@ 60°F
Molecular Weight	141.8	
Vapor Volume	16.97	CF/Gal
Weight	6.48	Lbs/Gal

Characteristics of Decanes (C10) Plus:

Specific Gravity	0.8455	(Water=1)
Molecular Weight	236.7	

Characteristics of Atmospheric Sample:

°API Gravity	46.63	@ 60°F
Reid Vapor Pressure Equivalent (D-6377)	9.26	psi

QUALITY CONTROL CHECK			
	Sampling Conditions	Test Samples	
Cylinder Number	------	W-2916*	------
Pressure, PSIG	128	128	------
Skin Temperature, °F	85	85	------

* Sample used for analysis

TOTAL EXTENDED REPORT - GPA 2186-M

COMPONENT	Mol %	LiqVol %	Wt %
Nitrogen	0.042	0.008	0.008
Carbon Dioxide	0.568	0.168	0.176
Methane	3.237	0.949	0.366
Ethane	2.459	1.138	0.521
Propane	4.399	2.097	1.368
Isobutane	1.321	0.748	0.542
n-Butane	4.754	2.594	1.949
2,2 Dimethylpropane	0.038	0.025	0.019
Isopentane	3.075	1.946	1.565
n-Pentane	4.350	2.729	2.213
2,2 Dimethylbutane	0.055	0.040	0.034
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.357	0.253	0.217
2 Methylpentane	2.313	1.661	1.406
3 Methylpentane	1.311	0.926	0.797
n-Hexane	3.741	2.662	2.274
Methylcyclopentane	1.119	0.686	0.665
Benzene	0.592	0.287	0.326
Cyclohexane	1.244	0.733	0.738
2-Methylhexane	0.796	0.640	0.562
3-Methylhexane	0.934	0.742	0.660
2,2,4 Trimethylpentane	0.594	0.534	0.478
Other C-7's	1.195	0.905	0.836
n-Heptane	2.353	1.879	1.663
Methylcyclohexane	2.426	1.688	1.680
Toluene	2.259	1.310	1.468
Other C-8's	5.346	4.360	4.156
n-Octane	2.033	1.803	1.638
E-Benzene	0.692	0.462	0.518
M & P Xylenes	1.344	0.902	1.006
O-Xylene	0.474	0.312	0.355
Other C-9's	4.508	4.106	4.014
n-Nonane	1.473	1.435	1.333
Other C-10's	4.836	4.841	4.819
n-decane	1.224	1.300	1.228
Undecanes(11)	4.711	4.838	4.884
Dodecanes(12)	3.414	3.788	3.877
Tridecanes(13)	3.354	3.989	4.139
Tetradecanes(14)	2.739	3.490	3.671
Pentadecanes(15)	2.362	3.223	3.431
Hexadecanes(16)	1.828	2.666	2.862
Heptadecanes(17)	1.593	2.457	2.663
Octadecanes(18)	1.503	2.441	2.661
Nonadecanes(19)	1.321	2.235	2.451
Eicosanes(20)	1.035	1.821	2.008
Heneicosanes(21)	0.882	1.631	1.810
Docosanes(22)	0.773	1.491	1.664
Tricosanes(23)	0.677	1.353	1.518
Tetracosanes(24)	0.582	1.206	1.359
Pentacosanes(25)	0.514	1.105	1.251
Hexacosanes(26)	0.470	1.047	1.191
Heptacosanes(27)	0.425	0.982	1.122
Octacosanes(28)	0.373	0.891	1.022
Nonacosanes(29)	0.343	0.847	0.974
Triacontanes(30)	0.291	0.741	0.855
Hentriacontanes Plus(31+)	3.348	10.888	12.986
Total	100.000	100.000	100.000

November 12, 2018

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: Chevron North America Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

Sample: Salado Draw 23 Compressor Station
Sales Gas
Spot Gas Sample @ 77 psig & 49 °F

Date Sampled: 10/16/18 Job Number: 83967.001

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	3.513	
Carbon Dioxide	7.394	
Methane	72.152	
Ethane	9.096	2.490
Propane	4.569	1.288
Isobutane	0.566	0.190
n-Butane	1.322	0.427
2-2 Dimethylpropane	0.000	0.000
Isopentane	0.360	0.135
n-Pentane	0.370	0.137
Hexanes	0.333	0.140
Heptanes Plus	0.325	0.134
Totals	100.000	4.941

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.343	(Air=1)
Molecular Weight	96.48	
Gross Heating Value	5135	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	0.790	(Air=1)
Compressibility (Z)	0.9963	
Molecular Weight	22.79	
Gross Heating Value		
Dry Basis	1157	BTU/CF
Saturated Basis	1138	BTU/CF

*Hydrogen Sulfide tested on location by: Stain Tube Method (GPA 2377)
Results: 0.220 Gr/100 CF, 3.5 PPMV or 0.0004 Mol%

Base Conditions: 15.025 PSI & 60 Deg F

Sampled By: (16) GRJ
Analyst: MR
Processor: KV
Cylinder ID: T-4622

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	3.513		4.319
Carbon Dioxide	7.394		14.280
Methane	72.152		50.799
Ethane	9.096	2.490	12.002
Propane	4.569	1.288	8.841
Isobutane	0.566	0.190	1.444
n-Butane	1.322	0.427	3.372
2,2 Dimethylpropane	0.000	0.000	0.000
Isopentane	0.360	0.135	1.140
n-Pentane	0.370	0.137	1.171
2,2 Dimethylbutane	0.004	0.002	0.015
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.031	0.013	0.117
2 Methylpentane	0.109	0.046	0.412
3 Methylpentane	0.062	0.026	0.234
n-Hexane	0.127	0.053	0.480
Methylcyclopentane	0.045	0.016	0.166
Benzene	0.031	0.009	0.106
Cyclohexane	0.027	0.009	0.100
2-Methylhexane	0.016	0.008	0.070
3-Methylhexane	0.019	0.009	0.084
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.043	0.019	0.187
n-Heptane	0.033	0.016	0.145
Methylcyclohexane	0.024	0.010	0.103
Toluene	0.025	0.009	0.101
Other C8's	0.032	0.015	0.155
n-Octane	0.009	0.005	0.045
Ethylbenzene	0.002	0.001	0.009
M & P Xylenes	0.004	0.002	0.019
O-Xylene	0.001	0.000	0.005
Other C9's	0.008	0.004	0.044
n-Nonane	0.002	0.001	0.011
Other C10's	0.002	0.001	0.012
n-Decane	0.001	0.001	0.006
Undecanes (11)	0.001	0.001	0.006
Totals	100.000	4.941	100.000

Computed Real Characteristics of Total Sample		
Specific Gravity	0.790	(Air=1)
Compressibility (Z)	0.9963	
Molecular Weight	22.79	
Gross Heating Value		
Dry Basis	1157	BTU/CF
Saturated Basis	1138	BTU/CF

November 12, 2018

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

Sample: Salado Draw 23 Compressor Station
Sales Gas
Spot Gas Sample @ 77 psig & 49 °F

Date Sampled: 10/16/18 Job Number: 83967.001

GLYCALC FORMAT

COMPONENT	MOL%	GPM	Wt %
Carbon Dioxide	7.394		14.280
Hydrogen Sulfide	< 0.001		< 0.001
Nitrogen	3.513		4.319
Methane	72.152		50.799
Ethane	9.096	2.490	12.002
Propane	4.569	1.288	8.841
Isobutane	0.566	0.190	1.444
n-Butane	1.322	0.427	3.372
Isopentane	0.360	0.135	1.140
n-Pentane	0.370	0.137	1.171
Cyclopentane	0.000	0.000	0.000
n-Hexane	0.127	0.053	0.480
Cyclohexane	0.027	0.009	0.100
Other C6's	0.206	0.087	0.778
Heptanes	0.156	0.067	0.652
Methylcyclohexane	0.024	0.010	0.103
2,2,4 Trimethylpentane	0.000	0.000	0.000
Benzene	0.031	0.009	0.106
Toluene	0.025	0.009	0.101
Ethylbenzene	0.002	0.001	0.009
Xylenes	0.005	0.002	0.024
Octanes Plus	0.055	0.028	0.279
Totals	100.000	4.941	100.000

Real Characteristics Of Octanes Plus:

Specific Gravity	4.028	(Air=1)
Molecular Weight	116.24	
Gross Heating Value	6111	BTU/CF

Real Characteristics Of Total Sample:

Specific Gravity	0.790	(Air=1)
Compressibility (Z)	0.9963	
Molecular Weight	22.79	
Gross Heating Value		
Dry Basis	1157	BTU/CF
Saturated Basis	1138	BTU/CF

November 29, 2018

FESCO, Ltd.
1100 Fesco Avenue - Alice, Texas 78332

For: Chevron North America Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

Date Sampled: 10/16/18

Date Analyzed: 11/01/18

Sample: Salado Draw 23 Compressor Station

Job Number: J83967

FLASH LIBERATION OF HYDROCARBON LIQUID		
	Separator HC Liquid	**Stock Tank**
Pressure, psig	86	0
Temperature, °F	51	70
Gas Oil Ratio (1)	------	75.5
Gas Specific Gravity (2)	------	1.390
Separator Volume Factor (3)	1.0322	1.000

STOCK TANK FLUID PROPERTIES	
Shrinkage Recovery Factor (4)	0.9688
Oil API Gravity at 60 °F	43.67
Reid Vapor Pressure Equivalent (D-6377), psi (5)	11.71

Quality Control Check			
	Sampling Conditions	**Test Samples**	
Cylinder No.	------	W-0361*	-----
Pressure, psig	86	89	------
Temperature, °F	51	51	------

(1) - Scf of flashed vapor per barrel of stock tank oil
(2) - Air = 1.000
(3) - Separator volume / Stock tank volume
(4) - Fraction of first stage separator liquid
(5) - Absolute pressure at 100 deg F
Analyst: E.T. III
* Sample used for flash study
Base Conditions: 15.025 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

November 27, 2018

FESCO, Ltd.
1100 Fesco Ave. - Alice, Texas 78332

For: Chevron North America Exploration and Production Company
6301 Deauville Blvd.
Midland, Texas 79706

Sample: Salado Draw Compressor Station
Gas Evolved from Hydrcarbon Liquid Flashed
From 86 psig & 51 °F to 0 psig & 70 °F

