NMED AIR QUALITY
INITIAL NSR APPLICATION

MARKWEST ENERGY WEST TEXAS GAS COMPANY, LLC
DAGGER LAKE TREATING FACILITY

Prepared By:

Daniel Dolce – Consultant

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

On behalf of:

Jacob Mezey – EHS Compliance Specialist

MarkWest Energy West Texas Gas Company, L.L.C.
1515 Arapahoe Street
Denver, Colorado 80202
(210) 626-6230

June 2025

Project 0253201.0006

Trinity Consultants

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

June 30, 2025

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

RE: Application for Initial NSR Permit
MarkWest Energy West Texas Gas Company, L.L.C. — Dagger Lake Treating Facility

Dear Permit Programs Manager:

On behalf of MarkWest Energy West Texas Gas Company, L.L.C., we are submitting this application for an initial NSR Permit for the Dagger Lake Treating Facility. This facility is located 22.4 miles west of Eunice, New Mexico in Lea County and sweetens and dehydrates sour gas. Dagger Lake Treating Facility is currently authorized to operate under GCP-O&G Permit No. 10187M1R1.

The format and content of this application are consistent with the Bureau's current policy regarding NSR applications; it is a complete application package using the most current application forms. Enclosed is one hard copy and one working copy of the application, including the original certification page, electronic files, and an application check. Please feel free to contact me at (505) 266-6611 or by email at Daniel.Dolce@trinityconsultants.com if you have any questions regarding this application. Alternatively, you may contact Jacob Mezey with MarkWest Energy West Texas Gas Company, L.L.C., at (210) 626-6230 or by email at JGMezey@MarathonPetroleum.com.

Sincerely,

TRINITY CONSULTANTS

Daniel Dolce
Consultant

cc: Jacob Mezey (MarkWest Energy West Texas Gas Company, L.L.C.)

Trinity Project File 0253201.0006

Check No	Check Date	Bank No	Vendor No	MPLXIF LLC 200 East Hardin Street Findlay, OH, 45840	Direct Inquiries to: Accounts Payable Dept. Phone: 1-800-837-6763, Option 1
020774	01/30/2025	JPM02	6417896		

Reference Number	Invoice Date	Document Number	Invoicing Company	Remit Comments	Discounts	Invoice/Pay Amt
AIRPERMITFEE13	01/29/2025	2000000469	MarkWest Tornado GP LLC		0.00	500.00
				Total Remittance : U.S. Dollars		500.00

(FOLD ON PERFORATION BELOW AND DETACH CHECK STUB BEFORE DEPOSITING)

DO NOT CASH UNLESS WARNING BAND AND THE CHECK BACKGROUND ARE IN VIOLET. THE LINE BELOW CONTAINS MICROPRINTING.

ORM 2501 REV. 5/00

MPLXIF LLC
19100 Ridgewood Pkwy
San Antonio, TX 78259

50-937/213

CHECK DATE 01/30/2025

CHECK NUMBER 020774

PAY TO THE ORDER OF:
NEW MEXICO ENVIRONMENT
DEPARTMENT AIR QUALITY BUREAU
525 CAMINO DE LOS MARQUEZ, STE 1
SANTA FE, NM 87505-1816

U.S.Funds $500.00****

EXACTLY *********500 DOLLARS AND 00 CENTS

JPMorgan Chase Bank, National Association
SYRACUSE, NY

Pay On Behalf Of MarkWest Tornado GP LLC

VOID AFTER 180 DAYS

Authorized Representative

DO NOT CASH UNLESS THIS CHECK IS ON WATERMARKED PAPER. HOLD TO LIGHT TO VIEW. THE LINE ABOVE CONTAINS MICROPRINTING.

⑈020774⑈ ⑆021309379⑆ 618549536⑈

Air Permit Application
Compliance History Disclosure Form

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

Permittee/Applicant Company Name		**Expected Application Submittal Date**
MarkWest Energy West Texas Gas Company, L.L.C.		June 30, 2025
Permittee/Company Contact	**Phone**	**Email**
Jacob Mezey	(210) 626-6230	JGMezey@MarathonPetroleum.com

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

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

Universal Air Quality Permit Application

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

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

This application is submitted as (check all that apply)**:** ☐ Request for a No Permit Required Determination (no fee)
☐ **Updating** an application currently under NMED review. Include this page and all pages that are being updated (no fee required).
Construction Status: ☐ Not Constructed ☑ Existing Permitted (or NOI) Facility ☐ Existing Non-permitted (or NOI) Facility
Minor Source: ☐ 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.: 020774 in the amount of $500
☑ I acknowledge the required submittal format for the hard copy application is printed double sided 'head-to-toe', 2-hole punched (except the Sect. 2 landscape tables is printed 'head-to-head'), numbered tab separators. Incl. a copy of the check on a separate page.
☑ I acknowledge there is an annual fee for permits in addition to the permit review fee: www.env.nm.gov/air-quality/permit-fees-2/.
☐ This facility qualifies for the small business fee reduction per 20.2.75.11.C. NMAC. The full $500.00 filing fee is included with this application and I understand the fee reduction will be calculated in the balance due invoice. The Small Business Certification Form has been previously submitted or is included with this application. (Small Business Environmental Assistance Program Information: www.env.nm.gov/air-quality/small-biz-eap-2/.)

Citation: Please provide the **low level citation** under which this application is being submitted: **20.2.72.200.A.(1) 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.): 9573	Updating Permit/NOI #: 10187M1R1

1	Facility Name: Dagger Lake Treating Facility	Plant primary SIC Code (4 digits): 1311
		Plant NAIC code (6 digits): 211130
a	Facility Street Address (If no facility street address, provide directions from a prominent landmark): From Eunice, head west on Ave J and turn right on Main St. In 0.4 mi turn left onto NM-176 W/Ave O. In 6.4 miles turn left to stay on NM-176 W. Continue straight for 13.7 miles before turning left onto Berry Booster. After 3.8 miles turn right. In 0.6 mi continue straight onto 21 CUT for 4.9 miles. Turn left and in 2.7 miles turn left again. Continue for 0.8 miles and then turn left onto Lease Rd. In 3.6 miles Dagger Lake Treating Facility will be on the left.	
2	Plant Operator Company Name: MarkWest Energy West Texas Gas Company, L.L.C.	Phone/Fax: (303) 925-9200 / N/A

a	Plant Operator Address: 1515 Arapahoe Street, Denver, Colorado 80202	
b	Plant Operator's New Mexico Corporate ID or Tax ID: TBD	
3	Plant Owner(s) name(s): MarkWest Energy West Texas Gas Company, L.L.C.	Phone/Fax: (303) 925-9200 / N/A
a	Plant Owner(s) Mailing Address(s): 1515 Arapahoe Street, Denver, Colorado 80202	
4	Bill To (Company): MarkWest Energy West Texas Gas Company, L.L.C.	Phone/Fax: (303) 925-9200 / N/A
a	Mailing Address: 1515 Arapahoe Street, Denver, Colorado 80202	E-mail: JOBrien@Marathonpetroleum.com
5	☑ Preparer: Trinity Consultants ☑ Consultant: Daniel Dolce	Phone/Fax: 505-266-6611
a	Mailing Address: 9400 Holly Ave NE, Building 3, Suite B Albuquerque, NM 87122	E-mail: Daniel.Dolce@trinityconsultants.com
6	Plant Operator Contact: Richard Aves	Phone/Fax: (575) 706-2903
a	Address: 5217 Sierra Vista Dr, Carlsbad, NM 88220	E-mail: RJaves@MarathonPetroleum.com
7	Air Permit Contact: Jacob Mezey	Title: EHS Compliance Specialist
a	E-mail: JGMezey@MarathonPetroleum.com	Phone/Fax: (210) 626-6230
b	Mailing Address: 1801 California St., Ste 1200, Denver, Colorado 80202	
c	The designated Air permit Contact will receive all official correspondence (i.e. letters, permits) from the Air Quality Bureau.	

Section 1-B: Current Facility Status

1.a	Has this facility already been constructed? ☑ Yes ☐ No	1.b If yes to question 1.a, is it currently operating in New Mexico? ☑ Yes ☐ No
2	If yes to question 1.a, was the existing facility subject to a Notice of Intent (NOI) (20.2.73 NMAC) before submittal of this application? ☐ Yes ☑ No	If yes to question 1.a, was the existing facility subject to a construction permit (20.2.72 NMAC) before submittal of this application? ☑ Yes ☐ No
3	Is the facility currently shut down? ☐ Yes ☑ No	If yes, give month and year of shut down (MM/YY): N/A
4	Was this facility constructed before 8/31/1972 and continuously operated since 1972? ☐ Yes ☑ No	
5	If Yes to question 3, has this facility been modified (see 20.2.72.7.P NMAC) or the capacity increased since 8/31/1972? ☐Yes ☐No ☑ N/A	
6	Does this facility have a Title V operating permit (20.2.70 NMAC)? ☐ Yes ☑ No	If yes, the permit No. is: N/A
7	Has this facility been issued a No Permit Required (NPR)? ☐ Yes ☑ No	If yes, the NPR No. is: N/A
8	Has this facility been issued a Notice of Intent (NOI)? ☐ Yes ☑ No	If yes, the NOI No. is: N/A
9	Does this facility have a construction permit (20.2.72/20.2.74 NMAC)? ☑ Yes ☐ No	If yes, the permit No. is: 10187M1R1
10	Is this facility registered under a General permit (GCP-1, GCP-2, etc.)? ☐ Yes ☑ No	If yes, the register No. is: N/A

Section 1-C: Facility Input Capacity & Production Rate

1	What is the facility's maximum input capacity, specify units (reference here and list capacities in Section 20, if more room is required)			
a	Current	Hourly: 2.5 MMscf/h	Daily: 60 MMscf/d	Annually: 21,900 MMscf/y
b	Proposed	Hourly: 2.5 MMscf/h	Daily: 60 MMscf/d	Annually: 21,900 MMscf/y
2	What is the facility's maximum production rate, specify units (reference here and list capacities in Section 20, if more room is required)			

a	Current	Hourly: 2.5 MMscf/h	Daily: 60 MMscf/d	Annually: 21,900 MMscf/y
b	Proposed	Hourly: 2.5 MMscf/h	Daily: 60 MMscf/d	Annually: 21,900 MMscf/y

Section 1-D: Facility Location Information

1	Section: 04	Range: 33E	Township: 22S	County: Lea	Elevation (ft): 3645
2	UTM Zone: ☐ 12 or ☑ 13			Datum: ☐ NAD 27 ☐ NAD 83 ☑ WGS 84	
a	UTM E (in meters, to nearest 10 meters): 633,909			UTM N (in meters, to nearest 10 meters): 3,587,863	
b	**AND** Latitude (deg., min., sec.): 32°25'11.30"			Longitude (deg., min., sec.): -103°34'33.02"	
3	Name and zip code of nearest New Mexico town: Eunice, 88231				
4	Detailed Driving Instructions from nearest NM town (attach a road map if necessary): From Eunice, head west on Ave J and turn right on Main St. In 0.4 mi turn left onto NM-176 W/Ave O. In 6.4 miles turn left to stay on NM-176 W. Continue straight for 13.7 miles before turning left onto Berry Booster. After 3.8 miles turn right. In 0.6 mi continue straight onto 21 CUT for 4.9 miles. Turn left and in 2.7 miles turn left again. Continue for 0.8 miles and then turn left onto Lease Rd. In 3.6 miles Dagger Lake Treating Facility will be on the left.				
5	The facility is 22.4 (distance) miles west (direction) of Eunice (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: Eddy County				
8	**20.2.72** NMAC applications **only**: Will the property on which the facility is proposed to be constructed or operated be closer than 50 km (31 miles) to other states, Bernalillo County, or a Class I area (see www.env.nm.gov/air-quality/modeling-publications/)? ☑ Yes ☐ No (20.2.72.206.A.7 NMAC) If yes, list all with corresponding distances in kilometers: Texas, 46.6 km				
9	Name nearest Class I area: Carlsbad Caverns National Park				
10	Shortest distance (in km) from facility boundary to the boundary of the nearest Class I area (to the nearest 10 meters): 79.2 km				
11	Distance (meters) from the perimeter of the Area of Operations (AO is defined as the plant site inclusive of all disturbed lands, including mining overburden removal areas) to nearest residence, school or occupied structure: over 3,000 m				
12	Method(s) used to delineate the Restricted Area: Continuous Fencing "**Restricted Area**" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area.				
13	Does the owner/operator intend to operate this source as a portable stationary source as defined in 20.2.72.7.X NMAC? ☐ Yes ☑ No A portable stationary source is not a mobile source, such as an automobile, but a source that can be installed permanently at one location or that can be re-installed at various locations, such as a hot mix asphalt plant that is moved to different job sites.				
14	Will this facility operate in conjunction with other air regulated parties on the same property? ☒ No ☐ Yes If yes, what is the name and permit number (if known) of the other facility?				

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

1	Facility **maximum** operating ($\frac{\text{hours}}{\text{day}}$): 24	($\frac{\text{days}}{\text{week}}$): 7	($\frac{\text{weeks}}{\text{year}}$): 52	($\frac{\text{hours}}{\text{year}}$): 8760		
2	Facility's maximum daily operating schedule (if less than 24 $\frac{\text{hours}}{\text{day}}$)? Start: N/A		☐AM ☐PM	End: N/A	☐AM ☐PM	
3	Month and year of anticipated start of construction: Upon receipt of permit.					
4	Month and year of anticipated construction completion: Upon receipt of permit.					
5	Month and year of anticipated startup of new or modified facility: Upon receipt of permit.					

6	Will this facility operate at this site for more than one year? ☑ Yes ☐ No

Section 1-F: Other Facility Information

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

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

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

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

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

1	Responsible Official (R.O.) (20.2.70.300.D.2 NMAC): N/A	Phone: N/A
a	R.O. Title: N/A	R.O. e-mail: N/A
b	R. O. Address: TBD	
2	Alternate Responsible Official (20.2.70.300.D.2 NMAC): N/A	Phone: N/A
a	A. R.O. Title: N/A	A. R.O. e-mail: N/A
b	A. R. O. Address: N/A	
3	Company's Corporate or Partnership Relationship to any other Air Quality Permittee (List the names of any companies that have operating (20.2.70 NMAC) permits and with whom the applicant for this permit has a corporate or partnership relationship): N/A	
4	Name of Parent Company ("Parent Company" means the primary name of the organization that owns the company to be permitted wholly or in part.): N/A	
a	Address of Parent Company: N/A	
5	Names of Subsidiary Companies ("Subsidiary Companies" means organizations, branches, divisions or subsidiaries, which are owned, wholly or in part, by the company to be permitted.): N/A	
6	Telephone numbers & names of the owners' agents and site contacts familiar with plant operations: Jacob Mezey, (210) 626-6230	

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: **States:** Texas (46.6 km) **Local Pollution Control Programs:** N/A **Indian Tribes and Pueblos:** N/A

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: **Daniel Dolce**, Daniel.Dolce@trinityconsultants.com, (505) 266-6611.

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

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

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

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

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

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

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

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

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

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

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Section 10: **Written Description of the Routine Operations of the Facility**
Section 11: **Source Determination**
Section 12: **PSD Applicability Determination for All Sources & Special Requirements for a PSD Application**
Section 13: **Discussion Demonstrating Compliance with Each Applicable State & Federal Regulation**
Section 14: **Operational Plan to Mitigate Emissions**
Section 15: **Alternative Operating Scenarios**
Section 16: **Air Dispersion Modeling**
Section 17: **Compliance Test History**
Section 18: **Addendum for Streamline Applications (streamline applications only)**
Section 19: **Requirements for the Title V (20.2.70 NMAC) Program (Title V applications only)**
Section 20: **Other Relevant Information**
Section 21: **Addendum for Landfill Applications**
Section 22: **Certification Page**

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.
AMINE-1	Amine Treating Unit	Kinder Morgan	400 gpm plant	1373	30 MMSCFD	30 MMSCFD	2024 2024	FL-1 FL-1	31000201	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
AMINE-2	Amine Treating Unit	Kinder Morgan	400 gpm plant	1374	30 MMSCFD	30 MMSCFD	2024 2024	FL-1 FL-1	31000201	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
HT-1	Amine Hot Oil Heater	Sigma Thermal	HC2-20.0-H-SF	J23050-001	36 MMBtu/hr	36 MMBtu/hr	2024 2024	N/A HT-1	31000404	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
HT-2	Amine Hot Oil Heater	Sigma Thermal	HC2-20.0-H-SF	J23053-001	36 MMBtu/hr	36 MMBtu/hr	2024 2024	N/A HT-2	31000404	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
DEHY-1	TEG Dehydrator	Cimarron	30 MM plant	14325	30 MMSCFD	30 MMSCFD	2024 2024	FL-1 FL-1	31000304	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
DEHY-2	TEG Dehydrator	Cimarron	30 MM plant	14292	30 MMSCFD	30 MMSCFD	2024 2024	FL-1 FL-1	31000304	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
REBOIL-1	Dehydrator Reboiler	Prostar Manufacturing, Inc.	750,000 reboiler	HA-0817	0.75 MMBtu/hr	0.75 MMBtu/hr	2024 2024	N/A REBOIL-1	31000228	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
REBOIL-2	Dehydrator Reboiler	Prostar Manufacturing, Inc.	750,000 reboiler	HA-0818	0.75 MMBtu/hr	0.75 MMBtu/hr	2024 2024	N/A REBOIL-2	31000228	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
T-SLOP	Slop Storage Tank	Angelina Tank & Manufacturing	Fixed Roof Tank	61008	500 bbl	500 bbl	Jun-22 2024	N/A N/A	40400311	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
TO-1	Thermal Oxidizer	Zeeco	VCU-5-40	TBD	16 MMBtu/hr	16 MMBtu/hr	TBD TBD	N/A TO-1	31000205	☐ Existing (unchanged) ☑ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
TO-2	Thermal Oxidizer	Zeeco	VCU-5-40	TBD	16 MMBtu/hr	16 MMBtu/hr	TBD TBD	N/A TO-2	31000205	☐ Existing (unchanged) ☑ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
FL-1	Temporary Flare	Zeeco	UFAA-24-38	TBD	3577 MMSCF/yr	471.99 MMSCF/yr	TBD TBD	FL-1 FL-1	31000216	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☑ To be Replaced	N/A	
FL-1	Acid Gas Flare	Zeeco	UFA-24-40	TBD	10.6 MMSCFD	10.6 MMSCFD	TBD TBD	FL-1 FL-1	30600904	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☑ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	FL-1
S-LOAD	Slop Truck Loading	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	40400250	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	
FUG-1	Fugitive Emissions	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31000220	☑ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	

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.
SSM	Start-Up, Shutdown, and Maintenance	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced	N/A	
M	Malfunction	N/A	N/A	N/A	N/A	N/A	N/A N/A	N/A N/A	31088811	☐ Existing (unchanged) ☑ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced	N/A	

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

[2] Specify dates required to determine regulatory applicability.

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

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

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

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

Unit Number	Source Description	Manufacturer	Model No. / Serial No.	Max Capacity / Capacity Units	List Specific 20.2.72.202 NMAC Exemption (e.g. 20.2.72.202.B.5) / Insignificant Activity citation (e.g. IA List Item #1.a)	Date of Manufacture /Reconstruction[2] / Date of Installation /Construction[2]	For Each Piece of Equipment, Check Onc
HAUL	Slop Truck Hauling Emissions	N/A	N/A N/A	N/A N/A	20.2.72.202.B.(5) NMAC N/A	N/A N/A	☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☑ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced
							☐ Existing (unchanged) ☐ To be Removed ☐ New/Additional ☐ Replacement Unit ☐ To Be Modified ☐ To be Replaced

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

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

Table 2-C: Emissions Control Equipment

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

Control Equipment Unit No.	Control Equipment Description	Date Installed	Controlled Pollutant(s)	Controlling Emissions for Unit Number(s)[1]	Efficiency (% Control by Weight)	Method used to Estimate Efficiency
FL-1	Acid Gas Flare	TBD	VOC, H_2S, HAPs	AMINE-1, AMINE-2, DEHY-1, DEHY-2	98%	Manufacturer Guarantee

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

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

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

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

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
AMINE-1	-	-	-	-	52.27	228.94	-	-	-	-	-	-	-	-	1.12	4.89	-	-
AMINE-2	-	-	-	-	52.27	228.94	-	-	-	-	-	-	-	-	1.12	4.89	-	-
HT-1	1.31	5.73	5.33	23.36	0.19	0.85	0.053	0.23	0.27	1.18	0.27	1.18	0.27	1.18	6.65E-06	2.91E-05	-	-
HT-2	1.31	5.73	5.33	23.36	0.19	0.85	0.053	0.23	0.27	1.18	0.27	1.18	0.27	1.18	6.65E-06	2.91E-05	-	-
DEHY-1	-	-	-	-	124.93	547.20	-	-	-	-	-	-	-	-	1.06E-04	4.63E-04	-	-
DEHY-2	-	-	-	-	124.93	547.20	-	-	-	-	-	-	-	-	1.06E-04	4.63E-04	-	-
REBOIL-1	0.074	0.32	0.062	0.27	4.04E-03	0.018	1.10E-03	4.83E-03	5.59E-03	0.024	5.59E-03	0.024	5.59E-03	0.024	1.39E-07	6.07E-07	-	-
REBOIL-2	0.074	0.32	0.062	0.27	4.04E-03	0.018	1.10E-03	4.83E-03	5.59E-03	0.024	5.59E-03	0.024	5.59E-03	0.024	1.39E-07	6.07E-07	-	-
T-SLOP	-	-	-	-	0.12	0.54	-	-	-	-	-	-	-	-	1.50E-07	6.55E-07	-	-
FL-1	0.084	0.37	0.38	1.67	6.76	29.62	0.18	0.79	-	-	-	-	-	-	9.12E-08	3.99E-07	-	-
S-LOAD	-	-	-	-	0.018	0.079	-	-	-	-	-	-	-	-	1.16E-08	5.06E-08	-	-
FUG-1	-	-	-	-	1.51	6.63	-	-	-	-	-	-	-	-	6.75E-05	2.96E-04	-	-
SSM	-	-	-	-	2,263.82	3.56	-	-	-	-	-	-	-	-	0.15	4.57E-04	-	-
Totals	**2.85**	**12.47**	**11.17**	**48.92**	**2,627.04**	**1,594.43**	**0.29**	**1.26**	**0.55**	**2.40**	**0.55**	**2.40**	**0.55**	**2.40**	**2.38**	**9.79**	**-**	**-**

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

Table 2-E: Requested Allowable Emissions

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

Unit No.	NOx		CO		VOC		SOx		PM[1]		PM10[1]		PM2.5[1]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
AMINE-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AMINE-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HT-1	1.31	5.73	5.33	23.36	0.19	0.85	0.053	0.23	0.27	1.18	0.27	1.18	0.27	1.18	6.65E-06	2.91E-05	-	-
HT-2	1.31	5.73	5.33	23.36	0.19	0.85	0.053	0.23	0.27	1.18	0.27	1.18	0.27	1.18	6.65E-06	2.91E-05	-	-
DEHY-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEHY-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
REBOIL-1	0.074	0.32	0.062	0.27	4.04E-03	0.018	1.10E-03	4.83E-03	5.59E-03	0.024	5.59E-03	0.024	5.59E-03	0.024	1.39E-07	6.07E-07	-	-
REBOIL-2	0.074	0.32	0.062	0.27	4.04E-03	0.018	1.10E-03	4.83E-03	5.59E-03	0.024	5.59E-03	0.024	5.59E-03	0.024	1.39E-07	6.07E-07	-	-
T-SLOP	-	-	-	-	0.12	0.54	-	-	-	-	-	-	-	-	1.50E-07	6.55E-07	-	-
FL-1	9.22	40.44	42.04	184.34	42.93	188.20	16.39	71.79	-	-	-	-	-	-	0.045	0.20	-	-
S-LOAD	-	-	-	-	0.018	0.079	-	-	-	-	-	-	-	-	1.16E-08	5.06E-08	-	-
FUG-1	-	-	-	-	1.51	6.63	-	-	-	-	-	-	-	-	6.75E-05	2.96E-04	-	-
SSM	-	-	-	-	2,263.82	3.56	-	-	-	-	-	-	-	-	0.091	2.32E-04	-	-
Totals	**11.99**	**52.54**	**52.83**	**231.59**	**2,308.81**	**200.75**	**16.50**	**72.27**	**0.55**	**2.40**	**0.55**	**2.40**	**0.55**	**2.40**	**0.14**	**0.20**	**-**	**-**

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

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

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

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

Unit No.	NOx		CO		VOC		SOx		PM[2]		PM10[2]		PM2.5[2]		H_2S		Lead	
	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr	lb/hr	ton/yr
SSM	-	-	-	-	2,263.82	3.56	-	-	-	-	-	-	-	-	0.09	2.3E-04	-	-
Totals	-	-	-	-	2263.82	3.56	-	-	-	-	-	-	-	-	0.09	2.32E-04	-	-

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

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

Table 2-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)			
Heater	HT-1	V	No	15.00	531	220	N/A	0	44.78	2.50
Heater	HT-2	V	No	15.00	531	220	N/A	0	44.78	2.50
Reboiler	REBOIL-1	V	No	13.00	600	5.15	N/A	0	9.45	0.83
Reboiler	REBOIL-2	V	No	13.00	600	5.15	N/A	0	9.45	0.83
Flare	FL-1	V	No	40.00	1832	751.37	N/A	0	65.62	2.00

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

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

Stack No.	Unit No.(s)	Total HAPs		Xylenes ☑ HAP or ☐ TAP		Benzene ☑ HAP or ☐ TAP		Toluene ☑ HAP or ☐ TAP		n-Hexane ☑ HAP or ☐ TAP		2,2,4 Trimethylpentane ☑ HAP or ☐ TAP		Ethylbenzene ☑ 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
AMINE-1	AMINE-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
AMINE-2	AMINE-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
HT-1	HT-1	0.13	0.55	-	-	7.42E-05	3.25E-04	1.20E-04	5.26E-04	0.064	0.28	-	-	-	-		
HT-2	HT-2	0.13	0.55	-	-	7.42E-05	3.25E-04	1.20E-04	5.26E-04	0.064	0.28	-	-	-	-		
DEHY-1	DEHY-1	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
DEHY-2	DEHY-2	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
REBOIL-1	REBOIL-1	2.61E-03	0.011	-	-	1.54E-06	6.76E-06	2.50E-06	1.10E-05	1.32E-03	5.80E-03	-	-	-	-		
REBOIL-2	REBOIL-2	2.61E-03	0.011	-	-	1.54E-06	6.76E-06	2.50E-06	1.10E-05	1.32E-03	5.80E-03	-	-	-	-		
T-SLOP	T-SLOP	0.053	0.23	2.16E-03	9.46E-03	0.026	0.11	0.021	0.092	2.66E-03	0.012	2.86E-07	1.25E-06	1.06E-03	4.63E-03		
FL-1	FL-1	3.23	14.14	0.15	0.68	1.18	5.18	0.99	4.35	0.85	3.44	0.090	0.33	0.053	0.23		
S-LOAD	S-LOAD	9.01E-03	0.039	2.93E-04	1.28E-03	3.50E-03	0.015	2.87E-03	0.013	3.64E-04	1.60E-03	3.99E-05	1.75E-04	1.43E-04	6.28E-04		
FUG-1	FUG-1	0.46	2.03	0.079	0.35	0.086	0.38	0.23	0.99	0.029	0.13	3.78E-03	0.017	0.039	0.17		
SSM	SSM	68.18	0.17	3.10	7.88E-03	12.45	0.032	13.22	0.034	34.35	0.087	3.64	9.25E-03	1.41	3.59E-03		
Totals:		**72.19**	**17.73**	**3.34**	**1.04**	**13.75**	**5.71**	**14.46**	**5.48**	**35.36**	**4.24**	**3.74**	**0.35**	**1.50**	**0.41**		

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 (BTU/scf)	Hourly Usage (Mscf/hr)	Annual Usage (MMscf/yf)	% Sulfur	% Ash
HT-1	Natural Gas	Pipeline quality natural gas	1154.47	31.20	273.32	10 ppm	N/A
HT-2	Natural Gas	Pipeline quality natural gas	1154.47	31.20	273.32	10 ppm	N/A
REBOIL-1	Natural Gas	Pipeline quality natural gas	1154.47	0.65	5.69	10 ppm	N/A
REBOIL-2	Natural Gas	Pipeline quality natural gas	1154.47	0.65	5.69	10 ppm	N/A
FL-1	Natural Gas	Pipeline quality natural gas	1154.47	1.07	9.33	10 ppm	N/A

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

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

Tank No.	SCC Code	Material Name	Composition	Liquid Density (lb/gal)	Vapor Molecular Weight (lb/lb*mol)	Average Storage Conditions		Max Storage Conditions	
						Temperature (°F)	True Vapor Pressure (psia)	Temperature (°F)	True Vapor Pressure (psia)
T-SLOP	40400311	Slop	Mixed hydrocarbons	2.316	25.32	62.99	9.98	75.80	10.56

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			
T-SLOP	44713	Slop	N/A	FX	500	79.49	4.72	2.49	White	White	Average	131,706	6.27

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

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

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

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

Material Processed				Material Produced			
Description	**Chemical Composition**	**Phase (Gas, Liquid, or Solid)**	**Quantity (specify units)**	**Description**	**Chemical Composition**	**Phase**	**Quantity (specify units)**
Natural Gas	Mixed Hydrocarbons	Gas	60.00 MMSCFD	Natural Gas	Mixed Hydrocarbons	Gas	52.13 MMSCFD
				Slop Oil	Mixed Hydrocarbons	Liquid	8.59 bbl/day

Table 2-N: CEM Equipment

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

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

Table 2-O: Parametric Emissions Measurement Equipment

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

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

Table 2-P: Greenhouse Gas Emissions

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

		CO_2 ton/yr	N_2O ton/yr	CH_4 ton/yr	SF_6 ton/yr	PFC/HFC ton/yr[2]								**Total GHG** Mass Basis ton/yr[4]	**Total CO_2e** ton/yr[5]
Unit No.	**GWPs [1]**	**1**	**265**	**28**	**22,800**	**footnote 3**									
AMINE-1	**mass GHG**	-	-	-	-	-								-	
	CO_2e	-	-	-	-	-									-
AMINE-2	**mass GHG**	-	-	-	-	-								-	
	CO_2e	-	-	-	-	-									-
HT-1	**mass GHG**	18,455.20	0.035	0.35	-	-								18,455.58	
	CO_2e	18,455.20	9.22	9.74	-	-									18,474.16
HT-2	**mass GHG**	18,455.20	0.035	0.35	-	-								18,455.58	
	CO_2e	18,455.20	9.22	9.74	-	-									18,474.16
DEHY-1	**mass GHG**	-	-	-	-	-								-	
	CO_2e	-	-	-	-	-									-
DEHY-2	**mass GHG**	-	-	-	-	-								-	
	CO_2e	-	-	-	-	-									-
REBOIL-1	**mass GHG**	384.27	7.24E-04	7.24E-03	-	-								384.28	
	CO_2e	384.27	0.19	0.20	-	-									384.66
REBOIL-2	**mass GHG**	384.27	7.24E-04	7.24E-03	-	-								384.28	
	CO_2e	384.27	0.19	0.20	-	-									384.66
T-SLOP	**mass GHG**	3.44E-05	-	0.05	-	-								0.05	
	CO_2e	3.44E-05	-	1.34	-	-									1.34
FL-1	**mass GHG**	152,148.63	0.13	326.05	-	-								152,474.80	
	CO_2e	152,148.63	34.89	9,129.29	-	-									161,312.81
S-LOAD	**mass GHG**	2.66E-22	-	2.35E-18	-	-								2.35E-18	
	CO_2e	2.66E-22	-	6.58E-17	-	-									6.58E-17
FUG-1	**mass GHG**	4.58	-	9.15	-	-								13.73	
	CO_2e	4.58	-	256.11	-	-									260.69
SSM	**mass GHG**	-	-	-	-	-								-	
	CO_2e	-	-	-	-	-									-
	mass GHG														
	CO_2e														
	mass GHG														
	CO2e														
Total	**mass GHG**	**189,832.15**	**0.20**	**335.95**	**-**	**-**								**190,168.30**	
	CO_2e	**189,832.15**	**53.71**	**9,406.63**	**-**	**-**									**199,292.49**

[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.

Application Summary

MarkWest Energy West Texas Gas Company, L.L.C. (MarkWest) is submitting an initial NSR application pursuant to 20.2.72.200.A.(1) NMAC for the Dagger Lake Treating Facility (Dagger Lake TF), located 22.4 miles west of Eunice, New Mexico in Lea County. The Dagger Lake TF is an existing facility currently operating under GCP-O&G Permit No. 10187M1R1. With this application, MarkWest requests the following:

The following units will be removed from the facility:

- Two (2) Zeeco 150 MMBtu/hr thermal oxidizers (Unit IDs: TO-1 & TO-2)
- Malfunction emissions (Unit ID: M)

The following units will be replaced at the facility:

- One (1) Zeeco temporary flare (Unit IDs: FL-1) with one (1) Zeeco acid gas flare (Unit ID: FL-1)

The following units will be modified at the facility:

- Start-up, shutdown, and maintenance emissions (Unit ID: SSM)

The following units will remain unchanged at the facility:

- Two (2) 30 MMSCFD amine treating units (Unit IDs: AMINE-1 & AMINE-2);
- Two (2) 30 MMSCFD TEG dehydrator units (Unit IDs: DEHY-1 & DEHY-2);
- One (1) 500 bbl slop storage tank (Unit ID: T-SLOP);
- Slop truck loading emissions (Unit ID: S-LOAD);
- Fugitive emissions (Unit ID: FUG-1);
- Two (2) 36 MMBtu/hr amine hot oil heaters (Unit IDs: HT-1 & HT-2); and
- Two (2) 0.75 MMBtu/hr dehydrator reboilers (Unit IDs: REBOIL-1 & REBOIL-2)

The proposed modifications to the facility will result in facility-wide emissions surpassing the 95 tpy threshold for GCP-O&G permits. As a result, an initial NSR permit will be required.

Process Summary

High pressure sour gas enters the facility on two trains, each with 30 MMscfd of gas. Each train sends the sour gas through an inlet separator, though no liquids drop out due to the high pressure. The sour gas is then sweetened using amine treating units. Each amine unit incorporates three distinct sources of air emissions: (1) a natural gas fired hot oil heater, (2) an amine regenerator still vent, and (3) an amine flash tank. Emissions generated in the hot oil heaters exhaust to the atmosphere through distinct stacks dedicated to the flow of combustion byproducts.

The sweetened gas is then sent to the TEG dehydrator units. Each dehydration unit incorporates three distinct sources of air emissions: (1) a natural gas-fired reboiler, (2) a TEG recovery still vent, and (3) a glycol flash tank. Emissions generated in the reboilers exhaust to the atmosphere through distinct stacks dedicated to the flow of combustion byproducts. Emissions from the glycol recovery still vent consists of water vapor and various volatile organic compounds (VOCs), including several hazardous air pollutants (HAPs). The vent stream from the glycol recovery still vent is controlled by a BTEX condenser.

Emissions from each amine regenerator still vent and flash tank, as well as each dehydrator BTEX condenser overheads and flash tank are routed to the acid gas flare with a 100% capture efficiency and a 98% DRE. Liquids from the BTEX condenser are sent to an atmospheric mixed hydrocarbon (slop) storage tank where the flash, working, and breathing emissions are vented to the atmosphere. Slop is loaded offsite via uncontrolled trucking and hauled away for treatment.

The dehydrated sweet gas is discharged from the station via pipelines to be processed further down the pipeline.

Startup, Shutdown, and Maintenance (SSM)

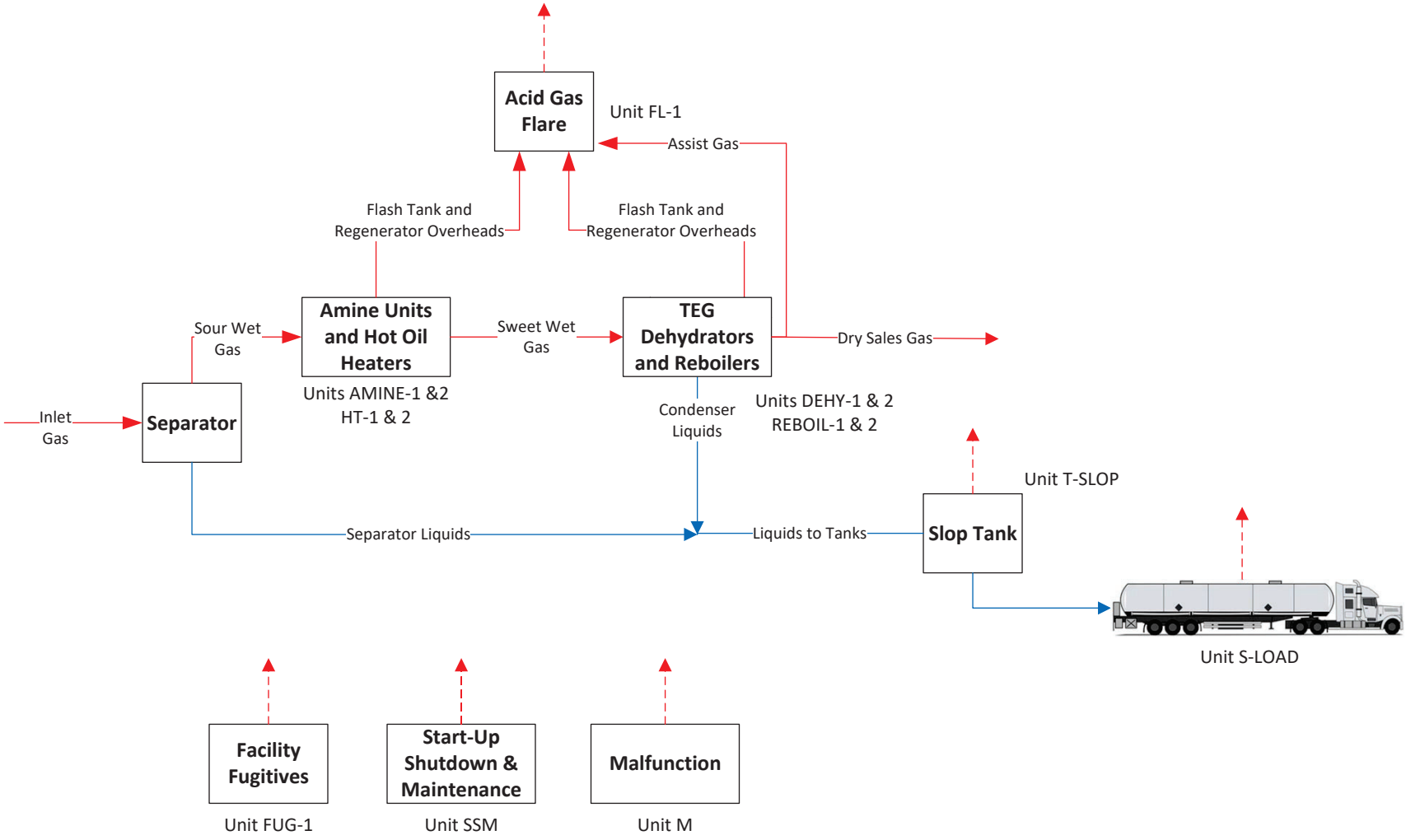
SSM activities at this facility include filter coalescer blowdowns and pipeline blowdowns and result from maintenance activities per manufacturer recommendations or other preventative measures. During facility or train shutdown, emissions will be routed to FL-1 in two different alternate operating scenarios (AOS). The two AOS are described further in Section 15.

Section 4

Process Flow Sheet

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

A process flow diagram is attached to this application.



MARKWEST

MarkWest Energy West Texas Gas Company, L.L.C.

Legend:

- Emissions
- Gas
- Liquid

PROCESS FLOW DIAGRAM

Dagger Lake Treating Facility

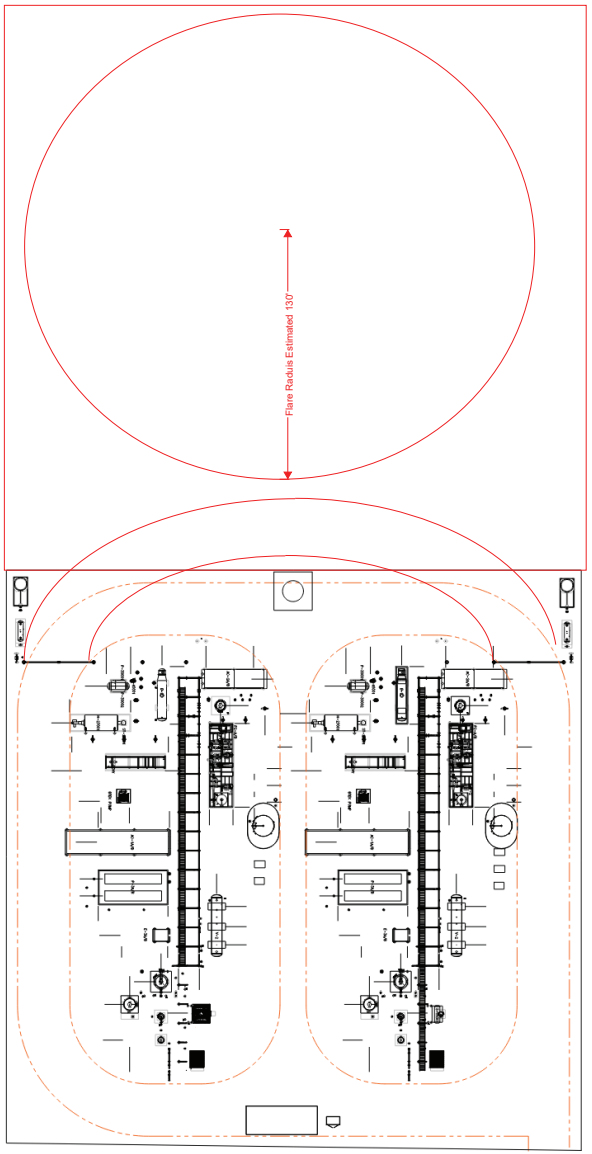
June 2025

Section 5

Plot Plan Drawn To Scale

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

A plot plan is attached to this application.



REFERENCE SHEET #	REFERENCE SHEET # CONTINUED	REV	STATUS	MOC	DESCRIPTION	DATE	BY	CHK	ENG	MGR
-	-	A	IFR	-	ISSUED FOR REVIEW	2/23/24	DEM	CJB	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-	-

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MPLX

ASSET:	DAGGER LAKE
LOCATION:	CARLSBAD, NM
	GENERAL
	PLOT PLAN
SCALE: NONE	DGLK-PLP-0001
REVISION	A

Section 6
All Calculations

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

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

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

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

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

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

Significant Figures:
A. All emissions standards are deemed to have at least two significant figures, but not more than three significant figures.
B. At least 5 significant figures shall be retained in all intermediate calculations.
C. In calculating emissions to determine compliance with an emission standard, the following rounding off procedures shall be used:

(1) If the first digit to be discarded is less than the number 5, the last digit retained shall not be changed;
(2) If the first digit discarded is greater than the number 5, or if it is the number 5 followed by at least one digit other than the number zero, the last figure retained shall be increased by one unit; **and**
(3) If the first digit discarded is exactly the number 5, followed only by zeros, the last digit retained shall be rounded upward if it is an odd number, but no adjustment shall be made if it is an even number.
(4) The final result of the calculation shall be expressed in the units of the standard.

Control Devices: In accordance with 20.2.72.203.A(3) and (8) NMAC, 20.2.70.300.D(5)(b) and (e) NMAC, and 20.2.73.200.B(7) NMAC, the permittee shall report all control devices and list each pollutant controlled by the control device regardless if the applicant takes credit for the reduction in emissions. The applicant can indicate in this section of the

application if they chose to not take credit for the reduction in emission rates. For notices of intent submitted under 20.2.73 NMAC, only uncontrolled emission rates can be considered to determine applicability unless the state or federal Acts require the control. This information is necessary to determine if federally enforceable conditions are necessary for the control device, and/or if the control device produces its own regulated pollutants or increases emission rates of other pollutants.

Amine Treating Units (Unit IDs: AMINE-1 and AMINE-2)
VOC, HAP, and H_2S emissions are calculated using BR&E ProMax. The flash gas and regenerator acid gas emissions are routed to the acid gas flare (Unit ID: FL-1) with a 100% capture efficiency and a 98% destruction efficiency. Controlled emissions are represented at the flare.

Hot Oil Heaters (Unit IDs: HT-1 and HT-2)
NO_x was calculated using the NMED ozone precursor rule limits of 30 ppmvd NO_x @ 3% O_2. CO emissions were calculated using the manufacturer specification sheet. VOC, PM, and HAP emissions were calculated using AP-42 Section 1.4 emission factors for external natural gas combustion sources in Tables 1.4-1, 1.4-2, and 1.4-3. As a conservative measure, it was assumed that PM(Total) = PM_{10} = $PM_{2.5}$. SO_2 was calculated using an assumed fuel sulfur content of 10 ppm (0.59 gr S/100 scf) and a 100% conversion of elemental sulfur into SO_2. H_2S was calculated using a fuel H_2S content of 0.047 ppm and assuming 95% H_2S is combusted and 100% of the combusted H_2S is converted to SO_2. Greenhouse gas emissions were estimated using emission factors from 40 CFR Part 98 Tables C-1 and C-2.

TEG Dehydrators (Unit IDs: DEHY-1 and DEHY-2)
VOC, HAP, and H_2S emissions are calculated using BR&E ProMax. The flash gas and BTEX condenser overheads are routed to FL-1, with a 100% capture efficiency and a 98% destruction efficiency. Controlled emissions are represented at the flare.

Dehydrator Reboilers (Unit IDs: REBOIL-1 and REBOIL-2)
NO_x, CO, VOC, PM, and HAP emissions were calculated using AP-42 Section 1.4 emission factors for external natural gas combustion sources in Tables 1.4-1, 1.4-2, and 1.4-3. As a conservative measure, it was assumed that PM(Total) = PM_{10} = $PM_{2.5}$. SO_2 was calculated using an assumed fuel sulfur content of 10 ppm (0.59 gr S/100 scf) and a 100% conversion of elemental sulfur into SO_2. H_2S was calculated using a fuel H_2S content of 0.047 ppm and assuming 95% H_2S is combusted and 100% of the combusted H_2S is converted to SO_2. Greenhouse gas emissions were estimated using emission factors from 40 CFR Part 98 Tables C-1 and C-2.

Slop Storage Tank (Unit ID: T-SLOP)
The slop storage tank contains liquid knockouts from the BTEX condensers of DEHY-1 and DEHY-2. VOC, H_2S, and HAP emissions are calculated using BR&E ProMax. Flash, working, and breathing emissions are uncontrolled and vent to the atmosphere.

Loading (Unit ID: S-LOAD)
VOC, H_2S, and HAP emissions are calculated using BR&E ProMax, with a 25% safety factor applied. Loading emissions are uncontrolled and all emissions are vented to the atmosphere.

Acid Gas Flare (Unit ID: FL-1)
The acid gas flare controls flash tank gas and regenerator acid gas streams from AMINE-1 and AMINE-2 as well as the flash tank and BTEX condenser overheads streams from DEHY-1 and DEHY-2. Fuel Gas is used as assist gas to increase the heating value of the process streams to 305 Btu/scf, as specified by the manufacturer. VOC and HAP emissions are calculated using BR&E ProMax for the streams routed to flare, and with a 98% DRE determined by manufacturer specifications. H_2S emissions are calculated using ProMax and 100% conversion to SO_2. SO_2 was calculated using a fuel sulfur content of 10 ppm (0.59 gr S/100 scf) and 100% conversion from elemental sulfur to SO_2. NO_x and CO emissions were calculated using AP-42 Section 13.5 emission factors for industrial flares in Table 13.5-1. Greenhouse gas emissions were estimated using the methodology outlined in 40 CFR §98.233(n).