Date Sampled: 10/16/2018 Job Number: 83967.031

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	0.240	
Carbon Dioxide	4.426	
Methane	26.421	
Ethane	19.943	5.526
Propane	22.079	6.302
Isobutane	3.759	1.274
n-Butane	9.781	3.195
2-2 Dimethylpropane	0.028	0.011
Isopentane	3.408	1.291
n-Pentane	3.727	1.400
Hexanes	3.291	1.404
Heptanes Plus	2.897	1.203
Totals	100.000	21.606

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.346	(Air=1)
Molecular Weight	95.39	
Gross Heating Value	5085	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.425	(Air=1)
Compressibility (Z)	0.9843	
Molecular Weight	40.62	
Gross Heating Value		
Dry Basis	2289	BTU/CF
Saturated Basis	2250	BTU/CF

*Hydrogen Sulfide tested in laboratory by: Stain Tube Method (GPA 2377)
Results: <0.013 Gr/100 CF, <0.2 PPMV or <0.001 Mol %

Base Conditions: 15.025 PSI & 60 Deg F

Sampled By: (16) Ronnie G.
Analyst: MR
Processor: NG
Cylinder ID: FL-11S

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	0.240		0.166
Carbon Dioxide	4.426		4.795
Methane	26.421		10.436
Ethane	19.943	5.526	14.762
Propane	22.079	6.302	23.966
Isobutane	3.759	1.274	5.378
n-Butane	9.781	3.195	13.994
2,2 Dimethylpropane	0.028	0.011	0.050
Isopentane	3.408	1.291	6.053
n-Pentane	3.727	1.400	6.619
2,2 Dimethylbutane	0.031	0.013	0.066
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.282	0.120	0.598
2 Methylpentane	1.074	0.462	2.278
3 Methylpentane	0.611	0.258	1.296
n-Hexane	1.293	0.551	2.743
Methylcyclopentane	0.444	0.159	0.920
Benzene	0.267	0.077	0.513
Cyclohexane	0.260	0.092	0.538
2-Methylhexane	0.157	0.076	0.387
3-Methylhexane	0.189	0.089	0.466
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.417	0.188	1.018
n-Heptane	0.315	0.151	0.777
Methylcyclohexane	0.222	0.092	0.537
Toluene	0.192	0.067	0.435
Other C8's	0.274	0.132	0.743
n-Octane	0.058	0.031	0.163
Ethylbenzene	0.010	0.004	0.026
M & P Xylenes	0.019	0.008	0.050
O-Xylene	0.004	0.002	0.010
Other C9's	0.058	0.030	0.180
n-Nonane	0.004	0.002	0.013
Other C10's	0.005	0.003	0.017
n-Decane	0.002	0.001	0.007
Undecanes (11)	0.000	0.000	0.000
Totals	100.000	21.606	100.000

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.425	(Air=1)
Compressibility (Z)	0.9843	
Molecular Weight	40.62	
Gross Heating Value		
Dry Basis	2289	BTU/CF
Saturated Basis	2250	BTU/CF

Process Streams		Oil Tank Breathing Losses	Oil Tank Flash Losses	Slop Tank Breathing Losses	Slop Tank Flash Losses	Water Tank Breathing Losses	Water Tank Flash Losses
Composition	Status:	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Total**	From Block:	--	--	--	--	--	--
	To Block:	--	--	--	--	--	--
Mole Fraction		%	%	%	%	%	%
Carbon Dioxide		4.34503*	5.23430*	11.0051*	6.84513*	26.6457*	39.9985*
Nitrogen		0.000914428*	0.0147973*	0.218084*	1.69278*	0.00153529*	0.160794*
Methane		2.63039*	9.36443*	41.4445*	71.3565*	0.853934*	32.1520*
Ethane		25.2805*	19.6227*	25.6450*	9.85328*	0.404103*	13.2073*
Propane		35.6639*	31.5773*	12.9124*	5.49926*	0.0343773*	6.56553*
Isobutane		5.82682*	5.76596*	1.49372*	0.708535*	0.000705365*	0.567842*
n-Butane		15.1318*	15.1680*	3.60678*	1.74487*	0.00221077*	1.91692*
2,2-Dimethylpropane		0.0257789*	0.0271232*	0.00614401*	0.00309940*	5.70606E-07*	0.00151539*
Isopentane		3.89392*	4.07483*	0.953307*	0.477582*	9.48923E-05*	0.316216*
n-Pentane		4.05789*	4.30035*	1.03524*	0.525316*	1.45723E-05*	0.155386*
2,2-Dimethylbutane		0.00877603*	0.00974141*	0.00242441*	0.00132192*	1.58621E-08*	0.000293838*
Cyclopentane		0*	0*	0*	0*	0*	0*
2,3-Dimethylbutane		0.0627091*	0.0710083*	0.0191519*	0.0106467*	5.04334E-07*	0.00503825*
2-Methylpentane		0.193880*	0.227135*	0.0609533*	0.0350595*	5.15882E-07*	0.0101345*
3-Methylpentane		0.0992513*	0.115688*	0.0327186*	0.0187162*	1.23022E-06*	0.0113593*
n-Hexane		0.993428*	1.14860*	0.365739*	0.206099*	4.88733E-07*	0.0268568*
Methylcyclopentane		0.0604416*	0.0761983*	0.0223680*	0.0137209*	1.55553E-06*	0.0117856*
Benzene		0.105369*	0.172996*	0.0432601*	0.0332865*	0.00119079*	0.155796*
Cyclohexane		0.612574*	0.841693*	0.268572*	0.173803*	5.20235E-05*	0.243773*
2-Methylhexane		0.00993095*	0.0124193*	0.00548231*	0.00330678*	3.37152E-09*	0.000338345*
3-Methylhexane		0.0112811*	0.0136292*	0.00657568*	0.00382955*	4.72606E-09*	0.000431081*
2,2,4-Trimethylpentane		0.0447522*	0.0550684*	0.0291173*	0.0173074*	7.02194E-09*	0.00115446*
Heptane		0.565139*	0.704357*	0.384274*	0.230006*	4.52240E-08*	0.0117251*
Methylcyclohexane		0.0137638*	0.0178966*	0.00882302*	0.00559919*	1.14600E-07*	0.00268150*
Toluene		0.104018*	0.168341*	0.0811524*	0.0616279*	0.000254490*	0.150536*
Octane		0.196986*	0.280663*	0.241827*	0.165707*	9.97296E-10*	0.00215674*
Ethylbenzene		0.0100877*	0.0160743*	0.0137812*	0.0103651*	6.77074E-06*	0.0140867*
o-Xylene		0.0183953*	0.0329647*	0.0282044*	0.0237365*	1.49571E-05*	0.0300281*
Nonane		0.0317056*	0.0535009*	0.0648195*	0.0525934*	4.07106E-11*	0.000353409*
Decanes Plus		3.07200E-05*	7.24197E-05*	0.000121274*	0.000129788*	4.99619E-14*	2.95679E-05*
Water		0.000531213*	0.832143*	0.000330320*	0.226752*	72.0558*	4.27936*
Mass Fraction		%	%	%	%	%	%
Carbon Dioxide		4.11561	5.04230	15.6372	[illegible]945	46.9351	53.6402
Nitrogen		0.000551328	0.00907342	0.197245	[illegible]401	0.00172139	0.137257
Methane		0.908210	3.28833	21.4662	[illegible]181	0.548301	15.7173
Ethane		16.3607	12.9152	24.8965	[illegible]833	0.486336	12.1014
Propane		33.8470	30.4785	18.3830	10.2990	0.0606725	8.82196
Isobutane		7.28901	7.33563	2.80303	1.74903	0.00164089	1.00570
n-Butane		18.9290	19.2972	6.76827	4.30723	0.00514292	3.39504
2,2-Dimethylpropane		0.0400303	0.0428345	0.0143119	0.00949729	1.64774E-06	0.00333160
Isopentane		6.04659	6.43519	2.22064	1.46343	0.000274021	0.695204
n-Pentane		6.30122	6.79134	2.41149	1.60969	4.20805E-05	0.341617
2,2-Dimethylbutane		0.0162771	0.0183751	0.00674535	0.00483816	5.47103E-08	0.000771597
Cyclopentane		0	0	0	0	0	0
2,3-Dimethylbutane		0.116308	0.133942	0.0532859	0.0389664	1.73950E-06	0.0132301
2-Methylpentane		0.359593	0.428440	0.169589	0.128316	1.77934E-06	0.0266124
3-Methylpentane		0.184083	0.218220	0.0910319	0.0685006	4.24317E-06	0.0298287
n-Hexane		1.84253	2.16658	1.01759	0.754314	1.68570E-06	0.0705241
Methylcyclopentane		0.109480	0.140369	0.0607779	0.0490433	5.23968E-06	0.0302241
Benzene		0.177143	0.295786	0.109099	0.110428	0.00372285	0.370828
Cyclohexane		1.10957	1.55053	0.729759	0.621233	0.000175237	0.625155
2-Methylhexane		0.0214172	0.0272393	0.0177360	0.0140726	1.35215E-08	0.00103308
3-Methylhexane		0.0243289	0.0298930	0.0212732	0.0162974	1.89539E-08	0.00131624
2,2,4-Trimethylpentane		0.110023	0.137689	0.107384	0.0839654	3.21038E-08	0.00401839
Heptane		1.21878	1.54487	1.24318	0.978833	1.81372E-07	0.0358008
Methylcyclohexane		0.0290859	0.0384631	0.0279694	0.0233490	4.50357E-07	0.00802282
Toluene		0.206275	0.339511	0.241412	0.241164	0.000938503	0.422649
Octane		0.484290	0.701750	0.891857	0.803914	4.55956E-09	0.00750710
Ethylbenzene		0.0230498	0.0373541	0.0472372	0.0467356	2.87701E-05	0.0455713
o-Xylene		0.0420323	0.0766044	0.0966751	0.107026	6.35553E-05	0.0971426
Nonane		0.0875196	0.150196	0.268409	0.286484	2.08981E-10	0.00138119
Decanes Plus		0.000156500	0.000375214	0.000926790	0.00130475	4.73327E-13	0.000213264
Water		0.000205970	0.328143	0.000192128	0.173495	51.9558	2.34920
Mass Flow		lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
Carbon Dioxide		0.129497*	334.669*	0.0199968*	292.307*	0.0342506*	127.125*
Nitrogen		1.73475E-05*	0.602223*	0.000252236*	46.0127*	1.25618E-06*	0.325293*
Methane		0.0285767*	218.254*	0.0274509*	1110.75*	0.000400120*	37.2494*
Ethane		0.514786*	857.213*	0.0318376*	287.482*	0.000354901*	28.6797*
Propane		1.06499*	2022.93*	0.0235082*	235.294*	4.42754E-05*	20.9076*
Isobutane		0.229348*	486.882*	0.00358451*	39.9590*	1.19743E-06*	2.38347*
n-Butane		0.595599*	1280.80*	0.00865525*	98.4045*	3.75302E-06*	8.04609*
2,2-Dimethylpropane		0.00125955*	2.84302*	1.83020E-05*	0.216979*	1.20243E-09*	0.00789575*
Isopentane		0.190255*	427.118*	0.00283975*	33.4340*	1.99965E-07*	1.64760*
n-Pentane		0.198267*	450.757*	0.00308381*	36.7757*	3.07080E-08*	0.809617*
2,2-Dimethylbutane		0.000512156*	1.21959*	8.62594E-06*	0.110535*	3.99245E-11*	0.00182865*
Cyclopentane		0*	0*	0*	0*	0*	0*
2,3-Dimethylbutane		0.00365961*	8.89001*	6.81419E-05*	0.890242*	1.26939E-09*	0.0313547*
2-Methylpentane		0.0113146*	28.4365*	0.000216869*	2.93156*	1.29846E-09*	0.0630701*
3-Methylpentane		0.00579216*	14.4838*	0.000116411*	1.56499*	3.09643E-09*	0.0706926*
n-Hexane		0.0579750*	143.801*	0.00130129*	17.2333*	1.23013E-09*	0.167139*
Methylcyclopentane		0.00344477*	9.31662*	7.77227E-05*	1.12046*	3.82362E-09*	0.0716298*
Benzene		0.00557378*	19.6320*	0.000139516*	2.52288*	2.71673E-06*	0.878846*
Cyclohexane		0.0349126*	102.912*	0.000933214*	14.1929*	1.27878E-07*	1.48159*
2-Methylhexane		0.000673889*	1.80794*	2.26808E-05*	0.321509*	9.86726E-12*	0.00244836*
3-Methylhexane		0.000765507*	1.98407*	2.72041E-05*	0.372336*	1.38315E-11*	0.00311943*
2,2,4-Trimethylpentane		0.00346186*	9.13875*	0.000137323*	1.91831*	2.34276E-11*	0.00952340*
Heptane		0.0383489*	102.537*	0.00158977*	22.3628*	1.32355E-10*	0.0848463*
Methylcyclohexane		0.000915184*	2.55288*	3.57672E-05*	0.533441*	3.28646E-10*	0.0190137*
Toluene		0.00649041*	22.5341*	0.000308717*	5.50972*	6.84868E-07*	1.00166*
Octane		0.0152381*	46.5767*	0.00114050*	18.3665*	3.32731E-12*	0.0177915*
Ethylbenzene		0.000725260*	2.47927*	6.04068E-05*	1.06774*	2.09948E-08*	0.108002*
o-Xylene		0.00132254*	5.08441*	0.000123628*	2.44517*	4.63791E-08*	0.230223*
Nonane		0.00275379*	9.96886*	0.000343240*	6.54511*	1.52502E-13*	0.00327335*
Decanes Plus		4.92427E-06*	0.0249038*	1.18518E-06*	0.0298088*	3.45408E-16*	0.000505426*
Water		6.48084E-06*	21.7796*	2.45693E-07*	3.96372*	0.0379145*	5.56749*