During SSM events affecting either a single train or both trains simultaneously, the associated blowdown volumes are routed to the flare for control. When one train is offline and the other remains in full operation, the blowdown gas from the offline train is used in lieu of assist gas to maintain flare combustion efficiency.

Fugitives (Unit ID: FUG-1)
Facility-wide fugitive emissions were calculated using emission factors from Table 2-4 of the EPA Protocol for Equipment Leak Emission Estimates (November 1995, EPA 452/R-95-017). Component counts were based on a similar facility design.

The VOC, HAPs, and H_2S weight percentages for gas service were conservatively obtained from the inlet gas analysis. For light oil service, the weight percentages were derived from the Liquid to Slop Tank stream from BR&E ProMax.

Haul Road Emissions (Unit HAUL) (Exempt pursuant to 20.2.72.202.B.(5) NMAC)

Unpaved haul road emissions were estimated based on Equation 1a of AP-42 Section 13.2.2-4 and Equation 2 of AP-42 Section 13.2.2.3 (November 2006). Particle size multipliers and constants for these equations are found in AP-42 Table 13.2.2-2. Silt content and annual wet days are referenced from the New Mexico default allowed by NMED without additional justification. These emissions are exempt under 20.2.72.202.B.(5) NMAC and emission calculations are included in this application as a reference.

Startup, Shutdown, and Maintenance (Unit SSM)

Startup, shutdown, and maintenance events consist of Filter Coalescer Blowdowns, Vented Train Blowdowns, and Pipeline Blowdowns. Emissions for VOC, HAP, and H_2S were calculated using ProMax and mass balance.

The volume of gas per blowdown per train for Vented Train Blowdown events were calculated based on exact volumes and rounded up to add a safety factor. Each event lasts 4 hours with 1 event per train per year.

Filter Coalescer Blowdowns events represent a monthly change of the facility's two (2) 24" x 8'2" coalescer filters for a total of 24 events per year lasting 1 hour per event. The volume of gas per blowdown per filter is representative of the filter size.

The volume of gas vented for pipeline blowdowns was calculated using the dimensions of the pipe (diameter and length) and converting the actual volume to standard cubic feet. There is 1 event per year lasting 4 hours.

Section 6.a

Green House Gas Emissions

(Submitting under 20.2.70, 20.2.72 20.2.74 NMAC)

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

Calculating GHG Emissions:

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

Sources for Calculating GHG Emissions:

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

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

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

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

Section 7

Information Used To Determine Emissions

Information Used to Determine Emissions shall include the following:

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

Amine Treating Units (Unit IDs: AMINE-1 and AMINE-2):

- Inlet gas analysis (dated June 6, 2023)
- BR&E ProMax report

Amine Hot Oil Heaters (Unit IDs: HT-1 and HT-2):

- Manufacturer specification sheet
- AP-42 Section 1.4 (July 1998) - Tables 1.4-1 & 1.4-2
- 40 CFR 98 Subpart A Table A-1
- 40 CFR 98 Subpart C Tables C-1 & C-2

TEG Dehydrators (Unit IDs: DEHY-1 and DEHY-2):

- Inlet gas analysis (dated June 6, 2023)
- BR&E ProMax report

Dehydrator Reboilers (Unit IDs: REBOIL-1 and REBOIL-2):

- AP-42 Section 1.4 (July 1998) - Tables 1.4-1 & 1.4-2
- 40 CFR 98 Subpart A Table A-1
- 40 CFR 98 Subpart C Tables C-1 & C-2

Slop Storage Tank (Unit ID: T-SLOP):

- Inlet gas analysis (dated June 6, 2023)
- BR&E ProMax report

Slop Truck Loading (Unit ID: S-LOAD):

- Inlet gas analysis (dated June 6, 2023)
- BR&E ProMax report

Flare (Unit ID: FL-1):

- Manufacturer specification sheet
- BR&E ProMax report
- AP-42 Section 13.5 (February 2018) - Tables 13.5-1 & 13.5-2

Fugitive Emissions (Unit ID: FUG-1):

- Inlet gas analysis
- Derived condensate composition from BR&E ProMax
- EPA Protocol for Equipment Leak Emission Estimates Table 2-4

Unpaved Haul Roads (Unit ID: HAUL) (exempt under 20.2.72.202.B.(5) NMAC):

- AP-42 Chapter 13.2.2

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Emissions Summary

Uncontrolled Emissions																	
		NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		H_2S		Total HAP	
Unit No.	Description/Source	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
AMINE-1	Amine Treating Unit	-	-	-	-	52.27	228.94	-	-	-	-	-	-	1.12	4.89	15.86	69.45
AMINE-2	Amine Treating Unit	-	-	-	-	52.27	228.94	-	-	-	-	-	-	1.12	4.89	15.86	69.45
HT-1	Amine Hot Oil Heater	1.31	5.73	5.33	23.36	0.19	0.85	0.053	0.23	0.27	1.18	0.27	1.18	6.65E-06	2.91E-05	0.13	0.55
HT-2	Amine Hot Oil Heater	1.31	5.73	5.33	23.36	0.19	0.85	0.053	0.23	0.27	1.18	0.27	1.18	6.65E-06	2.91E-05	0.13	0.55
DEHY-1	TEG Dehydrator	-	-	-	-	124.93	547.20	-	-	-	-	-	-	1.06E-04	4.63E-04	27.56	120.71
DEHY-2	TEG Dehydrator	-	-	-	-	124.93	547.20	-	-	-	-	-	-	1.06E-04	4.63E-04	27.56	120.71
REBOIL-1	Dehydrator Reboiler	0.074	0.32	0.062	0.27	4.04E-03	0.018	1.10E-03	4.83E-03	5.59E-03	0.024	5.59E-03	0.024	1.39E-07	6.07E-07	2.61E-03	0.011
REBOIL-2	Dehydrator Reboiler	0.074	0.32	0.062	0.27	4.04E-03	0.018	1.10E-03	4.83E-03	5.59E-03	0.024	5.59E-03	0.024	1.39E-07	6.07E-07	2.61E-03	0.011
T-SLOP	Slop Storage Tank	-	-	-	-	0.12	0.54	-	-	-	-	-	-	1.50E-07	6.55E-07	0.053	0.23
FL-1	Acid Gas Flare	0.084	0.37	0.38	1.67	6.76	29.62	0.18	0.79	-	-	-	-	9.12E-08	3.99E-07	0.014	0.059
S-LOAD	Slop Truck Loading	-	-	-	-	0.018	0.079	-	-	-	-	-	-	1.16E-08	5.06E-08	9.01E-03	0.039
FUG-1	Fugitive Emissions	-	-	-	-	1.51	6.63	-	-	-	-	-	-	6.75E-05	2.96E-04	0.46	2.03
SSM	Start-Up, Shutdown, and Maintenance	-	-	-	-	2,263.82	3.56	-	-	-	-	-	-	0.15	4.57E-04	110.06	0.34
Total		**2.85**	**12.47**	**11.17**	**48.92**	**2,627.04**	**1,594.43**	**0.29**	**1.26**	**0.55**	**2.40**	**0.55**	**2.40**	**2.38**	**9.79**	**197.69**	**384.14**

Controlled Emissions																	
		NOx		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		H_2S		Total HAP	
Unit No.	Description/Source	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
AMINE-1	Amine Treating Unit [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AMINE-2	Amine Treating Unit [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HT-1	Amine Hot Oil Heater	1.31	5.73	5.33	23.36	0.19	0.85	0.053	0.23	0.27	1.18	0.27	1.18	6.65E-06	2.91E-05	0.13	0.55
HT-2	Amine Hot Oil Heater	1.31	5.73	5.33	23.36	0.19	0.85	0.053	0.23	0.27	1.18	0.27	1.18	6.65E-06	2.91E-05	0.13	0.55
DEHY-1	TEG Dehydrator [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEHY-2	TEG Dehydrator [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
REBOIL-1	Dehydrator Reboiler	0.074	0.32	0.062	0.27	4.04E-03	0.018	1.10E-03	4.83E-03	5.59E-03	0.024	5.59E-03	0.024	1.39E-07	6.07E-07	2.61E-03	0.011
REBOIL-2	Dehydrator Reboiler	0.074	0.32	0.062	0.27	4.04E-03	0.018	1.10E-03	4.83E-03	5.59E-03	0.024	5.59E-03	0.024	1.39E-07	6.07E-07	2.61E-03	0.011
T-SLOP	Slop Storage Tank	-	-	-	-	0.12	0.54	-	-	-	-	-	-	1.50E-07	6.55E-07	0.053	0.23
FL-1	Acid Gas Flare [2]	9.22	40.44	42.04	184.34	42.93	188.20	16.39	71.79	-	-	-	-	0.045	0.20	3.23	14.14
S-LOAD	Slop Truck Loading	-	-	-	-	0.018	0.079	-	-	-	-	-	-	1.16E-08	5.06E-08	9.01E-03	0.039
FUG-1	Fugitive Emissions	-	-	-	-	1.51	6.63	-	-	-	-	-	-	6.75E-05	2.96E-04	0.46	2.03
SSM	Start-Up, Shutdown, and Maintenance	-	-	-	-	2,263.82	3.56	-	-	-	-	-	-	0.091	2.32E-04	68.18	0.17
Total		**11.99**	**52.54**	**52.83**	**231.59**	**2,308.81**	**200.75**	**16.50**	**72.27**	**0.55**	**2.40**	**0.55**	**2.40**	**0.14**	**0.20**	**72.19**	**17.73**
Total (without fugitives)		**11.99**	**52.54**	**52.83**	**231.59**	**2,307.29**	**194.12**	**16.50**	**72.27**	**0.55**	**2.40**	**0.55**	**2.40**	**0.14**	**0.20**	**71.72**	**15.71**

"-" Indicates emissions of this pollutant are not expected

[1] Emissions are sent to FL-1 with a 100% capture efficiency and a 98% destruction efficiency.

[2] lb/hr emissions represent the maximum emissions from flaring scenarios. Ton/yr emissions represent the sum of all flaring scenarios.

Controlled HAPs																GHGs			
		Formaldehyde		Xylene		Benzene		Toluene		n-Hexane		2,2,4 Trimethylpentane		Methanol		Ethylbenzene		CO_2	N_2O	CH_4	CO_2e
Unit No.	Description/Source	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	tpy	tpy	tpy	tpy
AMINE-1	Amine Treating Unit [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
AMINE-2	Amine Treating Unit [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
HT-1	Amine Hot Oil Heater	2.65E-03	0.012	-	-	7.42E-05	3.25E-04	1.20E-04	5.26E-04	0.064	0.28	-	-	-	-	-	-	18,455.20	0.035	0.35	18,474.16
HT-2	Amine Hot Oil Heater	2.65E-03	0.012	-	-	7.42E-05	3.25E-04	1.20E-04	5.26E-04	0.064	0.28	-	-	-	-	-	-	18,455.20	0.035	0.35	18,474.16
DEHY-1	TEG Dehydrator [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
DEHY-2	TEG Dehydrator [1]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
REBOIL-1	Dehydrator Reboiler	5.51E-05	2.42E-04	-	-	1.54E-06	6.76E-06	2.50E-06	1.10E-05	1.32E-03	5.80E-03	-	-	-	-	-	-	384.27	7.24E-04	7.24E-03	384.66
REBOIL-2	Dehydrator Reboiler	5.51E-05	2.42E-04	-	-	1.54E-06	6.76E-06	2.50E-06	1.10E-05	1.32E-03	5.80E-03	-	-	-	-	-	-	384.27	7.24E-04	7.24E-03	384.66
T-SLOP	Slop Storage Tank	-	-	2.16E-03	9.46E-03	0.026	0.11	0.021	0.092	2.66E-03	0.012	2.86E-07	1.25E-06	-	-	1.06E-03	4.63E-03	3.44E-05	-	0.048	1.34
FL-1	Acid Gas Flare	-	-	0.15	0.68	1.18	5.18	0.99	4.35	0.85	3.44	0.090	0.33	4.70E-06	2.06E-05	0.053	0.23	152,148.63	0.13	326.05	161,312.81
S-LOAD	Slop Truck Loading	-	-	2.93E-04	1.28E-03	3.50E-03	0.015	2.87E-03	0.013	3.64E-04	1.60E-03	3.99E-05	1.75E-04	-	-	1.43E-04	6.28E-04	2.66E-22	-	2.35E-18	6.58E-17
FUG-1	Fugitive Emissions	-	-	0.079	0.35	0.086	0.38	0.23	0.99	0.029	0.13	3.78E-03	0.017	-	-	0.039	0.17	4.58	-	9.15	260.69
SSM	Start-Up, Shutdown, and Maintenance	-	-	3.10	7.88E-03	12.45	0.032	13.22	0.034	34.35	0.087	3.64	9.25E-03	-	-	1.41	3.59E-03	-	-	-	-
Total		**5.41E-03**	**0.024**	**3.34**	**1.04**	**13.75**	**5.71**	**14.46**	**5.48**	**35.36**	**4.24**	**3.74**	**0.35**	**4.70E-06**	**2.06E-05**	**1.50**	**0.41**	**189,832.15**	**0.20**	**335.95**	**199,292.49**
Total (without fugitives)		**5.41E-03**	**0.024**	**3.26**	**0.70**	**13.67**	**5.34**	**14.24**	**4.49**	**35.33**	**4.11**	**3.73**	**0.34**	**4.70E-06**	**2.06E-05**	**1.47**	**0.24**	**189,827.57**	**0.20**	**326.80**	**199,031.79**

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Emission Calculation Inputs

Site-Wide		
Description	**Value**	**Unit**
Gas Throughput	60	MMscf/day
Slop Throughput	8.59	bbl/day
Annual Operating Hours	8,760	hr
Site Elevation	3,645	ft MSL
Site Location	32.420074°, -103.576389°	
Pipeline Quality Sales Gas Sulfur Content	10	ppm
	0.59	gr S/100 scf
Sales Gas H_2S Content	0.048	ppm
Sales Gas Heat Value	1,154.5	Btu/scf

Slop Storage Tank			
	Value	**Unit**	**Notes**
Number of Tanks	1		Facility Design
Volume	500	bbl	Facility Design
Height	16	ft	Typical Design
Diameter	15.5	ft	Typical Design
Facility Throughput	9	bbl/day	
Controlled by:	None		
Capture Efficiency:	0%		

Acid Gas Flare			
Parameter	**Value**	**Unit**	**Notes**
Controlled Units:	Amine Regenerator Overheads, Dehy BTEX Condenser Non-condensables		
Destruction Rate Efficiency:	98%		Engineering Estimate
Safety Factor	0	%	

Amine 1			
Parameter	**Value**	**Unit**	**Notes**
Sweet Gas Flow Rate	26.21	MMSCFD	Facility Design
Capture Efficiency	100%	%	
Safety Factor	0	%	
Amine 2			
Parameter	**Value**	**Unit**	**Notes**
Sweet Gas Flow Rate	26.21	MMSCFD	Facility Design
Capture Efficiency	100%	%	
Safety Factor	0	%	

Dehydrator 1			
Parameter	**Value**	**Unit**	**Notes**
Dry Gas Flow Rate	26.08	MMSCFD	Facility Design
Pump Circulation	7.50	gpm	Facility Design
Capture Efficiency	100%	%	
Safety Factor	0	%	
Dehydrator 2			
Parameter	**Value**	**Unit**	**Notes**
Dry Gas Flow Rate	26.08	MMSCFD	Facility Design
Pump Circulation	20.00	gpm	Facility Design
Capture Efficiency	100%	%	
Safety Factor	0	%	

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Amine Treating Unit 1

Unit: AMINE-1
Description: Amine Treating Unit
Control Equipment: Acid Gas Flare (FL-1)
Hours of Operation: 8,760
Sweet Gas Flow Rate: 26 MMSCFD

Uncontrolled Emissions per Amine Unit[1]

Unit	VOC		H_2S		Methane		Total HAP		n-Hexane		Benzene		Toluene		Ethylbenzene		Xylenes		2,2,4- Trimethylpentane	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Flash Tank	30.58	133.96	0.021	0.091	125.90	551.46	3.25	14.23	0.17	0.75	2.60	11.38	2.02	8.83	0.15	0.66	0.32	1.41	8.07E-03	0.035
Regenerator Overheads	21.69	94.98	1.10	4.80	5.86	25.68	12.61	55.22	4.30E-03	0.019	10.84	47.47	7.70	33.74	0.47	2.04	1.30	5.70	1.22E-04	5.34E-04
Total	**52.27**	**228.94**	**1.12**	**4.89**	**131.77**	**577.14**	**15.86**	**69.45**	**0.17**	**0.77**	**13.43**	**58.84**	**9.72**	**42.57**	**0.62**	**2.70**	**1.62**	**7.10**	**8.19E-03**	**0.036**

Controlled Emissions per Amine Unit[2]

Unit	VOC		H_2S		Methane		Total HAP		n-Hexane		Benzene		Toluene		Ethylbenzene		Xylenes		Xylenes	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Flash Tank	Emissions from AMINE-1 sent to FL-1. Emissions are sent to the flare with a 100% capture efficiency and a 98% DRE.																			
Regenerator Overheads	Emissions from AMINE-1 sent to FL-1. Emissions are sent to the flare with a 100% capture efficiency and a 98% DRE.																			

Notes

[1] Emissions are calculated using BR&E ProMax.

[2] Flash tank emissions and regenerator overheads are routed to FL-1 for combustion with a 100% capture efficiency and a 98% DRE. Emissions for these unit are represented there.

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Amine Treating Unit 2

Unit: AMINE-2
Description: Amine Treating Unit
Control Equipment: Acid Gas Flare (FL-1)
Hours of Operation: 8,760
Sweet Gas Flow Rate: 26 MMSCFD

Uncontrolled Emissions per Amine Unit[1]

Unit	VOC		H_2S		Methane		Total HAP		n-Hexane		Benzene		Toluene		Ethylbenzene		Xylenes		2,2,4- Trimethylpentane	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Flash Tank	30.58	133.96	0.021	0.091	125.90	551.46	3.25	14.23	0.17	0.75	2.60	11.38	2.02	8.83	0.15	0.66	0.32	1.41	8.07E-03	0.035
Regenerator Overheads	21.69	94.98	1.10	4.80	5.86	25.68	12.61	55.22	4.30E-03	0.019	10.84	47.47	7.70	33.74	0.47	2.04	1.30	5.70	1.22E-04	5.34E-04
Total	**52.27**	**228.94**	**1.12**	**4.89**	**131.77**	**577.14**	**15.86**	**69.45**	**0.17**	**0.77**	**13.43**	**58.84**	**9.72**	**42.57**	**0.62**	**2.70**	**1.62**	**7.10**	**8.19E-03**	**0.036**

Controlled Emissions per Amine Unit[2]

Unit	VOC		H_2S		Methane		Total HAP		n-Hexane		Benzene		Toluene		Ethylbenzene		Xylenes		2,2,4- Trimethylpentane	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Flash Tank	Emissions from AMINE-2 sent to FL-1. Emissions are sent to the flare with a 100% capture efficiency and a 98% DRE.																			
Regenerator Overheads	Emissions from AMINE-2 sent to FL-1. Emissions are sent to the flare with a 100% capture efficiency and a 98% DRE.																			

Notes

[1] Emissions are calculated using BR&E ProMax.

[2] Flash tank emissions and regenerator overheads are routed to FL-1 for combustion with a 100% capture efficiency and a 98% DRE. Emissions for these unit are represented there.

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Amine Hot Oil Heater

Unit: HT-1 & 2

Description: Amine Hot Oil Heaters

Heater Fuel Usage

Fuel Consumption	36	MMBtu/hr	Input heat rate	
Fuel heat value	1,154.47	Btu/scf	Sales Gas	
Hourly fuel usage	31.20	Mscf/hr	Fuel usage	Fuel Usage (MMBtu/hr) * (10^6 Btu/MMBtu) / Fuel LHV (Btu/scf) * (Mscf/1000 scf)
Daily fuel usage	748.81	Mscf/d	Throughput	
Annual fuel usage	273.32	MMscf/yr	Annual usage	
Operating hours	8760	hr/yr		

NO_x	CO	VOC	SO_2[1]	H_2S[1]	PM	Units	Notes
41.93	-	-	-	-	-	lb/MMscf[2]	NMED Ozone precursor rule limts (30 ppmvd NO_x @ 3% O_2)
-	170.91	-	-	-	-	lb/MMscf[2]	Mfg. spec sheet (200 ppm)
-	-	5.5	-	-	7.6	lb/MMscf	Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)
-	-	6.2	-	-	8.6	lb/MMscf	Adjusted emission factor: EF X (Heat Value/1,020 Btu/scf)
			1			g SO_2/100 scf	Fuel sulfur content (2 gr/100scf)
				0.003		g H_2S/100 scf	Fuel H_2S Content (0.047 ppm H_2S) / ((15.967 ppm H_2S / (gr H_2S/100 scf))
1.31	**5.33**	**0.19**	**0.05**	**6.65E-06**	**0.27**	**lb/hr**	lb/MMscf * (Mscf/hr / 1000 Mscf/1 MMscf)
5.73	**23.36**	**0.85**	**0.23**	**2.91E-05**	**1.18**	**tpy**	lb/hr * 8760 hrs/yr / 2000 lb/ton

n-Hexane	Benzene	Toluene	e-Benzene	m-Xylene	HCHO	Total HAPs[3]	Units	Notes
1.80	2.10E-03	3.40E-03	-	-	0.075		lb/MMscf	Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)
2.04	2.38E-03	3.85E-03	-	-	0.085		lb/MMscf	Adjusted emission factor: EF X (Heat Value/1,020 Btu/scf)
0.064	**7.42E-05**	**1.20E-04**	**-**	**-**	**2.65E-03**	**0.13**	**lb/hr**	Heater emissions
0.28	**3.25E-04**	**5.26E-04**	**-**	**-**	**0.012**	**0.55**	**tpy**	

Notes

[1] SO_2 emissions based on fuel sulfur content of 1 gr/100 scf

lb SO_2/hr = Sulfur Content (gr S/100 scf) / (7000 gr/lb) * (1000 scf/Mscf) * fuel consumption (Mscf/hr) * (64 lb SO_2/32 lb S) + H_2S Content (gr H_2S/ 100 scf) * (7000 gr/lb) * (1000 scf/Mscf) * fuel consumption (Mscf/hr) * (64 lb SO_2/34 lb H_2S)

H_2S emissions based on fuel H_2S content of 0.048 ppm and assuming 95% H_2S is combusted, and 100% of the combusted is converted to SO_2.

lb H_2S/hr = Fuel H_2S content (g H_2S/100 scf) / (7000 gr/lb) * (1000 scf/Mscf) * fuel consumption (Mscf/hr) * (1-95%)

[2] EF (lb/MMscf) = EF (lb/MMBtu) * Fuel Heat Value (Btu/scf). NO_x and CO ppm emission factors were converted to lb/MMbtu using the following website:
https://www.faberburner.com/resource-center/conversion-charts/emissions-conversions-calculator/

[3] HAP emission factors are from U.S. EPA, AP-42, Section 1.4, Natural Gas Combustion, Table 1.4-3 and 1.4-4, July 1998.

CO_2[4]	N_2O[4]	CH_4[4]	CO_2e[4]	Units	Notes
53.06	0.0001	0.001		kg/MMBtu	40 CFR 98 Subpart C Tables C-1 and C-2
1	265	28		GWP	40 CFR 98 Table A-1
18455.20	*0.035*	*0.348*		tpy	Reboiler
18455.2	**9.22**	**9.74**	**18474.2**	tpy CO_2e	

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

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

Proposed HAP Emissions for the Dehydrator Reboiler [1]

Constituent	Emission Factor [2,3,4] (lb/MMBtu)	Reboil-1 Emissions (lb/hr)	Reboil-1 Emissions (tpy)
Pb	4.33E-07	1.56E-05	6.83E-05
Benzene	1.82E-06	6.55E-05	2.87E-04
Formaldehyde	6.50E-05	2.34E-03	1.02E-02
Hexane	1.56E-03	5.62E-02	2.46E-01
Naphthalene	5.28E-07	1.90E-05	8.34E-05
Toluene	2.95E-06	1.06E-04	4.65E-04
Cobalt	7.28E-08	2.62E-06	1.15E-05
Chromium	1.21E-06	4.37E-05	1.91E-04
Manganese	3.29E-07	1.19E-05	5.19E-05
Nickel	1.82E-06	6.55E-05	2.87E-04
Selenium	2.08E-08	7.49E-07	3.28E-06
POM [4]	7.64E-08	2.75E-06	1.21E-05
Arsenic	1.73E-07	6.24E-06	2.73E-05
Beryllium	1.04E-08	3.74E-07	1.64E-06
Cadmium	9.53E-07	3.43E-05	1.50E-04
Mercury	2.25E-07	8.11E-06	3.55E-05
Total		**0.059**	**0.26**

Notes

[1] Emission factors were calculated using Reference 11 in footnote a of U.S. EPA, AP-42, Section 1.4, Table 1.4-1. The fuel gas higher heating value of 1154.47 Btu/scf is used to convert from emission factors from lb/MMscf to lb/MMBtu.

[2] HAP emission factors are from U.S. EPA, AP-42, Section 1.4, Natural Gas Combustion, Table 1.4-3 and 1.4-4, July 1998. Pb emission factors are from U.S. EPA, AP-42, Section 1.4, Natural

[3] Heating duty for fuel gas (btu/scf) = 1154.47

[4] Per U.S. EPA, AP-42, Section 1.4, Table 1.4-3, constituents categorized as Polycyclic Organic Matter (POM) are HAPs. The emission factor used in this spreadsheet represents the combined emission factors for the constituents listed in Table 1.4-3 identified as POMs.

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

TEG Dehydrator 1

Unit: Dehy-1
Description: TEG Dehydrator
Control Equipment: Acid Gas Flare (FL-1)
Dry Gas Flow Rate per Unit: 26 MMSCFD
Pump Circulation: 7.5 gpm
Hours of Operation: 8,760

Uncontrolled Emissions per Dehy Unit[1]

Unit	VOC		H_2S		Methane		Total HAP		n-Hexane		Benzene		Toluene		Ethylbenzene		Xylenes		2,2,4- Trimethylpentane	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Flash Tank	89.27	391.01	8.12E-05	3.56E-04	131.49	575.93	7.65	33.50	2.27	9.95	2.58	11.29	2.11	9.23	0.16	0.70	0.31	1.36	0.22	0.97
Condenser Overheads	35.66	156.19	2.44E-05	1.07E-04	15.00	65.70	19.91	87.21	0.82	3.61	8.77	38.40	8.63	37.81	0.53	2.31	1.06	4.64	0.10	0.44
Total	**124.93**	**547.20**	**1.06E-04**	**4.63E-04**	**146.49**	**641.63**	**27.56**	**120.71**	**3.10**	**13.56**	**11.35**	**49.69**	**10.74**	**47.04**	**0.69**	**3.01**	**1.37**	**5.99**	**0.32**	**1.41**

Controlled Emissions per Dehy Unit[2]

Unit	VOC		H_2S		Methane		Total HAP		n-Hexane		Benzene		Toluene		Ethylbenzene		Xylenes		2,2,4- Trimethylpentane	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Flash Tank	Emissions from DEHY-1 are sent to FL-1. Emissions are sent to the flare with a 100% capture efficiency and a 0% DRE.																			
Condenser Overheads	Emissions from DEHY-1 are sent to FL-1. Emissions are sent to the flare with a 100% capture efficiency and a 0% DRE.																			

Notes

[1] Emissions are calculated using BR&E ProMax.
[2] Flash tank emissions and condenser overheads are routed to FL-1 for combustion with a 100% capture efficiency and a 98% DRE. Emissions for these units are represented there.

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

TEG Dehydrator 2

Unit: Dehy-2
Description: TEG Dehydrator
Control Equipment: Acid Gas Flare (FL-1)
Dry Gas Flow Rate per Unit: 26 MMSCFD
Pump Circulation: 7.5 gpm
Hours of Operation: 8,760

Uncontrolled Emissions per Dehy Unit[1]

Unit	VOC		H_2S		Methane		Total HAP		n-Hexane		Benzene		Toluene		Ethylbenzene		Xylenes		2,2,4- Trimethylpentane	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Flash Tank	89.27	391.01	8.12E-05	3.56E-04	131.49	575.93	7.65	33.50	2.27	9.95	2.58	11.29	2.11	9.23	0.16	0.70	0.31	1.36	0.22	0.97
Condenser Overheads	35.66	156.19	2.44E-05	1.07E-04	15.00	65.70	19.91	87.21	0.82	3.61	8.77	38.40	8.63	37.81	0.53	2.31	1.06	4.64	0.10	0.44
Total	**124.93**	**547.20**	**1.06E-04**	**4.63E-04**	**146.49**	**641.63**	**27.56**	**120.71**	**3.10**	**13.56**	**11.35**	**49.69**	**10.74**	**47.04**	**0.69**	**3.01**	**1.37**	**5.99**	**0.32**	**1.41**

Controlled Emissions per Dehy Unit[2]

Unit	VOC		H_2S		Methane		Total HAP		n-Hexane		Benzene		Toluene		Ethylbenzene		Xylenes		2,2,4- Trimethylpentane	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Flash Tank	Emissions from DEHY-2 are sent to FL-1. Emissions are sent to the flare with a 100% capture efficiency and a 0% DRE.																			
Condenser Overheads	Emissions from DEHY-2 are sent to FL-1. Emissions are sent to the flare with a 100% capture efficiency and a 0% DRE.																			

Notes

[1] Emissions are calculated using BR&E ProMax.
[2] Flash tank emissions and condenser overheads are routed to FL-1 for combustion with a 100% capture efficiency and a 98% DRE. Emissions for these units are represented there.

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Dehydrator Reboiler

Unit: Reboil-1 & 2
Description: Dehydrator Reboiler

Reboiler Fuel Usage

Fuel Consumption	0.75	MMBtu/hr	Input heat rate	
Fuel heat value	1,154.47	Btu/scf	Sales Gas	
Hourly fuel usage	0.65	Mscf/hr	Fuel usage	Fuel Usage (MMBtu/hr) * (10^6 Btu/MMBtu) / Fuel LHV (Btu/scf) * (Mscf/1000 scf)
Daily fuel usage	15.59	Mscf/d	Throughput	
Annual fuel usage	5.69	MMscf/yr	Annual usage	
Operating hours	8760	hr/yr		

NO_x	CO	VOC	SO_2[1]	H_2S[1]	PM	Units	Notes
100	84	5.5	-	-	7.6	lb/MMscf	Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)
113.2	95.1	6.2	-	-	8.6	lb/MMscf	Adjusted emission factor: EF X (Heat Value/1,020 Btu/scf)
			1			g SO_2/100 scf	Fuel sulfur content (2 gr/100scf)
				0.003		g H_2S/100 scf	Fuel H_2S Content (0.047 ppm H_2S) / ((15.967 ppm H_2S / (gr H_2S/100 scf))
0.074	**0.062**	**4.04E-03**	**1.10E-03**	**1.39E-07**	**5.59E-03**	**lb/hr**	lb/MMscf * (Mscf/hr / 1000 Mscf/1 MMscf)
0.32	**0.27**	**0.018**	**0.005**	**6.07E-07**	**0.024**	**tpy**	lb/hr * 8760 hrs/yr / 2000 lb/ton

n-Hexane	Benzene	Toluene	e-Benzene	m-Xylene	HCHO	Total HAPs[2]	Units	Notes
1.80	2.10E-03	3.40E-03	-	-	0.075		lb/MMscf	Unit emission rates from AP-42 Table 1.4-1 & 2 (Assuming average NG heating value of 1,020 Btu/scf)
2.04	2.38E-03	3.85E-03	-	-	0.085		lb/MMscf	Adjusted emission factor: EF X (Heat Value/1,020 Btu/scf)
1.32E-03	**1.54E-06**	**2.50E-06**	**-**	**-**	**5.51E-05**	**2.61E-03**	**lb/hr**	Reboiler Emissions
5.80E-03	**6.76E-06**	**1.10E-05**	**-**	**-**	**2.42E-04**	**0.011**	**tpy**	

[1] SO_2 emissions based on fuel sulfur content of 1 gr/100 scf
lb SO_2/hr = Sulfur Content (gr S/100 scf) / (7000 gr/lb) * (1000 scf/Mscf) * fuel consumption (Mscf/hr) * (64 lb SO_2/32 lb S) + H_2S Content (gr H_2S/ 100 scf) * (7000 gr/lb) * (1000 scf/Mscf) * fuel consumption (Mscf/hr) * (64 lb SO_2/34 lb H_2S)
H_2S emissions based on fuel H_2S content of 0.048 ppm and assuming 95% H_2S is combusted, and 100% of the combusted is converted to SO_2.
lb H_2S/hr = Fuel H_2S content (g H_2S/100 scf) / (7000 gr/lb) * (1000 scf/Mscf) * fuel consumption (Mscf/hr) * (1-95%)

[2] HAP emission factors are from U.S. EPA, AP-42, Section 1.4, Natural Gas Combustion, Table 1.4-3 and 1.4-4, July 1998.

CO_2[3]	N_2O[3]	CH_4[3]	CO_2e[3]	Units	
53.06	0.0001	0.001		kg/MMBtu	40 CFR 98 Subpart C Tables C-1 and C-2
1	265	28		GWP	40 CFR 98 Table A-1
384.27	*0.001*	*0.007*		tpy	Reboiler
384.3	**0.19**	**0.20**	**384.7**	tpy CO_2e	

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

Proposed HAP Emissions for the Dehydrator Reboiler [1]

Constituent	Emission Factor [2,3,4] (lb/MMBtu)	Reboil-1 Emissions (lb/hr)	Reboil-1 Emissions (tpy)
Pb	4.33E-07	3.25E-07	1.42E-06
Benzene	1.82E-06	1.36E-06	5.98E-06
Formaldehyde	6.50E-05	4.87E-05	2.13E-04
Hexane	1.56E-03	1.17E-03	5.12E-03
Naphthalene	5.28E-07	3.96E-07	1.74E-06
Toluene	2.95E-06	2.21E-06	9.67E-06
Cobalt	7.28E-08	5.46E-08	2.39E-07
Chromium	1.21E-06	9.10E-07	3.98E-06
Manganese	3.29E-07	2.47E-07	1.08E-06
Nickel	1.82E-06	1.36E-06	5.98E-06
Selenium	2.08E-08	1.56E-08	6.83E-08
POM [4]	7.64E-08	5.73E-08	2.51E-07
Arsenic	1.73E-07	1.30E-07	5.69E-07
Beryllium	1.04E-08	7.80E-09	3.41E-08
Cadmium	9.53E-07	7.15E-07	3.13E-06
Mercury	2.25E-07	1.69E-07	7.40E-07
Total		**1.23E-03**	**5.37E-03**

[1] Emission factors were calculated using Reference 11 in footnote a of U.S. EPA, AP-42, Section 1.4, Table 1.4-1. The fuel gas higher heating value of 1154.47103523913 Btu/scf is HAP emission factors are from U.S. EPA, AP-42, Section 1.4, Natural Gas Combustion, Table 1.4-3 and 1.4-4, July 1998. Pb emission factors are from U.S. EPA, AP-42, Section 1.4,
[2] Natural Gas Combustion, Table 1.4-2, July 1998.
[3] Heating duty for fuel gas (btu/scf) 1154.471035
Per U.S. EPA, AP-42, Section 1.4, Table 1.4-3, constituents categorized as Polycyclic Organic Matter (POM) are HAPs. The emission factor used in this spreadsheet represents the
[4] combined emission factors for the constituents listed in Table 1.4-3 identified as POMs.

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Slop Storage Tank

Unit: T-SLOP
Material: Slop

General Tank Information

Number of Tanks	1		
Volume	500	bbl	
Volume	21,000	gal	
Diameter	15.5	ft	
Height	16	ft	
Vapor Space	2.49	m	
Hours of Operation	8,760	hr/yr	
Facility Throughput	8.59	average bbl/day	
Facility Throughput	3,136	bbl/yr	
Tank Throughput	131,706	gal/yr	
Turnovers	6.3	turnovers/yr	Turnovers = Tank throughput/Volume
Control Type	None		
Capture Efficiency	0%	Engineering Estimate	

Uncontrolled Emissions [1]

VOCs	Unit	Note
0.54	tpy	Working and Breathing Emissions
0.00E+00	tpy	Flash Emissions
0.54	**tpy**	**Total uncontrolled emissions**
0.54	**tpy**	**Total uncontrolled emissions per tank**

Hydrogen Sulfide	Unit	Note
6.55E-07	tpy	Working and Breathing Emissions
0.00E+00	tpy	Flash Emissions
6.55E-07	**tpy**	**Total uncontrolled emissions**
6.55E-07	**tpy**	**Total uncontrolled emissions per tank**

HAPs	Flash Emissions tpy		Working and Breathing Emissions tpy	
n-Hexane	0.00E+00		0.012	
Benzene	0.00E+00		0.11	
Toluene	0.00E+00		0.092	
Ethylbenzene	0.00E+00		4.63E-03	
Xylene	0.00E+00		9.462E-03	
2,2,4-Trimethylpentane	0.00E+00		1.25E-06	
Total HAPs	**0.00E+00**	**tpy**	**0.23**	**tpy**
Total HAPs per Tank	**0.00E+00**	**tpy**	**0.23**	**tpy**

Controlled Emissions [1,2]

VOCs	Unit	Note
0.54	tpy	Working and Breathing Emissions
0.00E+00	tpy	Flash Emissions
0.54	**tpy**	**Total uncontrolled emissions**
0.54	**tpy**	**Total uncontrolled emissions per tank**

Hydrogen Sulfide	Unit	Note
6.55E-07	tpy	Working and Breathing Emissions
0.00E+00	tpy	Flash Emissions
6.55E-07	**tpy**	**Total uncontrolled emissions**
6.55E-07	**tpy**	**Total uncontrolled emissions per tank**

HAPs	Flash Emissions tpy		Working and Breathing Emissions tpy	
n-Hexane	0.00E+00		0.012	
Benzene	0.00E+00		0.11	
Toluene	0.00E+00		0.092	
Ethylbenzene	0.00E+00		4.63E-03	
Xylene	0.00E+00		9.462E-03	
2,2,4-Trimethylpentane	0.00E+00		1.25E-06	
Total HAPs	**0.00E+00**	**tpy**	**0.23**	**tpy**
Total HAPs per Tank	**0.00E+00**	**tpy**	**0.23**	**tpy**

Notes

[1]Emissions calculated using BR&E ProMax.

[2]Slop tank emissions are uncontrolled are vented to the atmosphere.

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Flare Emissions Summary

Controlled Emissions [1]																
		NO_x		CO		VOC		SO_2		PM_{10}		$PM_{2.5}$		H_2S		Total HAP	
Unit No.	Description/Source	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FL-1	Pilot Only	0.084	0.37	0.38	1.67	6.76	29.62	0.18	0.79	-	-	-	-	9.12E-08	3.99E-07	0.014	0.059
FL-1	Acid Gas Flare Nominal Operations	9.14	40.03	41.66	182.48	36.17	158.41	16.21	71.00	-	-	-	-	0.045	0.20	3.21	14.07
FL-1 (AOS-1)	Acid Gas Flare - AOS: Concurrant Train 1 Blowdown and Train 2 Normal	6.10	0.024	27.82	0.11	24.34	0.097	2.16	8.66E-03	-	-	-	-	0.023	9.38E-05	1.99	7.95E-03
FL-2 (AOS-2)	Acid Gas Flare - AOS: Full Facility Blowdown	8.69	0.017	39.60	0.079	34.46	0.069	0.21	4.14E-04	-	-	-	-	2.25E-03	4.49E-06	1.68	3.35E-03
	Total	**9.22**	**40.44**	**42.04**	**184.34**	**42.93**	**188.20**	**16.39**	**71.79**	**-**	**-**	**-**	**-**	**0.045**	**0.20**	**3.23**	**14.14**

Controlled HAP Emissions [1]															
		n-Hexane		Benzene		Toluene		Ethylbenzene		Xylenes		2,2,4 Trimethylpentane		Methanol	
Unit No.	Description/Source	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
FL-1	Pilot Only	7.69E-03	0.034	2.27E-03	9.95E-03	2.27E-03	9.93E-03	-	-	4.88E-04	2.14E-03	7.83E-04	3.43E-03	-	-
FL-1	Acid Gas Flare Nominal Operations	0.78	3.40	1.18	5.16	0.99	4.33	0.053	0.23	0.15	0.67	0.074	0.32	4.70E-06	2.06E-05
FL-1 (AOS-1)	Acid Gas Flare - AOS: Concurrant Train 1 Blowdown and Train 2 Normal	0.55	2.19E-03	0.66	2.66E-03	0.58	2.32E-03	0.044	1.75E-04	0.098	3.93E-04	0.055	2.19E-04	2.35E-06	9.41E-09
FL-2 (AOS-2)	Acid Gas Flare - AOS: Full Facility Blowdown	0.84	1.69E-03	0.31	6.12E-04	0.32	6.50E-04	0.035	6.94E-05	0.076	1.52E-04	0.089	1.79E-04	-	-
	Total	**0.85**	**3.44**	**1.18**	**5.18**	**0.99**	**4.35**	**0.053**	**0.23**	**0.15**	**0.68**	**0.090**	**0.33**	**4.70E-06**	**2.06E-05**

GHG Emissions [1]					
		CO_2	N_2O	CH_4	CO_2e
Unit No.	Description/Source	tpy	tpy	tpy	tpy
FL-1	Pilot Only	0.030	1.19E-03	2.96	83.18
FL-1	Acid Gas Flare Nominal Operations	152,141.63	0.13	322.34	161,201.69
FL-1 (AOS-1)	Acid Gas Flare - AOS: Concurrant Train 1 Blowdown and Train 2 Normal	3.48	2.38E-04	0.61	20.55
FL-2 (AOS-2)	Acid Gas Flare - AOS: Full Facility Blowdown	3.48	5.63E-05	0.14	7.39
	Total	**152,148.63**	**0.13**	**326.05**	**161,312.81**

[1] lb/hr emissions are taking the maximum emissions for hourly as AOS-1, AOS-2, and Normal Operations cannot occur at the same time. Ton/yr emissions are taking the sum of all scenarios.

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Acid Gas Flare

Flare Information	
Unit(s):	FL-1
Description:	Acid Gas Flare
Unit Count:	1
Capture Efficiency:	100%
DRE (%)	98%
Hours of Operation:	8760

Heat Input and Flow Rate Calculation - Process Gas			
Parameters	Value	Unit	Notes:
Process Gas Flow Rate	8.86	MMSCFD	ProMax: AMINE-1 & 2 Flash Tanks and Regenerator Overheads; DEHY-1 & 2 Flash Tanks and Condenser Overheads
Process Gas Heating Value	140.23	Btu/scf	ProMax: AMINE-1 & 2 Flash Tanks and Regenerator Overheads; DEHY-1 & 2 Flash Tanks and Condenser Overheads
Total Annual Heating Rate	453,359.66	MMBtu/yr	Flow Rate (MMscf/day) * Heating Value (Btu/scf) / (24 hr/day) * (8760 hr/yr)
Short-Term Safety Factor	0%	%	Applied to account for short-term variations in heat content.
Annual Safety Factor	0%	%	Applied to account for variations in heat content.
Hourly Flow Rate with Safety Factor	0.37	MMscf/hr	Max Flow Rate (MMscf/hr) * (1 + Safety Factor)
Annual Flow Rate with Safety Factor	3,232.86	MMscf/yr	Flow Rate (MMscf/yr) * (1 + Safety Factor)
Short-Term Heating Rate	51.75	MMBtu/hr	With short-term safety factor applied.
Annual Heating Rate	453,359.66	MMBtu/yr	With annual safety factor applied.
Process VOC	711.46	lb/hr	ProMax: Combined Vent P Streams- Amine and Dehy Overheads
Process H_2S	2.23	lb/hr	ProMax: Combined Vent P Streams- Amine and Dehy Overheads
Process HAP	114.95	lb/hr	ProMax: Combined Vent P Streams- Amine and Dehy Overheads
Heat Input and Flow Rate Calculation - Assist Gas			
Hourly Volume Flow Rate	1.72	MMSCFD	
Sales Gas Heat Value	1154.47	Btu/scf	Facility Sales Gas
Annual Volume Flow Rate	627.05	MMscf/yr	Flow Rate (MMSCFD) / (24 hr/day) * (8760 hr/yr)
Hourly Heat Rate	82.64	MMBtu/hr	Flow Rate (MMSCFD) * Heat Value (Btu/scf) / (24 hr/day)
Annual Heat Rate	723,913.76	MMBtu/yr	Flow Rate (MMscf/yr) * Heat Value (Btu/scf)
Process VOC	1096.92	lb/hr	ProMax: Combined Vent P Streams- Assist Gas
Process H_2S	3.09E-04	lb/hr	ProMax: Combined Vent P Streams- Assist Gas
Process HAP	45.69	lb/hr	ProMax: Combined Vent P Streams- Assist Gas
Process and Assist Gas Heating Value	305.00	Btu/scf	Weighted Average
Pilot and Purge Input Information			
Hourly Volume Flow Rate	1065.00	scf/hr	Mfg. Spec Sheet
Sales Gas Heat Value	1154.47	Btu/scf	Facility Sales Gas
Pilot Operation	8760	hr/yr	Design Specification
Annual Volume Flow Rate	9.33	MMscf/yr	Flow Rate (scf/hr) * (8760 hr/yr) / (10^6 scf/MMscf)
Hourly Heat Rate	1.23	MMBtu/hr	Flow Rate (scf/hr) * Heat Value (Btu/scf) / (10^6 Btu/MMBtu)
Annual Heat Rate	10770.52	MMBtu/yr	Flow Rate (MMscf/yr) * Heat Value (Btu/scf)

Emission Summary

	NO_x[1]	CO[1]	VOC[2]	SO_2[3,4]	H_2S[2]	HAPs[2]	Unit	Notes
Emission Factors	0.068	0.31	5.5	-	-	-	lb/MMBtu	AP-42 Ch 13.5.1 Table 13.5-1 & Table 13.5-2
	-	-	-	1	-	-	gr S/100 scf	Fuel sulfur content
	-	-	-	0.08	-	-	lb S/ Mscf	lb S / Mscf = (gr S/100 scf) / (7000 gr/lb) * (1000 scf/Mscf)
	-	-	-	-	4.56E-06	0.68	lb/hr	
Pilot Emissions	0.084	0.38	6.76	0.18	9.12E-08	0.01	lb/hr	
	0.37	1.67	29.62	0.79	3.99E-07	0.06	tpy	tpy = lb/hr * (8760 hr/yr) / (2000 lb/ton)
Process Emissions	3.52	16.04	14.23	4.12	0.045	2.30	lb/hr	
	15.41	70.27	62.32	18.05	0.20	10.07	tpy	tpy = lb/hr * (8760 hr/yr) / (2000 lb/ton)
Assist Gas Emissions	5.62	25.62	21.94	12.09	6.17E-06	0.91	lb/hr	
	24.61	112.21	96.09	52.95	2.70E-05	4.00	tpy	tpy = lb/hr * (8760 hr/yr) / (2000 lb/ton)
Total Emissions	**9.22**	**42.04**	**42.93**	**16.39**	**0.045**	**3.23**	lb/hr	Hourly Pilot + Process Gas + Assist Gas
	40.39	**184.15**	**188.03**	**71.78**	**0.20**	**14.13**	tpy	Annual Pilot + Process Gas + Assist Gas

[1] Flare NO_x and CO emission factors: AP-42 Chapter 13.5.
[2] VOC and HAP emissions estimated based on event streams routed to FL-1 and 98% DRE efficiency. H_2S emissions estimated based on event streams routed to FL-1 and 100% conversion to SO_2.
[3] SO_2: Mass balance assuming 98% combustion of H_2S and 100% conversion of combusted H_2S to SO_2:
Pilot Gas and Assist Gas SO_2 Emissions (lb/hr) = (Flow Rate (Mscf/hr) * Sulfur Content (lb S/Mscf) * (64 lb/lbmol SO_2 / 32 lb/lbmol S)) + (H_2S emissions (lb/hr) * DRE (%) * (64 lb/lbmol SO2 / 32 lb/lbmol S))
Process SO_2 Emissions (lb/hr) = H_2S Emissions (lb/hr) * DRE (%) * (64 lb/lbmol SO_2 / 34 lb/lbmol H_2S)
[4] Fuel sulfur content is assumed to be 2 gr/100 scf.