Process Streams		Oil Tank Breathing Losses	Oil Tank Flash Losses	Slop Tank Breathing Losses	Slop Tank Flash Losses	Water Tank Breathing Losses	Water Tank Flash Losses
Properties	Status:	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Total**	From Block:	--	--	--	--	--	--
	To Block:	--	--	--	--	--	--
Property	Units						
Temperature	°F	82.3744	82.3744	82.3744	82.3744	82.3744	82.3744
Pressure	psia	20.5753	12.8800	95.3312	259.956	0.761000	12.8800
Molecular Weight	lb/lbmol	46.4627	45.6853	30.9730	23.5454	24.9848	32.8171
Mass Flow	lb/h	3.14649	6637.22	0.127880	2284.64	0.0729744	236.995
Std Vapor Volumetric Flow	MMSCFD	0.000616774	1.32317	3.76030E-05	0.883722	2.66011E-05	0.0657725
Std Liquid Volumetric Flow	sgpm	0.0122349	25.5126	0.000583723	11.7633	0.000164445	0.868868
Specific Gravity		1.60424	1.57739		0.812962	0.862660	1.13309
API Gravity							
Net Ideal Gas Heating Value	Btu/ft^3	2328.83	2259.13	1399.27	1098.51	15.2528	778.722
Gross Ideal Gas Heating Value	Btu/ft^3	2529.00	2453.87	1530.51	1209.38	53.0514	855.689

Process Streams		Oil Tank Breathing Losses	Oil Tank Flash Losses	Slop Tank Breathing Losses	Slop Tank Flash Losses	Water Tank Breathing Losses	Water Tank Flash Losses
Composition	Status:	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Vapor**	From Block:	--	--	--	--	--	--
	To Block:	--	--	--	--	--	--
Mole Fraction		%	%	%	%	%	%
Carbon Dioxide		4.34503	5.23430	11.1067	6.84513	26.6457	39.9985
Nitrogen		0.000914428	0.0147973	0.220265	1.69278	0.00153529	0.160794
Methane		2.63039	9.36443	41.8495	71.3565	0.853934	32.1520
Ethane		25.2805	19.6227	25.8545	9.85328	0.404103	13.2073
Propane		35.6639	31.5773	12.9617	5.49926	0.0343773	6.56553
Isobutane		5.82682	5.76596	1.48584	0.708535	0.000705365	0.567842
n-Butane		15.1318	15.1680	3.56310	1.74487	0.00221077	1.91692
2,2-Dimethylpropane		0.0257789	0.0271232	0.00602911	0.00309940	5.70606E-07	0.00151539
Isopentane		3.89392	4.07483	0.913045	0.477582	9.48923E-05	0.316216
n-Pentane		4.05789	4.30035	0.974780	0.525316	1.45723E-05	0.155386
2,2-Dimethylbutane		0.00877603	0.00974141	0.00218798	0.00132192	1.58621E-08	0.000293838
Cyclopentane		0	0	0	0	0	0
2,3-Dimethylbutane		0.0627091	0.0710083	0.0166887	0.0106467	5.04334E-07	0.00503825
2-Methylpentane		0.193880	0.227135	0.0525630	0.0350595	5.15882E-07	0.0101345
3-Methylpentane		0.0992513	0.115688	0.0277171	0.0187162	1.23022E-06	0.0113593
n-Hexane		0.993428	1.14860	0.298478	0.206099	4.88733E-07	0.0268568
Methylcyclopentane		0.0604416	0.0761983	0.0182827	0.0137209	1.55553E-06	0.0117856
Benzene		0.105369	0.172996	0.0351341	0.0332865	0.00119079	0.155796
Cyclohexane		0.612574	0.841693	0.211838	0.173803	5.20235E-05	0.243773
2-Methylhexane		0.00993095	0.0124193	0.00371954	0.00330678	3.37152E-09	0.000338345
3-Methylhexane		0.0112811	0.0136292	0.00431141	0.00382955	4.72606E-09	0.000431081
2,2,4-Trimethylpentane		0.0447522	0.0550684	0.0177251	0.0173074	7.02194E-09	0.00115446
Heptane		0.565139	0.704357	0.228607	0.230006	4.52240E-08	0.0117251
Methylcyclohexane		0.0137638	0.0178966	0.00532130	0.00559919	1.14600E-07	0.00268150
Toluene		0.104018	0.168341	0.0450296	0.0616279	0.000254490	0.150536
Octane		0.196986	0.280663	0.0772662	0.165707	9.97296E-10	0.00215674
Ethylbenzene		0.0100877	0.0160743	0.00400354	0.0103651	6.77074E-06	0.0140867
o-Xylene		0.0183953	0.0329647	0.00690104	0.0237365	1.49571E-05	0.0300281
Nonane		0.0317056	0.0535009	0.00842724	0.0525934	4.07106E-11	0.000353409
Decanes Plus		3.07200E-05	7.24197E-05	5.51301E-09	0.000129788	4.99619E-14	2.95679E-05
Water		0.000531213	0.832143	0.000333313	0.226752	72.0558	4.27936
Mass Fraction		%	%	%	%	%	%
Carbon Dioxide		4.11561	5.04230	16.0617	12.7945	46.9351	53.6402
Nitrogen		0.000551328	0.00907342	0.202755	2.01401	0.00172139	0.137257
Methane		0.908210	3.28833	22.0608	48.6181	0.548301	15.7173
Ethane		16.3607	12.9152	25.5456	12.5833	0.486336	12.1014
Propane		33.8470	30.4785	18.7809	10.2990	0.0606725	8.82196
Isobutane		7.28901	7.33563	2.83776	1.74903	0.00164089	1.00570
n-Butane		18.9290	19.2972	6.80503	4.30723	0.00514292	3.39504
2,2-Dimethylpropane		0.0400303	0.0428345	0.0142936	0.00949729	1.64774E-06	0.00333160
Isopentane		6.04659	6.43519	2.16462	1.46343	0.000274021	0.695204
n-Pentane		6.30122	6.79134	2.31098	1.60969	4.20805E-05	0.341617
2,2-Dimethylbutane		0.0162771	0.0183751	0.00619564	0.00483816	5.47103E-08	0.000771597
Cyclopentane		0	0	0	0	0	0
2,3-Dimethylbutane		0.116308	0.133942	0.0472569	0.0389664	1.73950E-06	0.0132301
2-Methylpentane		0.359593	0.428440	0.148841	0.128316	1.77934E-06	0.0266124
3-Methylpentane		0.184083	0.218220	0.0784859	0.0685006	4.24317E-06	0.0298287
n-Hexane		1.84253	2.16658	0.845194	0.754314	1.68570E-06	0.0705241
Methylcyclopentane		0.109480	0.140369	0.0505597	0.0490433	5.23968E-06	0.0302241
Benzene		0.177143	0.295786	0.0901792	0.110428	0.00372285	0.370828
Cyclohexane		1.10957	1.55053	0.585824	0.621233	0.000175237	0.625155
2-Methylhexane		0.0214172	0.0272393	0.0122469	0.0140726	1.35215E-08	0.00103308
3-Methylhexane		0.0243289	0.0298930	0.0141957	0.0162974	1.89539E-08	0.00131624
2,2,4-Trimethylpentane		0.110023	0.137689	0.0665308	0.0839654	3.21038E-08	0.00401839
Heptane		1.21878	1.54487	0.752706	0.978833	1.81372E-07	0.0358008
Methylcyclohexane		0.0290859	0.0384631	0.0171683	0.0233490	4.50357E-07	0.00802282
Toluene		0.206275	0.339511	0.136332	0.241164	0.000938503	0.422649
Octane		0.484290	0.701750	0.290018	0.803914	4.55956E-09	0.00750710
Ethylbenzene		0.0230498	0.0373541	0.0139664	0.0467356	2.87701E-05	0.0455713
o-Xylene		0.0420323	0.0766044	0.0240745	0.107026	6.35553E-05	0.0971426
Nonane		0.0875196	0.150196	0.0355157	0.286484	2.08981E-10	0.00138119
Decanes Plus		0.000156500	0.000375214	4.28793E-08	0.00130475	4.73327E-13	0.000213264
Water		0.000205970	0.328143	0.000197312	0.173495	51.9558	2.34920
Mass Flow		lb/h	lb/h	lb/h	lb/h	lb/h	lb/h
Carbon Dioxide		0.129497	334.669	0.0199795	292.307	0.0342506	127.125
Nitrogen		1.73475E-05	0.602223	0.000252211	46.0127	1.25618E-06	0.325293
Methane		0.0285767	218.254	0.0274419	1110.75	0.000400120	37.2494
Ethane		0.514786	857.213	0.0317767	287.482	0.000354901	28.6797
Propane		1.06499	2022.93	0.0233620	235.294	4.42754E-05	20.9076
Isobutane		0.229348	486.882	0.00352995	39.9590	1.19743E-06	2.38347
n-Butane		0.595599	1280.80	0.00846492	98.4045	3.75302E-06	8.04609
2,2-Dimethylpropane		0.00125955	2.84302	1.77802E-05	0.216979	1.20243E-09	0.00789575
Isopentane		0.190255	427.118	0.00269262	33.4340	1.99965E-07	1.64760
n-Pentane		0.198267	450.757	0.00287468	36.7757	3.07080E-08	0.809617
2,2-Dimethylbutane		0.000512156	1.21959	7.70689E-06	0.110535	3.99245E-11	0.00182865
Cyclopentane		0	0	0	0	0	0
2,3-Dimethylbutane		0.00365961	8.89001	5.87839E-05	0.890242	1.26939E-09	0.0313547
2-Methylpentane		0.0113146	28.4365	0.000185147	2.93156	1.29846E-09	0.0630701
3-Methylpentane		0.00579216	14.4838	9.76303E-05	1.56499	3.09643E-09	0.0706926
n-Hexane		0.0579750	143.801	0.00105135	17.2333	1.23013E-09	0.167139
Methylcyclopentane		0.00344477	9.31662	6.28923E-05	1.12046	3.82362E-09	0.0716298
Benzene		0.00557378	19.6320	0.000112176	2.52288	2.71673E-06	0.878846
Cyclohexane		0.0349126	102.912	0.000728719	14.1929	1.27878E-07	1.48159
2-Methylhexane		0.000673889	1.80794	1.52342E-05	0.321509	9.86726E-12	0.00244836
3-Methylhexane		0.000765507	1.98407	1.76583E-05	0.372336	1.38315E-11	0.00311943
2,2,4-Trimethylpentane		0.00346186	9.13875	8.27590E-05	1.91831	2.34276E-11	0.00952340
Heptane		0.0383489	102.537	0.000936307	22.3628	1.32355E-10	0.0848463
Methylcyclohexane		0.000915184	2.55288	2.13560E-05	0.533441	3.28646E-10	0.0190137
Toluene		0.00649041	22.5341	0.000169587	5.50972	6.84868E-07	1.00166
Octane		0.0152381	46.5767	0.000360759	18.3665	3.32731E-12	0.0177915
Ethylbenzene		0.000725260	2.47927	1.73731E-05	1.06774	2.09948E-08	0.108002
o-Xylene		0.00132254	5.08441	2.99467E-05	2.44517	4.63791E-08	0.230223
Nonane		0.00275379	9.96886	4.41788E-05	6.54511	1.52502E-13	0.00327335
Decanes Plus		4.92427E-06	0.0249038	5.33385E-11	0.0298088	3.45408E-16	0.000505426
Water		6.48084E-06	21.7796	2.45441E-07	3.96372	0.0379145	5.56749