	Speciated HAP Emissions	
	lb/hr	tpy
Xylene	0.15	0.67
Benzene	1.18	5.16
Toluene	0.99	4.33
n-Hexane	0.78	3.40
2,2,4-Trimethylpentane	0.07	0.32
MeOH	4.70E-06	2.06E-05
Ethylbenzene	0.05	0.23
Total HAPs	3.23	14.13

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Flare GHG Emissions

§98.233(n) Flare stack GHG emissions.

Step 1. If necessary, convert volume of gas sent to flare from actual to standard conditions using Equation W-33

$$E_{s,n} = \frac{E_{a,n} * (459.67 + T_s) * P_a}{(459.67 + T_a) * P_s * Z_a}$$ *(Equation W-33)*

where:

$E_{s,n}$ = Natural gas volumetric emissions at standard temperature and pressure (STP) conditions in cubic feet

$E_{a,n}$ = Natural gas volumetric emissions at actual conditions in cubic feet

T_s = Temperature at standard conditions (F) =	60	°F	
T_a = Temperature at actual conditions (F) =	75.8	°F	(Based on Annual Avg Max Tempurature for Roswell, NM from AP-42 Chapter 7)
P_s = Absolute pressure at standard conditions (psia) =	14.7	psia	
P_a = Absolute pressure at actual conditions (psia) =	12.88	psia	(Based on Avg Atmospheric Pressure for Roswell, NM from AP-42 Chapter 7)
Z_a = Compressibility factor at actual conditions for natural gas	1	(default value)	

Step 2. Calculate CO_2 and CH_4 Emissions from Flaring at standard conditions using Equations W-19 & W-20

$E_{s,CH4} = V_s * X_{CH4} * [(1 - \eta) * Z_L + Z_U]$ (Equation W-19)

$E_{s,CO2} = V_s * X_{CO2} * \Sigma (\eta * V_s * Y_j * R_j * Z_L)$ (Equation W-20)

where:

$E_{s,CH4}$ = Annual CH_4 emissions from flare stack in cubic feet, at standard conditions

$E_{s,CO2}$ = Annual CO_2 emissions from flare stack in cubic feet, at standard conditions

V_s = Volume of gas sent to flare in standard cubic feet

η = Flare combustion efficiency, expressed as fraction of gas combusted by a burning flare 0.98 (default value)

X_{CH4} = Mole fraction of CH_4 in the feed gas to the flare

Pilot Gas	Process and Assist Gas
0.7491	0.197

X_{CO2} = Mole fraction of CO_2 in the feed gas to the flare

Pilot Gas	Process and Assist Gas
0.00002	0.680

Z_U = Fraction of the feed gas sent to an un-lit flare determined by engineering estimate and process knowledge based on best available data and operating records

Z_L = Fraction of the feed gas sent to a burning flare (equal to 1 – Z_U) 1 (assumes all gas is sent to burning flare)

Y_j = Mole fraction of hydrocarbon constituents j in the feed gas to the flare

	Pilot Gas	Process and Assist Gas
Constituent j, Methane =	0.7491	0.1973
Constituent j, Ethane =	0.1074	0.0286
Constituent j, Propane =	0.0591	0.0154
Constituent j, Butane =	0.0267	0.0069
Constituent j, Pentanes Plus =	0.0198	0.0058

R_j = Number of carbon atoms in the hydrocarbon constituent j in the feed gas to the flare

Constituent j, Methane =	1
Constituent j, Ethane =	2
Constituent j, Propane =	3
Constituent j, Butane =	4
Constituent j, Pentanes Plus =	5

Step 3. Calculate CO_2 and CH_4 mass emissions using Equation W-36 (98.233(v))

$Mass_i = E_{s,i} * \rho_i * 10^{-3}$ (Equation W-36)

where:

$Mass_i$ = GHG_i (either CH_4 or CO_2) mass emissions in metric tons

$E_{s,i}$ = GHG_i (either CH_4 or CO_2) volumetric emissions at standard conditions, in cubic feet.

ρ_i = Density of GHG_i

CO_2 =	0.0526	kg/ft^3
CH_4 =	0.0192	kg/ft^3

Step 4. Calculate N2O mass emissions using Equation W-40 (98.233(z))

$Mass_{N2O} = (1* 10^{-3}) * Fuel * HHV * EF$ *(Equation W-40)*

where:

$Mass_{N2O}$ = Annual N_2O emissions from the combustion of a particular type of fuel (metric tons)

Fuel = Annual mass or volume of the fuel combusted (mass or volume per year, choose appropriately to be consistent with the units of HHV).

HHV = high heat value of the fuel

Pilot Gas	Process and Assist Gas	
0.0012	0.00031	MMBtu/scf

EF = Use 1.0×10^{-4} kg N_2O/mmBtu.

$1 * 10^{-3}$ = Conversion factor from kilograms to metric tons.

Step 5. Calculate total annual emission from flare by summing Equations W-36 and W-40.

Gas Sent to Flare	Gas Sent to Flare (acf/yr)	Gas Sent to Flare (scf/yr)	Annual CO_2 Emissions (scf)	Annual CH_4 Emissions (scf)	Combusted CO_2 Mass Emissions (mtpy)	Uncombusted CH_4 Mass Emissions (mtpy)	N_2O Mass Emissions (mtpy)	Combusted CO_2 Mass Emissions (tpy)	Uncombusted CH_4 Mass Emissions (tpy)	N_2O Mass Emissions (tpy)	CO_2e Mass Emissions (tpy)
Pilot Gas	10,971,416.03	9,329,400.00	512.065	139,779.538	0.03	2.68	1.08E-03	0.03	2.96	1.19E-03	83.178
Process and Assist Gas	4,539,271,928.45	3,859,910,462	2,623,968,317.98	15,230,390.20	138,020.73	292.42	0.12	152,141.63	322.34	0.13	161,201.69
							Total	**152,141.66**	**325.30**	**0.13**	**161,284.87**

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Acid Gas Flare - AOS: Concurrant Train 1 Blowdown and Train 2 Normal Operations

Flare Information	
Unit(s):	FL-1
Description:	Acid Gas Flare
Unit Count:	1
Capture Efficiency:	100%
DRE (%)	98%
SSM Event Volume (scf/event):	250,000
Events Per Year	2
Event Duration (hr/event):	4
SSM Annual Duration (hr/yr):	8

Process Gas during SSM Event			
Parameters	Value	Unit	Notes:
Process Gas Flow Rate	0.18	MMscf/hr	Nominal Dehy and Amine Emissions (MMSCFD) / (24 hr/day) / 2 trains
Process Gas Heating Value	140.23	Btu/scf	Nominal Dehy and Amine Emissions (MMSCFD) / (24 hr/day) / 2 trains
Total Annual Heating Rate	207.01	MMBtu/yr	Nominal Flow Rate (MMscf/hr) * Heating Value (Btu/scf) * SSM Annual Duration (hr/yr)
Short-Term Safety Factor	0%	%	Applied to account for short-term variations in heat content.
Annual Safety Factor	0%	%	Applied to account for variations in heat content.
Hourly Flow Rate with Safety Factor	0.18	MMscf/hr	Max Flow Rate (MMscf/hr) * (1 + Safety Factor)
Annual Flow Rate with Safety Factor	1.48	MMscf/yr	Flow Rate (MMscf/yr) * (1 + Safety Factor)
Short-Term Heating Rate	25.88	MMBtu/hr	With short-term safety factor applied.
Annual Heating Rate	207.01	MMBtu/yr	With annual safety factor applied.
Process VOC	355.73	lb/hr	Nominal Dehy and Amine Emissions / 2 trains
Process H_2S	1.12	lb/hr	Nominal Dehy and Amine Emissions / 2 trains
Process HAP	57.47	lb/hr	Nominal Dehy and Amine Emissions / 2 trains
Heat Input and Flow Rate Calculation - SSM Inlet Flaring			
Parameters	Value	Unit	Notes:
SSM Gas Flow Rate	0.25	MMscf/event	SSM Train Blowdowns for one Train
Process Gas Heating Value	1,022.00	Btu/scf	SSM Train Blowdowns for one Train
Total Annual Heating Rate	511.00	MMBtu/yr	Flow Rate (MMscf/event) * Heating Value (Btu/scf) * SSM Annual Duration (event/yr)
Short-Term Safety Factor	0%	%	Applied to account for short-term variations in heat content.
Annual Safety Factor	0%	%	Applied to account for variations in heat content.
Hourly Flow Rate with Safety Factor	0.063	MMscf/hr	SSM Gas Flow Rate (MMscf/event) / Event Duration (hr/event) * (1 + Safety Factor)
Annual Flow Rate with Safety Factor	0.50	MMscf/yr	Flow Rate with Safety Factor (MMscf/hr) * Annual SSM Duration (hr/yr)
Short-Term Heating Rate	63.88	MMBtu/hr	With short-term safety factor applied.
Annual Heating Rate	511.00	MMBtu/yr	With annual safety factor applied.
Process VOC	861.44	lb/hr	SSM Train Blowdowns for One Train
Process H_2S	0.056	lb/hr	SSM Train Blowdowns for One Train
Process HAP	41.88	lb/hr	SSM Train Blowdowns for One Train
Process and SSM Heat Value	363.33	Btu/scf	Weighted Average

Emission Summary

	NO_X[1]	CO[1]	VOC[2]	SO_2[3,4]	H_2S[2]	HAPs[2]	Unit	Notes
Emission Factors	0.068	0.31	5.5	-	-	-	lb/MMBtu	AP-42 Ch 13.5.1 Table 13.5-1 & Table 13.5-2
	-	-	-	1	-	-	gr S/100 scf	Fuel sulfur content
	-	-	-	0.08	-	-	lb S/ Mscf	lb S / Mscf = (gr S/100 scf) / (7000 gr/lb) * (1000 scf/Mscf)
Process Emissions	1.76	8.02	7.11	2.06	0.022	1.15	lb/hr	
	7.04E-03	0.032	0.028	8.242E-03	8.94E-05	4.60E-03	tpy	tpy = lb/hr * (8 hr/yr) / (2000 lb/ton)
SSM Emissions	4.34	19.80	17.23	0.10	1.12E-03	0.84	lb/hr	
	0.017	0.079	0.069	4.14E-04	4.49E-06	3.35E-03	tpy	tpy = lb/hr * (8 hr/yr) / (2000 lb/ton)
Total AOS Emissions	**6.10**	**27.82**	**24.34**	**2.16**	**0.023**	**1.99**	lb/hr	Hourly Process Gas + SSM Flaring
	0.024	**0.11**	**0.10**	**8.66E-03**	**9.38E-05**	**7.95E-03**	tpy	Annual Process Gas + SSM Flaring

[1] Flare NO_X and CO emission factors: AP-42 Chapter 13.5.

[2] VOC and HAP emissions estimated based on event streams routed to FL-1 and 98% DRE efficiency. H_2S emissions estimated based on event streams routed to FL-1 and 100% conversion to SO_2.

[3] SO_2: Mass balance assuming 98% combustion of H_2S and 100% conversion of combusted H_2S to SO_2:

Pilot Gas and Assist Gas SO_2 Emissions (lb/hr) = (Flow Rate (Mscf/hr) * Sulfur Content (lb S/Mscf) * (64 lb/lbmol SO_2 / 32 lb/lbmol S)) + (H_2S emissions (lb/hr) * DRE (%) * (64 lb/lbmol SO2 / 32 lb/lbmol S))

Process SO_2 Emissions (lb/hr) = H_2S Emissions (lb/hr) * DRE (%) * (64 lb/lbmol SO_2 / 34 lb/lbmol H_2S)

[4] Fuel sulfur content is assumed to be 2 gr/100 scf.

	Speciated HAP Emissions	
	lb/hr	tpy
Xylene	0.10	3.93E-04
Benzene	0.66	2.66E-03
Toluene	0.58	2.32E-03
n-Hexane	0.55	2.19E-03
2,2,4-Trimethylpentane	0.055	2.19E-04
MeOH	2.35E-06	9.41E-09
Ethylbenzene	0.044	1.75E-04
Total HAPs	1.99	7.95E-03

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Flare GHG Emissions - AOS: Concurrant Train 1 Blowdown and Train 2 Normal Operations

§98.233(n) Flare stack GHG emissions.

Step 1. If necessary, convert volume of gas sent to flare from actual to standard conditions using Equation W-33

$$E_{s,n} = \frac{E_{a,n} * (459.67 + T_s) * P_a}{(459.67 + T_a) * P_s * Z_a}$$ *(Equation W-33)*

where:

$E_{s,n}$ = Natural gas volumetric emissions at standard temperature and pressure (STP) conditions in cubic feet

$E_{a,n}$ = Natural gas volumetric emissions at actual conditions in cubic feet

T_s = Temperature at standard conditions (F) =	60	°F	
T_a = Temperature at actual conditions (F) =	75.8	°F	(Based on Annual Avg Max Tempurature for Roswell, NM from AP-42 Chapter 7)
P_s = Absolute pressure at standard conditions (psia) =	14.7	psia	
P_a = Absolute pressure at actual conditions (psia) =	12.88	psia	(Based on Avg Atmospheric Pressure for Roswell, NM from AP-42 Chapter 7)
Z_a = Compressibility factor at actual conditions for natural gas	1	(default value)	

Step 2. Calculate CO_2 and CH_4 Emissions from Flaring at standard conditions using Equations W-19 & W-20

$E_{s,CH4} = V_s * X_{CH4} * [(1 - \eta) * Z_L + Z_U]$ (Equation W-19)

$E_{s,CO2} = V_s * X_{CO2} * \Sigma (\eta * V_s * Y_j * R_j * Z_L)$ (Equation W-20)

where:

$E_{s,CH4}$ = Annual CH_4 emissions from flare stack in cubic feet, at standard conditions

$E_{s,CO2}$ = Annual CO_2 emissions from flare stack in cubic feet, at standard conditions

V_s = Volume of gas sent to flare in standard cubic feet

η = Flare combustion efficiency, expressed as fraction of gas combusted by a burning flare 0.98 (default value)

X_{CH4} = Mole fraction of CH_4 in the feed gas to the flare

Process Gas	SSM Flaring
0.7491	0.658

X_{CO2} = Mole fraction of CO_2 in the feed gas to the flare

Process Gas	SSM Flaring
0.00002	0.120

Z_U = Fraction of the feed gas sent to an un-lit flare determined by engineering estimate and process knowledge based on best available data and operating records

Z_L = Fraction of the feed gas sent to a burning flare (equal to $1 - Z_U$) 1 (assumes all gas is sent to burning flare)

Y_j = Mole fraction of hydrocarbon constituents j in the feed gas to the flare

	Process Gas	SSM Flaring
Constituent j, Methane =	0.7491	0.6575
Constituent j, Ethane =	0.1074	0.0947
Constituent j, Propane =	0.0591	0.0523
Constituent j, Butane =	0.0267	0.0238
Constituent j, Pentanes Plus =	0.0198	0.0187

R_j = Number of carbon atoms in the hydrocarbon constituent j in the feed gas to the flare

Constituent j, Methane =	1
Constituent j, Ethane =	2
Constituent j, Propane =	3
Constituent j, Butane =	4
Constituent j, Pentanes Plus =	5

Step 3. Calculate CO_2 and CH_4 mass emissions using Equation W-36 (98.233(v))

$Mass_i = E_{s,i} * \rho_i * 10^{-3}$ (Equation W-36)

where:

$Mass_i$ = GHG_i (either CH_4 or CO_2) mass emissions in metric tons

$E_{s,i}$ = GHG_i (either CH_4 or CO_2) volumetric emissions at standard conditions, in cubic feet.

ρ_i = Density of GHG_i

CO_2 =	0.0526	kg/ft^3
CH_4 =	0.0192	kg/ft^3

Step 4. Calculate N2O mass emissions using Equation W-40 (98.233(z))

$Mass_{N2O} = (1* 10^{-3}) * Fuel * HHV * EF$ *(Equation W-40)*

where:

$Mass_{N2O}$ = Annual N_2O emissions from the combustion of a particular type of fuel (metric tons)

Fuel = Annual mass or volume of the fuel combusted (mass or volume per year, choose appropriately to be consistent with the units of HHV).

HHV = high heat value of the fuel

Process Gas	SSM Flaring	
0.0012	0.00091	MMBtu/scf

EF = Use 1.0×10^{-4} kg N_2O/mmBtu.

$1 * 10^{-3}$ = Conversion factor from kilograms to metric tons.

Step 5. Calculate total annual emission from flare by summing Equations W-36 and W-40.

Gas Sent to Flare	Gas Sent to Flare (acf/yr)	Gas Sent to Flare (scf/yr)	Annual CO_2 Emissions (scf)	Annual CH_4 Emissions (scf)	Combusted CO_2 Mass Emissions (mtpy)	Uncombusted CH_4 Mass Emissions (mtpy)	N_2O Mass Emissions (mtpy)	Combusted CO_2 Mass Emissions (tpy)	Uncombusted CH_4 Mass Emissions (tpy)	N_2O Mass Emissions (tpy)	CO_2e Mass Emissions (tpy)
Process Gas	1,736,007.12	1,476,190.92	81.024	22,117.316	4.26E-03	0.42	1.70E-04	4.70E-03	0.47	1.88E-04	13.161
SSM Flaring	588,002.23	500,000	60,000.01	6,575.10	3.16	0.13	4.54E-05	3.48	0.14	5.01E-05	7.39
							Total	**3.48**	**0.61**	**2.38E-04**	**20.55**

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Acid Gas Flare - AOS: Full Facility Blowdown

Flare Information	
Unit(s):	FL-1
Description:	Acid Gas Flare
Unit Count:	1
Capture Efficiency:	100%
DRE (%)	98%
SSM Event Volume (scf/event):	500,000
Events Per Year	1
Event Duration (hr/event):	4
SSM Annual Duration (hr/yr):	4

Heat Input and Flow Rate Calculation - Full Facility Blowdown			
Parameters	Value	Unit	Notes:
Facility Blowdown Flow Rate	0.50	MMscf/event	SSM Train Blowdowns for Two Trains
Process Gas Heating Value	1,022.00	Btu/scf	SSM Train Blowdowns for Two Trains
Total Annual Heating Rate	2,044.00	MMBtu/yr	Flow Rate (MMscf/event) * Heating Value (Btu/scf) * SSM Annual Duration (event/yr)
Short-Term Safety Factor	0%	%	Applied to account for short-term variations in heat content.
Annual Safety Factor	0%	%	Applied to account for variations in heat content.
Hourly Flow Rate with Safety Factor	0.13	MMscf/hr	SSM Gas Flow Rate (MMscf/event) / Event Duration (hr/event) * (1 + Safety Factor)
Annual Flow Rate with Safety Factor	0.50	MMscf/yr	Flow Rate with Safety Factor (MMscf/hr) * Annual SSM Duration (hr/yr)
Short-Term Heating Rate	127.75	MMBtu/hr	With short-term safety factor applied.
Annual Heating Rate	2,044.00	MMBtu/yr	With annual safety factor applied.
Process VOC	1,722.88	lb/hr	SSM Train Blowdowns for Two Trains
Process H_2S	0.11	lb/hr	SSM Train Blowdowns for Two Trains
Process HAP	83.76	lb/hr	SSM Train Blowdowns for Two Trains

Emission Summary

	NO_x[1]	CO[1]	VOC[2]	SO_2[3,4]	H_2S[2]	HAPs[2]	Unit	Notes
Emission Factors	0.068	0.31	5.5	-	-	-	lb/MMBtu	AP-42 Ch 13.5.1 Table 13.5-1 & Table 13.5-2
	-	-	-	1	-	-	gr S/100 scf	Fuel sulfur content
	-	-	-	0.08	-	-	lb S/ Mscf	lb S / Mscf = (gr S/100 scf) / (7000 gr/lb) * (1000 scf/Mscf)
SSM Emissions	8.69	39.60	34.46	0.21	2.25E-03	1.68	lb/hr	
	0.017	0.079	0.069	4.14E-04	4.49E-06	3.35E-03	tpy	tpy = lb/hr * (4 hr/yr) / (2000 lb/ton)
Total Emissions	**8.69**	**39.60**	**34.46**	**0.21**	**2.25E-03**	**1.68**	lb/hr	SSM Flaring
	0.017	**0.079**	**0.069**	**4.14E-04**	**4.49E-06**	**3.35E-03**	tpy	Annual SSM Flaring

[1] Flare NO_x and CO emission factors: AP-42 Chapter 13.5.

[2] VOC and HAP emissions estimated based on event streams routed to FL-1 and 98% DRE efficiency. H_2S emissions estimated based on event streams routed to FL-1 and 100% conversion to SO_2.

[3] SO_2: Mass balance assuming 98% combustion of H_2S and 100% conversion of combusted H_2S to SO_2:

Pilot Gas and Assist Gas SO_2 Emissions (lb/hr) = (Flow Rate (Mscf/hr) * Sulfur Content (lb S/Mscf) * (64 lb/lbmol SO_2 / 32 lb/lbmol S)) + (H_2S emissions (lb/hr) * DRE (%) * (64 lb/lbmol SO2 / 32 lb/lbmol S))

Process SO_2 Emissions (lb/hr) = H_2S Emissions (lb/hr) * DRE (%) * (64 lb/lbmol SO_2 / 34 lb/lbmol H_2S)

[4] Fuel sulfur content is assumed to be 2 gr/100 scf.

	Speciated HAP Emissions	
	lb/hr	tpy
Xylene	0.08	1.52E-04
Benzene	0.31	6.12E-04
Toluene	0.32	6.50E-04
n-Hexane	0.84	1.69E-03
2,2,4-Trimethylpentane	0.09	1.79E-04
MeOH	--	--
Ethylbenzene	0.03	6.94E-05
Total HAPs	1.68	3.350E-03

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Flare GHG Emissions - AOS: Full Facility Blowdown

§98.233(n) Flare stack GHG emissions.

Step 1. If necessary, convert volume of gas sent to flare from actual to standard conditions using Equation W-33

$$E_{s,n} = \frac{E_{a,n} * (459.67 + T_s) * P_a}{(459.67 + T_a) * P_s * Z_a} \quad \textit{(Equation W-33)}$$

where:

$E_{s,n}$ = Natural gas volumetric emissions at standard temperature and pressure (STP) conditions in cubic feet

$E_{a,n}$ = Natural gas volumetric emissions at actual conditions in cubic feet

T_s = Temperature at standard conditions (F) =	60	°F	
T_a = Temperature at actual conditions (F) =	75.8	°F	(Based on Annual Avg Max Tempurature for Roswell, NM from AP-42 Chapter 7)
P_s = Absolute pressure at standard conditions (psia) =	14.7	psia	
P_a = Absolute pressure at actual conditions (psia) =	12.88	psia	(Based on Avg Atmospheric Pressure for Roswell, NM from AP-42 Chapter 7)
Z_a = Compressibility factor at actual conditions for natural gas	1	(default value)	

Step 2. Calculate CO_2 and CH_4 Emissions from Flaring at standard conditions using Equations W-19 & W-20

$E_{s,CH4} = V_s * X_{CH4} * [(1 - \eta) * Z_L + Z_U]$ (Equation W-19)

$E_{s,CO2} = V_s * X_{CO2} * \Sigma (\eta * V_s * Y_j * R_j * Z_L)$ (Equation W-20)

where:

$E_{s,CH4}$ = Annual CH_4 emissions from flare stack in cubic feet, at standard conditions

$E_{s,CO2}$ = Annual CO_2 emissions from flare stack in cubic feet, at standard conditions

V_s = Volume of gas sent to flare in standard cubic feet

η = Flare combustion efficiency, expressed as fraction of gas combusted by a burning flare 0.98 (default value)

X_{CH4} = Mole fraction of CH_4 in the feed gas to the flare

Pilot Gas	SSM Flaring
0.0000	0.658

X_{CO2} = Mole fraction of CO_2 in the feed gas to the flare

Pilot Gas	SSM Flaring
0.00000	0.120

Z_U = Fraction of the feed gas sent to an un-lit flare determined by engineering estimate and process knowledge based on best available data and operating records

Z_L = Fraction of the feed gas sent to a burning flare (equal to $1 - Z_U$) 1 (assumes all gas is sent to burning flare)

Y_j = Mole fraction of hydrocarbon constituents j in the feed gas to the flare

	Pilot Gas	SSM Flaring
Constituent j, Methane =	0.0000	0.6575
Constituent j, Ethane =	0.0000	0.0947
Constituent j, Propane =	0.0000	0.0523
Constituent j, Butane =	0.0000	0.0238
Constituent j, Pentanes Plus =	0.0000	0.0187

R_j = Number of carbon atoms in the hydrocarbon constituent j in the feed gas to the flare

Constituent j, Methane =	1
Constituent j, Ethane =	2
Constituent j, Propane =	3
Constituent j, Butane =	4
Constituent j, Pentanes Plus =	5

Step 3. Calculate CO_2 and CH_4 mass emissions using Equation W-36 (98.233(v))

$Mass_i = E_{s,i} * \rho_i * 10^{-3}$ (Equation W-36)

where:

$Mass_i$ = GHG_i (either CH_4 or CO_2) mass emissions in metric tons

$E_{s,i}$ = GHG_i (either CH_4 or CO_2) volumetric emissions at standard conditions, in cubic feet.

ρ_i = Density of GHG_i

CO_2 =	0.0526	kg/ft^3
CH_4 =	0.0192	kg/ft^3

Step 4. Calculate N2O mass emissions using Equation W-40 (98.233(z))

$Mass_{N2O} = (1* 10^{-3}) * Fuel * HHV * EF$ *(Equation W-40)*

where:

$Mass_{N2O}$ = Annual N_2O emissions from the combustion of a particular type of fuel (metric tons)

Fuel = Annual mass or volume of the fuel combusted (mass or volume per year, choose appropriately to be consistent with the units of HHV).

HHV = high heat value of the fuel

Pilot Gas	SSM Flaring	
0.0000	0.00102	MMBtu/scf

EF = Use 1.0×10^{-4} kg N_2O/mmBtu.

$1 * 10^{-3}$ = Conversion factor from kilograms to metric tons.

Step 5. Calculate total annual emission from flare by summing Equations W-36 and W-40.

Gas Sent to Flare	Gas Sent to Flare (acf/yr)	Gas Sent to Flare (scf/yr)	Annual CO_2 Emissions (scf)	Annual CH_4 Emissions (scf)	Combusted CO_2 Mass Emissions (mtpy)	Uncombusted CH_4 Mass Emissions (mtpy)	N_2O Mass Emissions (mtpy)	Combusted CO_2 Mass Emissions (tpy)	Uncombusted CH_4 Mass Emissions (tpy)	N_2O Mass Emissions (tpy)	CO_2e Mass Emissions (tpy)
SSM Flaring	588,002.23	500,000	60,000.01	6,575.10	3.16	0.13	5.11E-05	3.48	0.14	5.63E-05	7.39
							Total	**3.48**	**0.14**	**5.63E-05**	**7.39**

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Slop Truck Loading

Unit: S-LOAD
Material: Slop

General Information

Hours of Operation	8,760	hr/yr	
Facility Throughput	8.59	average bbl/day	ProMax
Facility Throughput	3,136	bbl/yr	
Capture Efficiency	0%		
Safety Factor	25%		

Uncontrolled Emissions [1]

VOCs	Unit	Note
0.014	pph	
0.063	tpy	
0.063	**tpy**	**Total uncontrolled emissions**
0.018	**pph**	**Total uncontrolled emissions with safety factor**
0.079	**tpy**	**Total uncontrolled emissions with safety factor**

Hydrogen Sulfide	Unit	Note
9.24E-09	pph	
4.05E-08	tpy	
4.05E-08	**tpy**	**Total uncontrolled emissions**
1.16E-08	**pph**	**Total uncontrolled emissions with safety factor**
5.06E-08	**tpy**	**Total uncontrolled emissions with safety factor**

HAPs	Loadout Emissions	
	pph	tpy
n-Hexane	3.64E-04	1.60E-03
Benzene	3.50E-03	0.015
Toluene	2.87E-03	0.013
Ethylbenzene	1.43E-04	6.28E-04
Xylenes	2.93E-04	1.28E-03
2,2,4-Trimethylpentane	3.99E-05	1.75E-04
Total HAPs	**0.032**	**tpy**
Total HAPs w/Safety	**9.01E-03** **0.039**	**pph** **tpy**

Controlled Emissions [2]

VOCs	Unit	Note
0.014	pph	
0.063	tpy	
0.063	**tpy**	**Total controlled emissions**
0.018	**pph**	**Total controlled emissions with safety factor**
0.079	**tpy**	**Total controlled emissions with safety factor**

Hydrogen Sulfide	Unit	Note
9.24E-09	pph	
4.05E-08	tpy	
4.05E-08	**tpy**	**Total controlled emissions**
1.16E-08	**pph**	**Total controlled emissions with safety factor**
5.06E-08	**tpy**	**Total controlled emissions with safety factor**

HAPs	Loadout Emissions	
	pph	tpy
n-Hexane	3.64E-04	1.60E-03
Benzene	3.50E-03	0.015
Toluene	2.87E-03	0.013
Ethylbenzene	1.43E-04	6.28E-04
Xylenes	2.93E-04	1.28E-03
2,2,4-Trimethylpentane	3.99E-05	1.75E-04
Total HAPs	**0.032**	**tpy**
Total HAPs w/Safety	**9.01E-03** **0.039**	**pph** **tpy**

Notes

[1] Emissions calculated using BR&E ProMax.
[2] Loading is uncontrolled and all emissions are vented to the atmosphere.

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Facility Fugitives

Unit: FUG-1
Description: Facility Fugitive Emissions
Safety Factor: 75%
Control Equipment: N/A

COMPONENT	CURRENT COUNT [1]	EPA[2] FACTOR (lb/hr-src)	REDUCTION ALLOWED FOR LDAR	% VOC IN STREAM[3]	VOC EMISSIONS (lb/hr)	VOC EMISSIONS (tpy)	% H_2S IN STREAM[3]	H_2S EMISSIONS (lb/hr)	H_2S EMISSIONS (tpy)	% HAP IN STREAM[3]	HAP EMISSIONS (lb/hr)	HAP EMISSIONS (tpy)	% Methane IN STREAM[3]	Methane EMISSIONS (lb/hr)	Methane EMISSIONS (tpy)	%CO_2 IN STREAM[3]	CO_2 EMISSIONS (lb/hr)	CO_2 EMISSIONS (tpy)
Inlet Gas (gas)																		
VALVES	375	9.9E-03	0%	21.07%	0.78	3.43	0.0014%	5.10E-05	2.23E-04	1.02%	0.038	0.17	42.48%	1.58	6.91	21.27%	0.79	3.461
FLANGES	375	8.6E-04	0%	21.07%	0.068	0.30	0.0014%	4.42E-06	1.94E-05	1.02%	3.30E-03	0.014	42.48%	0.14	0.60	21.27%	0.07	0.30
CONNECTORS	1124	4.4E-04	0%	21.07%	0.10	0.46	0.0014%	6.80E-06	2.98E-05	1.02%	5.07E-03	0.022	42.48%	0.21	0.92	21.27%	0.11	0.46
RELIEF VALVES	0	1.9E-02	0%	21.07%	-	-	0.0014%	-	-	1.02%	-	-	42.48%	-	-	21.27%	-	-
COMPRESSOR SEALS	0	1.9E-02	0%	21.07%	-	-	0.0014%	-	-	1.02%	-	-	42.48%	-	-	21.27%	-	-
PUMP SEALS	0	5.3E-03	0%	21.07%	-	-	0.0014%	-	-	1.02%	-	-	42.48%	-	-	21.27%	-	-
OPEN-ENDED LINES	39	4.4E-03	0%	21.07%	0.036	0.16	0.0014%	2.33E-06	1.02E-05	1.02%	1.74E-03	7.62E-03	42.48%	0.07	0.32	21.27%	0.04	0.16
SAMPLE POINTS	0	1.9E-02	0%	21.07%	-	-	0.0014%	-	-	1.02%	-	-	42.48%	-	-	21.27%	-	-
OTHER	11	1.9E-02	0%	21.07%	0.04	0.20	0.0014%	2.93E-06	1.28E-05	1.02%	2.19E-03	9.57E-03	42.48%	0.09	0.40	21.27%	0.05	0.20
Condensate (light oil)																		
VALVES	172	5.5E-03	0%	31.21%	0.29	1.29	0%	9.28E-10	4.06E-09	26.92%	0.254	1.11	0%	-	-	0%	1.31E-23	5.73E-23
FLANGES	172	2.4E-04	0%	31.21%	0.013	0.06	0%	4.08E-11	1.79E-10	26.92%	0.01	0.049	0%	-	-	0%	5.76E-25	2.52E-24
CONNECTORS	515	4.6E-04	0%	31.21%	0.07	0.33	0%	2.34E-10	1.02E-09	26.92%	0.064	0.281	0%	-	-	0%	3.30E-24	1.44E-23
PUMP SEALS	4	2.9E-02	0%	31.21%	0.031	0.14	0%	9.85E-11	4.31E-10	26.92%	0.03	0.118	0%	-	-	0%	1.39E-24	6.09E-24
OPEN-ENDED LINES	11	3.1E-03	0%	31.21%	0.011	0.046	0%	3.33E-11	1.46E-10	26.92%	9.14E-03	0.040	0%	-	-	0%	4.70E-25	2.06E-24
OTHER	11	1.7E-02	0%	31.21%	0.05	0.24	0%	1.70E-10	7.46E-10	26.92%	0.05	0.20	0%	-	-	0%	2.40E-24	1.05E-23
TOTAL EMISSIONS	2804.5				**1.51**	**6.63**		**6.75E-05**	**2.96E-04**		**0.46**	**2.03**		**2.09**	**9.15**		**1.05**	**4.58**

[1] Fugitive emission source counts are based on the facility design.
[2] Factors are from Protocol for Equipment Leak Emission Estimates from the EPA (Table 2-4).
[3] VOC, HAP, and H_2S content for each stream are calculated using ProMax.

1 kg = 2.20462 lb

				Speciated HAPs																		
COMPONENT	CURRENT COUNT [1]	EPA[2] FACTOR (lb/hr-src)	REDUCTION ALLOWED FOR LDAR	% Hexane IN STREAM[3]	Hexane EMISSIONS (lb/hr)	Hexane EMISSIONS (tpy)	% Benzene IN STREAM[3]	Benzene EMISSIONS (lb/hr)	Benzene EMISSIONS (tpy)	% Toluene IN STREAM[3]	Toluene EMISSIONS (lb/hr)	Toluene EMISSIONS (tpy)	% E-Benzene IN STREAM[3]	E-Benzene EMISSIONS (lb/hr)	E-Benzene EMISSIONS (tpy)	% Xylenes IN STREAM[3]	Xylene EMISSIONS (lb/hr)	Xylene EMISSIONS (tpy)	% 2,2,4-TMP IN STREAM[3]	2,2,4-TMP EMISSIONS (lb/hr)	2,2,4-TMP EMISSIONS (tpy)
Inlet Gas (gas)																						
VALVES	375	9.9E-03	0%	0.52%	0.02	0.08	0.19%	6.95E-03	0.03	0.20%	7.379E-03	0.03	0.021%	7.99E-04	3.50E-03	0.047%	1.73E-03	7.584E-03	0.055%	2.032E-03	8.90E-03
FLANGES	375	8.6E-04	0%	0.52%	1.667E-03	7.30E-03	0.19%	6.02E-04	2.64E-03	0.20%	6.39E-04	2.801E-03	0.021%	6.85E-05	3.00E-04	0.047%	1.50E-04	6.57E-04	0.055%	1.76E-04	7.71E-04
CONNECTORS	1124	4.4E-04	0%	0.52%	2.56E-03	0.01	0.19%	9.27E-04	4.06E-03	0.20%	9.84E-04	4.309E-03	0.021%	1.14E-04	5.00E-04	0.047%	2.31E-04	1.01E-03	0.055%	2.71E-04	1.19E-03
RELIEF VALVES	0	1.9E-02	0%	0.52%	-	-	0.19%	-	-	0.20%	-	-	0.021%	-	-	0.047%	-	-	0.055%	-	-
COMPRESSOR SEALS	0	1.9E-02	0%	0.52%	-	-	0.19%	-	-	0.20%	-	-	0.021%	-	-	0.047%	-	-	0.055%	-	-
PUMP SEALS	0	5.3E-03	0%	0.52%	-	-	0.19%	-	-	0.20%	-	-	0.021%	-	-	0.047%	-	-	0.055%	-	-
OPEN-ENDED LINES	39	4.4E-03	0%	0.52%	8.676E-04	3.80E-03	0.19%	3.18E-04	1.39E-03	0.20%	3.37E-04	1.48E-03	0.021%	4.57E-05	2.00E-04	0.047%	7.91E-05	3.47E-04	0.055%	9.29E-05	4.07E-04
SAMPLE POINTS	0	1.9E-02	0%	0.52%	-	-	0.19%	-	-	0.20%	-	-	0.021%	-	-	0.047%	-	-	0.055%	-	-
OTHER	11	1.9E-02	0%	0.52%	1.10E-03	4.80E-03	0.19%	3.99E-04	1.75E-03	0.20%	4.24E-04	1.86E-03	0.021%	4.57E-05	2.00E-04	0.047%	9.95E-05	4.36E-04	0.055%	1.17E-04	5.11E-04
Condensate (light oil)																						
VALVES	172	5.5E-03	0%	0.22%	2.12E-03	9.300E-03	5.00%	0.047	0.21	14.11%	0.13	0.58	2.49%	0.023	0.10	5.03%	0.05	0.21	0.071%	6.72E-04	2.95E-03
FLANGES	172	2.4E-04	0%	0.22%	9.132E-05	4.00E-04	5.00%	2.08E-03	9.106E-03	14.11%	5.870E-03	0.026	2.49%	1.03E-03	4.50E-03	5.03%	2.09E-03	9.159E-03	0.071%	2.96E-05	1.30E-04
CONNECTORS	515	4.6E-04	0%	0.22%	5.25E-04	2.30E-03	5.00%	0.012	0.05	14.11%	0.034	0.15	2.49%	5.913E-03	0.026	5.03%	0.012	0.05	0.071%	1.69E-04	7.42E-04
PUMP SEALS	4	2.9E-02	0%	0.22%	2.283E-04	1.00E-03	5.00%	5.01E-03	0.022	14.11%	0.014	0.06	2.49%	2.49E-03	0.011	5.03%	5.043E-03	0.022	0.071%	7.14E-05	3.13E-04
OPEN-ENDED LINES	11	3.1E-03	0%	0.22%	6.849E-05	3.000E-04	5.00%	1.70E-03	7.434E-03	14.11%	4.79E-03	0.021	2.49%	8.45E-04	3.70E-03	5.03%	1.71E-03	7.476E-03	0.071%	2.42E-05	1.06E-04
OTHER	11	1.7E-02	0%	0.22%	3.88E-04	1.70E-03	5.00%	8.679E-03	0.038	14.11%	0.025	0.11	2.49%	4.32E-03	0.019	5.03%	8.729E-03	0.04	0.071%	1.23E-04	5.41E-04
TOTAL EMISSIONS	2804.5				**0.029**	**0.13**		**0.086**	**0.38**		**0.23**	**0.99**		**0.039**	**0.17**		**0.079**	**0.35**		**3.78E-03**	**0.017**

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

SSM Summary

Uncontrolled SSM

Description	NO_x		CO		VOC		PM		PM_{10}		$PM_{2.5}$		SO_2		H_2S		Total HAPs	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Vented Train Blowdowns	-	-	-	-	861.44		-	-	-	-	-	-	-	-	0.06	2.25E-04	41.88	0.17
Filter Coalescer Blowdowns	-	-	-	-	34.46	0.83	-	-	-	-	-	-	-	-	2.25E-03	5.39E-05	1.68	0.04
Pipeline Blowdowns	-	-	-	-	1,367.92	2.74	-	-	-	-	-	-	-	-	0.09	1.78E-04	66.51	0.13
TOTAL	**-**	**-**	**-**	**-**	**2,263.82**	**3.56**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.15**	**4.57E-04**	**110.06**	**0.34**

Controlled SSM

Description	NO_x		CO		VOC		PM		PM_{10}		$PM_{2.5}$		SO_2		H_2S		Total HAPs	
	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)	(lb/hr)	(tpy)
Vented Train Blowdowns	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Filter Coalescer Blowdowns	-	-	-	-	34.46	0.83	-	-	-	-	-	-	-	-	2.25E-03	5.39E-05	1.68	0.04
Pipeline Blowdowns	-	-	-	-	1,367.92	2.74	-	-	-	-	-	-	-	-	0.089	1.78E-04	66.51	0.13
TOTAL	**-**	**-**	**-**	**-**	**2,263.82**	**3.56**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**0.091**	**2.32E-04**	**68.18**	**0.17**

Description	Xylene		Benzene		Toluene		n-Hexane		2,2,4 Trimethylpentane		Ethylbenzene	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Vented Train Blowdowns	-	-	-	-	-	-	-	-	-	-	-	-
Filter Coalescer Blowdowns	0.076	1.83E-03	0.31	7.34E-03	0.32	7.80E-03	0.84	0.020	0.089	2.15E-03	0.035	8.33E-04
Pipeline Blowdowns	3.03	6.05E-03	12.15	0.024	12.90	0.026	33.51	0.067	3.55	7.10E-03	1.38	2.75E-03
TOTAL	**3.10**	**7.88E-03**	**12.45**	**0.032**	**13.22**	**0.034**	**34.35**	**0.087**	**3.64**	**9.25E-03**	**1.41**	**3.59E-03**

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility
Emission Calculation Inputs

Vented Train Blowdowns			
Input Data	**Value**	**Units**	
Volume of gas per blowdown per train[1]	250,000	scf/event-train	
Number of Trains Down Per Event	1	Trains/event	
Number of Blowdowns per year	2	events/yr	One blowdown per train
Duration of Event	4	hr/event	

Filter Coalescer Blowdowns		
Input Data	**Value**	**Units**
Volume of gas per blowdown per filter	2500	scf/event-unit
Number of Filter Coalescers	2	Units
Number of Blowdowns per year	24	events/yr
Duration of Event	1	hr/event

Pipeline Blowdown - Only if pipeline is opened and a segment is vented		
Input Data	**Value**	**Units**
Pipeline Diameter	12	inches
Pipeline Length	10,000	ft
Duration of Event	4	hr/event
Maintenance events per year	1	events/yr
Actual Pressure	800	psia
Maximum Temperature	100	°F
Annual Temperature	80	°F
Pipeline volume vented[2]	396,987.05	scf/event

[1] Value was calculated based on exact volumes. The value was rounded up to add a safety factor.

[2] Pipeline volume vented calculation: [PI x (Pipeline Diameter (ft) / 2)^2 x Pipeline Length (ft) x Actual Pressure (psia) / 14.696 (psia/psig) x (60 F + 459.67 (F to Rankine)) / (Maximum Temperature (100 F) + 459.67 (F to Rankine))]

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Vented Train Blowdowns

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

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

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

Vented Train Blowdown Emissions

Estimated Gas Vented per Blowdown Event per Train [1] =	250,000	scf/event-train
Trains Blown Down =	1	trains
BlowDown Duration =	4	hrs/event
Train BlowDowns in One Year =	2	events/yr
Molecular Weight of Stream =	25	lb/lb-mol
Control Type =	FL-1	
Capture Efficiency =	100%	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)	Maximum Controlled Hourly Emissions (lb/hr)	Maximum Controlled Annual Emissions (tpy)
Nitrogen	3.7181	152.04	0.61	-	-
CO2	21.2693	869.75	3.48	-	-
H2S	0.0014	0.056	2.25E-04	-	-
Methane	42.4814	1,737.17	6.95	-	-
Ethane	11.4638	468.78	1.88	-	-
Propane	9.2866	379.75	1.52	-	-
i-Butane	1.6217	66.32	0.27	-	-
n-Butane	3.9557	161.76	0.65	-	-
Isopentane	1.3737	56.18	0.22	-	-
n-Pentane	1.3536	55.35	0.22	-	-
i-C6	1.0904	44.59	0.18	-	-
n-C6	0.5160	21.10	0.084	-	-
Benzene	0.1871	7.65	0.031	-	-
Cyclohexane	0.2587	10.58	0.042	-	-
2-Methylhexane	0.0760	3.11	0.012	-	-
C7	0.6080	24.86	0.099	-	-
Toluene	0.1986	8.12	0.032	-	-
2,2,4-Trimethylpentane	0.0547	2.24	8.95E-03	-	-
C8	0.2690	11.00	0.044	-	-
Ethylbenzene	0.0212	0.87	3.47E-03	-	-
o-Xylene	0.0085	0.35	1.38E-03	-	-
p-Xylene	0.0191	0.78	3.12E-03	-	-
m-Xylene	0.0191	0.78	3.12E-03	-	-
Isononane	0.0819	3.35	0.013	-	-
C9	0.0153	0.63	2.51E-03	-	-
C10	0.0511	2.09	8.36E-03	-	-
Water	0.0000	-	-	-	-
DGA	0.0000	-	-	-	-
MDEA	0.0000	-	-	-	-
Piperazine	0.0000	-	-	-	-
CHEMTHERM 550	0.0000	-	-	-	-
UCARSOL™ AP-814	0.0000	-	-	-	-
Total VOC	**21.07**	**861.44**	**3.45**	**-**	**-**
H_2S	**1.37E-03**	**0.056**	**2.25E-04**	**-**	**-**
Total HAP	**1.02**	**41.88**	**0.17**	**-**	**-**

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

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Filter Coalescer Blowdowns

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

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

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

Filter Coalescer BlowDown Emissions

Estimated Gas Vented per Blowdown Event [1] =	2,500	scf/event
Units at Site =	2	units
Units Blown Down Simultaneously =	1	units
Blowdown Duration =	1	hrs/event
Unit Blowdowns in One Year =	24	events/yr
Molecular Weight of Stream =	25	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)
Nitrogen	3.7181	6.08	0.15
CO2	21.2693	34.79	0.83
H2S	0.0014	2.25E-03	5.39E-05
Methane	42.4814	69.49	1.67
Ethane	11.4638	18.75	0.45
Propane	9.2866	15.19	0.36
i-Butane	1.6217	2.65	0.064
n-Butane	3.9557	6.47	0.16
Isopentane	1.3737	2.25	0.054
n-Pentane	1.3536	2.21	0.053
i-C6	1.0904	1.78	0.043
n-C6	0.5160	0.84	0.020
Benzene	0.1871	0.31	7.34E-03
Cyclohexane	0.2587	0.42	0.010
2-Methylhexane	0.0760	0.12	2.98E-03
C7	0.6080	0.99	0.024
Toluene	0.1986	0.32	7.80E-03
2,2,4-Trimethylpentane	0.0547	0.089	2.15E-03
C8	0.2690	0.44	0.011
Ethylbenzene	0.0212	0.035	8.33E-04
o-Xylene	0.0085	0.014	3.32E-04
p-Xylene	0.0191	0.031	7.49E-04
m-Xylene	0.0191	0.031	7.49E-04
Isononane	0.0819	0.13	3.22E-03
C9	0.0153	0.025	6.02E-04
C10	0.0511	0.084	2.01E-03
Water	0.0000	-	-
DGA	0.0000	-	-
MDEA	0.0000	-	-
Piperazine	0.0000	-	-
CHEMTHERM 550	0.0000	-	-
UCARSOL™ AP-814	0.0000	-	-
Total VOC	**21.07**	**34.46**	**0.83**
H_2S	**1.37E-03**	**2.25E-03**	**5.39E-05**
Total HAP	**1.02**	**1.68**	**0.040**

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

MarkWest Energy West Texas Gas Company, L.L.C. - Dagger Lake Treating Facility

Pipeline Blowdown

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

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

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

Pipeline Blowdown Emissions

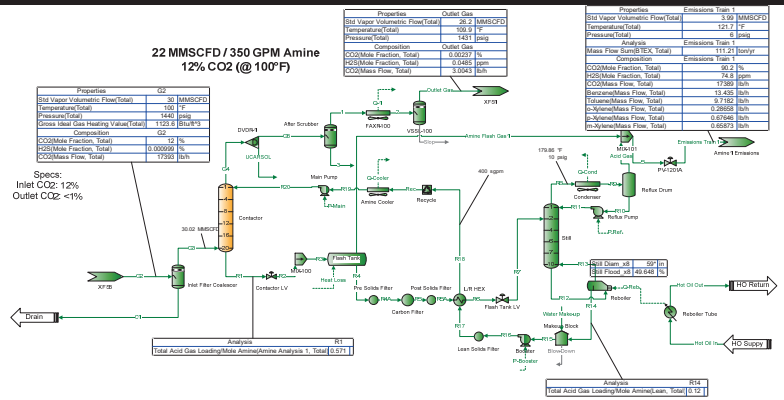
Pipeline Volume Vented =	396,987	scf/event
Event Duration =	4	hr/event
Maintenance Events per Year =	1	events/yr
Molecular Weight of Stream =	25	lb/lb-mol
Control Type =	None	

Compound	Composition (wt %)	Maximum Uncontrolled Hourly Emissions (lb/hr)	Maximum Uncontrolled Annual Emissions (tpy)
Nitrogen	3.7181	241.43	0.48
CO2	21.2693	1,381.12	2.76
H2S	0.0014	0.089	1.78E-04
Methane	42.4814	2,758.53	5.52
Ethane	11.4638	744.40	1.49
Propane	9.2866	603.03	1.21
i-Butane	1.6217	105.31	0.21
n-Butane	3.9557	256.87	0.51
Isopentane	1.3737	89.20	0.18
n-Pentane	1.3536	87.89	0.18
i-C6	1.0904	70.81	0.14
n-C6	0.5160	33.51	0.067
Benzene	0.1871	12.15	0.024
Cyclohexane	0.2587	16.80	0.034
2-Methylhexane	0.0760	4.93	9.87E-03
C7	0.6080	39.48	0.079
Toluene	0.1986	12.90	0.026
2,2,4-Trimethylpentane	0.0547	3.55	7.10E-03
C8	0.2690	17.47	0.035
Ethylbenzene	0.0212	1.38	2.75E-03
o-Xylene	0.0085	0.55	1.10E-03
p-Xylene	0.0191	1.24	2.48E-03
m-Xylene	0.0191	1.24	2.48E-03
Isononane	0.0819	5.32	0.011
C9	0.0153	1.00	1.99E-03
C10	0.0511	3.32	6.64E-03
Water	0.0000	-	-
DGA	0.0000	-	-
MDEA	0.0000	-	-
Piperazine	0.0000	-	-
CHEMTHERM 550	0.0000	-	-
UCARSOL™ AP-814	0.0000	-	-
Total VOC	**21.07**	**1,367.92**	**2.74**
H_2S	**1.37E-03**	**0.089**	**1.78E-04**
Total HAP	**1.02**	**66.51**	**0.13**

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

Amine400 sgpm #1
Plant Schematic

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine400 sgpm #1	



Properties	Outlet Gas
Std Vapor Volumetric Flow(Total)	26.2 MMSCFD
Temperature(Total)	109.9 °F
Pressure(Total)	1431 psig
Composition	Outlet Gas
CO2(Mole Fraction, Total)	0.00237 %
H2S(Mole Fraction, Total)	0.0485 ppm
CO2(Mass Flow, Total)	3.0043 lb/h

Properties	Emissions Train 1
Std Vapor Volumetric Flow(Total)	3.99 MMSCFD
Temperature(Total)	121.7 °F
Pressure(Total)	5 psig
Analysis	Emissions Train 1
Mass Flow Sum(B:1EX_Total)	111.21 ton/yr
Composition	Emissions Train 1
CO2(Mole Fraction, Total)	90.2 %
H2S(Mole Fraction, Total)	74.8 ppm
CO2(Mass Flow, Total)	17389 lb/h
Benzene(Mass Flow, Total)	13.435 lb/h
Toluene(Mass Flow, Total)	9.7182 lb/h
o-Xylene(Mass Flow, Total)	0.28655 lb/h
p-Xylene(Mass Flow, Total)	0.67646 lb/h
m-Xylene(Mass Flow, Total)	0.65873 lb/h

Properties	G2
Std Vapor Volumetric Flow(Total)	30 MMSCFD
Temperature(Total)	100 °F
Pressure(Total)	1440 psig
Gross Ideal Gas Heating Value(Total)	1123.6 Btu/ft^3
Composition	G2
CO2(Mole Fraction, Total)	12 %
H2S(Mole Fraction, Total)	0.000699 %
CO2(Mass Flow, Total)	17393 lb/h

Analysis	R1
Total Acid Gas Loading(Mole Amine(Amine Analysis 1, Total	0.571

Analysis	R14
Total Acid Gas Loading(Mole Amine(Lean, Total	0.12

Names	Units	G3	G4	R1	R2	Amine Flash Gas 1	R4	R6	R8	R9	Acid Gas	R11	R12	R13	R14	R16	R17	R18	R19	R20
Temperature	°F	100	106	170	172	185*	185	210*	180	120	120	120	213	238*	238	238	238	178	107*	106
Pressure	psig	1439	1436	1439	75*	75	75	70	10	8	8	70*	13	13	13	73	73	68	63	1450#
Mole Fraction Vapor	%	100	100	0	0.389	100	0	1.84	100	75.1	100	0	0	100	0	0	0	0	0	0
Std Vapor Volumetric Flow	MMSCFD	30.021	26.322	59.774	59.774	0.1828	59.591	59.591	5.0699	5.0699	3.8074	1.2625	60.84	5.0562	55.784	56.075	56.075	56.075	56.075	56.075
Std Liquid Volumetric Flow	sgpm	395.18	351.38	443.8	443.8	2.1838	441.62	441.62	47.768	47.768	42.77	4.9971	428.96	30.117	398.85	400	400	400	400	400
Specific Gravity		0.89684	0.76871	1.1609		1.075	1.1604		1.2451		1.4518	0.98914	1.0828	0.89074	1.0296	1.0295	1.0295	1.0518	1.0731	1.0742
Total Acid Gas Loading(Mole Amine				0.57											0.12					
CO2(Mole Fraction)	%	12	0.00237	7.63	7.63	46.8	7.51	7.51	69.3	69.3	92.3	0.0508	3.87	25.2	1.72	1.71	1.71	1.71	1.71	1.71
CO2(Mass Flow)	lb/h	17392	3.0141	22031	22031	413.22	21617	21617	16979	16979	16976	3.102	10798	6145.9	4641.8	4641.8	4641.8	4641.8	4641.8	4641.8

* User Specified Values
? Extrapolated or Approximate Values

ProMax 6.0.24240.0
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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine400 sgpm #1	

Connections

	Acid Gas	Amine Flash Gas 1	G2	Outlet Gas	R15
From Block	Reflux Drum	Flash Tank	XFS5	VSSL-100	Makeup Block
To Block	MIX-101	MIX-101	Inlet Filter Coalescer	XFS1	Booster

Stream Composition

Mole Fraction	Acid Gas %	Amine Flash Gas 1 %	G2 %	Outlet Gas %	R15 %
Nitrogen	0.000616894	0.833031	3.2928	3.76204	0
CO2	92.2682	46.7804	11.9886	0.00237202	1.71309
H2S	0.0076933	0.0030357	0.000998901	4.84764E-06	0.000211222
Methane	0.0874379	39.102	65.6931	74.8151	0
Ethane	0.0166252	5.2724	9.45644	10.7376	0
Propane	0.0045441	1.77472	5.22256	5.91254	0
i-Butane	0.000297301	0.146908	0.691707	0.779153	0
n-Butane	0.00131255	0.465401	1.68693	1.89304	0
Isopentane	5.32369E-05	0.0423602	0.471705	0.524919	0
n-Pentane	9.4182E-05	0.0562377	0.464663	0.514453	0
i-C6	2.70023E-05	0.0221873	0.313105	0.34048	0
n-C6	1.19392E-05	0.00984944	0.148078	0.15942	0
Benzene	0.033189	0.165656	0.0592162	0.0579158	0
Cyclohexane	0.00025729	0.0315753	0.0759676	0.0806355	0
2-Methylhexane	3.36587E-07	0.000525317	0.0187293	0.0196551	0
C7	2.49797E-06	0.00391554	0.149695	0.154246	0
Toluene	0.0199962	0.10902	0.0531374	0.0508017	0
2,2,4-Trimethylpentane	2.55319E-07	0.000352081	0.0118192	0.0122547	0
C8	1.01567E-06	0.00134757	0.0578644	0.0552413	0
Ethylbenzene	0.00104774	0.00711798	0.00490029	0.00441421	0
o-Xylene	0.000517783	0.00266471	0.00195403	0.0017191	0
p-Xylene	0.00122248	0.00628426	0.00440559	0.00392483	0
m-Xylene	0.00119023	0.00612339	0.00440482	0.00391883	0
Isononane	3.51505E-08	0.000114848	0.0156121	0.0136578	0
C9	6.59586E-09	2.07087E-05	0.0029154	0.00243925	0
C10	0	1.25731E-05	0.00866035	0.00617141	0
Water	7.55566	5.15614	0.100039	0.0919019	84.0516
DGA	0	0	0	0	0
MDEA	0	0	0	0	0
Piperazine	0	0	0	0	0
CHEMTHERM 550	0	0	0	0	0
UCARSOL™ AP-814	2.95512E-14	0.000582147	0	0	14.2351

Molar Flow	Acid Gas lbmol/h	Amine Flash Gas 1 lbmol/h	G2 lbmol/h	Outlet Gas lbmol/h	R15 lbmol/h
Nitrogen	0.0025789	0.167197	108.547	108.269	0
CO2	385.724	9.38923	395.202	0.0682653	105.474
H2S	0.0321616	0.000609292	0.0329287	0.000139512	0.0130048
Methane	0.365531	7.84812	2165.57	2153.13	0
Ethane	0.0695012	1.05822	311.731	309.022	0
Propane	0.0189965	0.356202	172.161	170.159	0
i-Butane	0.00124286	0.0294857	22.8021	22.4236	0
n-Butane	0.00548707	0.0934101	55.6096	54.4806	0
Isopentane	0.000222555	0.00850207	15.5497	15.1069	0
n-Pentane	0.000393724	0.0112874	15.3176	14.8056	0
i-C6	0.000112882	0.00445318	10.3215	9.79882	0
n-C6	4.99112E-05	0.00197687	4.88137	4.58802	0
Benzene	0.138745	0.0332486	1.95206	1.66678	0
Cyclohexane	0.00107559	0.00633743	2.50427	2.32064	0
2-Methylhexane	1.40709E-06	0.000105436	0.617411	0.565661	0

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine400 sgpm #1	

Molar Flow	Acid Gas lbmol/h	Amine Flash Gas 1 lbmol/h	G2 lbmol/h	Outlet Gas lbmol/h	R15 lbmol/h
C7	1.04426E-05	0.000785883	4.93468	4.43911	0
Toluene	0.0835932	0.0218812	1.75167	1.46204	0
2,2,4-Trimethylpentane	1.06735E-06	7.06658E-05	0.389619	0.352683	0
C8	4.24597E-06	0.00027047	1.9075	1.58981	0
Ethylbenzene	0.00438004	0.00142864	0.161538	0.127038	0
o-Xylene	0.00216457	0.000534831	0.0644145	0.0494748	0
p-Xylene	0.00511051	0.00126131	0.14523	0.112954	0
m-Xylene	0.00497571	0.00122902	0.145205	0.112781	0
Isononane	1.46945E-07	2.3051E-05	0.514652	0.393062	0
C9	2.75737E-08	4.15643E-06	0.0961061	0.0702	0
C10	0	2.52352E-06	0.285488	0.177609	0
Water	31.5861	1.03488	3.29777	2.64488	5175.01
DGA	0	0	0	0	0
MDEA	0	0	0	0	0
Piperazine	0	0	0	0	0
CHEMTHERM 550	0	0	0	0	0
UCARSOL™ AP-814	1.23538E-13	0.000116842	0	0	876.447

Mass Fraction	Acid Gas %	Amine Flash Gas 1 %	G2 %	Outlet Gas %	R15 %
Nitrogen	0.000411052	0.74954	3.71679	4.76891	0
CO2	96.587	66.1268	21.2593	0.00472384	2.3714
H2S	0.00623654	0.00332305	0.00137173	7.47603E-06	0.000226427
Methane	0.033365	20.1483	42.4646	54.3113	0
Ethane	0.0118907	5.09208	11.4573	14.6102	0
Propane	0.00476611	2.51358	9.2793	11.7978	0
i-Butane	0.000411017	0.274255	1.61995	2.04925	0
n-Butane	0.00181459	0.868834	3.95071	4.97889	0
Isopentane	9.13613E-05	0.0981646	1.37131	1.71377	0
n-Pentane	0.000161628	0.130324	1.35084	1.6796	0
i-C6	5.53482E-05	0.0614121	1.0872	1.32772	0
n-C6	2.44724E-05	0.0272623	0.514172	0.621665	0
Benzene	0.061664	0.415615	0.186378	0.204712	0
Cyclohexane	0.000515046	0.0853527	0.257613	0.307085	0
2-Methylhexane	8.0222E-07	0.00169069	0.0756196	0.0891212	0
C7	5.95364E-06	0.0126019	0.604393	0.699392	0
Toluene	0.0438236	0.322636	0.197278	0.211811	0
2,2,4-Trimethylpentane	6.93709E-07	0.00129177	0.0544	0.0633442	0
C8	2.75961E-06	0.00494418	0.266331	0.285541	0
Ethylbenzene	0.00264579	0.024272	0.0209623	0.0212063	0
o-Xylene	0.00130752	0.00908655	0.0083589	0.00825873	0
p-Xylene	0.00308704	0.0214291	0.0188461	0.0188553	0
m-Xylene	0.00300561	0.0208805	0.0188428	0.0188264	0
Isononane	1.07232E-07	0.000473114	0.0806812	0.0792655	0
C9	2.01218E-08	8.53092E-05	0.0150664	0.0141566	0
C10	0	5.74589E-05	0.0496502	0.0397341	0
Water	3.23768	2.98355	0.0726182	0.0749196	47.6284
DGA	0	0	0	0	0
MDEA	0	0	0	0	0
Piperazine	0	0	0	0	0
CHEMTHERM 550	0	0	0	0	0
UCARSOL™ AP-814	7.92103E-14	0.00217291	0	0	50

Mass Flow	Acid Gas lb/h	Amine Flash Gas 1 lb/h	G2 lb/h	Outlet Gas lb/h	R15 lb/h
Nitrogen	0.0722438	4.68375	3040.77	3032.99	0
CO2	16975.5	413.215	17392.7	3.00432	4641.85
H2S	1.09609	0.0207652	1.12224	0.00475469	0.443214

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine400 sgpm #1	

Mass Flow	Acid Gas lb/h	Amine Flash Gas 1 lb/h	G2 lb/h	Outlet Gas lb/h	R15 lb/h
Methane	5.86401	125.903	34741.1	34541.5	0
Ethane	2.08983	31.8196	9373.46	9291.98	0
Propane	0.83766	15.707	7591.56	7503.28	0
i-Butane	0.0722376	1.71378	1325.31	1303.31	0
n-Butane	0.31892	5.4292	3232.15	3166.53	0
Isopentane	0.0160571	0.613414	1121.9	1089.94	0
n-Pentane	0.0284067	0.814371	1105.15	1068.21	0
i-C6	0.00972764	0.383754	889.459	844.417	0
n-C6	0.00430112	0.170357	420.654	395.374	0
Benzene	10.8377	2.59711	152.479	130.195	0
Cyclohexane	0.0905211	0.533355	210.758	195.304	0
2-Methylhexane	0.000140993	0.0105649	61.8658	56.6803	0
C7	0.00104637	0.078747	494.465	444.808	0
Toluene	7.70215	2.0161	161.396	134.71	0
2,2,4-Trimethylpentane	0.000121922	0.00807205	44.5056	40.2864	0
C8	0.000485011	0.0308954	217.89	181.602	0
Ethylbenzene	0.465006	0.151672	17.1496	13.487	0
o-Xylene	0.229802	0.0567803	6.83857	5.25249	0
p-Xylene	0.542558	0.133907	15.4183	11.9918	0
m-Xylene	0.528246	0.130479	15.4156	11.9734	0
Isononane	1.88465E-05	0.00295641	66.0068	50.4123	0
C9	3.53647E-06	0.000533083	12.3261	9.00351	0
C10	0	0.000359051	40.6197	25.2706	0
Water	569.033	18.6437	59.4102	47.6483	93229.2
DGA	0	0	0	0	0
MDEA	0	0	0	0	0
Piperazine	0	0	0	0	0
CHEMTHERM 550	0	0	0	0	0
UCARSOL™ AP-814	1.39215E-11	0.0135782	0	0	97871.5

Stream Properties

Property	Units	Acid Gas	Amine Flash Gas 1	G2	Outlet Gas	R15
Temperature	°F	120	165 *	100	109.9	237.488
Pressure	psig	8	75	1440	1431	13
Mole Fraction Vapor	%	100	100	100	100	0
Mole Fraction Light Liquid	%	0	0	0	0	100
Mole Fraction Heavy Liquid	%	0	0	0	0	0
Phase Mole Fraction	%	100	100	100	100	100
Molecular Weight	lb/lbmol	42.0416	31.1338	24.8178	22.0989	31.7922
Mass Density	lb/ft^3	0.154494	0.423152	8.38506	6.94372	64.2051
Molar Flow	lbmol/h	418.046	20.0709	3296.5	2877.94	6156.94
Mass Flow	lb/h	17575.3	624.883	81811.8	63599.2	195743
Vapor Volumetric Flow	ft^3/h	113761	1476.73	9756.85	9159.23	3048.71
Liquid Volumetric Flow	gpm	14183.1	184.112	1216.44	1141.93	380.099
Std Vapor Volumetric Flow	MMSCFD	3.80741	0.182798	30.0232	26.2112	56.075
Std Liquid Volumetric Flow	sgpm	42.7704	2.18383	395.222	349.217	400 *
Compressibility		0.992823	0.984452	0.716859	0.752738	0.00183304
Specific Gravity		1.45159	1.07497	0.856895	0.763017	1.02944
API Gravity						-0.625938
Enthalpy	Btu/h	-6.83992E+07	-1.99389E+06	-1.67601E+08	-9.86641E+07	-7.66408E+08
Mass Enthalpy	Btu/lb	-3891.77	-3190.82	-2048.61	-1551.34	-3915.38
Mass Cp	Btu/(lb*°F)	0.21702	0.320305	0.681466	0.724661	0.873413
Ideal Gas CpCv Ratio		1.28098	1.25447	1.23753	1.23092	1.12363
Dynamic Viscosity	cP	0.0161185	0.0152659	0.0168938	0.0155966	1.00101
Kinematic Viscosity	cSt	6.51317	2.25219	0.125777	0.140222	0.973302
Thermal Conductivity	Btu/(h*ft*°F)	0.0106627	0.0169187	0.0249058	0.0256709	0.183763
Surface Tension	lbf/ft					0.00291116
Net Ideal Gas Heating Value	Btu/ft^3	3.52361	518.914	1020.7	1154.49	496.66

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine400 sgpm #1	

Stream Properties

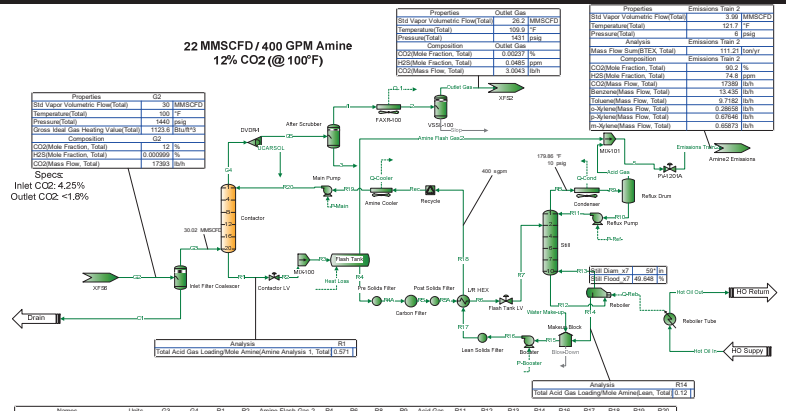
Property	Units	Acid Gas	Amine Flash Gas 1	G2	Outlet Gas	R15
Net Liquid Heating Value	Btu/lb	-75.0608	6228	15539.7	19760.2	5258.79
Gross Ideal Gas Heating Value	Btu/ft^3	7.5567	574.96	1123.63	1271.08	583.016
Gross Liquid Heating Value	Btu/lb	-38.6568	6911.25	17113.8	21762.6	6289.56

Remarks

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Amine 400 sgpm #2
Plant Schematic

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine 400 sgpm #2	



Properties	Outlet Gas	
Std Vapor Volumetric Flow(Total)	26.2	MMSCFD
Temperature(Total)	109.9	°F
Pressure(Total)	1431	psig
Composition	Outlet Gas	
CO2(Mole Fraction, Total)	0.00237	%
H2S(Mole Fraction, Total)	0.0485	ppm
CO2(Mass Flow, Total)	3.0043	lb/h

Properties	Emissions Train 2	
Std Vapor Volumetric Flow(Total)	3.99	MMSCFD
Temperature(Total)	121.7	°F
Pressure(Total)	6	psig
Analysis	Emissions Train 2	
Mass Flow Sum(BTEX, Total)	111.21	ton/yr
Composition	Emissions Train 2	
CO2(Mole Fraction, Total)	90.2	%
H2S(Mole Fraction, Total)	74.8	ppm
CO2(Mass Flow, Total)	17389	lb/h
Benzene(Mass Flow, Total)	13.435	lb/h
Toluene(Mass Flow, Total)	9.7182	lb/h
o-Xylene(Mass Flow, Total)	0.28638	lb/h
p-Xylene(Mass Flow, Total)	0.87646	lb/h
m-Xylene(Mass Flow, Total)	0.65873	lb/h

Properties	G2	
Std Vapor Volumetric Flow(Total)	30	MMSCFD
Temperature(Total)	100	°F
Pressure(Total)	1440	psig
Gross Ideal Gas Heating Value(Total)	1123.6	Btu/ft^3
Composition	G2	
CO2(Mole Fraction, Total)	12	%
H2S(Mole Fraction, Total)	0.000999	%
CO2(Mass Flow, Total)	17393	lb/h

Analysis	R1	
Total Acid Gas Loading(Mole Amine)Amine Analysis 1, Total	0.571	

Analysis	R14	
Total Acid Gas Loading(Mole Amine)Lean, Total	0.12	

Names	Units	G3	G4	R1	R2	Amine Flash Gas 2	R4	R6	R8	R9	Acid Gas	R11	R12	R13	R14	R16	R17	R18	R19	R20
Temperature	°F	100	106	170	172	165*	165	210*	180	120	120	120	213	238*	238	238	238	178	103*	106
Pressure	psig	1439	1436	1439	75*	75	75	70	10	8	8	70*	13	13	13	73	73	68	63	1450#
Mole Fraction Vapor	%	100	100	0	0.389	100	0	1.84	100	75.1	100	100	0	0	100	0	0	0	0	0
Std Vapor Volumetric Flow	MMSCFD	30.021	26.322	59.774	59.774	0.1828	59.591	59.591	5.0699	5.0699	3.8074	1.2625	60.84	5.0562	55.784	56.075	56.075	56.075	56.075	56.075
Std Liquid Volumetric Flow	sgpm	395.18	351.38	443.8	443.8	2.1838	441.62	441.62	47.768	47.768	42.77	4.9971	428.96	30.117	398.85	400	400	400	400	400
Specific Gravity		0.85684	0.78871	1.1609		1.075	1.1604		1.2451		1.4518	0.99914	1.0828	0.85074	1.0296	1.0295	1.0295	1.0518	1.0731	1.0742
Total Acid Gas Loading(Mole Amine)				0.57											0.12					
CO2(Mole Fraction)	%	12	0.00237	7.63	7.63	46.8	7.51	7.51	69.3	69.3	92.3	0.0508	3.67	25.2	1.72	1.71	1.71	1.71	1.71	1.71
CO2(Mass Flow)	lb/h	17392	3.0141	22031	22031	413.22	21617	21617	16979	16979	16976	3.102	10788	6145.9	4641.8	4641.8	4641.8	4641.8	4641.8	4641.8

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine 400 sgpm #2	

Connections

	Acid Gas	Amine Flash Gas 2	G2	Outlet Gas	R15
From Block	Reflux Drum	Flash Tank	XFS6	VSSL-100	Makeup Block
To Block	MIX-101	MIX-101	Inlet Filter Coalescer	XFS2	Booster

Stream Composition

Mole Fraction	Acid Gas %	Amine Flash Gas 2 %	G2 %	Outlet Gas %	R15 %
Nitrogen	0.000616894	0.833031	3.2928	3.76204	0
CO2	92.2682	46.7804	11.9886	0.00237202	1.71309
H2S	0.00769345	0.00303576	0.000998901	4.84796E-06	0.000211225
Methane	0.0874379	39.102	65.6931	74.8151	0
Ethane	0.0166252	5.2724	9.45644	10.7376	0
Propane	0.0045441	1.77472	5.22256	5.91254	0
i-Butane	0.000297301	0.146908	0.691707	0.779153	0
n-Butane	0.00131255	0.465401	1.68693	1.89304	0
Isopentane	5.32369E-05	0.0423602	0.471705	0.524919	0
n-Pentane	9.4182E-05	0.0562377	0.464663	0.514453	0
i-C6	2.70023E-05	0.0221873	0.313105	0.34048	0
n-C6	1.19392E-05	0.00984944	0.148078	0.15942	0
Benzene	0.033189	0.165656	0.0592162	0.0579158	0
Cyclohexane	0.00025729	0.0315753	0.0759676	0.0806355	0
2-Methylhexane	3.36587E-07	0.000525317	0.0187293	0.0196551	0
C7	2.49797E-06	0.00391554	0.149695	0.154246	0
Toluene	0.0199962	0.10902	0.0531374	0.0508017	0
2,2,4-Trimethylpentane	2.55319E-07	0.000352081	0.0118192	0.0122547	0
C8	1.01567E-06	0.00134757	0.0578644	0.0552413	0
Ethylbenzene	0.00104774	0.00711798	0.00490029	0.00441421	0
o-Xylene	0.000517783	0.00266471	0.00195403	0.0017191	0
p-Xylene	0.00122248	0.00628426	0.00440559	0.00392483	0
m-Xylene	0.00119023	0.00612339	0.00440482	0.00391883	0
Isononane	3.51505E-08	0.000114848	0.0156121	0.0136578	0
C9	6.59586E-09	2.07087E-05	0.0029154	0.00243925	0
C10	0	1.25731E-05	0.00866035	0.00617141	0
Water	7.55566	5.15614	0.100039	0.0919019	84.0516
DGA	0	0	0	0	0
MDEA	0	0	0	0	0
Piperazine	0	0	0	0	0
CHEMTHERM 550	0	0	0	0	0
UCARSOL™ AP-814	2.95512E-14	0.000582147	0	0	14.2351

Molar Flow	Acid Gas lbmol/h	Amine Flash Gas 2 lbmol/h	G2 lbmol/h	Outlet Gas lbmol/h	R15 lbmol/h
Nitrogen	0.0025789	0.167197	108.547	108.269	0
CO2	385.724	9.38923	395.202	0.0682653	105.474
H2S	0.0321622	0.000609303	0.0329287	0.000139521	0.013005
Methane	0.365531	7.84812	2165.57	2153.13	0
Ethane	0.0695012	1.05822	311.731	309.022	0
Propane	0.0189965	0.356202	172.161	170.159	0
i-Butane	0.00124286	0.0294857	22.8021	22.4236	0
n-Butane	0.00548707	0.0934101	55.6096	54.4806	0
Isopentane	0.000222555	0.00850207	15.5497	15.1069	0
n-Pentane	0.000393724	0.0112874	15.3176	14.8056	0
i-C6	0.000112882	0.00445318	10.3215	9.79882	0
n-C6	4.99112E-05	0.00197687	4.88137	4.58802	0
Benzene	0.138745	0.0332486	1.95206	1.66678	0
Cyclohexane	0.00107559	0.00633743	2.50427	2.32064	0
2-Methylhexane	1.40709E-06	0.000105436	0.617411	0.565661	0

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine 400 sgpm #2	

Molar Flow	Acid Gas lbmol/h	Amine Flash Gas 2 lbmol/h	G2 lbmol/h	Outlet Gas lbmol/h	R15 lbmol/h
C7	1.04426E-05	0.000785883	4.93468	4.43911	0
Toluene	0.0835932	0.0218812	1.75167	1.46204	0
2,2,4-Trimethylpentane	1.06735E-06	7.06658E-05	0.389619	0.352683	0
C8	4.24597E-06	0.00027047	1.9075	1.58981	0
Ethylbenzene	0.00438004	0.00142864	0.161538	0.127038	0
o-Xylene	0.00216457	0.000534831	0.0644145	0.0494748	0
p-Xylene	0.00511051	0.00126131	0.14523	0.112954	0
m-Xylene	0.00497571	0.00122902	0.145205	0.112781	0
Isononane	1.46945E-07	2.3051E-05	0.514652	0.393062	0
C9	2.75737E-08	4.15643E-06	0.0961061	0.0702	0
C10	0	2.52352E-06	0.285488	0.177609	0
Water	31.5861	1.03488	3.29777	2.64488	5175.01
DGA	0	0	0	0	0
MDEA	0	0	0	0	0
Piperazine	0	0	0	0	0
CHEMTHERM 550	0	0	0	0	0
UCARSOL™ AP-814	1.23538E-13	0.000116842	0	0	876.447

Mass Fraction	Acid Gas %	Amine Flash Gas 2 %	G2 %	Outlet Gas %	R15 %
Nitrogen	0.000411052	0.74954	3.71679	4.76891	0
CO2	96.587	66.1268	21.2593	0.00472384	2.3714
H2S	0.00623666	0.00332311	0.00137173	7.47652E-06	0.000226431
Methane	0.033365	20.1483	42.4646	54.3113	0
Ethane	0.0118907	5.09208	11.4573	14.6102	0
Propane	0.00476611	2.51358	9.2793	11.7978	0
i-Butane	0.000411017	0.274255	1.61995	2.04925	0
n-Butane	0.00181459	0.868834	3.95071	4.97889	0
Isopentane	9.13613E-05	0.0981646	1.37131	1.71377	0
n-Pentane	0.000161628	0.130324	1.35084	1.6796	0
i-C6	5.53482E-05	0.0614121	1.0872	1.32772	0
n-C6	2.44724E-05	0.0272623	0.514172	0.621665	0
Benzene	0.061664	0.415615	0.186378	0.204712	0
Cyclohexane	0.000515046	0.0853527	0.257613	0.307085	0
2-Methylhexane	8.0222E-07	0.00169069	0.0756196	0.0891212	0
C7	5.95364E-06	0.0126019	0.604393	0.699392	0
Toluene	0.0438236	0.322636	0.197278	0.211811	0
2,2,4-Trimethylpentane	6.93709E-07	0.00129177	0.0544	0.0633442	0
C8	2.75961E-06	0.00494418	0.266331	0.285541	0
Ethylbenzene	0.00264579	0.024272	0.0209623	0.0212063	0
o-Xylene	0.00130752	0.00908655	0.0083589	0.00825873	0
p-Xylene	0.00308704	0.0214291	0.0188461	0.0188553	0
m-Xylene	0.00300561	0.0208805	0.0188428	0.0188264	0
Isononane	1.07232E-07	0.000473114	0.0806812	0.0792655	0
C9	2.01218E-08	8.53092E-05	0.0150664	0.0141566	0
C10	0	5.74589E-05	0.0496502	0.0397341	0
Water	3.23768	2.98355	0.0726182	0.0749196	47.6284
DGA	0	0	0	0	0
MDEA	0	0	0	0	0
Piperazine	0	0	0	0	0
CHEMTHERM 550	0	0	0	0	0
UCARSOL™ AP-814	7.92103E-14	0.00217291	0	0	50

Mass Flow	Acid Gas lb/h	Amine Flash Gas 2 lb/h	G2 lb/h	Outlet Gas lb/h	R15 lb/h
Nitrogen	0.0722438	4.68375	3040.77	3032.99	0
CO2	16975.5	413.215	17392.7	3.00432	4641.85
H2S	1.09611	0.0207656	1.12224	0.00475501	0.443223

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine 400 sgpm #2	

Mass Flow	Acid Gas lb/h	Amine Flash Gas 2 lb/h	G2 lb/h	Outlet Gas lb/h	R15 lb/h
Methane	5.86401	125.903	34741.1	34541.5	0
Ethane	2.08983	31.8196	9373.46	9291.98	0
Propane	0.83766	15.707	7591.56	7503.28	0
i-Butane	0.0722376	1.71378	1325.31	1303.31	0
n-Butane	0.31892	5.4292	3232.15	3166.53	0
Isopentane	0.0160571	0.613414	1121.9	1089.94	0
n-Pentane	0.0284067	0.814371	1105.15	1068.21	0
i-C6	0.00972764	0.383754	889.459	844.417	0
n-C6	0.00430112	0.170357	420.654	395.374	0
Benzene	10.8377	2.59711	152.479	130.195	0
Cyclohexane	0.0905211	0.533355	210.758	195.304	0
2-Methylhexane	0.000140993	0.0105649	61.8658	56.6803	0
C7	0.00104637	0.078747	494.465	444.808	0
Toluene	7.70215	2.0161	161.396	134.71	0
2,2,4-Trimethylpentane	0.000121922	0.00807205	44.5056	40.2864	0
C8	0.000485011	0.0308954	217.89	181.602	0
Ethylbenzene	0.465006	0.151672	17.1496	13.487	0
o-Xylene	0.229802	0.0567803	6.83857	5.25249	0
p-Xylene	0.542558	0.133907	15.4183	11.9918	0
m-Xylene	0.528246	0.130479	15.4156	11.9734	0
Isononane	1.88465E-05	0.00295641	66.0068	50.4123	0
C9	3.53647E-06	0.000533083	12.3261	9.00351	0
C10	0	0.000359051	40.6197	25.2706	0
Water	569.033	18.6437	59.4102	47.6483	93229.2
DGA	0	0	0	0	0
MDEA	0	0	0	0	0
Piperazine	0	0	0	0	0
CHEMTHERM 550	0	0	0	0	0
UCARSOL™ AP-814	1.39215E-11	0.0135782	0	0	97871.5

Stream Properties

Property	Units	Acid Gas	Amine Flash Gas 2	G2	Outlet Gas	R15
Temperature	°F	120	165 *	100	109.9	237.488
Pressure	psig	8	75	1440	1431	13
Mole Fraction Vapor	%	100	100	100	100	0
Mole Fraction Light Liquid	%	0	0	0	0	100
Mole Fraction Heavy Liquid	%	0	0	0	0	0
Phase Mole Fraction	%	100	100	100	100	100
Molecular Weight	lb/lbmol	42.0416	31.1338	24.8178	22.0989	31.7922
Mass Density	lb/ft^3	0.154494	0.423152	8.38506	6.94372	64.2051
Molar Flow	lbmol/h	418.046	20.0709	3296.5	2877.94	6156.94
Mass Flow	lb/h	17575.3	624.883	81811.8	63599.2	195743
Vapor Volumetric Flow	ft^3/h	113761	1476.73	9756.85	9159.23	3048.71
Liquid Volumetric Flow	gpm	14183.1	184.112	1216.44	1141.93	380.099
Std Vapor Volumetric Flow	MMSCFD	3.80741	0.182798	30.0232	26.2112	56.075
Std Liquid Volumetric Flow	sgpm	42.7704	2.18383	395.222	349.217	400 *
Compressibility		0.992823	0.984452	0.716859	0.752738	0.00183304
Specific Gravity		1.45159	1.07497	0.856895	0.763017	1.02944
API Gravity						-0.625938
Enthalpy	Btu/h	-6.83992E+07	-1.99389E+06	-1.67601E+08	-9.86641E+07	-7.66408E+08
Mass Enthalpy	Btu/lb	-3891.77	-3190.82	-2048.61	-1551.34	-3915.38
Mass Cp	Btu/(lb*°F)	0.21702	0.320305	0.681466	0.724661	0.873413
Ideal Gas CpCv Ratio		1.28098	1.25447	1.23753	1.23092	1.12363
Dynamic Viscosity	cP	0.0161185	0.0152659	0.0168938	0.0155966	1.00101
Kinematic Viscosity	cSt	6.51317	2.25219	0.125777	0.140222	0.973302
Thermal Conductivity	Btu/(h*ft*°F)	0.0106627	0.0169187	0.0249058	0.0256709	0.183763
Surface Tension	lbf/ft					0.00291116
Net Ideal Gas Heating Value	Btu/ft^3	3.52361	518.914	1020.7	1154.49	496.66

* User Specified Values
? Extrapolated or Approximate Values

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Amine 400 sgpm #2	

Stream Properties

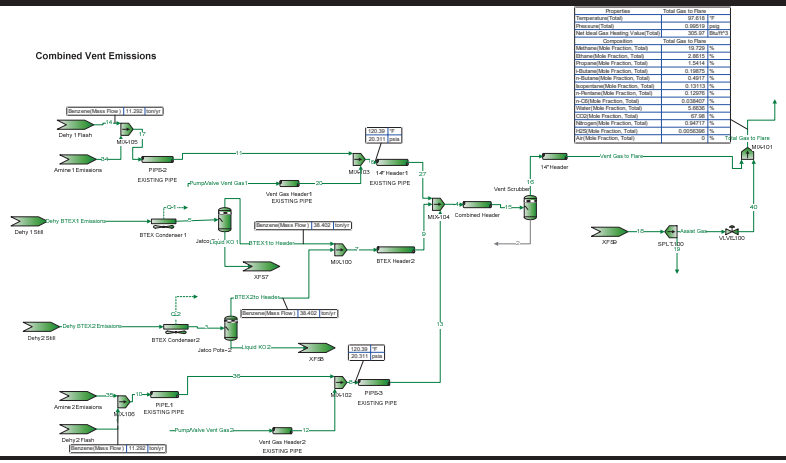
Property	Units	Acid Gas	Amine Flash Gas 2	G2	Outlet Gas	R15
Net Liquid Heating Value	Btu/lb	-75.0608	6228	15539.7	19760.2	5258.79
Gross Ideal Gas Heating Value	Btu/ft^3	7.55671	574.96	1123.63	1271.08	583.016
Gross Liquid Heating Value	Btu/lb	-38.6568	6911.25	17113.8	21762.6	6289.56

Remarks

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Combined Vent Emissions
Plant Schematic

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Combined Vent Emissions	



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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Combined Vent Emissions	

Connections

	Assist Gas	Dehy BTEX 1 Emissions	Dehy BTEX 2 Emissions	Liquid KO 1	Liquid KO 2
From Block	SPLT-100	Dehy 1 Still	Dehy 2 Still	Jatco Pots	Jatco Pots - 2
To Block	VLVE-100	BTEX Condenser 1	BTEX Condenser 2	XFS7	XFS8

Stream Composition

Mole Fraction	Assist Gas %	Dehy BTEX 1 Emissions %	Dehy BTEX 2 Emissions %	Liquid KO 1 %	Liquid KO 2 %
Methane	74.9135	21.8474	21.8474	0.0138361	0.0138361
Ethane	10.744	3.66871	3.66871	0.0121779	0.0121779
Propane	5.91323	2.455	2.455	0.0231767	0.0231767
i-Butane	0.779227	0.363182	0.363182	0.00756166	0.00756166
n-Butane	1.89181	1.11767	1.11767	0.0345405	0.0345405
Isopentane	0.524492	0.404093	0.404093	0.029633	0.029633
n-Pentane	0.513686	0.475455	0.475455	0.0431038	0.0431038
n-C6	0.159	0.259666	0.259666	0.0634459	0.0634459
C7	0.153573	0.415489	0.415489	0.231006	0.231006
Benzene	0.0518315	3.51127	3.51127	1.54682	1.54682
o-Xylene	0.00141915	0.194479	0.194479	0.248614	0.248614
Ethylbenzene	0	0.439926	0.439926	0.563591	0.563591
Toluene	0.0438329	4.31137	4.31137	3.6914	3.6914
Water	0.00450968	57.4038	57.4038	91.9074	91.9074
TEG	0.000211992	0.00031712	0.00031712	0.000551455	0.000551455
CO2	0.00236538	0.00133981	0.00133981	3.6286E-06	3.6286E-06
Nitrogen	3.76834	1.05492	1.05492	0.000180598	0.000180598
MDEA	0	0	0	0	0
DEA	0	0	0	0	0
H2S	4.76625E-06	1.68201E-05	1.68212E-05	1.58406E-07	1.58417E-07
Oxygen	0	0	0	0	0
SO2	0	0	0	0	0
Cyclohexane	0.0795503	0.521294	0.521294	0.187921	0.187921
C8	0.054924	0.22128	0.22128	0.216468	0.216468
m-Xylene	0.00336605	0.355908	0.355908	0.457937	0.457937
C10	0.00611264	0.0481955	0.0481955	0.0749437	0.0749437
C9	0.00242101	0.0141039	0.0141039	0.0179508	0.0179508
Piperazine	0	0	0	0	0
2,2-Dimethylpropane	0	0	0	0	0
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	0	0	0	0
2,3-Dimethylbutane	0	0	0	0	0
i-C6	0.339844	0.437829	0.437829	0.0801238	0.0801238
3-Methylpentane	0	0	0	0	0
Methylcyclopentane	0	0	0	0	0
2-Methylhexane	0.0195953	0.0390693	0.0390693	0.0167272	0.0167272
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	0.0122114	0.0293826	0.0293826	0.0150392	0.0150392
Methylcyclohexane	0	0	0	0	0
C11	0	0	0	0	0
MeOH	0	0	0	0	0
C12	0	0	0	0	0
DGA	0	0	0	0	0
Air	0	0	0	0	0
Isononane	0.0135649	0.0707212	0.0707212	0.0822846	0.0822846
p-Xylene	0.00339844	0.338103	0.338103	0.433609	0.433609

Molar Flow	Assist Gas lbmol/h	Dehy BTEX 1 Emissions lbmol/h	Dehy BTEX 2 Emissions lbmol/h	Liquid KO 1 lbmol/h	Liquid KO 2 lbmol/h
Methane	142.299	0.935335	0.935335	0.000340638	0.000340638

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Combined Vent Emissions	

Molar Flow	Assist Gas lbmol/h	Dehy BTEX 1 Emissions lbmol/h	Dehy BTEX 2 Emissions lbmol/h	Liquid KO 1 lbmol/h	Liquid KO 2 lbmol/h
Ethane	20.4084	0.157066	0.157066	0.000299815	0.000299815
Propane	11.2322	0.105104	0.105104	0.000570598	0.000570598
i-Butane	1.48015	0.0155486	0.0155486	0.000186164	0.000186164
n-Butane	3.5935	0.0478498	0.0478498	0.00085037	0.00085037
Isopentane	0.996277	0.0173001	0.0173001	0.00072955	0.00072955
n-Pentane	0.975751	0.0203553	0.0203553	0.00106119	0.00106119
n-C6	0.302022	0.0111169	0.0111169	0.00156201	0.00156201
C7	0.291714	0.017788	0.017788	0.00568725	0.00568725
Benzene	0.0984544	0.150325	0.150325	0.038082	0.038082
o-Xylene	0.00269568	0.00832606	0.00832606	0.00612075	0.00612075
Ethylbenzene	0	0.0188342	0.0188342	0.0138753	0.0138753
Toluene	0.083261	0.184579	0.184579	0.0908804	0.0908804
Water	0.00856618	2.45759	2.45759	2.26271	2.26271
TEG	0.000402681	1.35766E-05	1.35766E-05	1.35766E-05	1.35766E-05
CO2	0.00449305	5.73601E-05	5.73601E-05	8.93343E-08	8.93343E-08
Nitrogen	7.15799	0.0451636	0.0451636	4.44624E-06	4.44624E-06
MDEA	0	0	0	0	0
DEA	0	0	0	0	0
H2S	9.05353E-06	7.20108E-07	7.20155E-07	3.89988E-09	3.90014E-09
Oxygen	0	0	0	0	0
SO2	0	0	0	0	0
Cyclohexane	0.151107	0.0223177	0.0223177	0.00462652	0.00462652
C8	0.104329	0.00947348	0.00947348	0.00532933	0.00532933
m-Xylene	0.00639383	0.0152372	0.0152372	0.0112742	0.0112742
C10	0.011611	0.00206336	0.00206336	0.00184508	0.00184508
C9	0.00459872	0.000603821	0.000603821	0.000441941	0.000441941
Piperazine	0	0	0	0	0
2,2-Dimethylpropane	0	0	0	0	0
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	0	0	0	0
2,3-Dimethylbutane	0	0	0	0	0
i-C6	0.645536	0.0187444	0.0187444	0.00197261	0.00197261
3-Methylpentane	0	0	0	0	0
Methylcyclopentane	0	0	0	0	0
2-Methylhexane	0.0372215	0.00167264	0.00167264	0.000411815	0.000411815
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	0.0231957	0.00125794	0.00125794	0.000370257	0.000370257
Methylcyclohexane	0	0	0	0	0
C11	0	0	0	0	0
MeOH	0	0	0	0	0
C12	0	0	0	0	0
DGA	0	0	0	0	0
Air	0	0	0	0	0
Isononane	0.0257667	0.00302773	0.00302773	0.00202581	0.00202581
p-Xylene	0.00645536	0.0144749	0.0144749	0.0106752	0.0106752

Mass Fraction	Assist Gas %	Dehy BTEX 1 Emissions %	Dehy BTEX 2 Emissions %	Liquid KO 1 %	Liquid KO 2 %
Methane	54.4263	12.5585	12.5585	0.00921046	0.00921046
Ethane	14.6307	3.95275	3.95275	0.0151946	0.0151946
Propane	11.8086	3.87894	3.87894	0.0424074	0.0424074
i-Butane	2.05109	0.756367	0.756367	0.0182371	0.0182371
n-Butane	4.97962	2.32767	2.32767	0.0833041	0.0833041
Isopentane	1.71374	1.04466	1.04466	0.0887158	0.0887158
n-Pentane	1.67844	1.22915	1.22915	0.129045	0.129045
n-C6	0.620523	0.801797	0.801797	0.226873	0.226873
C7	0.696899	1.49177	1.49177	0.960495	0.960495
Benzene	0.183353	9.8276	9.8276	5.01364	5.01364
o-Xylene	0.00682318	0.739809	0.739809	1.09522	1.09522

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Combined Vent Emissions	

Mass Fraction	Assist Gas %	Dehy BTEX 1 Emissions %	Dehy BTEX 2 Emissions %	Liquid KO 1 %	Liquid KO 2 %
Ethylbenzene	0	1.67351	1.67351	2.4828	2.4828
Toluene	0.182902	14.2339	14.2339	14.1133	14.1133
Water	0.0036793	37.0551	37.0551	68.7048	68.7048
TEG	0.00144175	0.00170641	0.00170641	0.00343636	0.00343636
CO2	0.00471438	0.00211279	0.00211279	6.62646E-06	6.62646E-06
Nitrogen	4.78073	1.05889	1.05889	0.00020993	0.00020993
MDEA	0	0	0	0	0
DEA	0	0	0	0	0
H2S	7.3564E-06	2.05403E-05	2.05417E-05	2.24016E-07	2.24031E-07
Oxygen	0	0	0	0	0
SO2	0	0	0	0	0
Cyclohexane	0.303196	1.572	1.572	0.656257	0.656257
C8	0.284129	0.905697	0.905697	1.02604	1.02604
m-Xylene	0.0161838	1.3539	1.3539	2.01736	2.01736
C10	0.0393872	0.245709	0.245709	0.442466	0.442466
C9	0.014062	0.0648159	0.0648159	0.0955334	0.0955334
Piperazine	0	0	0	0	0
2,2-Dimethylpropane	0	0	0	0	0
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	0	0	0	0
2,3-Dimethylbutane	0	0	0	0	0
i-C6	1.3263	1.35193	1.35193	0.286511	0.286511
3-Methylpentane	0	0	0	0	0
Methylcyclopentane	0	0	0	0	0
2-Methylhexane	0.0889215	0.140274	0.140274	0.0695496	0.0695496
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	0.0631712	0.120263	0.120263	0.0712844	0.0712844
Methylcyclohexane	0	0	0	0	0
C11	0	0	0	0	0
MeOH	0	0	0	0	0
C12	0	0	0	0	0
DGA	0	0	0	0	0
Air	0	0	0	0	0
Isononane	0.0787899	0.325005	0.325005	0.437914	0.437914
p-Xylene	0.0163395	1.28616	1.28616	1.91019	1.91019