Process Streams		Oil Tank Breathing Losses	Oil Tank Flash Losses	Slop Tank Breathing Losses	Slop Tank Flash Losses	Water Tank Breathing Losses	Water Tank Flash Losses
Properties	Status:	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Vapor**	From Block:	--	--	--	--	--	--
	To Block:	--	--	--	--	--	--
Property	**Units**						
Temperature	°F	82.3744	82.3744	82.3744	82.3744	82.3744	82.3744
Pressure	psia	20.5753	12.8800	95.3312	259.956	0.761000	12.8800
Molecular Weight	lb/lbmol	46.4627	45.6853	30.4326	23.5454	24.9848	32.8171
Mass Flow	lb/h	3.14649	6637.22	0.124392	2284.64	0.0729744	236.995
Std Vapor Volumetric Flow	MMSCFD	0.000616774	1.32317	3.72270E-05	0.883722	2.66011E-05	0.0657725
Std Liquid Volumetric Flow	sgpm	0.0122349	25.5126	0.000573357	11.7633	0.000164445	0.868868
Specific Gravity		1.60424	1.57739	1.05076	0.812962	0.862660	1.13309
API Gravity							
Net Ideal Gas Heating Value	Btu/ft^3	2328.83	2259.13	1370.43	1098.51	15.2528	778.722
Gross Ideal Gas Heating Value	Btu/ft^3	2529.00	2453.87	1499.69	1209.38	53.0514	855.689

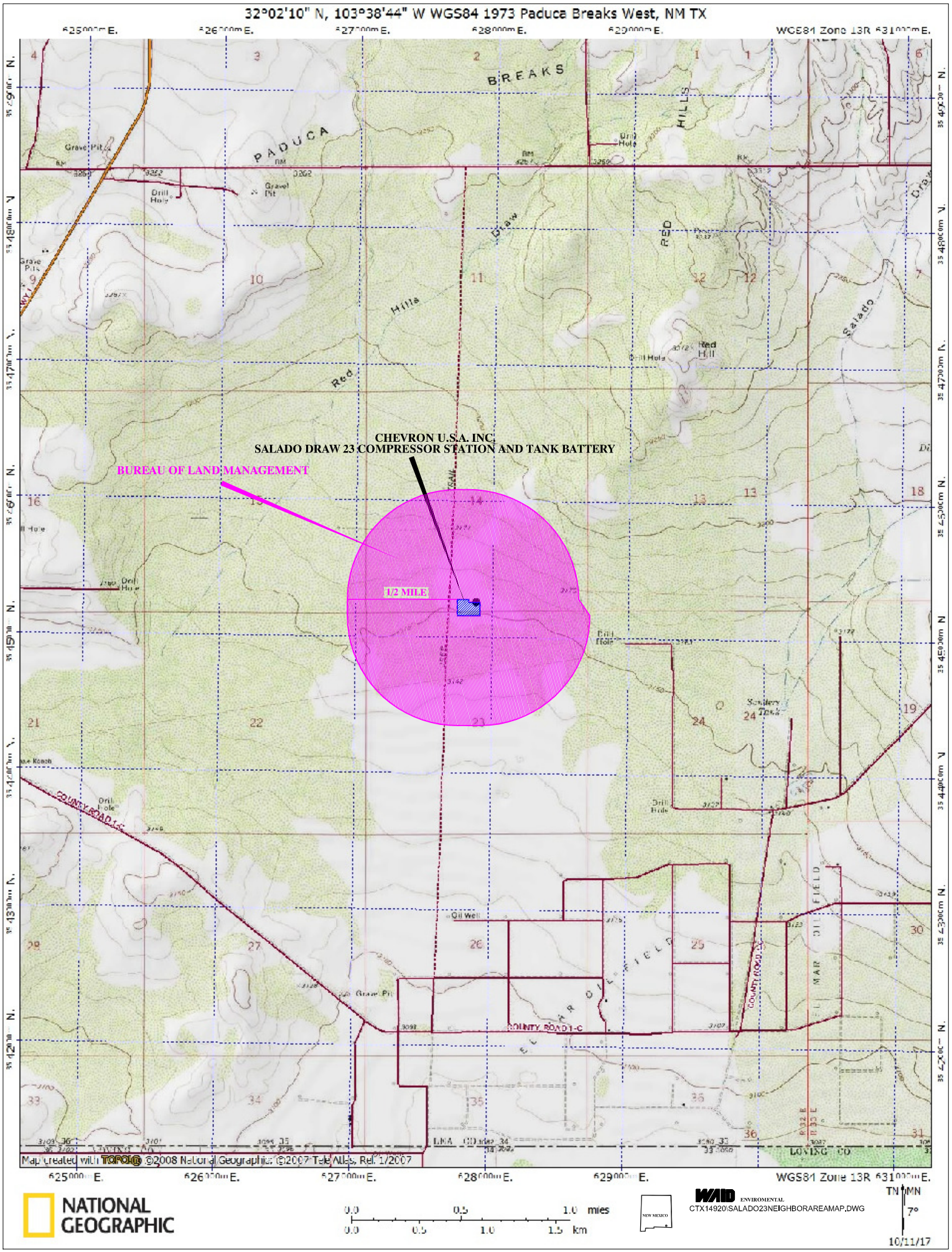
Process Streams		Oil Tank Breathing Losses	Oil Tank Flash Losses	Slop Tank Breathing Losses	Slop Tank Flash Losses	Water Tank Breathing Losses	Water Tank Flash Losses
Properties	**Status:**	Solved	Solved	Solved	Solved	Solved	Solved
Phase: **Light Liquid**	**From Block:**	--	--	--	--	--	--
	To Block:	--	--	--	--	--	--
Property	**Units**						
Temperature	°F			82.3744			
Pressure	psia			95.3312			
Molecular Weight	lb/lbmol			84.4725			
Mass Flow	lb/h			0.00348766			
Std Vapor Volumetric Flow	MMSCFD			3.76030E-07			
Std Liquid Volumetric Flow	sgpm			1.03660E-05			
Specific Gravity				0.675672			
API Gravity				74.2819			
Net Ideal Gas Heating Value	Btu/ft^3			4254.37			
Gross Ideal Gas Heating Value	Btu/ft^3			4582.50			

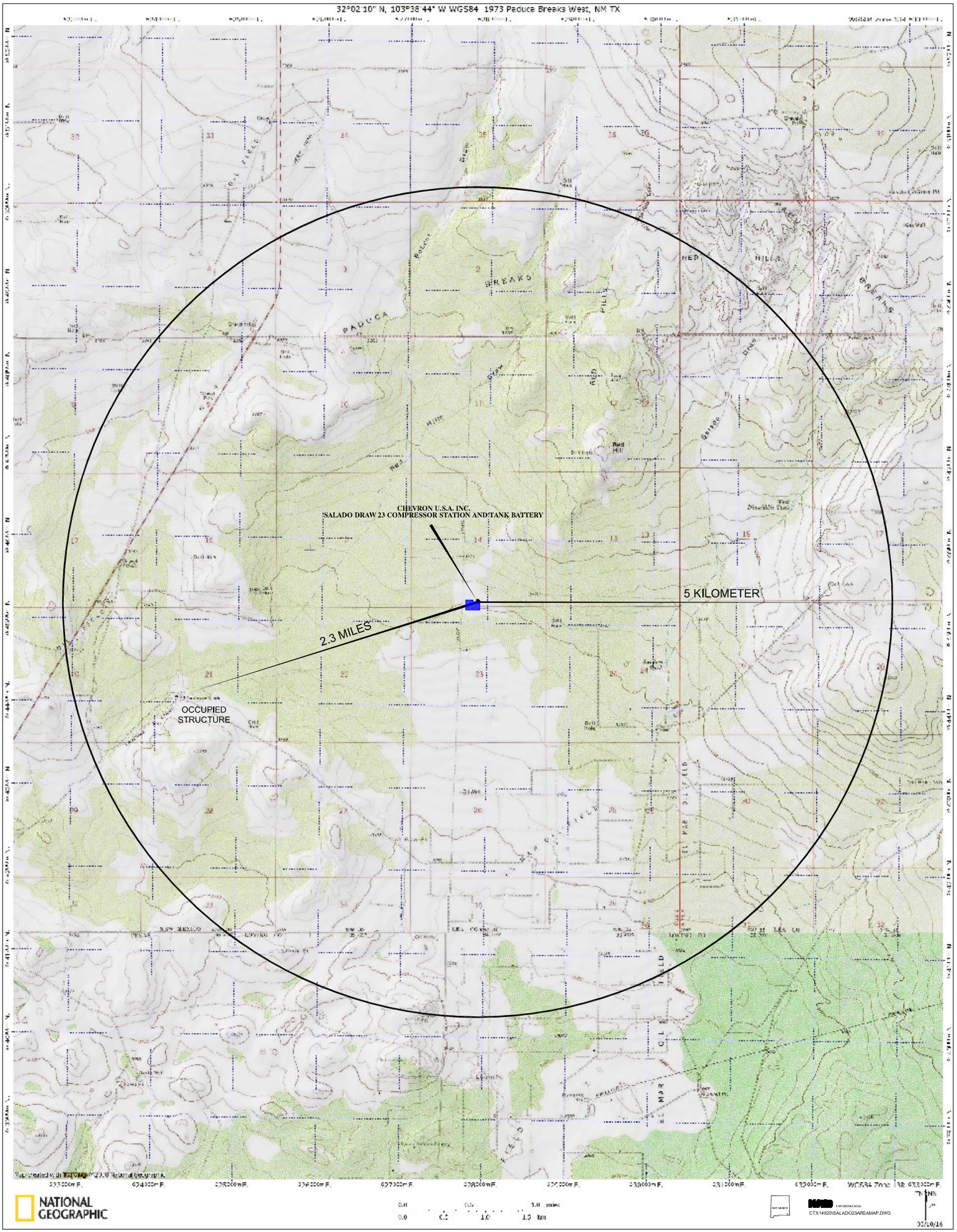
Section 8

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	


32°02'10" N, 103°38'44" W WGS84 1973 Paduca Breaks West, NM TX
WGS84 Zone 13R
CHEVRON U.S.A. INC.
SALADO DRAW 23 COMPRESSOR STATION AND TANK BATTERY
BUREAU OF LAND MANAGEMENT
1/2 MILE
BREAKS
PADUCA
RED HILL
Red Hills
Salado Draw
COUNTY ROAD 1-C
COUNTY ROAD 1-C
LOVING CO
NEW MEXICO
Map created with TOPO! ©2008 National Geographic ©2007 Tele Atlas, Rel. 1/2007
NATIONAL GEOGRAPHIC
0.0 0.5 1.0 miles
0.0 0.5 1.0 1.5 km
WHD ENVIROMENTAL
CTX14920\SALADO23NEIGHBORAREAMAP.DWG
TN MN
7°
10/11/17


32°02'10" N, 103°38'44" W WGS84 1973 Paduca Breaks West, NM TX
CHEVRON U.S.A. INC.
SALADO DRAW 23 COMPRESSOR STATION AND TANK BATTERY
5 KILOMETER
2.3 MILES
OCCUPIED STRUCTURE
NATIONAL GEOGRAPHIC
CTX14920\SALADO23AREAMAP.DWG

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.

---

(1) Notification of Property Owners within ½ miles of site include:

Carlsbad Field Office – Send by CERTIFIED MAIL
Bureau of Land Management
620 E. Greene St.
Carlsbad, NM 88220

(2) Notification of Municipalities, Counties, and Indian Tribes within 10 miles:

Mike Gallagher, Lea County Manager – Send by CERTIFIED MAIL
Lea County
100 North Main Ave., Suite 4
Lovington, NM, 88260
Phone: (575) 396-8601

Allen R. Davis, Eddy County Manager – Send by CERTIFIED MAIL
Eddy County
101 W Greene Street, Suite 110
Carlsbad, NM 88220
Phone: (575) 887-9511

(3) Notification in the Newspaper:

Hobbs News-Sun - Legal and Display Advertisement
http://www.hobbsnews.com
Phone: (575) 391-5417
Name: Kayla Montoya
Email: ter1@hobbsnews.com

(4) Notifications: General Postings:

a. Facility entrance

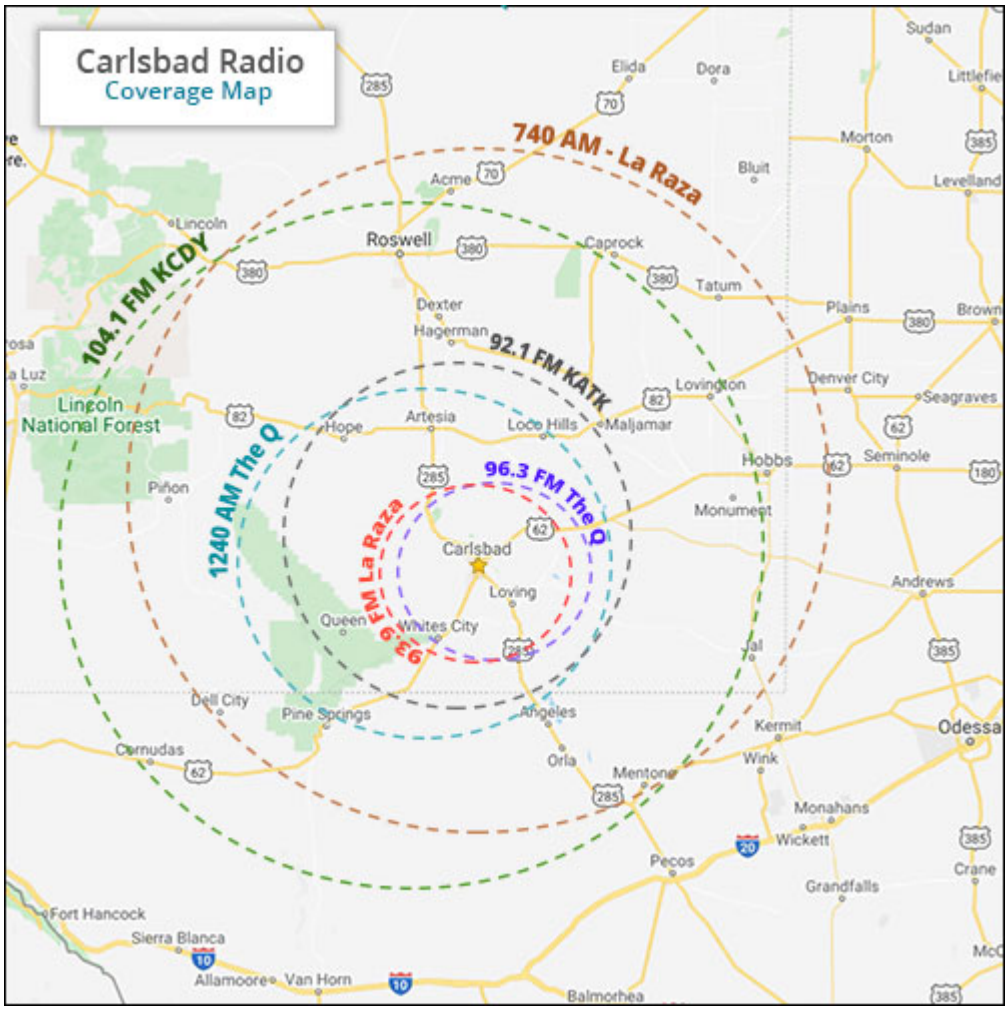
b. Site 1 (Public Library)
Woolworth Community Library – Send by FEDEX
100 E Utah Ave.
Jal, NM 88252
Phone: (575) 395-3268

c. Site 2 (City Hall)
Jal City Clerk – Send by FEDEX
Attn: Molly Sanchez
309 S Main St.
Jal, NM 88252
Phone: (575) 395-3340
msanchez@cityofjal.us

d. Site 3 (Post Office)
Jal Post Office – Send by FEDEX
Attn: Eric Barker
111 S 4th St.
Jal, NM 88252
Phone: (575) 395-3222
eric.barker@usps.gov

(5) Notification: Public Service Announcement

Carlsbad Radio Inc.
(575) 887-7563
Email: don@carlsbadradio.com, jerry@carlsbadradio.com, and traffic@carlsbadradio.com
Announcement will broadcast on four stations (104.1 FM, 92.1 FM, 1240 AM, 740 AM)
Carlsbad Radio Serves Lea County as well. See Coverage map below.