Mass Flow	Assist Gas lb/h	Dehy BTEX 1 Emissions lb/h	Dehy BTEX 2 Emissions lb/h	Liquid KO 1 lb/h	Liquid KO 2 lb/h
Methane	2282.82	15.0051	15.0051	0.00546468	0.00546468
Ethane	613.66	4.72281	4.72281	0.00901514	0.00901514
Propane	495.292	4.63463	4.63463	0.0251609	0.0251609
i-Butane	86.0295	0.90372	0.90372	0.0108203	0.0108203
n-Butane	208.862	2.78114	2.78114	0.0494254	0.0494254
Isopentane	71.8801	1.24818	1.24818	0.0526362	0.0526362
n-Pentane	70.3992	1.46861	1.46861	0.0765638	0.0765638
n-C6	26.0268	0.958001	0.958001	0.134606	0.134606
C7	29.2303	1.78239	1.78239	0.569873	0.569873
Benzene	7.69046	11.7422	11.7422	2.97466	2.97466
o-Xylene	0.286187	0.883936	0.883936	0.64981	0.64981
Ethylbenzene	0	1.99953	1.99953	1.47307	1.47307
Toluene	7.67154	17.0069	17.0069	8.37358	8.37358
Water	0.154322	44.2741	44.2741	40.7634	40.7634
TEG	0.0604718	0.00203884	0.00203884	0.00203883	0.00203883
CO2	0.197737	0.00252439	0.00252439	3.93156E-06	3.93156E-06
Nitrogen	200.52	1.26519	1.26519	0.000124554	0.000124554
MDEA	0	0	0	0	0
DEA	0	0	0	0	0
H2S	0.000308552	2.45419E-05	2.45435E-05	1.32911E-07	1.3292E-07
Oxygen	0	0	0	0	0

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Combined Vent Emissions	

Mass Flow	Assist Gas lb/h	Dehy BTEX 1 Emissions lb/h	Dehy BTEX 2 Emissions lb/h	Liquid KO 1 lb/h	Liquid KO 2 lb/h
SO2	0	0	0	0	0
Cyclohexane	12.717	1.87825	1.87825	0.389365	0.389365
C8	11.9173	1.08214	1.08214	0.608761	0.608761
m-Xylene	0.678801	1.61766	1.61766	1.19692	1.19692
C10	1.65203	0.293578	0.293578	0.262521	0.262521
C9	0.589809	0.0774431	0.0774431	0.0566811	0.0566811
Piperazine	0	0	0	0	0
2,2-Dimethylpropane	0	0	0	0	0
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	0	0	0	0
2,3-Dimethylbutane	0	0	0	0	0
i-C6	55.6293	1.61531	1.61531	0.16999	0.16999
3-Methylpentane	0	0	0	0	0
Methylcyclopentane	0	0	0	0	0
2-Methylhexane	3.72967	0.167602	0.167602	0.0412646	0.0412646
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	2.64961	0.143692	0.143692	0.0422939	0.0422939
Methylcyclohexane	0	0	0	0	0
C11	0	0	0	0	0
MeOH	0	0	0	0	0
C12	0	0	0	0	0
DGA	0	0	0	0	0
Air	0	0	0	0	0
Isononane	3.30471	0.388322	0.388322	0.25982	0.25982
p-Xylene	0.685334	1.53673	1.53673	1.13334	1.13334

Stream Properties

Property	Units	Assist Gas	Dehy BTEX 1 Emissions	Dehy BTEX 2 Emissions	Liquid KO 1	Liquid KO 2
Temperature	°F	111.985	189.11	189.11	120	120
Pressure	psig	1423	1.182	1.182	1.182	1.182
Mole Fraction Vapor	%	100	100	100	0	0
Mole Fraction Light Liquid	%	0	0	0	8.11164	8.11164
Mole Fraction Heavy Liquid	%	0	0	0	91.8884	91.8884
Phase Mole Fraction	%	100	100	100	100	100
Molecular Weight	lb/lbmol	22.0812	27.9083	27.9083	24.0993	24.0993
Mass Density	lb/ft^3	6.82884	0.0641059	0.0641059	57.8381	57.8381
Molar Flow	lbmol/h	189.951	4.28122	4.28122	2.46195	2.46195
Mass Flow	lb/h	4194.34	119.482	119.482	59.3312	59.3312
Vapor Volumetric Flow	ft^3/h	614.209	1863.82	1863.82	1.02582	1.02582
Liquid Volumetric Flow	gpm	76.5768	232.372	232.372	0.127894	0.127894
Std Vapor Volumetric Flow	MMSCFD	1.73 *	0.0389917	0.0389917	0.0224225	0.0224225
Std Liquid Volumetric Flow	sgpm	23.0562	0.361034	0.361034	0.125568	0.125568
Compressibility		0.757782	0.992815	0.992815	0.00106351	0.00106351
Specific Gravity		0.762405	0.963601	0.963601	0.927357	0.927357
API Gravity					18.0123	18.0123
Enthalpy	Btu/h	-6.49358E+06	-293123	-293123	-277687	-277687
Mass Enthalpy	Btu/lb	-1548.18	-2453.28	-2453.28	-4680.28	-4680.28
Mass Cp	Btu/(lb*°F)	0.719341	0.431403	0.431403	0.806438	0.806438
Ideal Gas CpCv Ratio		1.23048	1.19869	1.19869	1.25608	1.25608
Dynamic Viscosity	cP	0.0155233	0.0124112	0.0124112	0.520904	0.520904
Kinematic Viscosity	cSt	0.141911	12.0864	12.0864	0.562241	0.562241
Thermal Conductivity	Btu/(h*ft*°F)	0.0255982	0.0160886	0.0160886	0.262354	0.262354
Surface Tension	lbf/ft				0.0035855 ?	0.0035855 ?
Net Ideal Gas Heating Value	Btu/ft^3	1154.47	867.018	867.018	354.289	354.289
Net Liquid Heating Value	Btu/lb	19776.6	11312.4	11312.4	4796.31	4796.31
Gross Ideal Gas Heating Value	Btu/ft^3	1271.07	959.742	959.742	419.036	419.036
Gross Liquid Heating Value	Btu/lb	21780.8	12573.1	12573.1	5815.64	5815.64

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Combined Vent Emissions	

Connections

	Total Gas to Flare	Vent Gas to Flare	40		
From Block	MIX-101	14" Header	VLVE-100		
To Block	--	MIX-101	MIX-101		

Stream Composition

Mole Fraction	Total Gas to Flare %	Vent Gas to Flare %	40 %		
Methane	19.7289	8.95016	74.9135		
Ethane	2.86148	1.32184	10.744		
Propane	1.54143	0.687525	5.91323		
i-Butane	0.19875	0.0853695	0.779227		
n-Butane	0.491705	0.218233	1.89181		
Isopentane	0.131129	0.0542959	0.524492		
n-Pentane	0.12976	0.0547701	0.513686		
n-C6	0.0384066	0.014852	0.159		
C7	0.0353195	0.0122219	0.153573		
Benzene	0.064808	0.0673426	0.0518315		
o-Xylene	0.00119565	0.00115199	0.00141915		
Ethylbenzene	0.00213306	0.0025497	0		
Toluene	0.0460928	0.0465342	0.0438329		
Water	5.66358	6.76892	0.00450968		
TEG	4.6417E-05	1.40765E-05	0.000211992		
CO2	67.98	81.2576	0.00236538		
Nitrogen	0.947171	0.396134	3.76834		
MDEA	4.96585E-08	5.9358E-08	0		
DEA	5.94284E-14	7.10361E-14	0		
H2S	0.00563961	0.00674022	4.76625E-06		
Oxygen	0	0	0		
SO2	0	0	0		
Cyclohexane	0.0236669	0.0127516	0.0795503		
C8	0.0116865	0.00324125	0.054924		
m-Xylene	0.00250453	0.00233625	0.00336605		
C10	0.00114075	0.000169624	0.00611264		
C9	0.000477125	9.74413E-05	0.00242101		
Piperazine	8.1316E-14	9.71988E-14	0		
2,2-Dimethylpropane	0	0	0		
2,2-Dimethylbutane	0	0	0		
Cyclopentane	0	0	0		
2,3-Dimethylbutane	0	0	0		
i-C6	0.0799434	0.029179	0.339844		
3-Methylpentane	0	0	0		
Methylcyclopentane	0	0	0		
2-Methylhexane	0.00398373	0.000934436	0.0195953		
3-Methylhexane	0	0	0		
2,2,4-Trimethylpentane	0.00274887	0.000900618	0.0122114		
Methylcyclohexane	0.00101139	0.00120894	0		
C11	0	0	0		
MeOH	6.31402E-07	7.54729E-07	0		
C12	0	0	0		
DGA	0	0	0		
Air	0	0	0		
Isononane	0.00270438	0.000583063	0.0135649		
p-Xylene	0.00251211	0.00233899	0.00339844		

Molar Flow	Total Gas to Flare lbmol/h	Vent Gas to Flare lbmol/h	40 lbmol/h		
Methane	229.339	87.0402	142.299		
Ethane	33.2632	12.8549	20.4084		

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Combined Vent Emissions	

Molar Flow	Total Gas to Flare lbmol/h	Vent Gas to Flare lbmol/h	40 lbmol/h		
Propane	17.9184	6.68617	11.2322		
i-Butane	2.31037	0.830217	1.48015		
n-Butane	5.71582	2.12232	3.5935		
Isopentane	1.5243	0.528027	0.996277		
n-Pentane	1.50839	0.532638	0.975751		
n-C6	0.446458	0.144436	0.302022		
C7	0.410572	0.118858	0.291714		
Benzene	0.75336	0.654906	0.0984544		
o-Xylene	0.0138988	0.0112031	0.00269568		
Ethylbenzene	0.0247958	0.0247958	0		
Toluene	0.535805	0.452544	0.083261		
Water	65.8362	65.8277	0.00856618		
TEG	0.000539575	0.000136894	0.000402681		
CO2	790.233	790.229	0.00449305		
Nitrogen	11.0104	3.85239	7.15799		
MDEA	5.77255E-07	5.77255E-07	0		
DEA	6.90825E-13	6.90825E-13	0		
H2S	0.0655576	0.0655486	9.05353E-06		
Oxygen	0	0	0		
SO2	0	0	0		
Cyclohexane	0.275115	0.124009	0.151107		
C8	0.13585	0.0315211	0.104329		
m-Xylene	0.0291139	0.02272	0.00639383		
C10	0.0132606	0.00164959	0.011611		
C9	0.00554634	0.000947615	0.00459872		
Piperazine	9.45257E-13	9.45257E-13	0		
2,2-Dimethylpropane	0	0	0		
2,2-Dimethylbutane	0	0	0		
Cyclopentane	0	0	0		
2,3-Dimethylbutane	0	0	0		
i-C6	0.929302	0.283766	0.645536		
3-Methylpentane	0	0	0		
Methylcyclopentane	0	0	0		
2-Methylhexane	0.0463089	0.00908737	0.0372215		
3-Methylhexane	0	0	0		
2,2,4-Trimethylpentane	0.0319542	0.0087585	0.0231957		
Methylcyclohexane	0.0117569	0.0117569	0		
C11	0	0	0		
MeOH	7.33973E-06	7.33973E-06	0		
C12	0	0	0		
DGA	0	0	0		
Air	0	0	0		
Isononane	0.031437	0.00567028	0.0257667		
p-Xylene	0.029202	0.0227467	0.00645536		

Mass Fraction	Total Gas to Flare %	Vent Gas to Flare %	40 %		
Methane	8.60374	3.62046	54.4263		
Ethane	2.33896	1.00221	14.6307		
Propane	1.84771	0.764444	11.8086		
i-Butane	0.314023	0.125114	2.05109		
n-Butane	0.776889	0.319834	4.97962		
Isopentane	0.257181	0.0987775	1.71374		
n-Pentane	0.254496	0.0996402	1.67844		
n-C6	0.0899709	0.0322723	0.620523		
C7	0.0962064	0.03088	0.696899		
Benzene	0.137613	0.132638	0.183353		
o-Xylene	0.00345062	0.00308384	0.00682318		
Ethylbenzene	0.00615598	0.00682545	0		

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Combined Vent Emissions	

Mass Fraction	Total Gas to Flare %	Vent Gas to Flare %	40 %		
Toluene	0.115448	0.108112	0.182902		
Water	2.77361	3.07484	0.0036793		
TEG	0.000189488	5.33026E-05	0.00144175		
CO2	81.3281	90.1721	0.00471438		
Nitrogen	0.721285	0.279814	4.78073		
MDEA	1.60859E-07	1.78353E-07	0		
DEA	1.69847E-13	1.88318E-13	0		
H2S	0.00522484	0.00579225	7.3564E-06		
Oxygen	0	0	0		
SO2	0	0	0		
Cyclohexane	0.0541448	0.02706	0.303196		
C8	0.0362888	0.00933575	0.284129		
m-Xylene	0.00722803	0.00625408	0.0161838		
C10	0.00441215	0.000608553	0.0393872		
C9	0.00166349	0.000315123	0.014062		
Piperazine	1.90402E-13	2.11108E-13	0		
2,2-Dimethylpropane	0	0	0		
2,2-Dimethylbutane	0	0	0		
Cyclopentane	0	0	0		
2,3-Dimethylbutane	0	0	0		
i-C6	0.187274	0.0634039	1.3263		
3-Methylpentane	0	0	0		
Methylcyclopentane	0	0	0		
2-Methylhexane	0.0108512	0.00236095	0.0889215		
3-Methylhexane	0	0	0		
2,2,4-Trimethylpentane	0.00853575	0.00259404	0.0631712		
Methylcyclohexane	0.0026995	0.00299307	0		
C11	0	0	0		
MeOH	5.49967E-07	6.09777E-07	0		
C12	0	0	0		
DGA	0	0	0		
Air	0	0	0		
Isononane	0.00942876	0.00188561	0.0787899		
p-Xylene	0.00724992	0.00626141	0.0163395		

Mass Flow	Total Gas to Flare lb/h	Vent Gas to Flare lb/h	40 lb/h		
Methane	3679.16	1396.34	2282.82		
Ethane	1000.19	386.534	613.66		
Propane	790.123	294.831	495.292		
i-Butane	134.284	48.254	86.0295		
n-Butane	332.216	123.354	208.862		
Isopentane	109.977	38.0965	71.8801		
n-Pentane	108.828	38.4292	70.3992		
n-C6	38.4736	12.4468	26.0268		
C7	41.1401	11.9098	29.2303		
Benzene	58.8464	51.1559	7.69046		
o-Xylene	1.47556	1.18938	0.286187		
Ethylbenzene	2.63244	2.63244	0		
Toluene	49.3683	41.6967	7.67154		
Water	1186.06	1185.9	0.154322		
TEG	0.0810295	0.0205577	0.0604718		
CO2	34777.8	34777.6	0.197737		
Nitrogen	308.438	107.919	200.52		
MDEA	6.8787E-05	6.8787E-05	0		
DEA	7.26304E-11	7.26304E-11	0		
H2S	2.23426	2.23395	0.000308552		
Oxygen	0	0	0		
SO2	0	0	0		

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Combined Vent Emissions	

Mass Flow	Total Gas to Flare lb/h	Vent Gas to Flare lb/h	40 lb/h		
Cyclohexane	23.1536	10.4365	12.717		
C8	15.5179	3.60061	11.9173		
m-Xylene	3.09087	2.41207	0.678801		
C10	1.88674	0.234707	1.65203		
C9	0.711346	0.121536	0.589809		
Piperazine	8.14203E-11	8.14203E-11	0		
2,2-Dimethylpropane	0	0	0		
2,2-Dimethylbutane	0	0	0		
Cyclopentane	0	0	0		
2,3-Dimethylbutane	0	0	0		
i-C6	80.0829	24.4536	55.6293		
3-Methylpentane	0	0	0		
Methylcyclopentane	0	0	0		
2-Methylhexane	4.64024	0.910572	3.72967		
3-Methylhexane	0	0	0		
2,2,4-Trimethylpentane	3.65008	1.00047	2.64961		
Methylcyclohexane	1.15437	1.15437	0		
C11	0	0	0		
MeOH	0.000235179	0.000235179	0		
C12	0	0	0		
DGA	0	0	0		
Air	0	0	0		
Isononane	4.03196	0.727243	3.30471		
p-Xylene	3.10023	2.4149	0.685334		

Stream Properties

Property	Units	Total Gas to Flare	Vent Gas to Flare	40		
Temperature	°F	97.6175	119.816	-2.46109		
Pressure	psig	0.995193	0.995193	2 *		
Mole Fraction Vapor	%	99.99	100	99.6957		
Mole Fraction Light Liquid	%	0.00995283	0	0.304285		
Mole Fraction Heavy Liquid	%	0	0	0		
Phase Mole Fraction	%	100	100	100		
Molecular Weight	lb/lbmol	36.7864	39.6587	22.0812		
Mass Density	lb/ft^3	0.0969872	0.100529	0.0758969		
Molar Flow	lbmol/h	1162.45	972.499	189.951		
Mass Flow	lb/h	42762.3	38568	4194.34		
Vapor Volumetric Flow	ft^3/h	440907	383652	55263.6		
Liquid Volumetric Flow	gpm	54970.2	47831.9	6890.01		
Std Vapor Volumetric Flow	MMSCFD	10.5871	8.85715	1.73		
Std Liquid Volumetric Flow	sgpm	124.68	101.624	23.0562		
Compressibility		0.995141	0.995397	0.98999		
Specific Gravity			1.36931			
API Gravity						
Enthalpy	Btu/h	-1.50473E+08	-1.43979E+08	-6.49358E+06		
Mass Enthalpy	Btu/lb	-3518.82	-3733.13	-1548.18		
Mass Cp	Btu/(lb*°F)	0.254879	0.234156	0.440313		
Ideal Gas CpCv Ratio		1.27045	1.27372	1.25986		
Dynamic Viscosity	cP		0.0156414			
Kinematic Viscosity	cSt		9.71325			
Thermal Conductivity	Btu/(h*ft*°F)		0.0116954			
Surface Tension	lbf/ft					
Net Ideal Gas Heating Value	Btu/ft^3	305.967	140.235	1154.47		
Net Liquid Heating Value	Btu/lb	3055.68	1237.25	19776.6		
Gross Ideal Gas Heating Value	Btu/ft^3	339.552	157.605	1271.07		
Gross Liquid Heating Value	Btu/lb	3402.19	1403.48	21780.8		

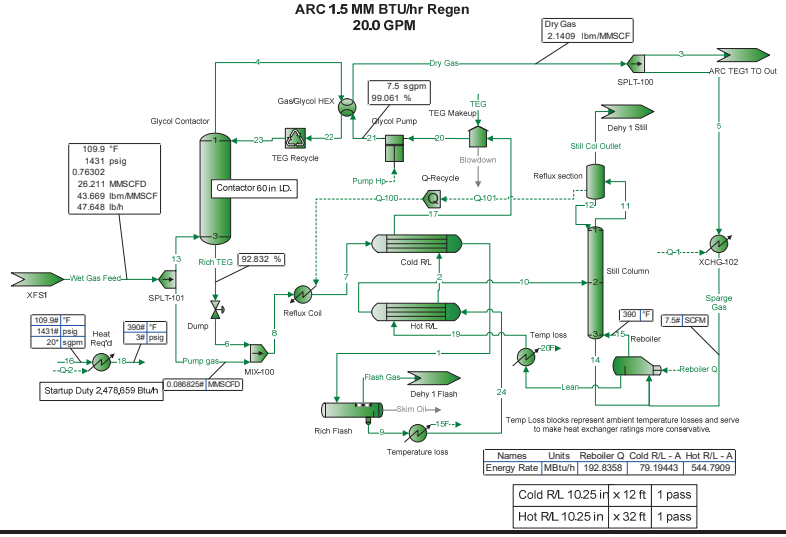
Remarks

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Dehy #1
Plant Schematic

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Dehy #1	



Names	Units	Reboiler Q	Cold R/L - A	Hot R/L - A
Energy Rate	MBtu/h	192.8358	79.19443	544.7909

Cold R/L 10.25 in	x 12 ft	1 pass
Hot R/L 10.25 in	x 32 ft	1 pass

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Dehy #1	

Connections

	Dry Gas	Flash Gas	Still Col Outlet	Wet Gas Feed	16
From Block	Gas/Glycol HEX	Rich Flash	Reflux section	XFS1	--
To Block	SPLT-100	Dehy 1 Flash	Dehy 1 Still	SPLT-101	Heat Req'd

Stream Composition

Mole Fraction	Dry Gas %	Flash Gas %	Still Col Outlet %	Wet Gas Feed %	16 %	
Nitrogen	3.7682	3.24036	1.05492	3.76204	0.000433148	*
CO2	0.00236529	0.00441637	0.00133981	0.00237202	0.394164	*
H2S	4.76591E-06	2.05741E-05	1.68201E-05	4.84764E-06	0.000166046	*
Methane	74.9107	70.7507	21.8474	74.8151	2.06558	*
Ethane	10.7436	11.8605	3.66871	10.7376	0.0596039	*
Propane	5.91301	7.07257	2.455	5.91254	0.0328857	*
i-Butane	0.779198	0.921495	0.363182	0.779153	0.00730073	*
n-Butane	1.89174	2.50221	1.11767	1.89304	0.0176813	*
Isopentane	0.524472	0.67994	0.404093	0.524919	0.00855939	*
n-Pentane	0.513667	0.722979	0.475455	0.514453	0.00924833	*
i-C6	0.339831	0.464804	0.437829	0.34048	0.0103687	*
n-C6	0.158994	0.227638	0.259666	0.15942	0.0141699	*
Benzene	0.0518296	0.284897	3.51127	0.0579158	0.0364901	*
Cyclohexane	0.0795474	0.186573	0.521294	0.0806355	0.0134658	*
2-Methylhexane	0.0195946	0.0274148	0.0390693	0.0196551	0.0252024	*
C7	0.153568	0.225334	0.415489	0.154246	0.016421	*
Toluene	0.0438313	0.197347	4.31137	0.0508017	0.228769	*
2,2,4-Trimethylpentane	0.012211	0.0167218	0.0293826	0.0122547	0.0292862	*
C8	0.054922	0.0727368	0.22128	0.0552413	0.0083567	*
Ethylbenzene	0.00372699	0.0130715	0.439926	0.00441421	0	*
o-Xylene	0.00141909	0.00449828	0.194479	0.0017191	0.0825867	*
p-Xylene	0.00339831	0.0103739	0.338103	0.00392483	0.0278517	*
m-Xylene	0.00336592	0.0102913	0.355908	0.00391883	0.0301458	*
Isononane	0.0135644	0.0156238	0.0707212	0.0136578	0.00190329	*
C9	0.00242091	0.00265639	0.0141039	0.00243925	0.00436562	*
C10	0.00611241	0.00521357	0.0481955	0.00617141	0.00652744	*
Water	0.00450951	0.479031	57.4038	0.0919019	32.8472	*
Oxygen	0	0	0	0	0	*
TEG	0.000211984	0.000590821	0.00031712	0	64.0213	*

Molar Flow	Dry Gas lbmol/h	Flash Gas lbmol/h	Still Col Outlet lbmol/h	Wet Gas Feed lbmol/h	16 lbmol/h	
Nitrogen	107.893	0.375397	0.0451636	108.269	0.000465422	*
CO2	0.0677244	0.000511638	5.73601E-05	0.0682653	0.423534	*
H2S	0.000136461	2.38351E-06	7.20108E-07	0.000139512	0.000178418	*
Methane	2144.89	8.19649	0.935335	2153.13	2.21948	*
Ethane	307.618	1.37404	0.157066	309.022	0.064045	*
Propane	169.305	0.819359	0.105104	170.159	0.035336	*
i-Butane	22.3105	0.106756	0.0155486	22.4236	0.00784471	*
n-Butane	54.1653	0.289882	0.0478498	54.4806	0.0189987	*
Isopentane	15.017	0.0787713	0.0173001	15.1069	0.00919715	*
n-Pentane	14.7076	0.0837574	0.0203553	14.8056	0.00993743	*
i-C6	9.73026	0.0538477	0.0187444	9.79882	0.0111413	*
n-C6	4.55242	0.0263719	0.0111169	4.58802	0.0152257	*
Benzene	1.48402	0.0330054	0.150325	1.66678	0.039209	*
Cyclohexane	2.27765	0.0216145	0.0223177	2.32064	0.0144691	*
2-Methylhexane	0.561045	0.00317602	0.00167264	0.565661	0.0270802	*
C7	4.39704	0.026105	0.017788	4.43911	0.0176445	*
Toluene	1.255	0.0228627	0.184579	1.46204	0.245814	*
2,2,4-Trimethylpentane	0.349632	0.00193722	0.00125794	0.352683	0.0314684	*

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Dehy #1	

Molar Flow	Dry Gas lbmol/h	Flash Gas lbmol/h	Still Col Outlet lbmol/h	Wet Gas Feed lbmol/h	16 lbmol/h	
C8	1.57256	0.00842659	0.00947348	1.58981	0.00897936	*
Ethylbenzene	0.106713	0.00151434	0.0188342	0.127038	0	*
o-Xylene	0.0406324	0.000521127	0.00832606	0.0494748	0.0887402	*
p-Xylene	0.0973026	0.00120182	0.0144749	0.112954	0.029927	*
m-Xylene	0.0963751	0.00119225	0.0152372	0.112781	0.0323919	*
Isononane	0.388385	0.00181002	0.00302773	0.393062	0.0020451	*
C9	0.0693171	0.000307743	0.000603821	0.0702	0.00469091	*
C10	0.175014	0.000603994	0.00206336	0.177609	0.0070138	*
Water	0.129119	0.0554959	2.45759	2.64488	35.2946	*
Oxygen	0	0	0	0	0	*
TEG	0.00606967	6.84468E-05	1.35766E-05	0	68.7915	*

Mass Fraction	Dry Gas %	Flash Gas %	Still Col Outlet %	Wet Gas Feed %	16 %	
Nitrogen	4.77987	3.84322	1.05889	4.76891	0.000117636	*
CO2	0.00471353	0.008229	0.00211279	0.00472384	0.168176	*
H2S	7.35484E-06	2.9687E-05	2.05403E-05	7.47603E-06	5.48629E-05	*
Methane	54.4166	48.0548	12.5585	54.3113	0.321256	*
Ethane	14.6281	15.0993	3.95275	14.6102	0.0173753	*
Propane	11.8065	13.2041	3.87894	11.7978	0.0140586	*
i-Butane	2.05072	2.26762	0.756367	2.04925	0.00411384	*
n-Butane	4.97873	6.15746	2.32767	4.97889	0.00996312	*
Isopentane	1.71344	2.07699	1.04466	1.71377	0.00598702	*
n-Pentane	1.67813	2.20846	1.22915	1.6796	0.00646892	*
i-C6	1.32606	1.69585	1.35193	1.32772	0.0086626	*
n-C6	0.620412	0.830543	0.801797	0.621665	0.0118383	*
Benzene	0.18332	0.942193	9.8276	0.204712	0.0276332	*
Cyclohexane	0.303141	0.664793	1.572	0.307085	0.0109869	*
2-Methylhexane	0.0889056	0.116304	0.140274	0.0891212	0.0244826	*
C7	0.696774	0.955956	1.49177	0.699392	0.015952	*
Toluene	0.182869	0.76985	14.2339	0.211811	0.204351	*
2,2,4-Trimethylpentane	0.0631599	0.0808708	0.120263	0.0633442	0.0324323	*
C8	0.284078	0.351774	0.905697	0.285541	0.00925441	*
Ethylbenzene	0.0179166	0.0587545	1.67351	0.0212063	0	*
o-Xylene	0.00682196	0.0202191	0.739809	0.00825873	0.0850023	*
p-Xylene	0.0163366	0.0466294	1.28616	0.0188553	0.0286664	*
m-Xylene	0.0161809	0.046258	1.3539	0.0188264	0.0310275	*
Isononane	0.0787758	0.084839	0.325005	0.0792655	0.00236657	*
C9	0.0140595	0.0144245	0.0648159	0.0141566	0.00542825	*
C10	0.0393802	0.0314065	0.245709	0.0397341	0.0090039	*
Water	0.00367864	0.365375	37.0551	0.0749196	5.73691	*
Oxygen	0	0	0	0	0	*
TEG	0.00144149	0.00375649	0.00170641	0	93.2084	*

Mass Flow	Dry Gas lb/h	Flash Gas lb/h	Still Col Outlet lb/h	Wet Gas Feed lb/h	16 lb/h	
Nitrogen	3022.46	10.5162	1.26519	3032.99	0.0130381	*
CO2	2.98052	0.0225169	0.00252439	3.00432	18.6395	*
H2S	0.0046507	8.12322E-05	2.45419E-05	0.00475469	0.00608065	*
Methane	34409.3	131.492	15.0051	34541.5	35.6059	*
Ethane	9249.78	41.3162	4.72281	9291.98	1.92577	*
Propane	7465.6	36.1302	4.63463	7503.28	1.55816	*
i-Butane	1296.73	6.20487	0.90372	1303.31	0.455952	*
n-Butane	3148.21	16.8486	2.78114	3166.53	1.10425	*
Isopentane	1083.46	5.68325	1.24818	1089.94	0.663563	*
n-Pentane	1061.14	6.04299	1.46861	1068.21	0.716973	*
i-C6	838.508	4.64035	1.61531	844.417	0.960107	*
n-C6	392.306	2.27261	0.958001	395.374	1.31208	*

* User Specified Values
? Extrapolated or Approximate Values

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Dehy #1	

Mass Flow	Dry Gas lb/h	Flash Gas lb/h	Still Col Outlet lb/h	Wet Gas Feed lb/h	16 lb/h
Benzene	115.919	2.57811	11.7422	130.195	3.06269 *
Cyclohexane	191.686	1.81907	1.87825	195.304	1.21772 *
2-Methylhexane	56.2178	0.318243	0.167602	56.6803	2.71349 *
C7	440.592	2.61577	1.78239	444.808	1.76801 *
Toluene	115.634	2.10653	17.0069	134.71	22.6489 *
2,2,4-Trimethylpentane	39.938	0.221286	0.143692	40.2864	3.59458 *
C8	179.631	0.962557	1.08214	181.602	1.0257 *
Ethylbenzene	11.3292	0.16077	1.99953	13.487	0 *
o-Xylene	4.31374	0.0553254	0.883936	5.25249	9.42111 *
p-Xylene	10.3301	0.127591	1.53673	11.9918	3.1772 *
m-Xylene	10.2317	0.126575	1.61766	11.9734	3.43889 *
Isononane	49.8124	0.232144	0.388322	50.4123	0.262295 *
C9	8.89028	0.0394697	0.0774431	9.00351	0.601633 *
C10	24.9013	0.0859373	0.293578	25.2706	0.997935 *
Water	2.32612	0.999773	44.2741	47.6483	635.843 *
Oxygen	0	0	0	0	0 *
TEG	0.9115	0.0102789	0.00203884	0	10330.6 *

Stream Properties

Property	Units	Dry Gas	Flash Gas	Still Col Outlet	Wet Gas Feed	16
Temperature	°F	111.593	145.975	189.11	109.9	109.9 *
Pressure	psig	1423	50 *	1.182	1431	1431 *
Mole Fraction Vapor	%	100	100	100	100	0
Mole Fraction Light Liquid	%	0	0	0	0	100
Mole Fraction Heavy Liquid	%	0	0	0	0	0
Phase Mole Fraction	%	100	100	100	100	100
Molecular Weight	lb/lbmol	22.0843	23.6192	27.9083	22.0989	103.148
Mass Density	lb/ft^3	6.84144	0.238222	0.0641059	6.94372	68.0686
Molar Flow	lbmol/h	2863.26	11.585	4.28122	2877.94	107.451
Mass Flow	lb/h	63233.1	273.629	119.482	63599.2	11083.4
Vapor Volumetric Flow	ft^3/h	9242.66	1148.63	1863.82	9159.23	162.826
Liquid Volumetric Flow	gpm	1152.33	143.206	232.372	1141.93	20.3004
Std Vapor Volumetric Flow	MMSCFD	26.0775	0.105512	0.0389917	26.2112	0.978623
Std Liquid Volumetric Flow	sgpm	347.556	1.44618	0.361034	349.217	20 *
Compressibility		0.757013	0.986912	0.992815	0.752738	0.35841
Specific Gravity		0.762514	0.815509	0.963601	0.763017	1.09139
API Gravity						-4.55003
Enthalpy	Btu/h	-9.78962E+07	-388309	-293123	-9.86641E+07	-2.81532E+07
Mass Enthalpy	Btu/lb	-1548.18	-1419.11	-2453.28	-1551.34	-2540.14
Mass Cp	Btu/(lb*°F)	0.720041	0.493706	0.431403	0.724661	0.588763
Ideal Gas CpCv Ratio		1.23056	1.20843	1.19869	1.23092	1.05114
Dynamic Viscosity	cP	0.0155279	0.0117028	0.0124112	0.0155966	12.7618
Kinematic Viscosity	cSt	0.141691	3.0668	12.0864	0.140222	11.7043
Thermal Conductivity	Btu/(h*ft*°F)	0.0255986	0.0195535	0.0160886	0.0256709	0.118801
Surface Tension	lbf/ft					0.00300819
Net Ideal Gas Heating Value	Btu/ft^3	1154.61	1232.53	867.018	1154.49	2464.83
Net Liquid Heating Value	Btu/lb	19776.2	19723.5	11312.4	19760.2	8764.3
Gross Ideal Gas Heating Value	Btu/ft^3	1271.22	1354.36	959.742	1271.08	2710.35
Gross Liquid Heating Value	Btu/lb	21780.2	21681.3	12573.1	21762.6	9667.56

Warnings

ProMax:ProMax!Project!Flowsheets!Dehy #1!PStreams!Dry Gas!Analyses!Freeze!Properties!Water Dew Point

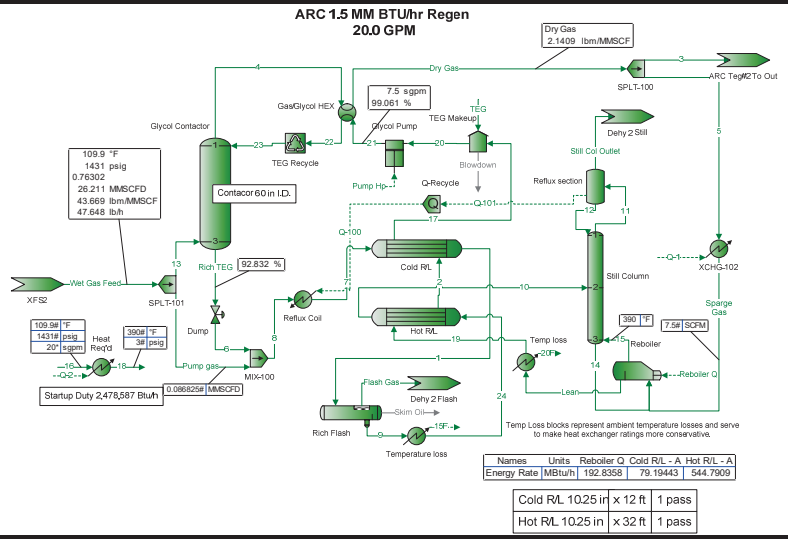
Warning: Water dew point temperature is thermodynamically unstable as other phases will form instead of a free aqueous liquid phase.

Remarks

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Dehy #2
Plant Schematic

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Dehy #2	



Names	Units	Reboiler Q	Cold R/L - A	Hot R/L - A
Energy Rate	MBtu/h	192.8358	79.19443	544.7909

Cold R/L 10.25 in	x 12 ft	1 pass
Hot R/L 10.25 in	x 32 ft	1 pass

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Dehy #2	

Connections

	Dry Gas	Flash Gas	Still Col Outlet	Wet Gas Feed	16
From Block	Gas/Glycol HEX	Rich Flash	Reflux section	XFS2	--
To Block	SPLT-100	Dehy 2 Flash	Dehy 2 Still	SPLT-101	Heat Req'd

Stream Composition

Mole Fraction	Dry Gas %	Flash Gas %	Still Col Outlet %	Wet Gas Feed %	16 %	
Methane	74.9107	70.7507	21.8474	74.8151	2.06562	*
Ethane	10.7436	11.8605	3.66871	10.7376	0.0596054	*
Propane	5.91301	7.07257	2.455	5.91254	0.0328866	*
i-Butane	0.779198	0.921495	0.363182	0.779153	0.00730096	*
n-Butane	1.89174	2.50221	1.11767	1.89304	0.0176818	*
Isopentane	0.524472	0.67994	0.404093	0.524919	0.00855968	*
n-Pentane	0.513667	0.722979	0.475455	0.514453	0.00924869	*
n-C6	0.158994	0.227638	0.259666	0.15942	0.0141705	*
C7	0.153568	0.225334	0.415489	0.154246	0.0164217	*
Benzene	0.0518296	0.284897	3.51127	0.0579158	0.0364913	*
o-Xylene	0.00141909	0.00449828	0.194479	0.0017191	0.0825895	*
Ethylbenzene	0.00372699	0.0130715	0.439926	0.00441421	0	*
Toluene	0.0438313	0.197347	4.31137	0.0508017	0.228776	*
Water	0.00450951	0.479031	57.4038	0.0919019	32.8449	*
TEG	0.000211984	0.000590821	0.00031712	0	64.0235	*
Nitrogen	3.7682	3.24036	1.05492	3.76204	0.000433155	*
Oxygen	0	0	0	0	0	*
CO2	0.00236529	0.00441637	0.00133981	0.00237202	0.394172	*
Carbon Monoxide	0	0	0	0	0	*
C8	0.054922	0.0727368	0.22128	0.0552413	0.00835712	*
C9	0.00242091	0.00265639	0.0141039	0.00243925	0.00436585	*
C10	0.00611241	0.00521357	0.0481955	0.00617141	0.00652782	*
m-Xylene	0.00336592	0.0102913	0.355908	0.00391883	0.0301468	*
2,2-Dimethylbutane	0	0	0	0	0	*
Cyclopentane	0	0	0	0	0	*
i-C6	0.339831	0.464804	0.437829	0.34048	0.0103692	*
Cyclohexane	0.0795474	0.186573	0.521294	0.0806355	0.0134663	*
2-Methylhexane	0.0195946	0.0274148	0.0390693	0.0196551	0.0252034	*
3-Methylhexane	0	0	0	0	0	*
H2S	4.76623E-06	2.05754E-05	1.68212E-05	4.84796E-06	0.00016605	*
2,2,4-Trimethylpentane	0.012211	0.0167218	0.0293826	0.0122547	0.0292875	*
Isononane	0.0135644	0.0156238	0.0707212	0.0136578	0.00190339	*
p-Xylene	0.00339831	0.0103739	0.338103	0.00392483	0.0278527	*
p-Xylene, 2-Propyl-	0	0	0	0	0	*

Molar Flow	Dry Gas lbmol/h	Flash Gas lbmol/h	Still Col Outlet lbmol/h	Wet Gas Feed lbmol/h	16 lbmol/h	
Methane	2144.89	8.19649	0.935335	2153.13	2.21947	*
Ethane	307.618	1.37404	0.157066	309.022	0.0640448	*
Propane	169.305	0.819359	0.105104	170.159	0.035336	*
i-Butane	22.3105	0.106756	0.0155486	22.4236	0.00784473	*
n-Butane	54.1653	0.289882	0.0478498	54.4806	0.0189988	*
Isopentane	15.017	0.0787713	0.0173001	15.1069	0.0091972	*
n-Pentane	14.7076	0.0837574	0.0203553	14.8056	0.00993753	*
n-C6	4.55242	0.0263719	0.0111169	4.58802	0.015226	*
C7	4.39704	0.026105	0.017788	4.43911	0.0176448	*
Benzene	1.48402	0.0330054	0.150325	1.66678	0.0392091	*
o-Xylene	0.0406324	0.000521127	0.00832606	0.0494748	0.0887407	*
Ethylbenzene	0.106713	0.00151434	0.0188342	0.127038	0	*
Toluene	1.255	0.0228627	0.184579	1.46204	0.245815	*

* User Specified Values
? Extrapolated or Approximate Values

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Dehy #2	

Molar Flow	Dry Gas lbmol/h	Flash Gas lbmol/h	Still Col Outlet lbmol/h	Wet Gas Feed lbmol/h	16 lbmol/h	
Water	0.129119	0.0554959	2.45759	2.64488	35.2911	*
TEG	0.00606967	6.84468E-05	1.35766E-05	0	68.792	*
Nitrogen	107.893	0.375397	0.0451636	108.269	0.000465416	*
Oxygen	0	0	0	0	0	*
CO2	0.0677244	0.000511638	5.73601E-05	0.0682653	0.42353	*
Carbon Monoxide	0	0	0	0	0	*
C8	1.57256	0.00842659	0.00947348	1.58981	0.00897956	*
C9	0.0693171	0.000307743	0.000603821	0.0702	0.00469102	*
C10	0.175014	0.000603994	0.00206336	0.177609	0.00701401	*
m-Xylene	0.0963751	0.00119225	0.0152372	0.112781	0.0323921	*
2,2-Dimethylbutane	0	0	0	0	0	*
Cyclopentane	0	0	0	0	0	*
i-C6	9.73026	0.0538477	0.0187444	9.79882	0.0111414	*
Cyclohexane	2.27765	0.0216145	0.0223177	2.32064	0.0144693	*
2-Methylhexane	0.561045	0.00317602	0.00167264	0.565661	0.0270806	*
3-Methylhexane	0	0	0	0	0	*
H2S	0.00013647	2.38367E-06	7.20155E-07	0.000139521	0.000178417	*
2,2,4-Trimethylpentane	0.349632	0.00193722	0.00125794	0.352683	0.0314688	*
Isononane	0.388385	0.00181002	0.00302773	0.393062	0.00204515	*
p-Xylene	0.0973026	0.00120182	0.0144749	0.112954	0.0299271	*
p-Xylene, 2-Propyl-	0	0	0	0	0	*

Mass Fraction	Dry Gas %	Flash Gas %	Still Col Outlet %	Wet Gas Feed %	16 %	
Methane	54.4166	48.0548	12.5585	54.3113	0.321253	*
Ethane	14.6281	15.0993	3.95275	14.6102	0.0173753	*
Propane	11.8065	13.2041	3.87894	11.7978	0.0140586	*
i-Butane	2.05072	2.26762	0.756367	2.04925	0.00411385	*
n-Butane	4.97873	6.15746	2.32767	4.97889	0.00996314	*
Isopentane	1.71344	2.07699	1.04466	1.71377	0.00598705	*
n-Pentane	1.67813	2.20846	1.22915	1.6796	0.00646898	*
n-C6	0.620412	0.830543	0.801797	0.621665	0.0118385	*
C7	0.696774	0.955956	1.49177	0.699392	0.0159522	*
Benzene	0.18332	0.942193	9.8276	0.204712	0.0276333	*
o-Xylene	0.00682196	0.0202191	0.739809	0.00825873	0.0850026	*
Ethylbenzene	0.0179166	0.0587545	1.67351	0.0212063	0	*
Toluene	0.182869	0.76985	14.2339	0.211811	0.204351	*
Water	0.00367864	0.365375	37.0551	0.0749196	5.73634	*
TEG	0.00144149	0.00375649	0.00170641	0	93.209	*
Nitrogen	4.77987	3.84322	1.05889	4.76891	0.000117635	*
Oxygen	0	0	0	0	0	*
CO2	0.00471353	0.008229	0.00211279	0.00472384	0.168174	*
Carbon Monoxide	0	0	0	0	0	*
C8	0.284078	0.351774	0.905697	0.285541	0.0092546	*
C9	0.0140595	0.0144245	0.0648159	0.0141566	0.00542838	*
C10	0.0393802	0.0314065	0.245709	0.0397341	0.00900417	*
m-Xylene	0.0161809	0.046258	1.3539	0.0188264	0.0310277	*
2,2-Dimethylbutane	0	0	0	0	0	*
Cyclopentane	0	0	0	0	0	*
i-C6	1.32606	1.69585	1.35193	1.32772	0.00866269	*
Cyclohexane	0.303141	0.664793	1.572	0.307085	0.010987	*
2-Methylhexane	0.0889056	0.116304	0.140274	0.0891212	0.0244829	*
3-Methylhexane	0	0	0	0	0	*
H2S	7.35533E-06	2.96889E-05	2.05417E-05	7.47652E-06	5.48626E-05	*
2,2,4-Trimethylpentane	0.0631599	0.0808708	0.120263	0.0633442	0.0324327	*
Isononane	0.0787758	0.084839	0.325005	0.0792655	0.00236662	*
p-Xylene	0.0163366	0.0466294	1.28616	0.0188553	0.0286665	*
p-Xylene, 2-Propyl-	0	0	0	0	0	*

* User Specified Values
? Extrapolated or Approximate Values

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Dehy #2	

Mass Flow	Dry Gas lb/h	Flash Gas lb/h	Still Col Outlet lb/h	Wet Gas Feed lb/h	16 lb/h
Methane	34409.3	131.492	15.0051	34541.5	35.6057 *
Ethane	9249.78	41.3162	4.72281	9291.98	1.92577 *
Propane	7465.6	36.1302	4.63463	7503.28	1.55816 *
i-Butane	1296.73	6.20487	0.90372	1303.31	0.455953 *
n-Butane	3148.21	16.8486	2.78114	3166.53	1.10425 *
Isopentane	1083.46	5.68325	1.24818	1089.94	0.663567 *
n-Pentane	1061.14	6.04299	1.46861	1068.21	0.716981 *
n-C6	392.306	2.27261	0.958001	395.374	1.3121 *
C7	440.592	2.61577	1.78239	444.808	1.76804 *
Benzene	115.919	2.57811	11.7422	130.195	3.0627 *
o-Xylene	4.31374	0.0553254	0.883936	5.25249	9.42116 *
Ethylbenzene	11.3292	0.16077	1.99953	13.487	0 *
Toluene	115.634	2.10653	17.0069	134.71	22.649 *
Water	2.32612	0.999773	44.2741	47.6483	635.78 *
TEG	0.9115	0.0102789	0.00203884	0	10330.7 *
Nitrogen	3022.46	10.5162	1.26519	3032.99	0.0130379 *
Oxygen	0	0	0	0	0 *
CO2	2.98052	0.0225169	0.00252439	3.00432	18.6393 *
Carbon Monoxide	0	0	0	0	0 *
C8	179.631	0.962557	1.08214	181.602	1.02572 *
C9	8.89028	0.0394697	0.0774431	9.00351	0.601647 *
C10	24.9013	0.0859373	0.293578	25.2706	0.997965 *
m-Xylene	10.2317	0.126575	1.61766	11.9734	3.43891 *
2,2-Dimethylbutane	0	0	0	0	0 *
Cyclopentane	0	0	0	0	0 *
i-C6	838.508	4.64035	1.61531	844.417	0.960118 *
Cyclohexane	191.686	1.81907	1.87825	195.304	1.21773 *
2-Methylhexane	56.2178	0.318243	0.167602	56.6803	2.71353 *
3-Methylhexane	0	0	0	0	0 *
H2S	0.004651	8.12375E-05	2.45435E-05	0.00475501	0.00608062 *
2,2,4-Trimethylpentane	39.938	0.221286	0.143692	40.2864	3.59464 *
Isononane	49.8124	0.232144	0.388322	50.4123	0.262301 *
p-Xylene	10.3301	0.127591	1.53673	11.9918	3.17721 *
p-Xylene, 2-Propyl-	0	0	0	0	0 *

Stream Properties

Property	Units	Dry Gas	Flash Gas	Still Col Outlet	Wet Gas Feed	16
Temperature	°F	111.593	145.975	189.11	109.9	109.9 *
Pressure	psig	1423	50 *	1.182	1431	1431 *
Mole Fraction Vapor	%	100	100	100	100	0
Mole Fraction Light Liquid	%	0	0	0	0	100
Mole Fraction Heavy Liquid	%	0	0	0	0	0
Phase Mole Fraction	%	100	100	100	100	100
Molecular Weight	lb/lbmol	22.0843	23.6192	27.9083	22.0989	103.151
Mass Density	lb/ft^3	6.84144	0.238222	0.0641059	6.94372	68.0686
Molar Flow	lbmol/h	2863.26	11.585	4.28122	2877.94	107.448
Mass Flow	lb/h	63233.1	273.629	119.482	63599.2	11083.4
Vapor Volumetric Flow	ft^3/h	9242.66	1148.63	1863.82	9159.23	162.826
Liquid Volumetric Flow	gpm	1152.33	143.206	232.372	1141.93	20.3004
Std Vapor Volumetric Flow	MMSCFD	26.0775	0.105512	0.0389917	26.2112	0.978595
Std Liquid Volumetric Flow	sgpm	347.556	1.44618	0.361034	349.217	20 *
Compressibility		0.757013	0.986912	0.992815	0.752738	0.358421
Specific Gravity		0.762514	0.815509	0.963601	0.763017	1.09139
API Gravity						-4.55006
Enthalpy	Btu/h	-9.78962E+07	-388309	-293123	-9.86641E+07	-2.8153E+07
Mass Enthalpy	Btu/lb	-1548.18	-1419.11	-2453.28	-1551.34	-2540.11
Mass Cp	Btu/(lb*°F)	0.720041	0.493706	0.431403	0.724661	0.588758
Ideal Gas CpCv Ratio		1.23056	1.20843	1.19869	1.23092	1.05113

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Dehy #2	

Stream Properties

Property	Units	Dry Gas	Flash Gas	Still Col Outlet	Wet Gas Feed	16
Dynamic Viscosity	cP	0.0155279	0.0117028	0.0124112	0.0155966	12.7619
Kinematic Viscosity	cSt	0.141691	3.0668	12.0864	0.140222	11.7044
Thermal Conductivity	Btu/(h*ft*°F)	0.0255986	0.0195535	0.0160886	0.0256709	0.1188
Surface Tension	lbf/ft					0.00300817
Net Ideal Gas Heating Value	Btu/ft^3	1154.61	1232.53	867.018	1154.49	2464.92
Net Liquid Heating Value	Btu/lb	19776.2	19723.5	11312.4	19760.2	8764.36
Gross Ideal Gas Heating Value	Btu/ft^3	1271.22	1354.36	959.742	1271.08	2710.44
Gross Liquid Heating Value	Btu/lb	21780.2	21681.3	12573.1	21762.6	9667.62

Warnings

ProMax:ProMax!Project!Flowsheets!Dehy #2!PStreams!Dry Gas!Analyses!Freeze!Properties!Water Dew Point

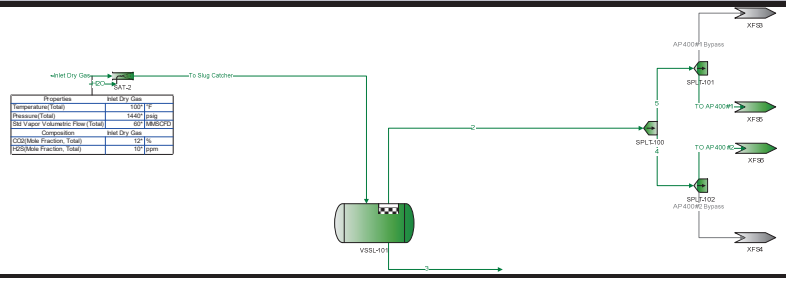
Warning: Water dew point temperature is thermodynamically unstable as other phases will form instead of a free aqueous liquid phase.