November 8, 2021

Carlsbad Field Office
Bureau of Land Management
620 E Greene St.
Carlsbad, NM 88220

Sent via Certified Mail
9414 8118 9956 0887 8381 83

Dear Bureau of Land Management:

Chevron U.S.A. Inc. announces its application submittal to the New Mexico Environment Department for an air quality permit for the modification of its central tank battery and compressor station, Salado Draw 23 CS and TB. The expected date of application submittal to the Air Quality Bureau is November 12, 2021.

The exact location for the proposed modifications to the facility known as, Salado Draw 23 Compressor Station and Tank Battery, is latitude 32 deg, 2 min, 10.2 sec and longitude -103 deg, 38 min, 44 sec. From Jal, NM intersection of S 3rd St. and NM-128W, head west on NM-128W for 29.77 mi. Turn left on Orla Rd./J-1 and continue for 12.64 miles. Turn left onto unnamed road and after 2.86 miles, the site will be on the left. The approximate location of this facility is 27.1 miles southwest of Jal, NM in Lea County.

In the proposed modification, gas analyses were updated, tank working and standing emissions calculations were updated and due to the updated gas analyses, the glycol dehydrator emissions estimation and the ProMax simulation were rerun with the updated values. This modification will not alter the site throughput of the site. After the modification, the site will consist of 4 compressor engines, 6 heaters, 2 dehydration units and associated condenser, reboiler, and glowplug, 3 condensate storage tanks, 4 water storage tanks, 1 flash gas compressor, 2 slop tanks, water truck loading, a flare, and a vapor recovery unit system with redundant capacity.

The estimated maximum quantities of any regulated air contaminants will be as follows in pound per hour (pph) and tons per year (tpy). These reported emissions could change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
Total Suspended Particulates (TSP)	0.824	3.63
PM_{10}	0.824	3.63
$PM_{2.5}$	0.824	3.63
Sulfur Dioxide (SO_2)	3.57	15.62
Nitrogen Oxides (NO_x)	29.71	58.00
Carbon Monoxide (CO)	74.42	38.29
Volatile Organic Compounds (VOC)	728.94	125.74
Total sum of all Hazardous Air Pollutants (HAPs)	33.64	7.78
Hydrogen Sulfide (H_2S)	0.031	0.001
Green House Gas Emissions as Total CO2e	N/A	<75,000

The standard and maximum operating schedules of the facility will be 24 hours per day, 7 days a week, and a maximum of 52 weeks per year.

Owners and operators of the facility include:

Chevron U.S.A. Inc.
Keaton Byars
HSE Specialist
6301 Deauville Blvd, N3203
Midland, TX 79706
(432) 687-7448

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Attención
Este es un aviso de la Agencia de Calidad de Aire del Departamento de Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor de comunicarse con la oficina de Calidad de Aire al teléfono 505-476-5557.

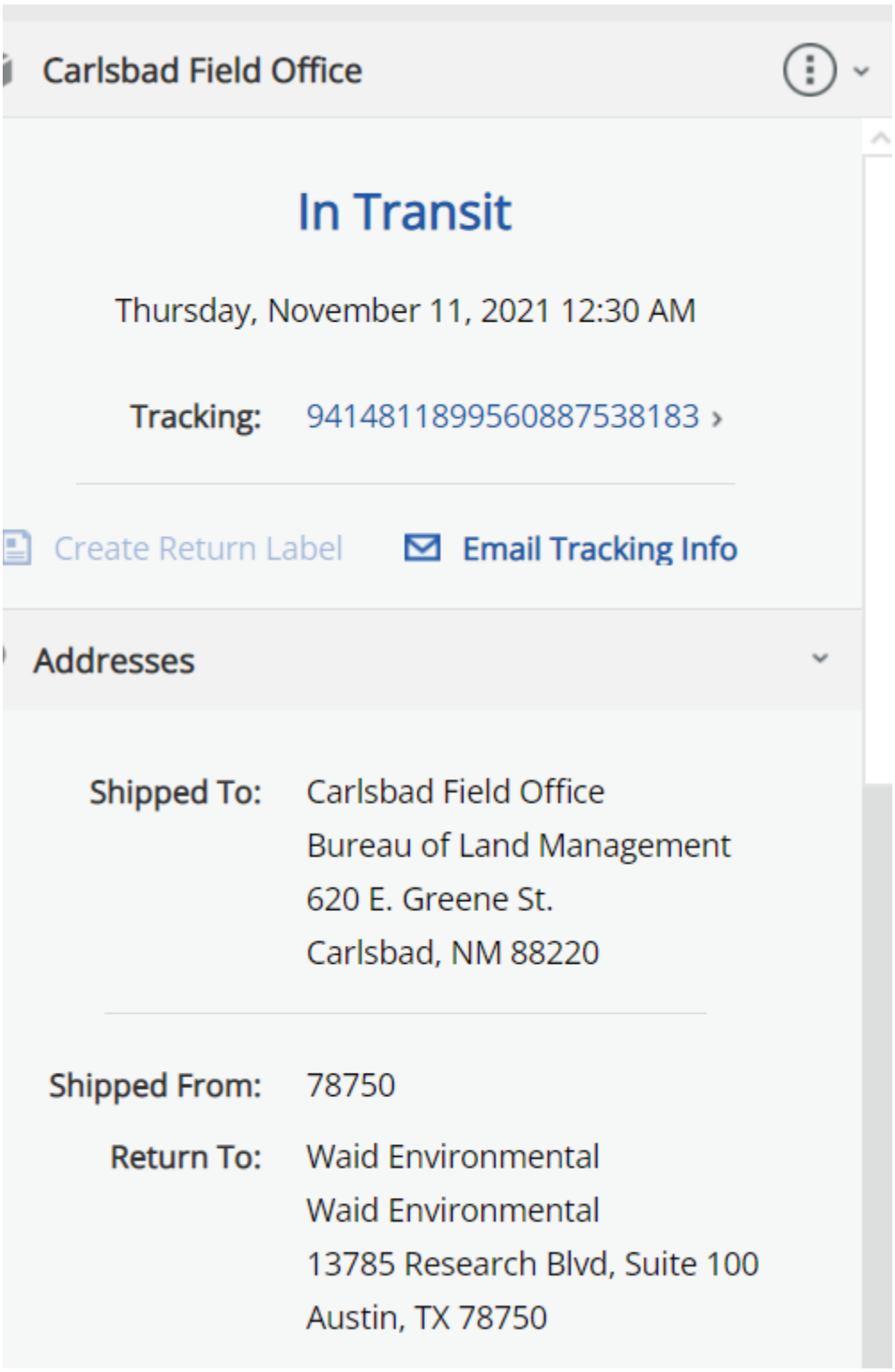
Sincerely,

Justin K. Mechell

Justin K. Mechell, P.E.
Senior Engineer

JKM/tvp

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Kathryn Becker, Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.


Carlsbad Field Office
In Transit
Thursday, November 11, 2021 12:30 AM
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Create Return Label
Email Tracking Info
Addresses
Shipped To: Carlsbad Field Office
Bureau of Land Management
620 E. Greene St.
Carlsbad, NM 88220
Shipped From: 78750
Return To: Waid Environmental
Waid Environmental
13785 Research Blvd, Suite 100
Austin, TX 78750

November 8, 2021

Mr. Mike Gallagher, Lea County Manager
Lea County
100 North Main Ave., Suite 4
Lovington, NM 88260

Sent via Certified Mail
9414 8118 9956 0887 1444 14

Dear Mr. Gallagher:

Chevron U.S.A. Inc. announces its application submittal to the New Mexico Environment Department for an air quality permit for the modification of its central tank battery and gas compression facility, Salado Draw 23 CS and TB. The expected date of application submittal to the Air Quality Bureau is November 12th, 2021.

The exact location for the proposed modifications to the facility known as, Salado Draw 23 Compressor Station and Tank Battery, is latitude 32 deg, 2 min, 10.2 sec and longitude -103 deg, 38 min, 44 sec. From Jal, NM intersection of S 3rd St. and NM-128W, head west on NM-128W for 29.77 mi. Turn left on Orla Rd./J-1 and continue for 12.64 miles. Turn left onto unnamed road and after 2.86 miles, the site will be on the left. The approximate location of this facility is 27.1 miles southwest of Jal, NM in Lea County.

In the proposed modification, gas analyses were updated, tank working and standing emissions calculations were updated and due to the updated gas analyses, the glycol dehydrator emissions estimation and the ProMax simulation were rerun with the updated values. This modification will not alter the site throughput of the site. After the modification, the site will consist of 4 compressor engines, 6 heaters, 2 dehydration units and associated condenser, reboiler, and glowplug, 3 condensate storage tanks, 4 water storage tanks, 1 flash gas compressor, 2 slop tanks, water truck loading, a flare, and a vapor recovery unit system with redundant capacity.

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Carbon Monoxide (CO)	74.42	38.29
Volatile Organic Compounds (VOC)	728.94	125.74
Total sum of all Hazardous Air Pollutants (HAPs)	33.64	7.78
Hydrogen Sulfide (H_2S)	0.031	0.001
Green House Gas Emissions as Total CO2e	N/A	<75,000

The standard and maximum operating schedules of the facility will be 24 hours per day, 7 days a week, and a maximum of 52 weeks per year.

Owners and operators of the facility include:

Chevron U.S.A. Inc.
Keaton Byars
HSE Specialist
6301 Deauville Blvd, N3203
Midland, TX 79706
(432) 687-7448

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

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Attención
Este es un aviso de la Agencia de Calidad de Aire del Departamento de Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor de comunicarse con la oficina de Calidad de Aire al teléfono 505-476-5557.