Remarks

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Inlet Header
Plant Schematic

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Inlet Header	



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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Inlet Header	

Connections

	Inlet Dry Gas				
From Block	--				
To Block	SAT-2				

Stream Composition

Mole Fraction	Inlet Dry Gas %					
Nitrogen	3.29553	*				
CO2	12	*				
H2S	0.001	*				
Methane	65.751	*				
Ethane	9.46634	*				
Propane	5.22923	*				
i-Butane	0.6928	*				
n-Butane	1.68989	*				
Isopentane	0.47277	*				
n-Pentane	0.46583	*				
i-C6	0.31419	*				
n-C6	0.14867	*				
Benzene	0.05947	*				
Cyclohexane	0.07632	*				
2-Methylhexane	0.01883	*				
C7	0.15065	*				
Toluene	0.05352	*				
2,2,4-Trimethylpentane	0.01189	*				
C8	0.05848	*				
Ethylbenzene	0.00496	*				
o-Xylene	0.00198	*				
p-Xylene	0.00446	*				
m-Xylene	0.00446	*				
Isononane	0.01586	*				
C9	0.00297	*				
C10	0.00892	*				
Water	0	*				
DGA	0	*				
MDEA	0	*				
Piperazine	0	*				
CHEMTHERM 550	0	*				
UCARSOL™ AP-814	0	*				

Molar Flow	Inlet Dry Gas lbmol/h					
Nitrogen	217.106	*				
CO2	790.547	*				
H2S	0.0658789	*				
Methane	4331.6	*				
Ethane	623.632	*				
Propane	344.496	*				
i-Butane	45.6409	*				
n-Butane	111.328	*				
Isopentane	31.1456	*				
n-Pentane	30.6884	*				
i-C6	20.6985	*				
n-C6	9.79422	*				
Benzene	3.91782	*				
Cyclohexane	5.02788	*				
2-Methylhexane	1.2405	*				
C7	9.92466	*				
Toluene	3.52584	*				
2,2,4-Trimethylpentane	0.7833	*				
C8	3.8526	*				

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Inlet Header	

Molar Flow	Inlet Dry Gas lbmol/h				
Ethylbenzene	0.326759 *				
o-Xylene	0.13044 *				
p-Xylene	0.29382 *				
m-Xylene	0.29382 *				
Isononane	1.04484 *				
C9	0.19566 *				
C10	0.58764 *				
Water	0 *				
DGA	0 *				
MDEA	0 *				
Piperazine	0 *				
CHEMTHERM 550	0 *				
UCARSOL™ AP-814	0 *				

Mass Fraction	Inlet Dry Gas %				
Nitrogen	3.71806 *				
CO2	21.2693 *				
H2S	0.00137258 *				
Methane	42.4814 *				
Ethane	11.4638 *				
Propane	9.28665 *				
i-Butane	1.62172 *				
n-Butane	3.95573 *				
Isopentane	1.37374 *				
n-Pentane	1.35357 *				
i-C6	1.09044 *				
n-C6	0.515979 *				
Benzene	0.187086 *				
Cyclohexane	0.258683 *				
2-Methylhexane	0.0759893 *				
C7	0.607955 *				
Toluene	0.198602 *				
2,2,4-Trimethylpentane	0.0546994 *				
C8	0.269034 *				
Ethylbenzene	0.0212075 *				
o-Xylene	0.00846589 *				
p-Xylene	0.0190696 *				
m-Xylene	0.0190696 *				
Isononane	0.0819226 *				
C9	0.0153411 *				
C10	0.051114 *				
Water	0 *				
DGA	0 *				
MDEA	0 *				
Piperazine	0 *				
CHEMTHERM 550	0 *				
UCARSOL™ AP-814	0 *				

Mass Flow	Inlet Dry Gas lb/h				
Nitrogen	6081.88 *				
CO2	34791.6 *				
H2S	2.24521 *				
Methane	69489.6 *				
Ethane	18752 *				
Propane	15190.8 *				
i-Butane	2652.75 *				
n-Butane	6470.64 *				
Isopentane	2247.12 *				

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Inlet Header	

Mass Flow	Inlet Dry Gas lb/h				
n-Pentane	2214.13 *				
i-C6	1783.7 *				
n-C6	844.02 *				
Benzene	306.028 *				
Cyclohexane	423.144 *				
2-Methylhexane	124.301 *				
C7	994.47 *				
Toluene	324.865 *				
2,2,4-Trimethylpentane	89.4752 *				
C8	440.077 *				
Ethylbenzene	34.6904 *				
o-Xylene	13.8482 *				
p-Xylene	31.1934 *				
m-Xylene	31.1934 *				
Isononane	134.006 *				
C9	25.0944 *				
C10	83.6104 *				
Water	0 *				
DGA	0 *				
MDEA	0 *				
Piperazine	0 *				
CHEMTHERM 550	0 *				
UCARSOL™ AP-814	0 *				

Stream Properties

Property	Units	Inlet Dry Gas				
Temperature	°F	100 *				
Pressure	psig	1440 *				
Mole Fraction Vapor	%	99.9738				
Mole Fraction Light Liquid	%	0.0261876				
Mole Fraction Heavy Liquid	%	0				
Phase Mole Fraction	%	100				
Molecular Weight	lb/lbmol	24.8299				
Mass Density	lb/ft^3	8.38885				
Molar Flow	lbmol/h	6587.89				
Mass Flow	lb/h	163576				
Vapor Volumetric Flow	ft^3/h	19499.3				
Liquid Volumetric Flow	gpm	2431.08				
Std Vapor Volumetric Flow	MMSCFD	60 *				
Std Liquid Volumetric Flow	sgpm	790.464				
Compressibility		0.716884				
Specific Gravity						
API Gravity						
Enthalpy	Btu/h	-3.34603E+08				
Mass Enthalpy	Btu/lb	-2045.55				
Mass Cp	Btu/(lb*°F)	0.681263				
Ideal Gas CpCv Ratio		1.23741				
Dynamic Viscosity	cP					
Kinematic Viscosity	cSt					
Thermal Conductivity	Btu/(h*ft*°F)					
Surface Tension	lbf/ft					
Net Ideal Gas Heating Value	Btu/ft^3	1022				
Net Liquid Heating Value	Btu/lb	15552.7				
Gross Ideal Gas Heating Value	Btu/ft^3	1125				
Gross Liquid Heating Value	Btu/lb	17127.1				

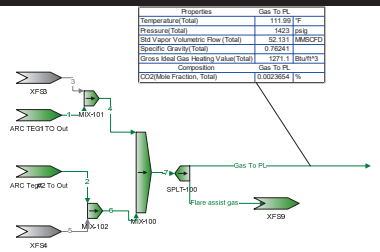
Remarks

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Out G w ARC TEGs
Plant Schematic

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Out G w ARC TEGs	

Names	Units	Gas To PL	1	2
Temperature	°F	111.99	111.99	111.99
Pressure	psig	1423	1423	1423
Std Vapor Volumetric Flow	MMSCFD	52.131	26.066	26.066
Gross Ideal Gas Heating Value	Btu/ft^3	1271.1	1271.1	1271.1
CO2(Mole Fraction)	%	0.0023654	0.0023654	0.0023654
H2S(Mole Fraction)	%	4.7662e-06	4.7661e-06	4.7664e-06
Methane(Mole Fraction)	%	74.913	74.913	74.913
Ethane(Mole Fraction)	%	10.744	10.744	10.744
Propane(Mole Fraction)	%	5.9132	5.9132	5.9132
i-Butane(Mole Fraction)	%	0.77923	0.77923	0.77923
n-Butane(Mole Fraction)	%	1.8918	1.8918	1.8918
Isopentane(Mole Fraction)	%	0.52449	0.52449	0.52449
n-Pentane(Mole Fraction)	%	0.51369	0.51369	0.51369
i-C6(Mole Fraction)	%	0.33984	0.33984	0.33984
n-C6(Mole Fraction)	%	0.159	0.159	0.159
C7(Mole Fraction)	%	0.15357	0.15357	0.15357
C8(Mole Fraction)	%	0.054924	0.054924	0.054924
C9(Mole Fraction)	%	0.002421	0.002421	0.002421
2-Methylhexane(Mole Fraction)	%	0.019595	0.019595	0.019595
Toluene(Mole Fraction)	%	0.043833	0.043833	0.043833
2,2,4-Trimethylpentane(Mole Fraction)	%	0.012211	0.012211	0.012211
o-Xylene(Mole Fraction)	%	0.0014191	0.0014191	0.0014191
p-Xylene(Mole Fraction)	%	0.0033984	0.0033984	0.0033984
m-Xylene(Mole Fraction)	%	0.003366	0.003366	0.003366
Isononane(Mole Fraction)	%	0.013565	0.013565	0.013565
Water Content	lbm/ft^3	2.141e-06	2.141e-06	2.141e-06



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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Out G w ARC TEGs	

Connections

	Gas To PL				
From Block	SPLT-100				
To Block	--				

Stream Composition

Mole Fraction	Gas To PL %				
Nitrogen	3.76834				
CO2	0.00236538				
H2S	4.76625E-06				
Methane	74.9135				
Ethane	10.744				
Propane	5.91323				
i-Butane	0.779227				
n-Butane	1.89181				
Isopentane	0.524492				
n-Pentane	0.513686				
i-C6	0.339844				
n-C6	0.159				
C7	0.153573				
C8	0.054924				
C9	0.00242101				
Water	0.00450968				
MDEA	0				
Piperazine	0				
UCARSOL™ AP-814	0				
TEG	0.000211992				
Benzene	0.0518315				
Cyclohexane	0.0795503				
2-Methylhexane	0.0195953				
Toluene	0.0438329				
2,2,4-Trimethylpentane	0.0122114				
o-Xylene	0.00141915				
p-Xylene	0.00339844				
m-Xylene	0.00336605				
Isononane	0.0135649				
C10	0.00611264				

Molar Flow	Gas To PL lbmol/h				
Nitrogen	215.697				
CO2	0.135393				
H2S	0.000272817				
Methane	4288				
Ethane	614.981				
Propane	338.47				
i-Butane	44.6025				
n-Butane	108.286				
Isopentane	30.0216				
n-Pentane	29.4031				
i-C6	19.4525				
n-C6	9.10106				
C7	8.79044				
C8	3.14382				
C9	0.138577				
Water	0.258131				
MDEA	0				
Piperazine	0				
UCARSOL™ AP-814	0				
TEG	0.0121343				
Benzene	2.9668				

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Out G w ARC TEGs	

Molar Flow	Gas To PL lbmol/h				
Cyclohexane	4.55341				
2-Methylhexane	1.12163				
Toluene	2.50897				
2,2,4-Trimethylpentane	0.698975				
o-Xylene	0.0812311				
p-Xylene	0.194525				
m-Xylene	0.19267				
Isononane	0.776449				
C10	0.349883				

Mass Fraction	Gas To PL %				
Nitrogen	4.78073				
CO2	0.00471438				
H2S	7.3564E-06				
Methane	54.4263				
Ethane	14.6307				
Propane	11.8086				
i-Butane	2.05109				
n-Butane	4.97962				
Isopentane	1.71374				
n-Pentane	1.67844				
i-C6	1.3263				
n-C6	0.620523				
C7	0.696899				
C8	0.284129				
C9	0.014062				
Water	0.0036793				
MDEA	0				
Piperazine	0				
UCARSOL™ AP-814	0				
TEG	0.00144175				
Benzene	0.183353				
Cyclohexane	0.303196				
2-Methylhexane	0.0889215				
Toluene	0.182902				
2,2,4-Trimethylpentane	0.0631712				
o-Xylene	0.00682318				
p-Xylene	0.0163395				
m-Xylene	0.0161838				
Isononane	0.0787899				
C10	0.0393872				

Mass Flow	Gas To PL lb/h				
Nitrogen	6042.42				
CO2	5.95856				
H2S	0.00929785				
Methane	68790.1				
Ethane	18491.9				
Propane	14925				
i-Butane	2592.4				
n-Butane	6293.81				
Isopentane	2166.02				
n-Pentane	2121.4				
i-C6	1676.32				
n-C6	784.287				
C7	880.819				
C8	359.114				
C9	17.7732				

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Out G w ARC TEGs	

Mass Flow	Gas To PL lb/h				
Water	4.65031				
MDEA	0				
Piperazine	0				
UCARSOL™ AP-814	0				
TEG	1.82224				
Benzene	231.743				
Cyclohexane	383.213				
2-Methylhexane	112.389				
Toluene	231.172				
2,2,4-Trimethylpentane	79.8429				
o-Xylene	8.6239				
p-Xylene	20.6517				
m-Xylene	20.4549				
Isononane	99.5835				
C10	49.782				

Stream Properties

Property	Units	Gas To PL				
Temperature	°F	111.985				
Pressure	psig	1423				
Mole Fraction Vapor	%	100				
Mole Fraction Light Liquid	%	0				
Mole Fraction Heavy Liquid	%	0				
Phase Mole Fraction	%	100				
Molecular Weight	lb/lbmol	22.0812				
Mass Density	lb/ft^3	6.82884				
Molar Flow	lbmol/h	5723.94				
Mass Flow	lb/h	126391				
Vapor Volumetric Flow	ft^3/h	18508.5				
Liquid Volumetric Flow	gpm	2307.55				
Std Vapor Volumetric Flow	MMSCFD	52.1314				
Std Liquid Volumetric Flow	sgpm	694.771				
Compressibility		0.757782				
Specific Gravity		0.762405				
API Gravity						
Enthalpy	Btu/h	-1.95676E+08				
Mass Enthalpy	Btu/lb	-1548.18				
Mass Cp	Btu/(lb*°F)	0.719341				
Ideal Gas CpCv Ratio		1.23048				
Dynamic Viscosity	cP	0.0155233				
Kinematic Viscosity	cSt	0.141911				
Thermal Conductivity	Btu/(h*ft*°F)	0.0255982				
Surface Tension	lbf/ft					
Net Ideal Gas Heating Value	Btu/ft^3	1154.47				
Net Liquid Heating Value	Btu/lb	19776.6				
Gross Ideal Gas Heating Value	Btu/ft^3	1271.07				
Gross Liquid Heating Value	Btu/lb	21780.8				

Warnings

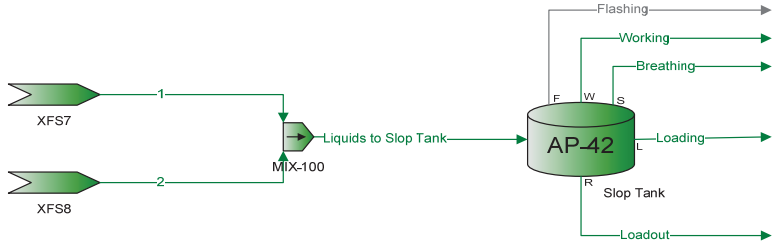
ProMax:ProMax!Project!Flowsheets!Out G w ARC TEGs!PStreams!Gas To PL!Analyses!Freeze 1!Properties!Water Dew Point
Warning: Water dew point temperature is thermodynamically unstable as other phases will form instead of a free aqueous liquid phase.
ProMax:ProMax!Project!Flowsheets!Out G w ARC TEGs!PStreams!Gas To PL!Analyses!Line Sizing 1
Warning: The design or operating pressure of 1423 psig exceeds the maximum allowable pressure for the selected material of construction and application criteria.

Remarks

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Slop Tank
Plant Schematic

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Slop Tank	



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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Slop Tank	

Connections

	Breathing	Flashing	Loading	Loadout	Working
From Block	Slop Tank	Slop Tank	Slop Tank	Slop Tank	Slop Tank
To Block	--	--	--	--	--

Stream Composition

Mole Fraction	Breathing %	Flashing %	Loading %	Loadout %	Working %
Methane	19.4013	67.1597	1.31893E-14	4.2583E-18	19.4013
Ethane	17.0761	8.98212	9.52475E-16	2.27189E-18	17.0761
Propane	17.5964	5.13381	15.8104	0.0106353	17.5964
i-Butane	2.24832	0.669777	3.45262	0.00596251	2.24832
n-Butane	6.42095	1.93135	10.8266	0.0299827	6.42095
Isopentane	1.94969	0.599474	3.58851	0.0282627	1.94969
n-Pentane	2.1543	0.667579	4.00614	0.0415971	2.1543
n-C6	0.879955	0.280541	1.66789	0.0628632	0.879955
C7	0.920218	0.301744	1.74353	0.230514	0.920218
Benzene	9.30583	3.01175	17.6535	1.54129	9.30583
o-Xylene	0.128427	0.0437685	0.241277	0.2487	0.128427
Ethylbenzene	0.283683	0.0969544	0.532876	0.563791	0.283683
Toluene	6.50282	2.16005	12.2902	3.68939	6.50282
Water	10.6435	3.66146	20.1795	91.9653	10.6435
TEG	1.6884E-10	9.23009E-11	2.88735E-10	0.000551849	1.6884E-10
CO2	0.00508809	0.00324001	5.43229E-19	7.57934E-22	0.00508809
Nitrogen	0.253238	3.93568	6.2142E-16	3.81032E-20	0.253238
MDEA	0	0	0	0	0
DEA	0	0	0	0	0
H2S	0.000124923	3.63329E-05	0.000106973	6.93711E-08	0.000124923
Oxygen	0	0	0	0	0
SO2	0	0	0	0	0
Cyclohexane	1.5625	0.500909	2.96832	0.18694	1.5625
C8	0.263899	0.0888175	0.497571	0.216434	0.263899
m-Xylene	0.228878	0.0780987	0.429842	0.458101	0.228878
C10	0.00990085	0.00350304	0.0184358	0.0749902	0.00990085
C9	0.00895313	0.0030769	0.0168155	0.0179573	0.00895313
Piperazine	0	0	0	0	0
2,2-Dimethylpropane	0	0	0	0	0
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	0	0	0	0
2,3-Dimethylbutane	0	0	0	0	0
i-C6	1.6973	0.533381	3.21076	0.0789697	1.6973
3-Methylpentane	0	0	0	0	0
Methylcyclopentane	0	0	0	0	0
2-Methylhexane	0.104611	0.0338575	0.198494	0.0166644	0.104611
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	0.0726365	0.0235566	0.1378	0.0149981	0.0726365
Methylcyclohexane	0	0	0	0	0
C11	0	0	0	0	0
MeOH	0	0	0	0	0
C12	0	0	0	0	0
DGA	0	0	0	0	0
Air	0	0	0	0	0
Isononane	0.0591393	0.020124	0.111322	0.0823011	0.0591393
p-Xylene	0.222187	0.0756698	0.41742	0.43376	0.222187

Molar Flow	Breathing lbmol/h	Flashing lbmol/h	Loading lbmol/h	Loadout lbmol/h	Working lbmol/h
Methane	0.000486668	0	3.34416E-20	2.09525E-19	0.000194609
Ethane	0.000428343	0	2.41501E-21	1.11786E-19	0.000171286
Propane	0.000441394	0	4.00872E-05	0.000523296	0.000176505
i-Butane	5.63976E-05	0	8.75414E-06	0.000293379	2.25523E-05
n-Butane	0.000161065	0	2.7451E-05	0.00147527	6.44069E-05

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Slop Tank	

Molar Flow	Breathing lbmol/h	Flashing lbmol/h	Loading lbmol/h	Loadout lbmol/h	Working lbmol/h
Isopentane	4.89067E-05	0	9.09868E-06	0.00139064	1.95569E-05
n-Pentane	5.40392E-05	0	1.01576E-05	0.00204674	2.16093E-05
n-C6	2.20731E-05	0	4.22894E-06	0.00309311	8.8266E-06
C7	2.3083E-05	0	4.42073E-06	0.0113422	9.23046E-06
Benzene	0.000233431	0	4.47606E-05	0.0758373	9.33444E-05
o-Xylene	3.22149E-06	0	6.11759E-07	0.012237	1.28821E-06
Ethylbenzene	7.116E-06	0	1.35111E-06	0.0277407	2.84555E-06
Toluene	0.000163119	0	3.11619E-05	0.181532	6.52281E-05
Water	0.000266986	0	5.11652E-05	4.52505	0.000106762
TEG	4.23523E-15	0	7.32089E-16	2.71531E-05	1.69359E-15
CO2	1.27631E-07	0	1.37736E-24	3.72933E-23	5.10373E-08
Nitrogen	6.35231E-06	0	1.57561E-21	1.87483E-21	2.54017E-06
MDEA	0	0	0	0	0
DEA	0	0	0	0	0
H2S	3.13362E-09	0	2.71231E-10	3.41333E-09	1.25307E-09
Oxygen	0	0	0	0	0
SO2	0	0	0	0	0
Cyclohexane	3.91941E-05	0	7.52619E-06	0.00919817	1.5673E-05
C8	6.61973E-06	0	1.26159E-06	0.0106494	2.6471E-06
m-Xylene	5.74125E-06	0	1.08986E-06	0.0225403	2.29582E-06
C10	2.48356E-07	0	4.67439E-08	0.00368981	9.93128E-08
C9	2.24583E-07	0	4.26358E-08	0.000883567	8.98065E-08
Piperazine	0	0	0	0	0
2,2-Dimethylpropane	0	0	0	0	0
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	0	0	0	0
2,3-Dimethylbutane	0	0	0	0	0
i-C6	4.25756E-05	0	8.1409E-06	0.00388562	1.70252E-05
3-Methylpentane	0	0	0	0	0
Methylcyclopentane	0	0	0	0	0
2-Methylhexane	2.62409E-06	0	5.03283E-07	0.000819956	1.04932E-06
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	1.82204E-06	0	3.49391E-07	0.000737964	7.28598E-07
Methylcyclohexane	0	0	0	0	0
C11	0	0	0	0	0
MeOH	0	0	0	0	0
C12	0	0	0	0	0
DGA	0	0	0	0	0
Air	0	0	0	0	0
Isononane	1.48347E-06	0	2.82259E-07	0.00404953	5.93211E-07
p-Xylene	5.57342E-06	0	1.05837E-06	0.0213427	2.2287E-06

Mass Fraction	Breathing %	Flashing %	Loading %	Loadout %	Working %
Methane	6.88252	41.1129	3.48092E-15	2.83645E-18	6.88252
Ethane	11.3542	10.3062	4.71165E-16	2.83645E-18	11.3542
Propane	17.158	8.63842	11.4693	0.019472	17.158
i-Butane	2.88966	1.48549	3.30135	0.0143893	2.88966
n-Butane	8.25255	4.28353	10.3523	0.0723571	8.25255
Isopentane	3.11058	1.65043	4.25935	0.0846664	3.11058
n-Pentane	3.43702	1.83794	4.75505	0.124612	3.43702
n-C6	1.67683	0.922524	2.36456	0.22493	1.67683
C7	2.03898	1.15375	2.87413	0.95905	2.03898
Benzene	16.0738	8.97708	22.6855	4.99882	16.0738
o-Xylene	0.301497	0.177313	0.421403	1.09629	0.301497
Ethylbenzene	0.665981	0.392779	0.930695	2.48523	0.665981
Toluene	13.2492	7.59456	18.6295	14.1144	13.2492
Water	4.24007	2.51707	5.98069	68.7912	4.24007
TEG	5.60677E-10	5.28928E-10	7.13332E-10	0.00344096	5.60677E-10
CO2	0.00495163	0.00544117	3.93305E-19	1.38499E-21	0.00495163
Nitrogen	0.156871	4.20712	2.86386E-16	4.43195E-20	0.156871

* User Specified Values
? Extrapolated or Approximate Values

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Slop Tank	

Mass Fraction	Breathing %	Flashing %	Loading %	Loadout %	Working %
MDEA	0	0	0	0	0
DEA	0	0	0	0	0
H2S	9.41459E-05	4.72509E-05	5.99772E-05	9.81651E-08	9.41459E-05
Oxygen	0	0	0	0	0
SO2	0	0	0	0	0
Cyclohexane	2.90783	1.60865	4.10974	0.65324	2.90783
C8	0.666591	0.387144	0.935038	1.02652	0.666591
m-Xylene	0.537319	0.316391	0.75074	2.01934	0.537319
C10	0.0311507	0.0190192	0.0431529	0.443018	0.0311507
C9	0.0253919	0.0150587	0.0354801	0.0956274	0.0253919
Piperazine	0	0	0	0	0
2,2-Dimethylpropane	0	0	0	0	0
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	0	0	0	0
2,3-Dimethylbutane	0	0	0	0	0
i-C6	3.23436	1.75396	4.55189	0.28256	3.23436
3-Methylpentane	0	0	0	0	0
Methylcyclopentane	0	0	0	0	0
2-Methylhexane	0.231792	0.129458	0.327208	0.0693322	0.231792
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	0.183475	0.10268	0.258954	0.0711341	0.183475
Methylcyclohexane	0	0	0	0	0
C11	0	0	0	0	0
MeOH	0	0	0	0	0
C12	0	0	0	0	0
DGA	0	0	0	0	0
Air	0	0	0	0	0
Isononane	0.167725	0.0984891	0.234886	0.438276	0.167725
p-Xylene	0.521612	0.306551	0.729046	1.91205	0.521612

Mass Flow	Breathing lb/h	Flashing lb/h	Loading lb/h	Loadout lb/h	Working lb/h
Methane	0.00780735	0	5.36486E-19	3.3613E-18	0.00312201
Ethane	0.0128799	0	7.26169E-20	3.3613E-18	0.00515041
Propane	0.0194636	0	0.00176767	0.0230751	0.00778311
i-Butane	0.00327795	0	0.00050881	0.0170518	0.00131079
n-Butane	0.00936146	0	0.00159551	0.0857458	0.00374347
Isopentane	0.00352856	0	0.000656458	0.100333	0.001411
n-Pentane	0.00389886	0	0.000732857	0.14767	0.00155908
n-C6	0.00190216	0	0.000364431	0.26655	0.000760636
C7	0.00231296	0	0.000442966	1.13651	0.00092491
Benzene	0.0182337	0	0.00349633	5.92379	0.0072913
o-Xylene	0.00034201	0	6.49474E-05	1.29914	0.000136763
Ethylbenzene	0.00075547	0	0.00014344	2.94509	0.000302098
Toluene	0.0150295	0	0.00287121	16.7261	0.00601001
Water	0.00480982	0	0.000921755	81.5201	0.00192335
TEG	6.36017E-13	0	1.0994E-13	0.00407766	2.54331E-13
CO2	5.61699E-06	0	6.06169E-23	1.64126E-21	2.24613E-06
Nitrogen	0.00017795	0	4.41383E-20	5.25203E-20	7.11587E-05
MDEA	0	0	0	0	0
DEA	0	0	0	0	0
H2S	1.06796E-07	0	9.24379E-09	1.16329E-07	4.27059E-08
Oxygen	0	0	0	0	0
SO2	0	0	0	0	0
Cyclohexane	0.00329856	0	0.000633401	0.774113	0.00131903
C8	0.000756162	0	0.00014411	1.21646	0.000302375
m-Xylene	0.000609519	0	0.000115706	2.393	0.000243735
C10	3.53365E-05	0	6.65081E-06	0.524992	1.41304E-05
C9	2.88039E-05	0	5.46825E-06	0.113322	1.15181E-05
Piperazine	0	0	0	0	0
2,2-Dimethylpropane	0	0	0	0	0

* User Specified Values
? Extrapolated or Approximate Values

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Process Streams Report
All Streams
Tabulated by Total Phase

Client Name:	MPLX	Job: FLARE DESIGN AND ANALYSIS
Location:	DAGGER LAKE	
Flowsheet:	Slop Tank	

Mass Flow	Breathing lb/h	Flashing lb/h	Loading lb/h	Loadout lb/h	Working lb/h
2,2-Dimethylbutane	0	0	0	0	0
Cyclopentane	0	0	0	0	0
2,3-Dimethylbutane	0	0	0	0	0
i-C6	0.00366897	0	0.000701545	0.334844	0.00146715
3-Methylpentane	0	0	0	0	0
Methylcyclopentane	0	0	0	0	0
2-Methylhexane	0.000262939	0	5.043E-05	0.0821612	0.000105144
3-Methylhexane	0	0	0	0	0
2,2,4-Trimethylpentane	0.000208129	0	3.99105E-05	0.0842965	8.32266E-05
Methylcyclohexane	0	0	0	0	0
C11	0	0	0	0	0
MeOH	0	0	0	0	0
C12	0	0	0	0	0
DGA	0	0	0	0	0
Air	0	0	0	0	0
Isononane	0.000190262	0	3.62011E-05	0.519373	7.60823E-05
p-Xylene	0.000591702	0	0.000112362	2.26585	0.00023661

Stream Properties

Property	Units	Breathing	Flashing	Loading	Loadout	Working
Temperature	°F	71.7199	71.7199	71.7199	71.7199	71.7199
Pressure	psig	-1.81595	-1.81595	-1.81595	-1.81595	-1.81595
Mole Fraction Vapor	%	75.1149		30.1587	0	75.1149
Mole Fraction Light Liquid	%	16.5115		50.6096	8.03653	16.5115
Mole Fraction Heavy Liquid	%	8.37361		19.2317	91.9635	8.37361
Phase Mole Fraction	%	100	100	100	100	100
Molecular Weight	lb/lbmol	45.2224	26.206	60.7855	24.0842	45.2224
Mass Density	lb/ft^3	0.137445		0.462045	58.8437	0.137445
Molar Flow	lbmol/h	0.00250843	0	0.00025355	4.92039	0.00100307
Mass Flow	lb/h	0.113437	0	0.0154122	118.504	0.0453614
Vapor Volumetric Flow	ft^3/h	0.825327	0	0.0333564	2.01387	0.330033
Liquid Volumetric Flow	gpm	0.102898	0	0.00415872	0.25108	0.0411469
Std Vapor Volumetric Flow	MMSCFD	2.28458E-05	0	2.30924E-06	0.044813	9.13562E-06
Std Liquid Volumetric Flow	sgpm	0.000395588	0	4.29214E-05	0.250582	0.000158188
Compressibility		0.743126		0.297135	0.000924424	0.743126
Specific Gravity					0.943481	
API Gravity					17.9478	
Enthalpy	Btu/h	-105.57	0	-12.6704	-559818	-42.2156
Mass Enthalpy	Btu/lb	-930.651		-822.101	-4724.06	-930.651
Mass Cp	Btu/(lb*°F)	0.421199		0.453099	0.798827	0.421199
Ideal Gas CpCv Ratio		1.13764	1.21913	1.10844	1.26393	1.13764
Dynamic Viscosity	cP				0.839052	
Kinematic Viscosity	cSt				0.890159	
Thermal Conductivity	Btu/(h*ft*°F)				0.252794	
Surface Tension	lbf/ft				0.00391863	
Net Ideal Gas Heating Value	Btu/ft^3	2183.11	1297.26	2799.9	352.984	2183.11
Net Liquid Heating Value	Btu/lb	18126.5	18672	17256	4778.45	18126.5
Gross Ideal Gas Heating Value	Btu/ft^3	2352.45	1416.9	2993.74	417.656	2352.45
Gross Liquid Heating Value	Btu/lb	19547.6	20404.7	18466.1	5797.24	19547.6

Remarks

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ZEECO PROPOSAL



CLIENT: Ross Group

END USER: Ross Group

ZEECO QUOTE #: 2024-12343RA-02

QUOTE REV #: 1

DATE OF ISSUE: 2/20/2025

APPLICATION ENGINEER: Landon Martinson

BURNERS | FLARES | THERMAL OXIDIZERS
VAPOR CONTROL | RENTALS | AFTERMARKET

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OR CALL OUR U.S. TOLL FREE NUMBER: 844 GO ZEECO

Contact Information:

Customer:	Courtney Alston	573/373.5183	Courtney.Alston@withrossgroup.com
Zeeco Local Contact:	Kyle Larsen	918.728.1616	kyle_larsen@zeeco.com
Zeeco Applications Engineer:	Landon Martinson	918.893.8967	landon_martinson@zeeco.com
End User Support Contact:	Ned Southwick	720.695.8344	ned_southwick@zeeco.com

Design Information (Estimated):

Source	Normal Operating	Loss of Inlet Gas	Max Inlet Flow Gas
Gas MW	36.8	22.6	36.7
Gas LHV (Btu/Scf)	285	1160	286
Max Flow Rate (MMScfd)	6.7	0.7	8.6
Available Pressure (psig)	1	1.1	0.9
Temperature (°F)	117.9	102.3	115.3

Scope of Supply:

Qty	Equipment
1	Self-Supported Stack – 40’ OAH
1	Air Assisted Tip (UFA)
1	Velocity Seal
1	Air Assist Blower (VFD Included)
3	HSLF Pilot w/ Type K Thermocouple
3	Retractable Pilot Components
1	Automatic Ignition/Monitoring Panel
	Optional Equipment
1	*Group D Deflagration Arrester*
1	*Control Panel Solar Powered Backup*
1	*Zeeco ViZion Remote Flare Monitoring and Control*
1	*Zeeco Contour Camera (includes stand & 1 day of Site Service for Monitor Configuration)*

Required Utilities:

Consumer	Utility Type	Consumption	Supply
Pilot Gas	Fuel Gas	195 Scfh	15 psig
Purge Gas*	Fuel Gas	870 Scfh	15 psig
Blower	Electricity	25 hp (34 A)	480 VAC / 3 Ph / 60 Hz
Control Panel	Electricity	10 A	120 VAC / 1 Ph / 60 Hz
Solar Control Panel	Electricity	10 A	12 VDC (Solar Powered)
ViZion	Electricity		120 VAC / 1 Ph / 60 Hz

**Purge gas to be oxygen free and not go to dew point at operating temperatures.*

Customer Connections (Estimated, TBC by customer):

Service	Size	Type	Rating
Flare Gas	12"	RF	150#
Pilot Gas	1/2"	NPT	3000#

Equipment Description:

Self-Supported Stack	The stack is mounted onto a customer supplied concrete foundation to secure the system and prevent it from blowing over in high winds.
Air Assisted Tip (UFA)	The UFA style tip provides high stability combustion while also ensuring reliability of the flame from purge all the way to max flow rates. An air plenum is used to direct air from the provided blower into the combustion zone to provide turbulent mixing. Components located in the high heat zone will be made of 310SS or equivalent casting material. The tip will provide a VOC destruction efficiency of at least 98 wt%.
Velocity Seal	An integral purge reducing velocity seal is included to reduce the quantity of purge gas to prevent oxygen ingress through the tip at low rates.
Air Assist Blower (VFD Included)	For low pressure applications and/or heavy gas compositions, an air assist blower is required for smokeless operation. The blower utilizes ambient air to increase air and gas mixing in the combustion zone, which eliminates any smoke that may form in the flames. A VFD is included for fine tuning of the performance of the system. Flow or pressure transmitter for automated VFD control are by others.
HSLF Pilot w/ Type K Thermocouple	The premix pilot is proven to stay lit in hurricane force weather conditions. Testing has shown that a stable flame is present even in wind speeds greater than 150 mph in addition to rainfall of over 10 inches per hour. The pilot will be equipped with a Type K thermocouple for continuous monitoring of the pilot status. The pilot also meets or exceeds API 537 design requirements.
Retractable Pilot Components	For ease of service, instead of retracting the entire pilot, only the components that may need service are made retractable. This ensures that the location of the pilot with relation to the tip is maintained, ensuring proper ignition every time. The ignition probe and thermocouple are the only components that potentially require regular maintenance. Both components will be retractable so that maintenance can be performed without needing a shutdown of the system or any special equipment.
Automatic Ignition/Monitoring Panel	The automatic pilot ignition and monitoring panel will continuously monitor the pilot and attempt to relight if a pilot failure signal is received. The control panel will require customer supplied electricity and also be skid mounted.
Optional Equipment:	
Group D Deflagration Arrester	*Due to potential for having combustible levels of oxygen in the waste gases, an arrester is recommended to ensure that any flashback from the tip is stopped before it can enter into the upstream piping system.*
Automatic Ignition/Monitoring Panel (Solar Powered Backup)	*The automatic pilot ignition and monitoring panel will continuously monitor the pilot and attempt to relight if a pilot failure signal is received. The control panel will be powered via a solar panel and rechargeable deep cycle battery. Battery power provides the electricity required to continually run the panel, while the solar panel recharges the battery. The control panel, solar cell, and battery are skid mounted.*
Zeeco ViZion Remote Flare Monitoring and Control	*The Zeeco ViZion utilizes simplified video imaging spectro-radiometry (VISR) technology to measure, monitor, and control flare performance. The ViZion is approved under the EPA's OTM 56 for measuring and quantifying NHVdil and NHVcz parameters. Additionally, the unit can monitor the smoke index in real-time and provide an alert for a smoking flare system in line with Method 22 requirements. The ViZion can be integrated into plant control loops to adjust*

Thermal Fluid System Datasheet

Customer Name	*Kinder Morgan*		*Project Name*	*HOS*	
Date completed	*July 7, 2022*		*Project Location*	*West Texas*	
Revision number	*2*		*Sales Engineer*	*Joaquin Grimaux*	
Heater Design & Performance					
Heat Input	26.40	MMBTU/hr	Heater Model Number	HC2-20.0-H-SF	
Heater Type	HC2		Heater Configuration	Horizontal	
System Flow Rate	881	GPM	Fluid Pressure Drop	18	psid
Heater Flow Rate	1,000	GPM	Flue Gas Pressure Drop	8.3	inWC
System Bypass	119	GPM	Average Heat Flux	12,424	BTU/hr-ft^2
Heater Bypass	0	GPM	Radiant Zone Heat Flux	29,644	BTU/hr-ft^2
Thermal Fluid	Chemtherm 550		Maximum Film Temperature	472	°F
Process Supply Temperature	380	°F	Inner Coil Velocity	9	ft/s
Heater Outlet Temperature	380	°F	Outer Coil Velocity	6	ft/s
Process Return Temperature	272	°F	Thermal Efficiency	85.5%	% LHV Basis
Heater Coil Design Temperature	750	°F	Heater Coil Design Pressure	250	psig
Burner & Combustion Data					
Fuel Type	Gas		Selected Burner Make	Webster	
Combustion Air Preheat	No		Burner Model Selected	HD9-400	
Efficiency with Preheat	N/A	% LHV Basis	Steady State Firing Rate (HHV Basis)	34,305,556	BTU/hr
Oxygen Trim	No		Burner Design Margin	5%	
Combustion Control Type	Single Point Positioning		Design Firing Rate (HHV Basis)	36,020,834	BTU/hr
Low NOx Required	No		Combustion Air Design Temperature	60.8	°F
BMS Type	Standard		Available Fuel Pressure From Customer	150	psig
Combustion Control Type	Standard		Excess Air	15	%
Control Panel Location	Mounted Local to Heater		Design Fuel Flow Rate	35,450	SCFH
NOx Required (if any)	100	ppm	Burner Duty Cycle	Continuous	
CO Required (if any)	200	ppm	Fuel Train Location	Heater Mounted	
Gas Consumption @ Steady State	33,762	SCFH	Fuel Train / BMS Code Compliance	NFPA 87	
Air Consumption @ Steady State	6,216	ACFM	Estimated Blower Motor Power Required	33.2	BHP
Gas Consumption @ High Fire	35,450	SCFH	Fuel Train Type	Sigma Thermal Standard	
Air Consumption @ High Fire	6,527	ACFM	Fuel Train Construction	NPT	
Exhaust Gas Flow Rate	13,189	ACFM	Flue Gas Velocity	49	ft/s
Exhaust Stack Mounting Configuration	Free Standing		Exhaust Gas Temperature	531	°F
Exhuast Stack Diameter	30	in	Exhaust Stack Height From Grade	15	ft
Pump, Piping, & Expansion Tank Data					
Estimated User & Piping Pressure Drop	30	psig	Pump Model	ZTND 100-200	
Pump Configuration	2 x 100%		Estimated Motor Size	50	hp
Calculated Total Pump Flow Required	1025	GPM	Line Size	8	in
Calculated Total System Pressure Drop	57.6	psid	Valve Specification	Sigma Thermal Standard	
Selected Pump Make	Sihi		Valve Type	Buttweld Gate	
Thermal Fluid Piping Design Temperature	750	°F	Thermal Fluid Piping Design Pressure	150	psig
Total Estimated System Volume	3,684	gal	Tank Type	Standard	
Calculated Expansion Volume	535	gal	Nitrogen Blanket Pressure (if applicable)	5	psig
Expansion Tank Size	1000	gal	Drain Tank Size	By Others	gal
General Project Data					
Minimum / Maximum Ambient Temperature	20 / 90	°F	Control Panel Area Classification	Class I Div. II	
Elevation (above mean sea level)	0	ft	Skid Area Classification	Class I Div. II	
Installation Location	Outdoor		Wiring Standards	Sigma Thermal Standard	
Motor Requirements	Premium Efficiency TEFC		Electrical Code of Construction	NEC	
Instrumentation	Sigma Thermal Standard		Control Panel Certification	UL	
Motor Starters	By Others		Primary Voltage	460V / 3 / 60Hz	
Minimum Electrical Enclosures Rating	NEMA 4		Control Voltage	120V / 1 / 60Hz	
Will a blanket be used?	Yes		Will a tank tower be supplied?	Yes	
Will the heater be skid mounted?	No		Are there secondary circulation skids required?	No	
Will a side stream filter be used?	Yes		User Control Valves	No	
Automated System Bypass Valve	By Others		Heater Code of Construction	ASME Section VIII	
Expansion Tank Code of Construction	ASME Section VIII		Applicable Piping Code / Standard	ASME B31.3	
Paint Colors	Sigma Thermal Standard		Overall Paint Specification	Sigma Thermal Standard	

Graystone Emissions

AIR EMISSIONS REPORT

02\04\2025

For:

MarkWest West Texas Gas Company

Requirements:

20.2.50.119 NMAC

Location:

Dagger Lake Amine Plant

Lea Co. New Mexico

Equipment:

Sigma Thermal Heater

Unit #

Heater I

Test Technician

Kenneth Calvert

Emissions Test Report

Emissions Test Date: 02/04/2025 Requirement 20.2.50.119 NMAC

1105
MarkWest Ennergy West Texas Gas Co.
Michael Tyler
Phone: (210) 626-6323
, TX
Mobile: (210) 248-7579
Email: mgtyler@marathonpetroleum.com

CO: ppm*	NOx: ppm*
68.419	4.670
Pass	Pass
(400 ppm)	(30 ppm)

* Values corrected to 3% O2

PHYSICAL LOCATION

Operational Area: Lea Co New Mexico

Facility Name: Dagger Lake Amine Plant

PERMIT INFORMATION

Permit Equipment #: Hearter 1

Permit Units: ppm @ 3 % O2

Permit CO Limit: 400

Permit NOx Limit: 30

ANALYZER INFORMATION

Model: ecom-J2KNpro Industrial Serial #: 15835

Last Stability Test : 00/00/00

Last Linearity Test : 00/00/00

EMISSIONS TEST RESULTS

Parameter	Test 1	Test 2	Test 3	Overall Average
O2%	7.64	7.87	8.25	7.92
CO ppm @ 3% O2	130.92	44.49	29.85	68.42
NOx ppm @ 3% O2	4.78	4.70	4.53	4.67

Graystone Emissions

AIR EMISSIONS REPORT

02\07\2025

For:

MarkWest West Texas Gas Company

Requirements:

20.2.50.119 NMAC

Location:

Dagger Lake Amine Plant

Lea Co. New Mexico

Equipment:

Sigma Thermal Heater

Unit #

Heater II

Test Technician

Kenneth Calvert

Emissions Test Report

Emissions Test Date: 02/07/2025 Requirement: 20.2.50.119 NMAC

MarkWest
MarkWest Energy West Texas Gas Co
Michael Tyler
Phone: 210-626-6323
, TX
Mobile: 210-248-7579
Email: mgtyler@marathonpetrolrum.com