Sincerely,

Justin K. Mechell

Justin K. Mechell, P.E.
Senior Engineer

JKM/tvp

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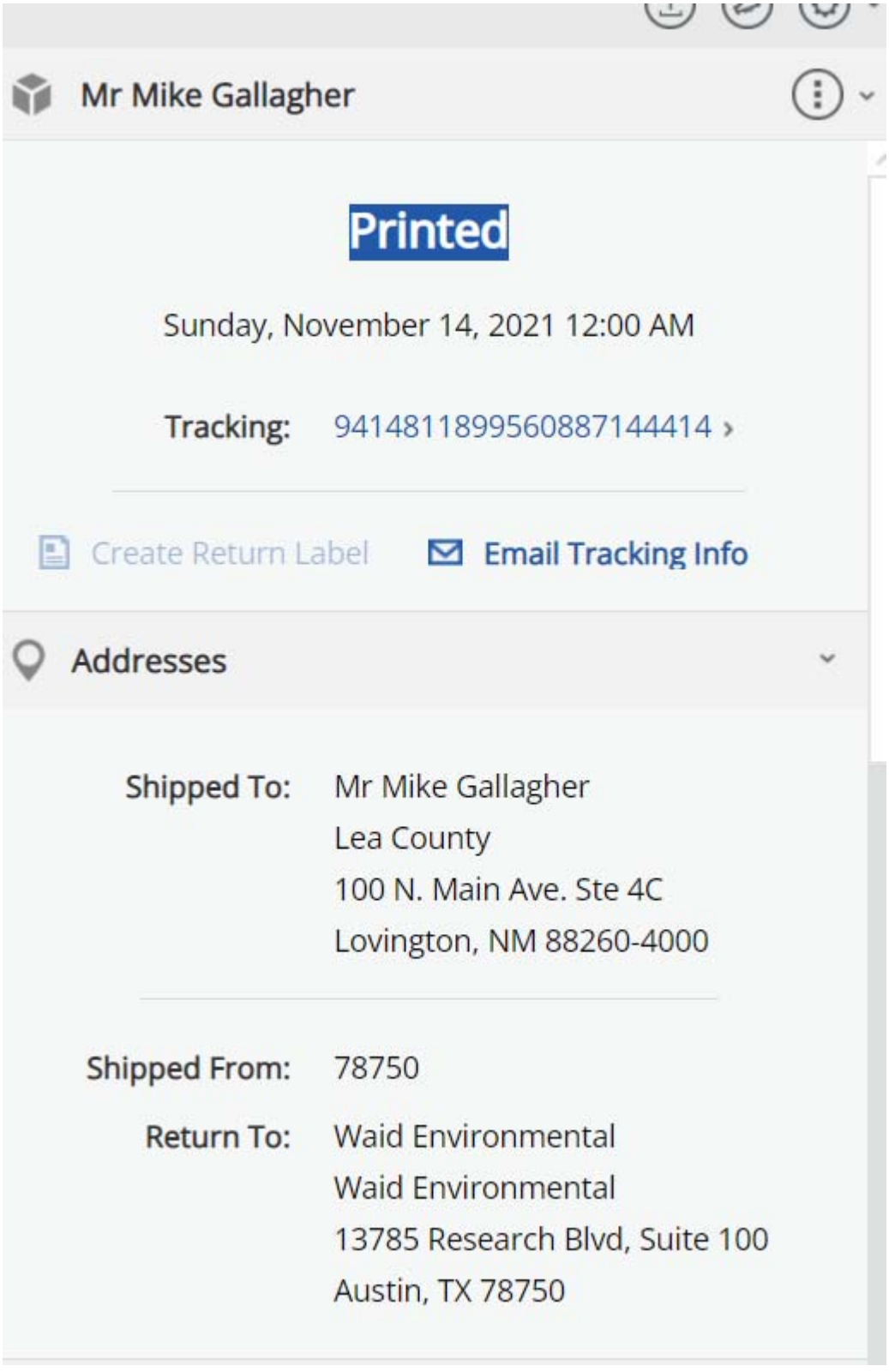
Mr Mike Gallagher
Printed
Sunday, November 14, 2021 12:00 AM
Tracking: 9414811899560887144414 ›
Create Return Label
Email Tracking Info
Addresses
Shipped To: Mr Mike Gallagher
Lea County
100 N. Main Ave. Ste 4C
Lovington, NM 88260-4000
Shipped From: 78750
Return To: Waid Environmental
Waid Environmental
13785 Research Blvd, Suite 100
Austin, TX 78750

November 8, 2021

Mr. Allen R. Davis,
Eddy County Manager
Eddy County
101 W Greene Street, Suite 110
Carlsbad, NM 88220

Sent via Certified Mail
9414 8118 9956 0887 1940 44

Dear Mr. Davis:

Chevron U.S.A. Inc. announces its application submittal to the New Mexico Environment Department for an air quality permit for the modification of its central tank battery and compressor station, Salado Draw 23 CS and TB. The expected date of application submittal to the Air Quality Bureau is November 12th, 2021.

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Sincerely,

Justin K. Mechell, P.E.
Senior Engineer

JKM/tvp

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Mr Allen R. Davis

Delivered

Wednesday, November 10, 2021 10:15 AM
CARLSBAD, NM 88220

Tracking: 9414811899560887194044 ›

Create Return Label Email Tracking Info

Addresses

Shipped To: Mr Allen R. Davis
Eddy County Manager
101 W. Greene Street
Suite 110
Carlsbad, NM 88220-6258

Shipped From: 78750

Return To: Waid Environmental
Waid Environmental
13785 Research Blvd, Suite 100
Austin, TX 78750

November 8, 2021

Woolworth Community Library
100 E Utah Ave.
Jal, NM 88252

Sent via Federal Express
7751 4639 2825

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Sincerely,

Justin K. Mechell, P.E.
Senior Engineer

JKM/tvp

Enclosure

Austin Office
13785 Research Blvd., Suite 100, Austin, Texas 78750
512.255.9999 • 512.255.8780 FAX

Houston Office
1325 Space Park Dr., Suite D, Houston, Texas 77058
281.333.9990 • 512.255.8780 FAX

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Keaton Byars
HSE Specialist
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Midland, TX 79706
(432) 687-7448

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November 12, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775146392825

Delivery Information:			
Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	S.SILVER	**Delivery Location:**	
Service type:	FedEx Priority Overnight		
Special Handling:	Deliver Weekday		JAL, NM,
		Delivery date:	Nov 9, 2021 15:52

Shipping Information:			
Tracking number:	775146392825	**Ship Date:**	Nov 8, 2021
		Weight:	0.5 LB/0.23 KG

Recipient:	**Shipper:**
JAL, NM, US,	AUSTIN, TX, US,

Reference	CTX14919 and CTX14920

Signature image is available. In order to view image and detailed information, the shipper or payor account number of the shipment must be provided.

November 8, 2021

Ms. Molly Sanchez
Jal City Hall
309 N Main St.
Jal, NM 88252

Sent via Federal Express
7751 4644 8166

Dear Ms. Sanchez:

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Justin K. Mechell, P.E.
Senior Engineer

JKM/tvp

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512.255.9999 • 512.255.8780 FAX

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HSE Specialist
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Midland, TX 79706
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November 12, 2021

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The following is the proof-of-delivery for tracking number: 775146448166

Delivery Information:

Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	S.SELENA	**Delivery Location:**	
Service type:	FedEx Priority Overnight		
Special Handling:	Deliver Weekday		JAL, NM,
		Delivery date:	Nov 9, 2021 15:44

Shipping Information:

Tracking number:	775146448166	**Ship Date:**	Nov 8, 2021
		Weight:	0.5 LB/0.23 KG

Recipient:	**Shipper:**
JAL, NM, US,	AUSTIN, TX, US,

Reference CTX14919 and CTX14920

Signature image is available. In order to view image and detailed information, the shipper or payor account number of the shipment must be provided.

November 8, 2021

Jal Post Office
111 S 4th Street
Jal, NM 88252

Sent via Federal Express
7751 4649 7999

Attn: Post Master

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(432) 687-7448

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816; (505) 476-4300; 1 800 224-7009; https://www.env.nm.gov/aqb/permit/aqb_draft_permits.html. Other comments and questions may be submitted verbally.

Please refer to the company name and facility name, or send a copy of this notice along with your comments, since the Department may have not yet received the permit application. Please include a legible return mailing address with your comments. Once the Department has performed a preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Attención
Este es un aviso de la Agencia de Calidad de Aire del Departamento de Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor de comunicarse con la oficina de Calidad de Aire al teléfono 505-476-5557.

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Kathryn Becker, Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@state.nm.us. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.
Coordinator identified above or visit our website at https://www.env.nm.gov/NMED/EJ/index.html to learn how and where to file a complaint of discrimination.

November 12, 2021

Dear Customer,

The following is the proof-of-delivery for tracking number: 775146497999

Delivery Information:			
Status:	Delivered	**Delivered To:**	Receptionist/Front Desk
Signed for by:	F.FULFER	**Delivery Location:**	
Service type:	FedEx Priority Overnight		
Special Handling:	Deliver Weekday		JAL, NM,
		Delivery date:	Nov 9, 2021 15:47

Shipping Information:			
Tracking number:	775146497999	**Ship Date:**	Nov 8, 2021
		Weight:	0.5 LB/0.23 KG

Recipient:	**Shipper:**
JAL, NM, US,	AUSTIN, TX, US,

Reference	CTX14919 and CTX14920

Signature image is available. In order to view image and detailed information, the shipper or payor account number of the shipment must be provided.

Submittal of Public Service Announcement – Certification

I, Keaton Byars, the undersigned, certify that on November 9th, 2021, submitted a public service announcement to Carlsbad Radio Inc. that serves the city of Jal, Lea County, New Mexico, in which the source is located and that Carlsbad Radio Inc. responded that it would air the announcement.

Signed this 12 day of November, 2021.

Keaton Byars
Signature

11/12/2021
Date

Keaton Byars
Printed Name

HSE Specialist
Title

General Posting of Notices – Certification

I, Keaton Byars, the undersigned, certify that on November 9th, 2021, posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in Jal of Lea County, State of New Mexico on the following dates:

1. Facility entrance {11/9/21}
2. Woolworth Community Library {11/9/21}
3. Jal City Hall {11/9/21}
4. Jal Post Office {11/9/21}

Signed this 12 day of November, 2021.

Signature

11/12/2021
Date

Keaton Byars
Printed Name

HSE Specialist
Title

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 Salado Draw 23 Compressor Station and Tank Battery is currently authorized under NSR Permit No. 6832-M7. In this revision application, gas analyses were updated, tank working and standing emissions calculations were updated and due to the updated gas analyses, the glycol dehydrator emissions estimation and the ProMax simulation were rerun with the updated values.

The Salado Draw 23 Compressor Station and Tank Battery is designed to remove water and hydrocarbon liquids from natural gas produced in the surrounding area, and to compress the gas into a pipeline for delivery to a processing plant. The site will include 4 compressor engines, 6 heaters, 2 dehydration units and associated condenser, reboiler, and glowplug, flare, 3 condensate tanks, 4 water tanks, 2 slop tanks, 1 flash gas compressor, water truck loading, a flare and VRU system with redundant capacity.

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)**:**

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

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

■ **Yes** □ **No**

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

■ **Yes** □ **No**

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

■ **Yes** □ **No**

C. Make a determination:

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

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

Section 12

Section 12.A
PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

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

A. This facility is:

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

B. **This facility is not one of the listed 20.2.74.501 Table I – PSD Source Categories. The "project" emissions** for this modification are **not significant because they remain within the emission limits designated below. The "project" emissions listed below or 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: <100 TPY**
b. **CO: <100 TPY**
c. **VOC: <100 TPY**
d. **SOx: <100 TPY**
e. **PM: <100 TPY**
f. **PM10: <100 TPY**
g. **PM2.5: <100 TPY**
h. **Fluorides: 0 TPY**
i. **Lead: 0 TPY**
j. **Sulfur compounds (listed in Table 2): <100 TPY**
k. **GHG: <75,000 TPY**

C. **Netting is not required (project is not significant).**

D. **BACT** is **not required for this modification, as this application is a minor modification.**

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.

Section 13

Determination of State & Federal Air Quality Regulations

This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

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

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

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

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

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

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

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

Table for STATE REGULATIONS:

STATE REGU-LATIONS CITATION	Title	Applies ? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.1 NMAC	General Provisions	Yes	Facility	Chevron U.S.A. Inc. will comply with the requirements of 20.2.1 NMAC.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	NMAAQS is applicable. The enclosed air dispersion modeling demonstrates compliance with the NMAAQS.
20.2.7 NMAC	Excess Emissions	Yes	Facility	Chevron U.S.A. Inc. will comply with the requirements of 20.2.7 NMAC, in the event of excess emissions.
20.2.23 NMAC	Fugitive Dust Control	No	N/A	Does not apply. This application is not for a Notice of Intent (NOI).
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide	No	N/A	None of the sources are affected because they each have a heat input of less than 1,000,000 million BTU per year.
20.2.35 NMAC	Natural Gas Processing Plant – Sulfur	No	N/A	Does not apply. The facility is not a natural gas processing plant.
20.2.37 and 20.2.36 NMAC	Petroleum Processing Facilities and Petroleum Refineries	No	N/A	Does not apply. The facility is not a petroleum refinery or natural gas processing plant.
20.2.38 NMAC	Hydrocarbon Storage Facility	Yes	See below	Chevron U.S.A. Inc. will comply with the applicable parts of 20.2.38 NMAC.
20.2.38.109	Tank Storage Associated with Petroleum Production or Processing Facility	No	N/A	Does not apply. All storage tanks have a capacity less than 20,000 gallons.
20.2.38.110	Tank Battery or Storage Facility – Within Municipality	No	N/A	Does not apply. The facility is not located within the corporate limits of any municipality.
20.2.38.111	Tank Battery or Storage Facility – Within Five Miles of Municipality of Twenty Thousand or More	No	N/A	Does not apply. The facility is not located within five miles of any municipality with a population of twenty thousand or more.
20.2.38.112	New Tank Battery – More than 65,000 Gallons Capacity	Yes	Applies to TK-1, TK-2, TK-3, TK-S2 Does not apply to PW-1, PW-2, PW-3, PW-4, TK-S1	The condensate storage tanks and condensate slop tank emissions are reduced by the VRU system with redundant capacity and meet control requirements. There are no requirements for the water storage tanks or slop tanks.
20.2.38.113	New Tank Battery and the Pecos-Permian Interstate	No	N/A	Does not apply. The facility is located within the Pecos-Permian Interstate Air Quality Control Region.

STATE REGU-LATIONS CITATION	Title	Applies ? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
	Air Quality Control Region			
20.2.61.109 NMAC	Smoke & Visible Emissions		ENG-1, ENG-2, ENG-3, ENG-4, HTR-1, HTR-2, HTR-3, HTR-4, HTR-5, HTR-6, REB-1, FLARE	Chevron U.S.A. Inc. does not expect visible emissions from the gas-fired heaters, reboiler, flare, or engines to exceed an opacity of 20%.
20.2.70 NMAC	Operating Permits	No	N/A	Does not apply. The site is not a major source and is not part of any other source category subject to this regulation.
20.2.71 NMAC	Operating Permit Fees	No	N/A	Does not apply. The site is not subject to 20.2.70 NMAC.
20.2.72 NMAC	Construction Permits	Yes	Facility	Chevron U.S.A. Inc. is applying for a construction permit for the Salado Draw 23 Compressor Station and Tank Battery because potential emission rates for several pollutants are greater than 10 pounds per hour and 25 tons per year.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	An emissions inventory report will be submitted upon request by NMED.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	A filing fee of $500 is being submitted according to 20.2.75.10.A NMAC. The filing fee will be applied to the total permit fee determined from 20.2.75.11 NMAC.
20.2.77 NMAC	New Source Performance	Yes	NSPS JJJJ applies to ENG-1, ENG-2, ENG-3, ENG-4, NSPS OOOOa applies to FUG NSPS OOOO/OOOOa does not apply to TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4, TK-S1, TK-S2	Chevron U.S.A. Inc. will comply with the applicable requirements by complying with NSPS JJJJ, NSPS OOOO, and NSPS OOOOa.

STATE REGU-LATIONS CITATION	Title	Applies ? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.78 NMAC	Emission Standards for HAPS	No	N/A	Does not apply. There are no applicable NESHAP standards.
20.2.82 NMAC	MACT Standards for source categories of HAPS	Yes	ENG-1, ENG-2, ENG-3 ENG-4, DHY-1, DHY-2	Chevron U.S.A. Inc. will comply with the applicable requirements by complying with MACT HH and ZZZZ.

Example of a Table for Applicable FEDERAL REGULATIONS (Note: This is not an exhaustive list):

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION
40 CFR 50	NAAQS	Yes	Facility	NAAQS is applicable. The enclosed air dispersion modeling demonstrates compliance with the NAAQS.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	Applies to: ENG-1, ENG-2, ENG-3, ENG-4, FUG Exempt: TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4, TK-S1, TK-S2	Chevron U.S.A. Inc. will comply with the applicable general provisions of Subpart 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	The storage vessels are not subject to NSPS 40 CFR 60, Subpart Kb because each has a capacity less than 10,000 bbl and is located prior to custody transfer.

FEDERAL REGU-LATIONS CITATION	Title	Applies? Enter Yes or No	Unit(s) or Facility	JUSTIFICATION
NSPS 40 CFR Part 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which construction, modification or reconstruction commenced after August 23, 2011 and before September 18, 2015	No	Exempt: TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4, TK-S1, TK-S2	NSPS OOOO does not apply to the storage tanks because they were constructed after 09/18/15.
NSPS 40 CFR Part 60 Subpart OOOOa	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced After September 18, 2015	Yes	Applies to ENG-1, ENG-2, ENG-3, ENG-4, Does not apply to TK-1, TK-2, TK-3, PW-1, PW-2, PW-3, PW-4, TK-S1, TK-S2	The site is subject to NSPS OOOOa. Specifically, the collection of fugitive emission components and the reciprocating compressors are NSPS OOOOa affected facilities. The storage vessels are not NSPS OOOOa affected facilities since the PTE from each storage vessel is less than 6 tpy. Any pneumatic pumps are not affected facilities since they will not be gas driven.
NSPS 40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	Yes	ENG-1, ENG-2, ENG-3, ENG-4,	NSPS JJJJ is an applicable standard to the engines. Chevron U.S.A. Inc. will comply with the applicable provision of Subpart JJJJ.
NESHAP 40 CFR 61 Subpart A	General Provisions	No	N/A	There are no applicable NESHAP standards.
MACT 40 CFR 63, Subpart A	General Provisions	Yes	ENG-1, ENG-2, ENG-3, ENG-4, DHY-1, DHY-2	Chevron U.S.A. Inc. will comply with the applicable general provisions of Subpart A. This subpart applies because MACT HH and ZZZZ apply.
MACT 40 CFR 63.760 Subpart HH	Oil and Natural Gas Production Facilities	Yes	DHY-1, DHY-2	The dehydrators meet the requirements of MACT HH by emitting < 1 tpy benzene.
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)	Yes	ENG-1, ENG-2, ENG-3, ENG-4, DHY-1, DHY-2	Each engine meets the requirements of MACT ZZZZ by complying with NSPS JJJJ, per 63.6590(c)(1).

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.

Chevron U.S.A. Inc. 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 20.2.72.203A.5. Chevron U.S.A. Inc. has also 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.

The plan(s) will be kept on site or at the nearest field office to be made available to the Department upon request.

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.

Normally, flare emissions are from pilot/sweep gas combustion. During SSM activities, flaring of up to 89,000 scf/hr may occur.

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.	
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.	X

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.

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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

Compliance Test History Table

Unit No.	Test Description	Test Date

Section 20

Other Relevant Information

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

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

No additional information is included.

Section 22: Certification

Company Name: Chevron U.S.A. Inc.

I, Keaton Byars, 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 12 day of November, 2021, upon my oath or affirmation, before a notary of the State of Texas.

Keaton Byars
*Signature

11/12/2021
Date

Keaton Byars
Printed Name

HSE Specialist
Title

Scribed and sworn before me on this 12 day of November, 2021.

My authorization as a notary of the State of Texas expires on the 25th day of February, 2024.

Notary's Signature

11/12/2021
Date

Dulce Sarai Castaneda
Notary's Printed Name

DULCE SARAI CASTANEDA
Notary Public, State of Texas
Comm. Expires 02-25-2024
Notary ID 132375160

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