CO: ppm*	NOx: ppm*
133.29	23.97
Pass	Pass
(400.0 ppm)	(30.0 ppm)

* Values corrected to 3% O2

PHYSICAL LOCATION

Operational Area: Lea Co New Mexico

Facility Name: Dagger Lake Amine Plant

ANALYZER INFORMATION

Model: J2KN pro

Serial #: 8879

Last Stability Test : 00/00/00

Last Linearity Test : 00/00/00

EMISSIONS TEST RESULTS

Parameter	Test 1	Test 2	Test 3	Overall Average
O2%	9.76	4.97	7.08	7.27
CO ppm @ 3% O2	55.38	37.34	307.17	133.29
NOx ppm @ 3% O2	24.76	22.69	24.47	23.97

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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

June 6, 2023

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

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

Sample: Dagger Lake CS 4
Inlet Separator
Spot Gas Sample @ 60 psig & 68 °F

Date Sampled: 05/22/2023 Job Number: 232282.001

CHROMATOGRAPH EXTENDED ANALYSIS - GPA 2286

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	0.001	
Nitrogen	3.325	
Carbon Dioxide	11.213	
Methane	66.339	
Ethane	9.551	2.616
Propane	5.276	1.488
Isobutane	0.699	0.234
n-Butane	1.705	0.550
2-2 Dimethylpropane	0.003	0.001
Isopentane	0.474	0.178
n-Pentane	0.470	0.174
Hexanes	0.405	0.171
Heptanes Plus	0.539	0.219
Totals	100.000	5.631

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.326	(Air=1)
Molecular Weight	95.94	
Gross Heating Value	5123	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	0.855	(Air=1)
Compressibility (Z)	0.9959	
Molecular Weight	24.65	
Gross Heating Value		
Dry Basis	1165	BTU/CF
Saturated Basis	1145	BTU/CF

*Hydrogen Sulfide tested on location by: Stain Tube Method (GPA 2377)
Results: 0.314 Gr/100 CF, 5.0 PPMV or 0.001 Mol %

Base Conditions: 15.025 PSI & 60 Deg F

Sampled By: (14) P. Ramirez
Analyst: JS
Processor: DS
Cylinder ID: G-0337

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	3.325		3.778
Carbon Dioxide	11.213		20.016
Methane	66.339		43.163
Ethane	9.551	2.616	11.649
Propane	5.276	1.488	9.437
Isobutane	0.699	0.234	1.648
n-Butane	1.705	0.550	4.020
2,2 Dimethylpropane	0.003	0.001	0.009
Isopentane	0.474	0.178	1.387
n-Pentane	0.470	0.174	1.375
2,2 Dimethylbutane	0.004	0.002	0.014
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.046	0.019	0.161
2 Methylpentane	0.128	0.054	0.447
3 Methylpentane	0.077	0.032	0.269
n-Hexane	0.150	0.063	0.524
Methylcyclopentane	0.062	0.022	0.212
Benzene	0.060	0.017	0.190
Cyclohexane	0.077	0.027	0.263
2-Methylhexane	0.019	0.009	0.077
3-Methylhexane	0.024	0.011	0.098
2,2,4 Trimethylpentane	0.012	0.006	0.056
Other C7's	0.035	0.016	0.141
n-Heptane	0.040	0.019	0.163
Methylcyclohexane	0.053	0.022	0.211
Toluene	0.054	0.019	0.202
Other C8's	0.046	0.022	0.206
n-Octane	0.013	0.007	0.060
Ethylbenzene	0.005	0.002	0.022
M & P Xylenes	0.009	0.004	0.039
O-Xylene	0.002	0.001	0.009
Other C9's	0.016	0.008	0.082
n-Nonane	0.003	0.002	0.016
Other C10's	0.005	0.003	0.029
n-Decane	0.001	0.001	0.006
Undecanes (11)	0.003	0.002	0.020
Totals	100.000	5.631	100.000

Computed Real Characteristics of Total Sample

Specific Gravity	0.855	(Air=1)
Compressibility (Z)	0.9959	
Molecular Weight	24.65	

Gross Heating Value

Dry Basis	1165	BTU/CF
Saturated Basis	1145	BTU/CF

June 6, 2023

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

Sample: Dagger Lake CS 4
Inlet Separator
Spot Gas Sample @ 60 psig & 68 °F

Date Sampled: 05/22/2023 Job Number: 232282.001

GLYCALC FORMAT

COMPONENT	MOL%	GPM	Wt %
Carbon Dioxide	11.213		20.016
Hydrogen Sulfide	0.001		0.001
Nitrogen	3.325		3.778
Methane	66.339		43.163
Ethane	9.551	2.616	11.649
Propane	5.276	1.488	9.437
Isobutane	0.699	0.234	1.648
n-Butane	1.708	0.552	4.029
Isopentane	0.474	0.178	1.387
n-Pentane	0.470	0.174	1.375
Cyclopentane	0.000	0.000	0.000
n-Hexane	0.150	0.063	0.524
Cyclohexane	0.077	0.027	0.263
Other C6's	0.255	0.108	0.891
Heptanes	0.180	0.077	0.691
Methylcyclohexane	0.053	0.022	0.211
2,2,4 Trimethylpentane	0.012	0.006	0.056
Benzene	0.060	0.017	0.190
Toluene	0.054	0.019	0.202
Ethylbenzene	0.005	0.002	0.022
Xylenes	0.011	0.004	0.048
Octanes Plus	0.087	0.044	0.419
Totals	100.000	5.631	100.000

Real Characteristics Of Octanes Plus:

Specific Gravity	4.101	(Air=1)
Molecular Weight	118.29	
Gross Heating Value	6232	BTU/CF

Real Characteristics Of Total Sample:

Specific Gravity	0.855	(Air=1)
Compressibility (Z)	0.9959	
Molecular Weight	24.65	
Gross Heating Value		
Dry Basis	1165	BTU/CF
Saturated Basis	1145	BTU/CF

United States
Environmental Protection
Agency

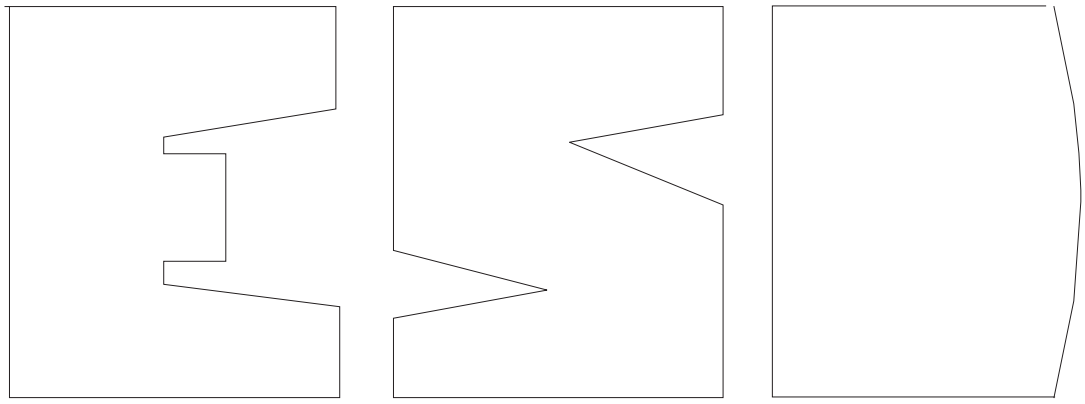
Office of Air Quality
Planning and Standards
Research Triangle Park NC 27711

EPA-453/R-95-017
November 1995

Air

EPA

Protocol for Equipment Leak Emission Estimates



EPA-453/R-95-017

1995 Protocol for Equipment Leak Emission Estimates

Emission Standards Division

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

November 1995

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

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

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

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

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

13.2.2 Unpaved Roads

13.2.2.1 General

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

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

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

13.2.2.2 Emissions Calculation And Correction Parameters[1-6]

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

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

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

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

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

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

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

[a]References 1,5-15.

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

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

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

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

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

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

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

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

1 lb/VMT = 281.9 g/VKT

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

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

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

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

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

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

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

[a] See discussion in text.

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

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

as shown in Table 13.2.2-4

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

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

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

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

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

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

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

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

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

where:

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

E = emission factor from Equation 1a or 1b

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

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

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

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

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

13.2.2.3 Controls[18-22]

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

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

2. Surface improvement, by measures such as (a) paving or (b) adding gravel or slag to a dirt road; and
3. Surface treatment, such as watering or treatment with chemical dust suppressants.

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

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

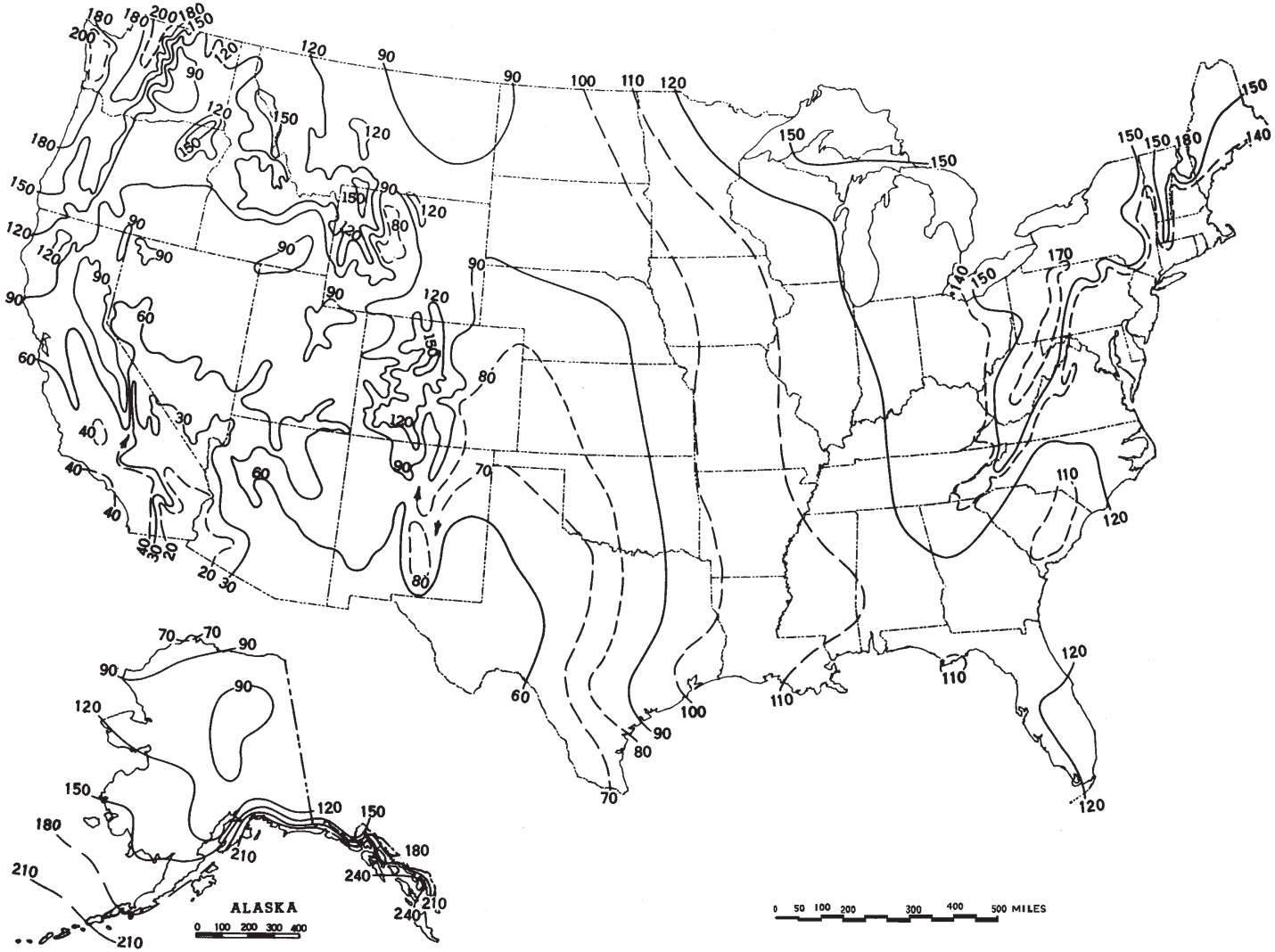


Figure 13.2.2-1. Mean number of days with 0.01 inch or more of precipitation in United States.

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

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

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

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

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

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

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

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

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

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

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

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

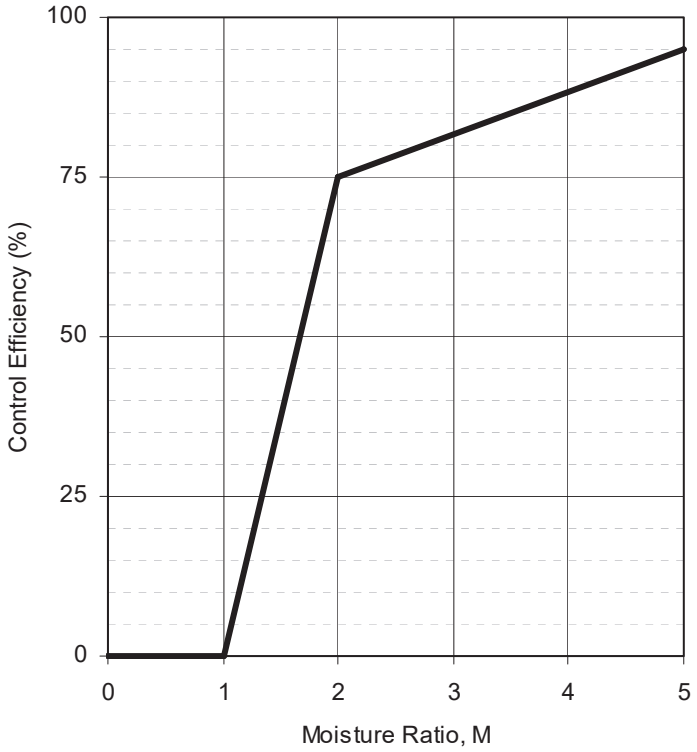


Figure 13.2.2-2. Watering control effectiveness for unpaved travel surfaces

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

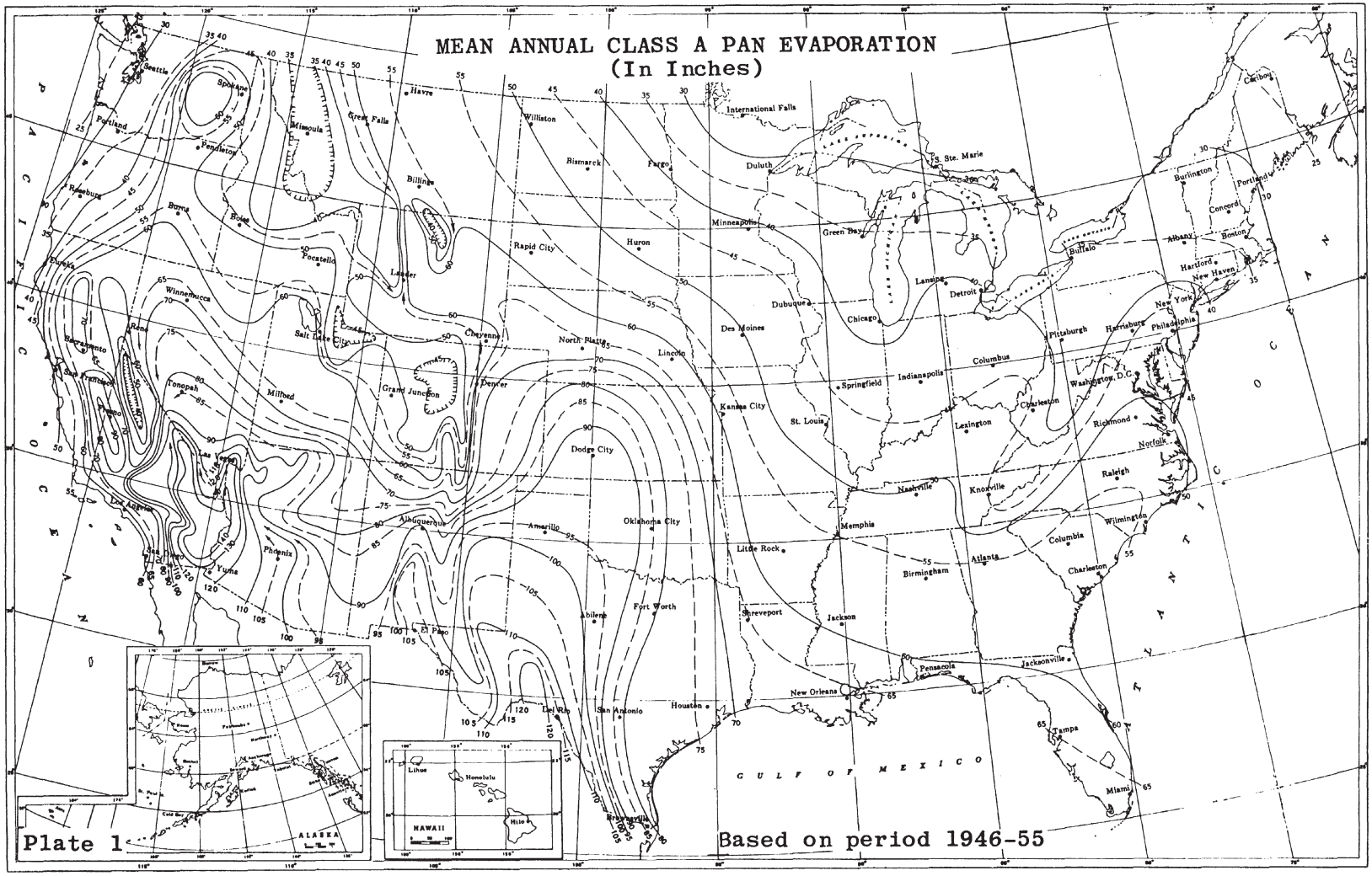


Figure 13.2.2-3. Annual evaporation data.

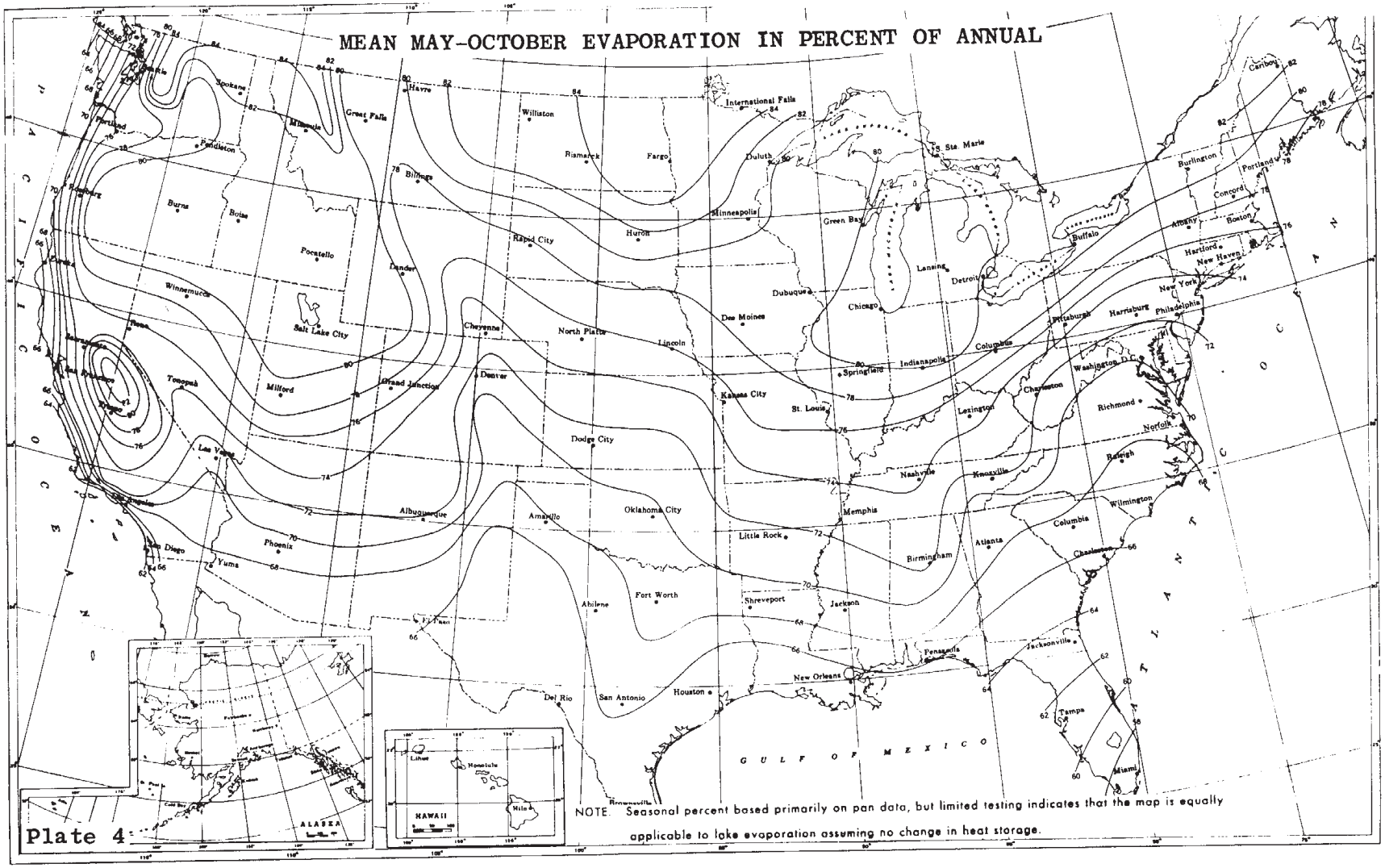


Figure 13.2.2-4. Geographical distribution of the percentage of evaporation occurring between May and October.

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

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

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

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

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

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

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

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

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

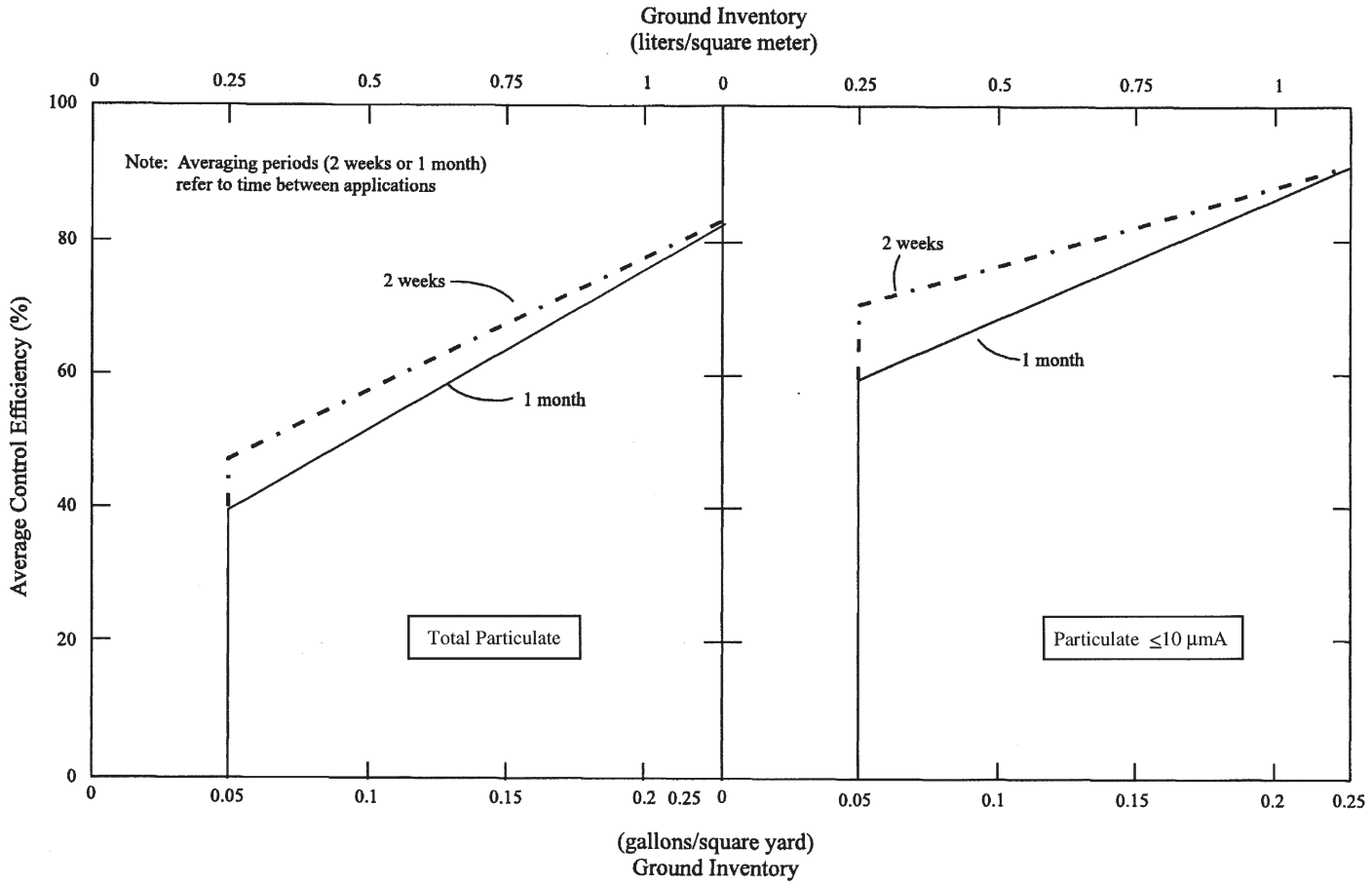


Figure 13.2.2-5. Average control efficiencies over common application intervals.

13.2.2.4 Updates Since The Fifth Edition

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

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

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

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

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

References For Section 13.2.2

1. C. Cowherd, Jr., *et al., Development Of Emission Factors For Fugitive Dust Sources,* EPA-450/3-74-037, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

2. R. J. Dyck and J. J. Stukel, "Fugitive Dust Emissions From Trucks On Unpaved Roads", *Environmental Science And Technology, 10*(10):1046-1048, October 1976.

3. R. O. McCaldin and K. J. Heidel, "Particulate Emissions From Vehicle Travel Over Unpaved Roads", Presented at the 71st Annual Meeting of the Air Pollution Control Association, Houston, TX, June 1978.

4. C. Cowherd, Jr, *et al., Iron And Steel Plant Open Dust Source Fugitive Emission Evaluation*, EPA-600/2-79-013, U. S. Environmental Protection Agency, Cincinnati, OH, May 1979.

5. G. Muleski, *Unpaved Road Emission Impact*, Arizona Department of Environmental Quality, Phoenix, AZ, March 1991.

6. *Emission Factor Documentation For AP-42, Section 13.2.2, Unpaved Roads, Final Report*, Midwest Research Institute, Kansas City, MO, September 1998.

7. T. Cuscino, Jr., *et al., Taconite Mining Fugitive Emissions Study*, Minnesota Pollution Control Agency, Roseville, MN, June 1979.

8. *Improved Emission Factors For Fugitive Dust From Western Surface Coal Mining Sources*, 2 Volumes, EPA Contract No. 68-03-2924, Office of Air Quality Planning and Standards, U. S. Environmental Protection Agency, Research Triangle Park, NC.

9. T. Cuscino, Jr., *et al., Iron And Steel Plant Open Source Fugitive Emission Control Evaluation*, EPA-600/2-83-110, U. S. Environmental Protection Agency, Cincinnati, OH, October 1983.

10. *Size Specific Emission Factors For Uncontrolled Industrial And Rural Roads*, EPA Contract No. 68-02-3158, Midwest Research Institute, Kansas City, MO, September 1983.

11. C. Cowherd, Jr., and P. Englehart, *Size Specific Particulate Emission Factors For Industrial And Rural Roads*, EPA-600/7-85-038, U. S. Environmental Protection Agency, Cincinnati, OH, September 1985.

12. *PM-10 Emission Inventory Of Landfills In The Lake Calumet Area*, EPA Contract 68-02-3891, Work Assignment 30, Midwest Research Institute, Kansas City, MO, September 1987.

13. *Chicago Area Particulate Matter Emission Inventory — Sampling And Analysis*, EPA Contract No. 68-02-4395, Work Assignment 1, Midwest Research Institute, Kansas City, MO, May 1988.

14. *PM-10 Emissions Inventory Data For The Maricopa And Pima Planning Areas*, EPA Contract No. 68-02-3888, Engineering-Science, Pasadena, CA, January 1987.

15. *Oregon Fugitive Dust Emission Inventory*, EPA Contract 68-D0-0123, Midwest Research Institute, Kansas City, MO, January 1992.

16. *Climatic Atlas Of The United States*, U. S. Department Of Commerce, Washington, DC, June 1968.

17. National Climatic Data Center, *Solar And Meteorological Surface Observation Network 1961-1990*; 3 Volume CD-ROM. Asheville, NC, 1993.

18. C. Cowherd, Jr. *et al., Control Of Open Fugitive Dust Sources*, EPA-450/3-88-008, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1988.

19. G. E. Muleski, *et al., Extended Evaluation Of Unpaved Road Dust Suppressants In The Iron And Steel Industry*, EPA-600/2-84-027, U. S. Environmental Protection Agency, Cincinnati, OH, February 1984.

20. C. Cowherd, Jr., and J. S. Kinsey, *Identification, Assessment And Control Of Fugitive Particulate Emissions*, EPA-600/8-86-023, U. S. Environmental Protection Agency, Cincinnati, OH, August 1986.

21. G. E. Muleski and C. Cowherd, Jr., *Evaluation Of The Effectiveness Of Chemical Dust Suppressants On Unpaved Roads*, EPA-600/2-87-102, U. S. Environmental Protection Agency, Cincinnati, OH, November 1986.

22. *Fugitive Dust Background Document And Technical Information Document For Best Available Control Measures*, EPA-450/2-92-004, Office Of Air Quality Planning And Standards, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1992.

23. Written communication (Technical Memorandum) from P. Hemmer, E.H. Pechan & Associates, Inc., Durham, NC to B. Kuykendal, U. S. Environmental Protection Agency, Research Triangle Park, NC, August, 21, 2003.

24. MOBILE6 User Guide, United States Environmental Protection Agency, Office of Transportation and Air Quality. EPA420-R-02-028, October 2002.

25. Written communication (Technical Memorandum) from G. Muleski, Midwest Research Institute, Kansas City, MO, to B. Kuykendal, U. S. Environmental Protection Agency, Research Triangle Park, NC, Subject "Unpaved Roads", September 27, 2001.

26. Written communication (Technical Memorandum) from W. Kuykendal, U. S. Environmental Protection Agency, to File, Subject "Decisions on Final AP-42 Section 13.2.2 Unpaved Roads", November 24, 2003.

27. C. Cowherd, *Background Document for Revisions to Fine Fraction Ratios &sed for AP-42 Fugitive Dust Emission Factors*. Prepared by Midwest Research Institute for Western Governors Association, Western Regional Air Partnership, Denver, CO, February 1, 2006.

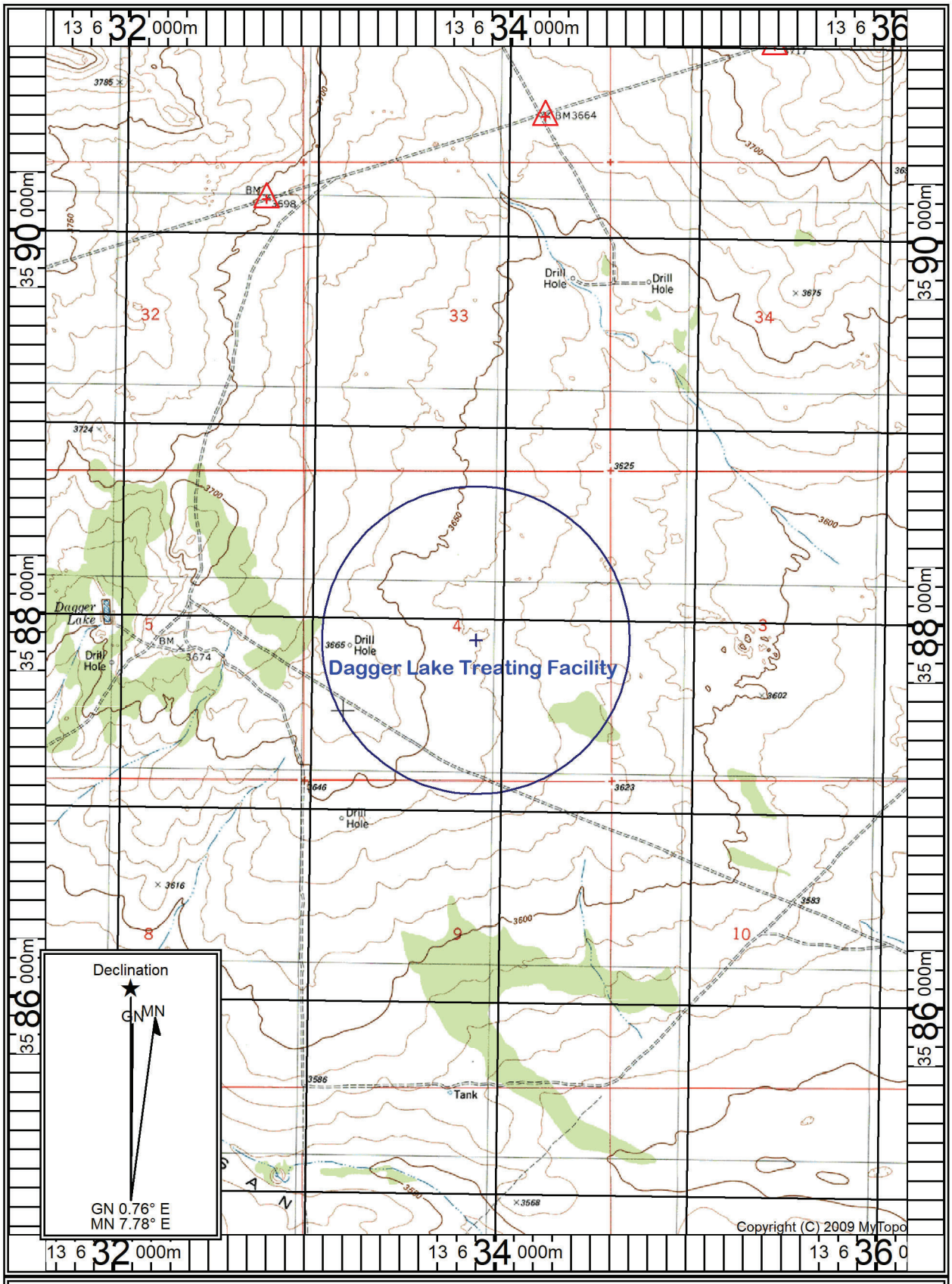
Section 8

Map(s)

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

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

A map is attached to this application.



Map Name: GRAMA RIDGE (NM) Scale: 1 inch = 2,500 ft. Horizontal Datum: WGS84
Print Date: 11/28/23 Map Center: 13 0633857 E 3587890

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.



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Eunice, NM 88231

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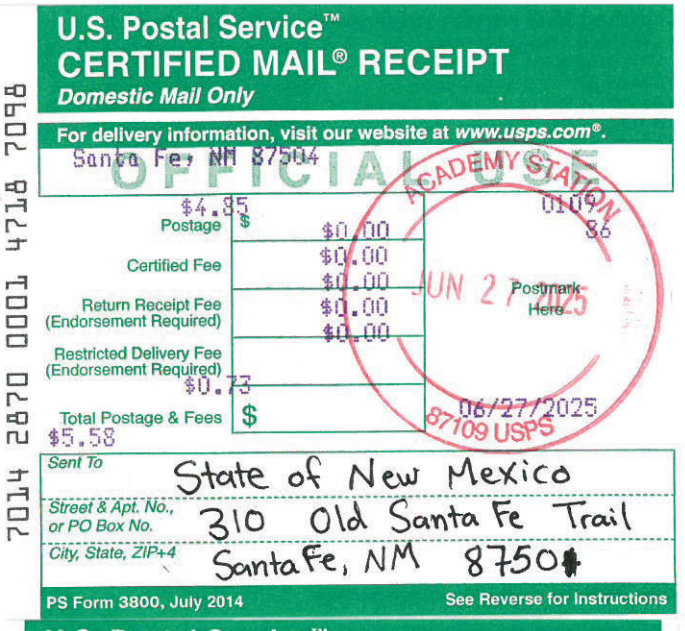
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Certified Fee	$0.00
Return Receipt Fee (Endorsement Required)	$0.00
Restricted Delivery Fee (Endorsement Required)	$0.00
Total Postage & Fees	$0.73
	$5.58

ACADEMY STATION 0109 86
JUN 27 2025
Postmark Here
06/27/2025
87109 USPS

7014 2870 0001 4718 7081

Sent To: Merchant Livestock Company
Street & Apt. No., or PO Box No.: P.O. Box 1105
City, State, ZIP+4: Eunice, NM 88231

PS Form 3800, July 2014 — See Reverse for Instructions



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Santa Fe, NM 87504

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Certified Fee	$0.00
Return Receipt Fee (Endorsement Required)	$0.00
Restricted Delivery Fee (Endorsement Required)	$0.00
Total Postage & Fees	$0.73
	$5.58

ACADEMY STATION 0109 86
JUN 27 2025
Postmark Here
06/27/2025
87109 USPS

7014 2870 0001 4718 7098

Sent To: State of New Mexico
Street & Apt. No., or PO Box No.: 310 Old Santa Fe Trail
City, State, ZIP+4: Santa Fe, NM 87501

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Lovington, NM 88260

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Certified Fee	$0.00
Return Receipt Fee (Endorsement Required)	$0.00
Restricted Delivery Fee (Endorsement Required)	$0.00
Total Postage & Fees	$0.73
	$5.58

ACADEMY STATION 0109 86
JUN 27 2025
Postmark Here
06/27/2025
87109 USPS

7014 2870 0001 4718 7203

Sent To: Lea County Managers Office
Street & Apt. No., or PO Box No.: 100 North Main
City, State, ZIP+4: Lovington, NM 88260

PS Form 3800, July 2014 — See Reverse for Instructions



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Santa Fe, NM 87508

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Postage	$4.85
Certified Fee	$0.00
Return Receipt Fee (Endorsement Required)	$0.00
Restricted Delivery Fee (Endorsement Required)	$0.00
Total Postage & Fees	$0.73
	$5.58

ACADEMY STATION 0109 86
JUN 27 2025
Postmark Here
06/27/2025
87109 USPS

7014 2870 0001 4718 7104

Sent To: US Bureau of Land Management
Street & Apt. No., or PO Box No.: 301 Dinosaur Trail
City, State, ZIP+4: Santa Fe, NM 87508

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Carlsbad, NM 88220

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Postage	$4.85
Certified Fee	$0.00
Return Receipt Fee (Endorsement Required)	$0.00
Restricted Delivery Fee (Endorsement Required)	$0.00
Total Postage & Fees	$0.73
	$5.58

ACADEMY STATION 0109 86
JUN 27 2025
Postmark Here
06/27/2025
87109 USPS

7014 2870 0001 4718 7210

Sent To: Eddy County Managers Office
Street & Apt. No., or PO Box No.: 101 W Greene St.
City, State, ZIP+4: Carlsbad, NM 88220

PS Form 3800, July 2014 — See Reverse for Instructions

List of Posted Notice Locations

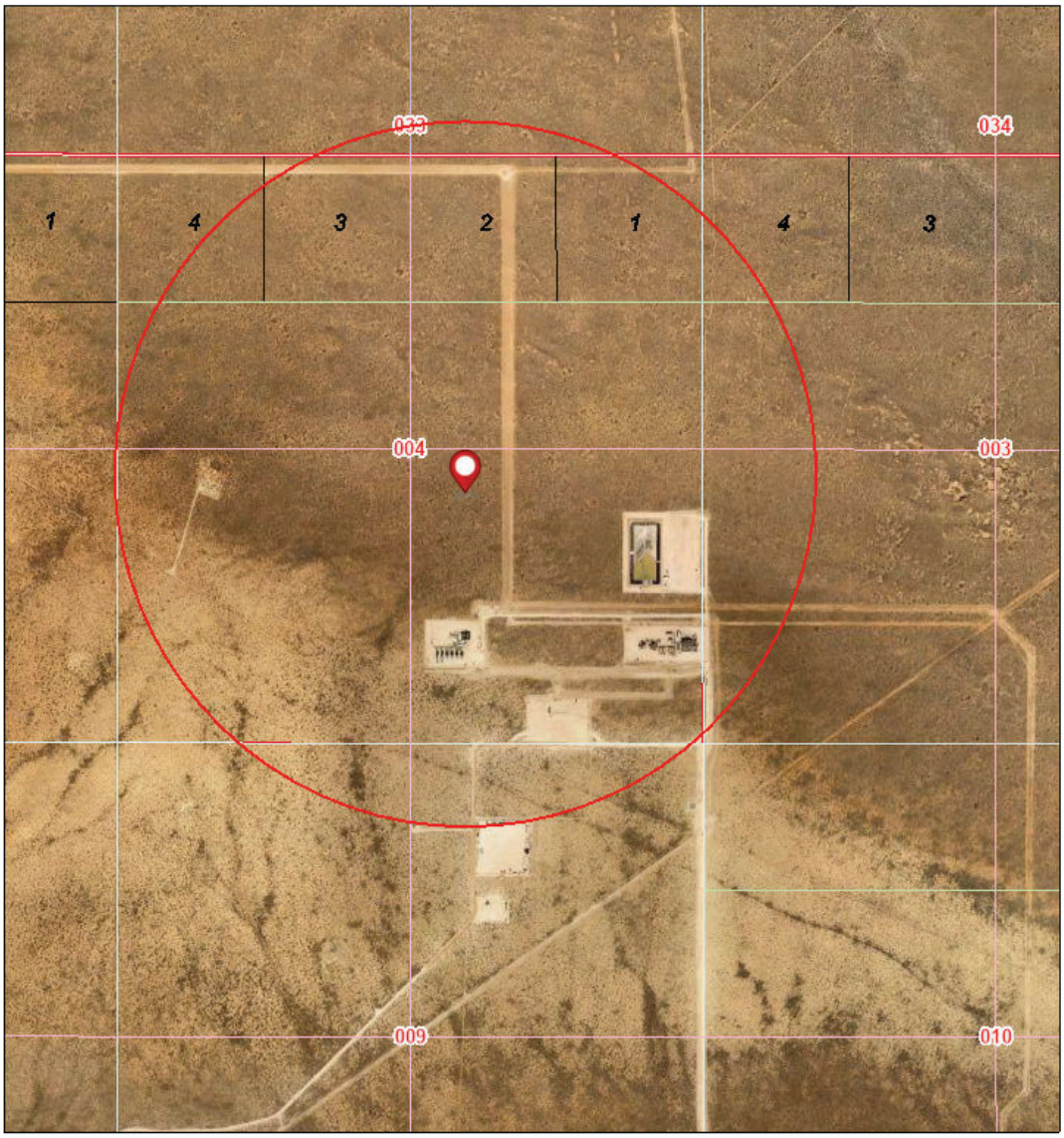
1. Dagger Lake Treating Facility Entrance
2. Eunice Public Library, 1003 Avenue N, Eunice, NM 88231
3. Post Office, 1201 Avenue K, Eunice, NM 88231
4. Lowes Market, 1326 Avenue J, Eunice, NM 88231

Lea County Parcel Report

Area of Interest (AOI) Information

Area : 722.95 acres

Feb 11 2025 11:57:56 Mountain Standard Time



Parcel Lines
- Parcel
- Township
- Section
- QSection
- Dashed QSection

- Lot Lines
- Townships
- Sections
- Parcels
- Lea County Boundary

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

Esri Community Maps Contributors, New Mexico State University, Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Click to Print

Owner Information

Owner #:50193 **District:**080
Name: MERCHANT LIVESTOCK
Co Name: COMPANY
Address1: PO BOX 1105
Address2:
City: EUNICE **State:** NM **Zip Code:** 88231

Estimated Taxes for Owner

Estimated Tax	Estimated Year used
$22.20	2024

Calculate Estimated Tax

Recap Value Information

Central Full Value	0	**Full Value**	2646
Land Full Value	2646	**Taxable Value**	882
Improvements Full value	0	**Exempt Value**	0
Personal Property Full Value	0	**Net Value**	882
Manufactured Home Full Value	0		
Livestock Full Value	0		

Property Information

Property Code:4000501930001

Book:
Page:0
Reception#:0

Physical Address:

Bldg:
Apt:

Property Value Information

120 Non-Residential Land 840.24 0.00 2646

Click to Print

Owner Information

Owner #:50193 **District:**080
Name: MERCHANT LIVESTOCK
Co Name: COMPANY
Address1: PO BOX 1105
Address2:
City: EUNICE **State:** NM **Zip Code:** 88231

Estimated Taxes for Owner

Estimated Tax	Estimated Year used
$22.20	2024

Calculate Estimated Tax

Recap Value Information

Central Full Value	0	**Full Value**	2646
Land Full Value	2646	**Taxable Value**	882
Improvements Full value	0	**Exempt Value**	0
Personal Property Full Value	0	**Net Value**	882
Manufactured Home Full Value	0		
Livestock Full Value	0		

Property Information

Property Code:4000501930002

Book:
Page:0
Reception#:0

Physical Address:

Bldg:
Apt:

Dagger Lake Treating Facility - Public Notice

Table of Noticed Neighbors (within 0.5 miles of facility)

Location	Owner Address	City	State	ZIP
Merchant Livestock Company	PO Box 1105	Eunice	NM	88231
State of New Mexico	310 Old Santa Fe Trail	Santa Fe	NM	87501
US Bureau of Land Management	301 Dinosaur Trail	Santa Fe	NM	87508

Table of Noticed Municipalities (within 10 miles of facility)

Location	Owner Address	City	State	ZIP
N/A- No municipalilities within 10-mile radius.				

Table of Noticed Counties (within 10 miles of facility)

Location	Owner Address	City	State	ZIP
Lea County	100 North Main	Lovington	NM	88260
Eddy County	101 W Greene St.	Carlsbad	NM	88220

Table of Noticed Tribes (within 10 miles of facility)

Location	Owner Address	City	State	ZIP
N/A - No tribes within 10-mile radius.				

NOTICE

MarkWest Energy West Texas Gas Company, L.L.C. announces its application to the New Mexico Environment Department for an air quality permit for the **modification** of its **gas treating** facility. The expected date of application submittal to the Air Quality Bureau is **June 30, 2025.**

The exact location for the proposed facility known as, **Dagger Lake Treating Facility**, is latitude **32.419806°** and longitude **-103.575839°**. The approximate location of this facility is **22.4** miles **west** of **Eunice, NM** in **Lea** county.

The proposed **modification** consists of the replacement of one (1) temporary flare (Unit FL-1) with one (1) acid gas flare (Unit FL-1), the removal of two (2) thermal oxidizers (Units TO-1 & TO-2) and malfunction emissions (Unit M), and the modification of startup, shutdown, and maintenance emissions (Unit SSM.

The estimated maximum quantities of any regulated air contaminant will be as follows in pound per hour (pph) and tons per year (tpy) and could change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
Particulate Matter (PM)	1	3
PM_{10}	1	3
$PM_{2.5}$	1	3
Sulfur Dioxide (SO_2)	19	80
Nitrogen Oxides (NO_x)	14	58
Carbon Monoxide (CO)	59	248
Volatile Organic Compounds (VOC)	7053	218
Total sum of all Hazardous Air Pollutants (HAPs)	345	18
Hydrogen Sulfide (H_2S)	1	1
Toxic Air Pollutant (TAP)	N/A	N/A
Green House Gas Emissions as Total CO_2e	N/A	218,935

The maximum operating schedule 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: **MarkWest Energy West Texas Gas Company, L.L.C., 1515 Arapahoe Street, Denver, CO 80202**

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

With your comments, please refer to the company name and facility name, or send a copy of this notice along with your comments. This information is necessary since the Department may have not yet received the permit application. Please include a legible return mailing address. Once the Department has completed its preliminary review of the application and its air quality impacts, the Department's notice will be published in the legal section of a newspaper circulated near the facility location.

Attención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.


NO TRESPASSING
ACCESS TO THIS FACILITY IS LIMITED TO AUTHORIZED PERSONNEL ONLY.
DANGER - NO SMOKING OR OPEN FLAMES
PHOTOGRAPHING OR OTHERWISE RECORDING THIS FACILITY OR ITS OPERATIONS IS PROHIBITED.
AREA IS SUBJECT TO VIDEO MONITORING
TO REPORT AN INCIDENT CALL 1-877-MAPLINE (627-5463)
NOTICE
ACCESS TO THIS FACILITY IS LIMITED TO AUTHORIZED PERSONNEL ONLY.
ILLEGAL DRUGS, UNAUTHORIZED ALCOHOL, WEAPONS AND FIREARMS ARE PROHIBITED ON COMPANY PROPERTY, INCLUDING PARKING LOTS.
THE COMPANY RESERVES THE RIGHT TO CONDUCT SEARCHES AND INSPECTIONS OF ALL PERSONS, PERSONAL PROPERTY, AND VEHICLES ENTERING, ON OR LEAVING THE COMPANY PREMISES OR OTHERWISE ENGAGED IN COMPANY BUSINESS WITHOUT FURTHER NOTICE.
SMOKING IS PROHIBITED EXCEPT IN DESIGNATED AREAS.
PHOTOGRAPHING OR OTHERWISE RECORDING THIS FACILITY OF ITS OPERATIONS IS PROHIBITED WITHOUT WRITTEN CONSENT FROM THE COMPANY.
ALL PERSONS AND VEHICLES ENGAGED IN COMPANY BUSINESS OR ENTERING, ON OR LEAVING COMPANY PROPERTY ARE SUBJECT TO THESE POLICIES.
ANY PERSON FOUND OR SUSPECTED TO BE IN VIOLATION OF ANY COMPANY POLICY OR ANY APPLICABLE LAW OF THIS JURISDICTION MAY BE REMOVED AND BARRED FROM COMPANY PROPERTY, SUBJECTED TO DISCIPLINARY ACTION, INCLUDING DISCHARGE AND REFERRED TO LAW ENFORCEMENT OFFICIALS.
THIS PROPERTY IS SUBJECT TO VIDEO MONITORING AND RECORDING AS PERMITTED BY LAW. EACH PERSON WHO ENTERS ONTO COMPANY PROPERTY OR ENGAGES IN COMPANY BUSINESS MAY BE SUBJECT TO SUCH VIDEO MONITORING AND RECORDING.
TO REPORT AN INCIDENT CALL 1-877-MAPLINE (627-5463)
WELCOME TO THE
MPLX
DAGGER LAKE AMINE PLANT,
ADDRESS: 1919 W NM HWY 176
JAL, NM 88252
COORDINATES: 32.4173869 -103.5700928)
AUTHORIZED PERSONNEL ONLY
SAFETY FIRST
ALL SAFETY & ENVIRONMENTAL HAZARDS MUST BE REPORTED IMMEDIATELY TO A COMPANY REPRESENTATIVE,
PLEASE COMMUNICATE ALL ACCIDENTS AND INJURIES IMMEDIATELY
MANDATORY
ALL PERSONNEL ON SITE MUST WEAR THE FOLLOWING PERSONAL PROTECTIVE EQUIPMENT (PPE)
ADDITIONAL PPE MAY BE REQUIRED
IN CASE OF EMERGENCY
CALL
1(877)MAPLINE (627-5463)
24 HRS
SMOKIKNG
IN DESIGNATED AREAS ONLY
ALL PERSONS AND VEHICLES ON COMPANY PROPERTY ARE SUBJECT TO SEARCH AT ANY TIME
MUSTER AREA
NOTICE

Eunice Public Library



Post Office


MECA
Therapies LLC
FREE
Developmental and Hearing Screenings
BENEFIT OF GETTING YOUR CHILD SCREENED
LEARN HOW TO PROTECT ME WHILE I SLEEP
REMEMBER the ABCs of Safe Sleep
Alone. Back. Crib. Smoke-free.
PMS
Presbyterian Medical Services
Home Visiting Program
TAXPAYER BILL of RIGHTS
FACT SHEET
People
Plant
THE PLANT
CELEBRATE RECOVERY
MONDAYS IN EUNICE
ASSEMBLY OF GOD
900 TEXAS AVE
@ 7PM
THURSDAYS IN JAL
ASSEMBLY OF GOD
FOR MORE INFO CALL:
COURTNEY M. (432)803-3256
BOB (575)691-8558
Women, Infants and Children
What is WIC?
Who is eligible?
WIC services are free!
WIC
SMALL BUSINESS WEBINAR SERIES
Independent Contractor or Employee?
How to Navigate Legal Classification and Contracts
New Mexico State Bar Foundation
Modest Means Helpline
505-797-6013 • 888-857-9935
NOTICE
Modest Means Helpline
Become a Community Partner
Goodwill provide job training opportunities to older workers
Become a Host Agency
win-win partnership
Do you need a babysitter for the Summer? I am a Grandma, and have a substitute teaching license. Call (575)408-6624, ask for Lisa.
Goodwillit.
WITH SCSEP!
FIX YOUR HAIL DAMAGE FOR FREE
TALK TO US
CHI St. Joseph's Children
Telehealth Home Visiting
We know your first baby is your first priority.
Mrs. G's
HOME DAY CARE
SPACES AVAILABLE
We offer:
Infant and Toddler Care
After School Care
School Break Programs
Winter, Spring, and Summer
SET UP INTERVIEW & HOME VISIT
PHARMACY
Blue Cross and Blue Shield of New Mexico for Turquoise Care Members
PHARMACY COMMUNITY PLANS
Your Health Is Our Priority
CHI St. Joseph's Children
Telehealth-Home Visiting
Babies DO Come with Instructions!
It's okay to be nervous.
Bringing a child into the world is a major life event & today there are many unknowns.
One thing is certain, we are here to support you.
Telehealth-Home Visiting
Opportunity to Learn and grow
What you can Expect
Need to Know
Contact Us
Website: www.stjosephsnm.org
Phone: 505.924.8000
Facebook: @StJosephsChildren
Twitter: @StJosesChildren
HAT ALL MAY READ
New Mexico State Library for the Blind and Print Disabled
1 (800) 456-5515
APPLY TODAY!
Audio Books
Topics covered:
Each workshop includes:
Upcoming Dates in 2023:
To Register: Call LREP at 505-797-6005 or 1-800-876-6657
Legal Resources for the Elderly Program
New Mexico State Bar Foundation

Lowes Market



General Posting of Notices – Certification

I, Mike Parks, the undersigned, certify that on **{DATE}**, posted a true and correct copy of the attached Public Notice in the following publicly accessible and conspicuous places in the **{CITY\TOWN\VILLAGE}** of **{COUNTY NAME}** County, State of New Mexico on the following dates:

1. ` Eunice Public Library
2. ` Post Office
3. ` Lowes Market
4. `

Signed this 24 day of June, 2025.

Mike Parks
Signature

6/24/25
Date

Mike Parks
Printed Name

Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

Attachment 2 – Submittal of Public Service Annoucement Certification [delete this text]

Submittal of Public Service Announcement – Certification

I, Beth Morley , the undersigned, certify that on **June 27, 2025**, submitted a public service announcement to 1 Radio Square **(KZOR-KIXN-KPZA-KEJL-KLEA-KBIM FM-KBIM)** that serves the City of **Hobbs, Lea** County, New Mexico, in which the source is or is proposed to be located and that
1 Radio Square **DID NOT RESPOND.**

Signed this 27th day of June, 2025,



Signature

06/27/2025
Date

Beth Morley
Printed Name

Consultant
Title {APPLICANT OR RELATIONSHIP TO APPLICANT}

Affidavit of Publicatio

STATE OF NEW MEXICO
COUNTY OF LEA

I, Daniel Russell, Publisher of the Hobbs News-Sun, a newspaper published at Hobbs, New Mexico, solemnly swear that the clipping attached hereto was publishe in the regular and entire issue of said newspaper, and not a supplement thereof for a period of 1 issue(s).

Beginning with the issue dated
June 26, 2025
and ending with the issue dated
June 26, 2025.

Publisher

Sworn and subscribed to before me this 26th day of June 2025.

Business Manager

My commission expires
January 29, 2027
(Seal)

STATE OF NEW MEXICO
NOTARY PUBLIC
GUSSIE RUTH BLACK
COMMISSION # 1087526
COMMISSION EXPIRES 01/29/2027

This newspaper is duly qualified to publish legal notices or advertisements within the meaning of Section 3, Chapter 167, Laws of 1937 and payment of fees for said publication has been made.

LEGAL LEGAL LEGAL LEGAL

LEGAL NOTICE
June 26, 2025

NOTICE OF AIR QUALITY PERMIT APPLICATION

MarkWest Tornado Gas Plant, L.L.C. announces its application submittal to the New Mexico Environment Department for an air quality permit for the **modification** of its **gas treating** facility. The expected date of application submittal to the Air Quality Bureau is **June 30, 2025**.

The exact location for the proposed facility known as, **Dagger Lake Treating Facility**, is at latitude **32.420074°** and longitude - **103.576389°**. The approximate location of this facility is **22.5** miles **west** of **Eunice, NM** in **Lea** county.

The proposed **modification** consists of the replacement of one (1) temporary flare (Unit FL-1) with one (1) acid gas flare (Unit FL-1), the removal of two (2) thermal oxidizers (Units TO-1 & TO-2) and malfunction emissions (Unit M), and the modification of startup, shutdown, and maintenance emissions (Unit SSM).

The estimated maximum quantities of any regulated air contaminant will be as follows in pound per hour (pph) and tons per year (tpy) and could change slightly during the course of the Department's review:

Pollutant:	Pounds per hour	Tons per year
Particulate Matter (PM)	1	3
PM_{10}	1	3
$PM_{2.5}$	1	3
Sulfur Dioxide (SO_2)	19	80
Nitrogen Oxides (NO_x)	14	58
Carbon Monoxide (CO)	59	248
Volatile Organic Compounds (VOC)	7053	218
Total sum of all Hazardous Air Pollutants (HAPs)	345	18
Hydrogen Sulfide (H_2S)	1	1
Toxic Air Pollutant (TAP)	N/A	N/A
Green House Gas Emissions as Total CO2e	N/A	218,935

The maximum operating schedule 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: **MarkWest Tornado Gas Plant, L.L.C., 1515 Arapahoe Street, Denver, CO 80202**

If you have any comments about the construction or operation of this facility, and you want your comments to be made as part of the permit review process, you must submit your comments in writing to this address: Permit Programs Manager; New Mexico Environment Department; Air Quality Bureau; 525 Camino de los Marquez, Suite 1; Santa Fe, New Mexico; 87505-1816. Other comments and questions may be submitted verbally. (505) 476-4300; 1 800 224-7009.

Please refer to the company name and site 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.

General information about air quality and the permitting process, and links to the regulations can be found at the Air Quality Bureau's website: www.env.nm.gov/air-quality/permitting-section-home-page/. The regulation dealing with public participation in the permit review process is 20.2.72.206 NMAC.

Atención
Este es un aviso de la oficina de Calidad del Aire del Departamento del Medio Ambiente de Nuevo México, acerca de las emisiones producidas por un establecimiento en esta área. Si usted desea información en español, por favor comuníquese con esa oficina al teléfono 505-629-3395.

Notice of Non-Discrimination
NMED does not discriminate on the basis of race, color, national origin, disability, age or sex in the administration of its programs or activities, as required by applicable laws and regulations. NMED is responsible for coordination of compliance efforts and receipt of inquiries concerning non-discrimination requirements implemented by 40 C.F.R. Part 7, including Title VI of the Civil Rights Act of 1964, as amended; Section 504 of the Rehabilitation Act of 1973; the Age Discrimination Act of 1975, Title IX of the Education Amendments of 1972, and Section 13 of the Federal Water Pollution Control Act Amendments of 1972. If you have any questions about this notice or any of NMED's non-discrimination programs, policies or procedures, or if you believe that you have been discriminated against with respect to a NMED program or activity, you may contact: Non-Discrimination Coordinator, NMED, 1190 St. Francis Dr., Suite N4050, P.O. Box 5469, Santa Fe, NM 87502, (505) 827-2855, nd.coordinator@env.nm.gov. You may also visit our website at https://www.env.nm.gov/non-employee-discrimination-complaint-page/ to learn how and where to file a complaint of discrimination.
#00302060

01100104 00302060

TRACY POWELL
TRINITY CONSULTANTS, INC.
12700 PARK CENTRAL DR., STE. 600
DALLAS, TX 75251

Affidavit of Publicatio

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COUNTY OF LEA

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GUSSIE RUTH BLACK
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The maximum operating schedule 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: **MarkWest Energy West Texas Gas Company, L.L.C, 1515 Arapahoe Street, Denver, CO 80202**

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01100104 00302061

TRACY POWELL
TRINITY CONSULTANTS, INC.
12700 PARK CENTRAL DR., STE. 600
DALLAS, TX 75251

Lea County Parcel Report

Area of Interest (AOI) Information

Area : 722.95 acres

Feb 11 2025 11:57:56 Mountain Standard Time



Parcel Lines
- Parcel
- Township
- Section
- QSection
- Dashed QSection

- Lot Lines
- Townships
- Sections
- Parcels
- Lea County Boundary

1:18,056

0 0.13 0.25 0.5 mi

0 0.2 0.4 0.8 km

Esri Community Maps Contributors, New Mexico State University, Texas Parks & Wildlife, CONANP, Esri, TomTom, Garmin, SafeGraph, GeoTechnologies, Inc, METI/NASA, USGS, EPA, NPS, US Census Bureau, USDA, USFWS

Section 10

Written Description of the Routine Operations of the Facility

---

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

Dagger Lake Treating Facility is an existing facility located in Lea County. High pressure sour gas is gathered from various compressor stations in the area. The gas enters the facility on two trains, each with 30 MMSCFD of gas. Each train sends the sour gas through an inlet separator, though no liquids drop out due to the high pressure. The dehydrated sweet gas is discharged from the station via pipelines to be processed further down the pipeline. The facility is authorized to operate continuously (8,760 hours per year) at design maximum capacity processing rates.

Amine Treating
The amine units are designed to remove CO_2 and H_2S from the natural gas stream to meet pipeline specifications. Lean MDEA solution is pumped to the top of the contactors and allowed to flow downward. Wet gas is fed into the bottom of the contactors and flows upward. As the lean MDEA solution flows down through the contactors, in comes in contact with the wet gas. The CO_2 and H_2S react with the amine to form an amine carbonate. The reacted amine, known as "sour" or "rich" amine is returned to a regeneration units and the processed "sweet" gas continues to the dehydration systems. Three distinct sources of air emissions are incorporated with each amine unit (Unit IDs: AMINE-1 & AMINE-2): (1) a natural gas-fired hot oil heater (Unit IDs: HT-1 & HT-2), (2) an amine regenerator still vent, and (3) an amine flash tank. Emissions generated in the hot oil heaters exhaust to the atmosphere through distinct stacks dedicated to the flow of combustion byproducts. Emissions generated at the regenerator still vent and flash tank are controlled by the acid gas flare (Unit ID: FL-1).

Glycol Dehydration
Triethylene glycol (TEG) dehydration is used to remove water from the natural gas stream and is accomplished by reducing the inlet water dew point (temperature at which vapor begins to condense into liquid) to the outlet dew point, which will contain a specified amount of water. The wet gas is brought into contact with dry "lean" glycol in a countercurrent contactor tower. Water vapor is absorbed in the TEG solution and consequently, its dew point is reduced. Wet gas passing through the contactor tower is dehydrated. The wet (or "rich") glycol then flows from the absorber to a regeneration system in which it is partially decompressed, and then heated to remove water vapor resulting in "lean" glycol that is reintroduced to the contactor tower. Each dehydration unit (DEHY-1 and DEHY-2) incorporates three distinct sources of air emissions: (1) a natural gas fired reboiler (Unit IDs: REBOIL-1 & REBOIL-2), (2) a TEG recovery still vent, and (3) a glycol flash tank. Emissions generated in the reboilers exhaust to the atmosphere through distinct stacks dedicated to the flow of combustion byproducts. Emissions from the glycol recovery still vents consists of water vapor and various VOCs, including several HAPs. The vent stream from the glycol recovery still vent is controlled by a BTEX condenser. Emissions generated at the regenerator still vent and flash tank are controlled by the acid gas flare.

Flares
Acid gas emissions from each amine regenerator still vent and flash tank as well as each dehydrator BTEX condenser overhead and flash tank are routed to the acid gas flare with a 100% capture efficiency and 98% DRE. Sales gas is used as assist gas to ensure the flared stream meets a minimum heating value of 305 Btu/scf. In addition to normal operations, the flare also controls emissions during startup, shutdown, and malfunction (SSM) events. Each train can operate independently, and during SSM events affecting either a single train or both trains simultaneously, the associated blowdown volumes are routed to the flare for control. When one train is offline and the other remains in full operation, the blowdown gas from the offline train is used in lieu of assist gas to maintain flare combustion efficiency.

Storage and Loading Operations
Liquids from the BTEX condenser are sent to an atmospheric mixed hydrocarbon (slop) storage tank (Unit ID: T-SLOP), where the flash, working, and breathing emissions are vented to the atmosphere. Slop is loaded offsite via uncontrolled trucking (Unit ID: S-LOAD) and hauled away for treatment (Unit ID: HAUL).

Section 11
Source Determination

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

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

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

A. Identify the emission sources evaluated in this section (list and describe)**: Please refer to Table 2-A.**

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

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

☑ **Yes** ☐ **No**

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

☑ **Yes** ☐ **No**

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

☑ **Yes** ☐ **No**

C. Make a determination:

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

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

Section 12

Section 12.A

PSD Applicability Determination for All Sources

(Submitting under 20.2.72, 20.2.74 NMAC)

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

A. This facility is:

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

This application is for an initial NSR application.

Section 13

Determination of State & Federal Air Quality Regulations

This section lists each state and federal air quality regulation that may apply to your facility and/or equipment that are stationary sources of regulated air pollutants.

Not all state and federal air quality regulations are included in this list. Go to the Code of Federal Regulations (CFR) or to the Air Quality Bureau's regulation page to see the full set of air quality regulations.

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

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

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

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

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

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

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

State Regulations:

State Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.1 NMAC	General Provisions	Yes	Facility	General Provisions apply to Notice of Intent, Construction, and Title V permit applications.
20.2.3 NMAC	Ambient Air Quality Standards NMAAQS	Yes	Facility	20.2.3 NMAC is a State Implementation Plan (SIP) approved regulation that limits the maximum allowable concentration of Sulfur Compounds, Carbon Monoxide, and Nitrogen Dioxide. The facility meets the maximum allowable concentrations of the aforementioned pollutants under this regulation.
20.2.7 NMAC	Excess Emissions	Yes	Facility	This regulation establishes requirements for the facility if operations at the facility result in any excess emissions. The owner or operator of a source having an excess emission shall, to the extent practicable, operate the source, including associated air pollution control equipment, in a manner consistent with good air pollution control practices for minimizing emissions. The facility will also notify the NMED of any excess emissions per 20.2.7.110 NMAC.
20.2.23 NMAC	Fugitive Dust Control	No	N/A	This regulation does not apply as the facility does not operate any of the fugitive dust sources listed in 20.2.23.108.A NMAC.
20.2.33 NMAC	Gas Burning Equipment - Nitrogen Dioxide	No	N/A	This regulation applies to facilities that have gas-burning external combustion sources with more than 1,000,000 MMBtu/hr capacity. None of the external combustion equipment of this facility have a capacity greater than 1,000,000 MMBtu/hr. Therefore, this regulation does not apply to this facility.
20.2.34 NMAC	Oil Burning Equipment: NO_2	No	N/A	This regulation applies to facilities that have oil-burning external combustion sources with more than 1,000,000 MMBtu/hr capacity. This facility does not have any oil-burning external combustion equipment.
20.2.35 NMAC	Natural Gas Processing Plant – Sulfur	Yes	Facility	This regulation establishes sulfur emission standards for natural gas processing plants. This facility meets the definition of a new natural gas processing plant under this regulation and is subject to the requirements of this regulation [20.2.35.7.B NMAC]. The facility will comply with all requirements under 20.2.35 NMAC as applicable.
20.2.37 and 20.2.36 NMAC	Petroleum Processing Facilities and Petroleum Refineries	N/A	N/A	**These regulations were repealed by the Environmental Improvement Board. If you had equipment subject to 20.2.37 NMAC before the repeal, your combustion emission sources are now subject to 20.2.61 NMAC.**
20.2.38 NMAC	Hydrocarbon Storage Facility	No	N/A	This facility does not store hydrocarbons containing hydrogen sulfide in a container associated with a petroleum production facility or petroleum processing facility having a capacity of 20,000 gallons or greater with a throughput of at least 30,000 gallons per week (20.2.38.109 NMAC); therefore, this regulation does not apply.
20.2.39 NMAC	Sulfur Recovery Plant - Sulfur	No	N/A	This regulation establishes sulfur emission standards for sulfur recovery plants which are not part of petroleum or natural gas processing facilities. This facility is a natural gas processing facility and is thus not subject to this regulation.
20.2.50 NMAC	Oil and Gas Sector – Ozone Precursor Pollutants	Yes	FUG-1, HT-1, HT-2, S-LOAD	Check the box for the subparts that are applicable: ☐113 – Engines and Turbines: There are no natural gas-fired spark ignition engines, compression ignition engines, or natural gas-fired combustion turbines at this facility; therefore, this subpart does not apply. ☐114 – Compressor Seals: There are no centrifugal compressors at this facility; therefore, this subpart does not apply. ☐115 – Control Devices and Closed Vent Systems: The control devices at this facility are not used to comply with this regulation; therefore, this subpart does not apply. ☒116 – Equipment Leaks and Fugitive Emissions: This facility is a natural gas processing plant and will therefore comply with the requirements of this subpart.

State Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
				☐ 117 – Natural Gas Well Liquid Unloading: There are no liquid unloading operations resulting in the venting of natural gas at natural gas wells at this facility; therefore, this subpart does not apply. ☐ 118 – Glycol Dehydrators: DEHY-1 and DEHY-2 are glycol dehydrators with a PTE of less than 2 tpy; therefore, this subpart does not apply. ☒ 119 – Heaters: HT-1 and HT-2 are natural gas-fired heaters with a rated heat input ≥ 20 MMBtu/hr and will therefore comply with the requirements of this subpart. ☒ 120 – Hydrocarbon Liquid Transfers: This facility is a natural gas processing plant with hydrocarbon liquid transfers and will therefore comply with the requirements of this subpart. ☐121 – Pig Launching and Receiving: There are no pipeline pigging operations at this facility; therefore, this subpart does not apply. ☒122 – Pneumatic Controllers and Pumps: This facility is a natural gas processing plant with natural gas-driven pneumatic controllers and pumps and will therefore comply with the requirements of this subpart. ☐ 123 – Storage Vessels: S-TANK is a new storage vessel with a PTE < 2 tpy VOCs; therefore, this subpart does not apply. ☐124 – Well Workovers: There are no oil or natural gas wells at this facility; therefore, this subpart does not apply. ☐ 125 – Small Business Facilities: This facility does not qualify as a small business facility; therefore, this subpart does not apply. ☐126 – Produced Water Management Unit: There are no produced water management units located at this facility; therefore, this subpart does not apply . ☐127 – Flowback Vessels and Preproduction Operations: There are no wells at this facility; therefore, this subpart does not apply.
20.2.61.109 NMAC	Smoke & Visible Emissions	Yes	HT-1, HT-2, REBOIL-1, REBOIL-2, FL-1	This regulation establishes control on smoke and visible emissions from certain sources. Heaters, reboilers, and flares are stationary combustion equipment. Units HT-1, HT-2, REBOIL-1, REBOIL-2, and FL-1 are subject to this regulation and will comply with the requirements.
20.2.70 NMAC	Operating Permits	No	Facility	This regulation establishes requirements for obtaining an operating permit. This facility is a minor source with respect to Title V. The facility will comply with all operating permit condition as applicable.
20.2.71 NMAC	Operating Permit Fees	No	Facility	This regulation establishes a schedule of operating permit emission fees. The facility is subject to 20.2.70 NMAC and is therefore subject to requirements of this regulation.
20.2.72 NMAC	Construction Permits	Yes	Facility	This regulation establishes the requirement for obtaining a construction permit. This facility is applying for an initial NSR permit and will comply with all requirements of this regulation.
20.2.73 NMAC	NOI & Emissions Inventory Requirements	Yes	Facility	This regulation establishes emission inventory requirements. The facility meets the applicability requirements of 20.2.73.300 NMAC. The facility will meet all applicable reporting requirements under 20.2.73.300.B.4 NMAC.

State Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification: (You may delete instructions or statements that do not apply in the justification column to shorten the document.)
20.2.74 NMAC	Permits – Prevention of Significant Deterioration (PSD)	No	Facility	This regulation establishes requirements for obtaining a prevention of significant deterioration permit. This facility is not a major source with respect to PSD and is therefore not subject to 20.2.74 NMAC.
20.2.75 NMAC	Construction Permit Fees	Yes	Facility	This regulation establishes a schedule of operating permit emission fees. This facility is subject to 20.2.72 NMAC and in turn subject to 20.2.75 NMAC. The facility is exempt from annual fees under this part (20.2.75.11.E NMAC) as it is subject to fees pursuant to 20.2.71 NMAC.
20.2.77 NMAC	New Source Performance	Yes	AMINE-1, AMINE-2, HT-1, HT-2, FUG-1	This regulation establishes state authority to implement new source performance standards (NSPS) for stationary sources. FUG-1, AMINE-1 and AMINE-2 are subject to 40 CFR 60 Subpart OOOOb. Units H-1 and HT-2 are subject to 40 CFR 60 Subpart Dc. Therefore, this regulation applies.
20.2.78 NMAC	Emission Standards for HAPS	No	N/A	This regulation establishes state authority to implement new source performance standards (NSPS) for stationary sources. This facility does not have any sources subject to this regulation.
20.2.79 NMAC	Permits – Nonattainment Areas	No	Facility	This regulation establishes the requirements for obtaining a nonattainment area permit. The facility is not located in a non-attainment area and therefore is not subject to this regulation.
20.2.80 NMAC	Stack Heights	No	N/A	This regulation establishes requirements for the evaluation of stack height and other dispersion techniques. This regulation does not apply as all stacks at the facility follow good engineering practice.
20.2.82 NMAC	MACT Standards for source categories of HAPS	Yes	DEHY-1, DEHY-2	This regulation establishes state authority to implement MACT standards for source categories of HAPs. DEHY-1 and DEHY-2 are subject to 40 CFR 63 Subpart HH. Therefore, this regulation applies.

Applicable Federal Regulations:

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
40 CFR 50	NAAQS	Yes	Facility	This regulation defines National Ambient Air Quality Standards (NAAQS). The facility meets all applicable NAAQS for NOx, CO, SO_2, H_2S, PM_{10}, and $PM_{2.5}$ under this regulation.
NSPS 40 CFR 60, Subpart A	General Provisions	Yes	AMINE-1, AMINE-2, HT-1, HT-2, FUG-1	The provisions of this part apply to any stationary source which contains an affected facility, the construction or modification of which is commenced after the date of publication in this part of any standard applicable to that facility. The fugitive components (FUG-1) and the sweetening units (AMINE-1 & AMINE-2) are subject to NSPS OOOOb. The heaters are subject to NSPS Dc. Therefore, this regulation applies.
NSPS 40 CFR60.40a, Subpart Da	Subpart Da, Performance Standards for **Electric Utility Steam Generating Units**	No	N/A	This regulation establishes standards of performance for electric utility steam generating units that are capable of combusting more than 250 MMBtu/hr heat input of fossil fuel and for which construction, modification, or reconstruction is commenced after September 18, 1978. This regulation does not apply as the facility does not have any fossil fuel-fired steam-generating units with a heat input rate of 250 MMBtu/hr.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
NSPS 40 CFR60.40b Subpart Db	Standards of Performance for **Industrial-Commercial-Institutional Steam Generating Units**	No	N/A	This regulation establishes standards of performance for industrial-commercial-institutional steam generating units that commenced construction, modification or reconstruction after June 19, 1984, and that have a heat input capacity from fuels combusted in the steam generating unit of greater than 100 MMBtu/hr. This regulation does not apply because the facility does not operate any industrial-commercial-institutional steam generating units with a heat capacity greater than 100 MMBtu/hr.
40 CFR 60.40c, Subpart Dc	Standards of Performance for **Small Industrial-Commercial-Institutional Steam Generating Units**	Yes	HT-1, HT-2	This regulation establishes standards of performance for steam generating units for which construction, modification, or reconstruction was commenced after June 9, 1989 with a maximum design heat input capacity between 10 and 100 MMBtu/hr. The heaters (HT-1 and HT-2) each have a heat capacity of 26.4 MMBtu/hr; therefore, this regulation applies.
NSPS 40 CFR 60, Subpart Ka	Standards of Performance for **Storage Vessels for Petroleum Liquids** for which Construction, Reconstruction, or Modification Commenced **After** May 18, 1978, and **Prior** to July 23, 1984	No	N/A	This regulation establishes performance standards for storage vessels with a storage capacity greater than 40,000 gallons that is used to store petroleum liquids for which construction commenced after May 18, 1978 prior to July 23, 1984. The facility was not constructed prior to July 23, 1984. Thus, this rule does not apply to this facility.
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, and **On** or **Before** October 4, 2023	No	N/A	This regulation establishes performance standards for storage vessels with a capacity ≥ 75 cubic meters that is used to store volatile organic liquids for which construction, reconstruction, or modification is commenced after July 24, 1984, and on or before October 4, 2023. This facility was not constructed prior to October 4, 2023. Thus, this rule does not apply.
NSPS 40 CFR 60, Subpart Kc	Standards of Performance for **Volatile Organic Liquid Storage Vessels** (Including Petroleum Liquid Storage Vessels) for Which Construction, Reconstruction, or Modification Commenced **After** October 4, 2023	No	N/A	This regulation establishes performance standards for storage vessels with a capacity ≥ 20,000 gallons that is used to store volatile organic liquids (VOL) for which construction, reconstruction, or modification is commenced after October 4, 2023. T-SLOP is a vessel with a design capacity less than 420,000 gal (1,589.874 m^3) used for condensate processed prior to custody transfer and is therefore exempt from this regulation per §60.110c(b)(4).

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
NSPS 40 CFR 60, Subpart GG	Standards of Performance for **Stationary Gas Turbines**	No	N/A	This regulation establishes performance standards for stationary gas turbines with a heat input at peak load ≥ 10 MMBtu/hr and which commenced construction, modification, or reconstruction after October 3, 1977. This facility does not have any applicable units. Therefore, the facility is not subject to this regulation.
NSPS 40 CFR 60, Subpart KKK	Standards of Performance for Equipment Leaks of VOC From **Onshore Natural Gas Processing Plants** for Which Construction, Reconstruction, or Modification Commenced **After** January 20, 1984, and on or **Before** August 23, 2011	No	N/A	This regulation defines standards of performance for equipment leaks of VOC emissions from onshore natural gas processing plants for which construction, reconstruction, or modification commenced after January 20, 1984, and on or before August 23, 2011. This facility was constructed after August 23, 2011. Therefore, this regulation does not apply to this facility.
NSPS 40 CFR Part 60 Subpart LLL	Standards of Performance for SO_2 Emissions From **Onshore Natural Gas Processing** for Which Construction, Reconstruction, or Modification Commenced **After** January 20, 1984, and on or **Before** August 23, 2011	No	N/A	This regulation establishes standards of performance for SO_2 emissions from onshore natural gas processing for which construction, reconstruction, or modification of the amine sweetening units commenced after January 20, 1984, and on or before August 23, 2011. The facility is not subject to this regulation as the amine sweetening units were constructed after August 23, 2011.
NSPS 40 CFR Part 60 Subpart OOOO	Standards of Performance for Crude Oil and Natural Gas Production, Transmission, and Distribution for which construction, modification or reconstruction commenced **after** August 23, 2011 and **before** September 18, 2015	No	N/A	This regulation establishes emission standards for the control of VOC and SO_2 emissions from affected facilities, as listed in paragraphs (a) through (g) of this section, that commenced construction, modification, or reconstruction after August 23, 2011, and on or before September 18, 2015. The facility was constructed after September 18, 2015. Therefore, this regulation does not apply.
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**	No	N/A	This regulation establishes emission standards for the control of GHGs and for VOC and SO_2 emissions from affected facilities in the crude oil and natural gas source category, as listed in paragraphs (a) through (j) of this section, that commenced construction, modification, or reconstruction after September 18, 2015, and on or before December 6, 2022. This facility was constructed after December 6, 2022. Therefore, this regulation does not apply.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
	September 18, 2015 and On or **Before** December 6, 2022			
NSPS 40 CFR Part 60 Subpart OOOOb	Standards of Performance for Crude Oil and Natural Gas Facilities for which Construction, Modification or Reconstruction Commenced **After** December 6, 2022	Yes	AMINE-1, AMINE-2, FUG-1	This regulation establishes emission standards for the control of GHGs and for VOC and SO_2 emissions from affected facilities in the crude oil and natural gas source category, as listed in paragraphs (a) through (i) of this section, that commenced construction, modification, or reconstruction after December 6, 2022. The sweetening units (AMINE-1 & AMINE-2) and the facility fugitives (FUG-1) are subject to this regulation. The slop storage tank (T-SLOP) has the potential to emit less than 6 tons/year and is therefore not subject to this regulation.
NSPS 40 CFR 60 Subpart IIII	Standards of performance for Stationary Compression Ignition Internal Combustion Engines	No	N/A	This regulation establishes standards of performance for stationary compression ignition combustion engines. The facility does not have any applicable units. Therefore, the facility is not subject to this regulation.
NSPS 40 CFR Part 60 Subpart JJJJ	Standards of Performance for Stationary Spark Ignition Internal Combustion Engines	No	N/A	This regulation establishes standards of performance for stationary spark ignition internal combustion engines. The facility does not have any applicable units. Therefore, the facility is not subject to this regulation.
NSPS 40 CFR 60 Subpart TTTT	Standards of Performance for Greenhouse Gas Emissions for Electric Generating Units	No	N/A	This regulation establishes standards of performance for greenhouse gas emissions for electric generating units. This facility does not have electric generating units. This regulation does not apply.
NSPS 40 CFR 60 Subpart UUUU	Emissions Guidelines for Greenhouse Gas Emissions and Compliance Times for Electric Utility Generating Units	No	N/A	This regulation establishes emissions guidelines for greenhouse gas emissions and compliance times for electric generating units. This facility does not have electric generating units. This regulation does not apply.
NSPS 40 CFR 60, Subparts WWW, XXX, Cc, and Cf	Standards of performance for Municipal Solid Waste (MSW) Landfills	No	N/A	This facility is not a municipal solid waste landfill. This regulation does not apply.
NESHAP 40 CFR 61 Subpart A	General Provisions	No	N/A	NSPS 40 CFR 61 does not apply to the facility because the facility does not emit or have the triggering substances on site and/or the facility is not involved in the triggering activity.
NESHAP 40 CFR 61 Subpart E	National Emission Standards for **Mercury**	No	N/A	The provisions of this subpart are applicable to those stationary sources that process mercury ore to recover mercury, use mercury chlor-alkali cells to produce chlorine gas and alkali metal hydroxide, and incinerate or dry wastewater treatment plant sludge
NESHAP 40 CFR 61 Subpart V	National Emission Standards for **Equipment Leaks**	No	N/A	This regulation establishes national emission standards for equipment leaks (fugitive emission sources). The facility does not have equipment that operates in volatile hazardous air pollutant (VHAP) service [40 CFR Part 61.240]. The

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
	(Fugitive Emission Sources)			regulated activities subject to this regulation do not take place at this facility. The facility is not subject to this regulation.
MACT 40 CFR 63, Subpart A	General Provisions	Yes	DEHY-1, DEHY-2	This facility includes TEG dehydrators that will be subject to MACT HH which will therefore be subject to this regulation.
MACT 40 CFR 63.760 Subpart HH	National Emission Standards for Hazardous Air Pollutants From **Oil and Natural Gas Production Facilities**	Yes	DEHY-1, DEHY-2	This facility is subject to the requirements of MACT HH, which includes requirements applicable to area sources with TEG Dehydrators. The site is an area sources of HAPs with affected units and therefore is subject to this subpart. The dehydrators have the potential to emit less than 0.9 megagram per year of benzene and are therefore exempt from the requirements of §63.764(d) pursuant to §63.764(e)(1)(ii).
MACT 40 CFR 63 Subpart HHH	National Emission Standards for Hazardous Air Pollutants From **Natural Gas Transmission and Storage Facilities**	No	N/A	This regulation establishes national emission standards for hazardous air pollutants from natural gas transmission and storage facilities. This regulation does not apply because this facility is not a natural gas transmission or storage facility as defined in this regulation [40 CFR Part 63.1270(a)].
MACT 40 CFR 63 Subpart DDDDD	National Emission Standards for Hazardous Air Pollutants for Major Industrial, Commercial, and Institutional Boilers & Process Heaters	No	N/A	This regulation establishes national emission standards for a major source of HAPs for industrial, commercial, and institutional boilers and process heaters. This facility is not a major source of HAPs. Therefore, this regulation does not apply to this facility.
MACT 40 CFR 63 Subpart UUUUU	National Emission Standards for Hazardous Air Pollutants Coal & Oil Fire Electric Utility Steam Generating Unit	No	N/A	This regulation establishes national emission standards for hazardous air pollutants from coal and oil-fired electric utility steam generating units. The facility does not contain the affected units. Therefore, this regulation does not apply.
MACT 40 CFR 63 Subpart ZZZZ	National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (**RICE MACT**)	No	N/A	This regulation establishes national emission standards for hazardous air pollutants from stationary reciprocating internal combustion engines. The facility does not contain the affected units. Therefore, this regulation does not apply.
40 CFR 64	**Compliance Assurance Monitoring**	No	N/A	This regulation establishes requirements for a Compliance Assurance Monitoring (CAM) plan for pollutant-specific emissions units at a major source required for part 70 or 71 permitting. This application is being submitted under part 72 and is therefore not subject to this regulation.
40 CFR 68	**Chemical Accident Prevention**	No	N/A	This facility does not have any sources listed in this subpart. Therefore, this regulation does not apply.
Title IV – Acid Rain	**Acid Rain**	No	N/A	This facility is not an acid rain source. This regulation does not apply.

Federal Regulation Citation	Title	Applies? Enter Yes or No	Unit(s) or Facility	Justification:
40 CFR 72				
Title IV – Acid Rain 40 CFR 73	**Sulfur Dioxide** Allowance Emissions	No	N/A	This regulation establishes sulfur dioxide allowance emissions for certain types of facilities. This facility is not an acid rain source. This regulation does not apply.
Title IV-Acid Rain 40 CFR 75	**Continuous Emissions Monitoring**	No	N/A	The facility is not an acid rain source and is therefore not subject to this regulation.
Title IV – Acid Rain 40 CFR 76	**Acid Rain** Nitrogen Oxides **Emission Reduction Program**	No	N/A	This regulation establishes an acid rain nitrogen oxide emission reduction program. This regulation applies to each coal-fired utility unit that is subject to an acid rain emissions limitation or reduction requirement for SO_2. This part does not apply because the facility does not operate any coal-fired units and is not an acid rain source [40 CFR Part 76.1].
Title VI – 40 CFR 82	Protection of **Stratospheric Ozone**	No	N/A	This regulation establishes a regulation for the protection of the stratospheric ozone. The regulation is not applicable because the facility does not "service", "maintain" or "repair" class I or class II appliances nor "dispose" of the appliances [40 CFR Part 82.1(a)].

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.

All required documentation is kept onsite and will 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: www.env.nm.gov/air-quality/permitting-section-procedures-and-guidance/. Compliance with standards must be maintained during construction, which should not usually be a problem unless simultaneous operation of old and new equipment is requested.

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

There are two (2) alternate operating scenarios (AOS) for flaring at Dagger Lake Treating Facility. AOS-1, AOS-2, and Normal Operations cannot occur at the same time.

AOS-1
In the event one train goes down, blowdown emissions are routed to FL-1. The duration of a train blowdown event is 4 hours with 2 events per year. The volume of the event is conservatively assumed to be 250,000 scf/event. Train blowdown gas routed to FL-1 is used in lieu of assist gas for the other train's nominal acid gas to achieve a minimal heat value of 305 Btu/scf.

SO_2, NOx, CO, and GHG emissions for train blowdowns are calculated using the same methodology outlined in Section 6. VOC, HAP, and H_2S emissions for the train blowdown gas are calculated using ProMax and the following equation:

Emissions (lb/hr) = Train Blowdown Volume (scf/event) / Blowdown Duration (hr/event) * Molecular Weight (lb/lbmol) * Inlet Gas Composition (wt%) / Standard Molar Volume (scf/lbmol) * (1 - 98% DRE)

Emissions (ton/yr) = Hourly Emissions (lb/hr) * Annual Blowdown Duration (hours/yr) / 2000 (lb/ton)

AOS-2
In the event of a full facility blowdown, emissions are routed to FL-1. The duration of a full facility blowdown event is 4 hours, with 1 event per year. The volume of gas routed to the flare is conservatively assumed to be 500,000 scf/event. During a full facility blowdown event, AMINE-1, AMINE-2, DEHY-1, and DEHY-2 are not operational, and therefore do not have any flash tank or condenser overheads routed to the flare.

SO_2, NOx, CO, and GHG emissions for train blowdowns are calculated using the same methodology outlined in Section 6. VOC, HAP, and H_2S emissions for full facility blowdown gas are calculated using the same methodology outlined in AOS-1.

Section 16

Air Dispersion Modeling

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

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

Check each box that applies:

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

Daniel Dolce

From: Mustafa, Sufi A., ENV <sufi.mustafa@env.nm.gov>
Sent: Monday, June 30, 2025 11:53 AM
To: Daniel Dolce; Johnny Nguyen
Cc: Beth Morley
Subject: RE: [EXTERNAL] RE: Modeling Protocol for MarkWest Tornado Gas Plant, L.L.C. Dagger Lake Treating Facility - Initial NSR Application

Daniel
I am sorry for delay.
Your modeling protocol is acceptable.
Thank you.

Sufi A. Mustafa, Ph.D.
Manager Air Dispersion Modeling and Emission Inventory Section
New Mexico Environment Department's Air Quality Bureau
Office: (505) 629 6186
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Santa Fe, New Mexico, 87505
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"Innovation, Science, Collaboration, Compliance"

From: Daniel Dolce <Daniel.Dolce@trinityconsultants.com>
Sent: Monday, June 30, 2025 11:17 AM
To: Johnny Nguyen <Johnny.Nguyen@trinityconsultants.com>; Mustafa, Sufi A., ENV <sufi.mustafa@env.nm.gov>
Cc: Beth Morley <Beth.Morley@trinityconsultants.com>
Subject: [EXTERNAL] RE: Modeling Protocol for MarkWest Tornado Gas Plant, L.L.C. Dagger Lake Treating Facility - Initial NSR Application

CAUTION: This email originated outside of our organization. Exercise caution prior to clicking on links or opening attachments.

Good morning Sufi,

I just wanted to follow up with you on Johnny's email from last week. We intend to submit the application this week, but we need approval of the modeling protocol first. Please reach out if you have any questions, comments, or concerns.

Thank you and regards,
Daniel Dolce

Daniel Dolce
Consultant

P 505.266.6611 x3208 M 505.818.8761
Email: Daniel.Dolce@trinityconsultants.com
9400 Holly Avenue NE, Building 3, Suite B, Albuquerque, NM 87122

Want to meet? Book a meeting with Daniel Dolce at Trinity Consultants.

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From: Johnny Nguyen <Johnny.Nguyen@trinityconsultants.com>
Sent: Friday, June 27, 2025 3:29 PM
To: sufi.mustafa@env.nm.gov
Cc: Daniel Dolce <Daniel.Dolce@trinityconsultants.com>; Beth Morley <Beth.Morley@trinityconsultants.com>
Subject: RE: Modeling Protocol for MarkWest Tornado Gas Plant, L.L.C. Dagger Lake Treating Facility - Initial NSR Application

Good afternoon Sufi,

We are looking to submit an initial NSR application for the Dagger Lake Treating Facility, as mentioned below. A modeling protocol was submitted to you on February 14, 2025, but it is attached for your reference. Would you be able to review the modeling protocol and approve it?

Thank you and regards,

Johnny Nguyen
Consultant

P 505.266.6611 ext. 3203
M 505.266.9578
Email: Johnny.Nguyen@trinityconsultants.com
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From: Johnny Nguyen
Sent: Friday, February 14, 2025 2:21 PM
To: sufi.mustafa@env.nm.gov
Cc: Daniel Dolce <Daniel.Dolce@trinityconsultants.com>; Beth Morley <Beth.Morley@trinityconsultants.com>
Subject: Modeling Protocol for MarkWest Tornado Gas Plant, L.L.C. Dagger Lake Treating Facility - Initial NSR Application

Good evening Sufi,

Please find the attached modeling protocol for MarkWest Tornado Gas Plant, L.L.C.'s Dagger Lake Treating Facility. The facility is currently permitted under GCP O&G permit 10187. Modeling is being completed as part of an **initial NSR application** for the facility.

Thank you and regards,

Johnny Nguyen
Associate Consultant

P 505.266.6611
Email: Johnny.Nguyen@trinityconsultants.com
9400 Holly Avenue NE, Building 3, Suite B, Albuquerque, NM 87122



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AIR DISPERSION MODELING PROTOCOL

Initial NSR Modeling Protocol

Mark West Tornado Gas Plant, L.L.C.
Dagger Lake Treating Facility

Prepared By:

Daniel Dolce - Consultant

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

January 2025

Project 253201.0006

1. INTRODUCTION

1.1 Purpose of Modeling

Dagger Lake Treating Facility (Dagger Lake) is a sour field gas treating facility owned by and operated by Mark West Tornado Gas Plant, L.L.C. (Mark West). High pressure sour gas enters the facility on two trains, with each train sending sour gas through an inlet separator. The sour gas is sweetened using amine treating units. The sweetened gas is then sent to TEG dehydrator units. Finally, the dehydrated sweet gas is sent offsite via pipelines to be processed further. Both the flash tank and regenerator overheads from the amine and dehy units are routed to a flare for control. The facility collects and stores slop generated from the BTEX condensers, which will be transported offsite via truck. Dagger Lake is currently permitted under GCP-O&G permit no. 10187 and is located approximately 22.5 miles west of Eunice, NM in Lea County.

Mark West is submitting an application pursuant to 20.2.72.200.A NMAC for an initial NSR Permit application. With this application, the facility will be permitted for the following units:

- Two (2) amine treating units (AMINE-1 and AMINE-2);
- Two (2) amine hot oil treaters (HT-1 and HT-2);
- Two (2) TEG dehydrators (DEHY-1 and DEHY-2);
- Two (2) dehydrator reboilers (REBOIL-1 and REBOIL-2);
- One (1) 500 bbl slop storage tank (T-SLOP);
- One (1) acid gas flare (FL-1);
- Slop truck loading emissions (S-LOAD); and
- Facility fugitive emissions (FUG)

Mark West seeks to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS), the New Mexico Ambient Air Quality Standards (NMAAQS), and PSD Increment standards, as applicable, for the following pollutants and averaging periods: NO_2 (1-hour, 24-hour, and annual), CO (1-hour and 8-hour), SO_2 (1-hour, 3-hour, 24-hour, and annual), H_2S (1/2-hour), $PM_{2.5}$ (24-hour and annual), and PM_{10} (24-hour and annual).

1.2 Facility Description and Location

The approximate UTM coordinates of the facility are 633,904 meters East and 3,587,902 meters North with WGS84 datum at an elevation of approximately 3,642 feet above mean sea level.

2. PROPOSED MODELING

2.1 Model Input Options

The latest version of the AERMOD dispersion model (version 24142) will be used for this analysis. The model will be run in regulatory mode with all default options. The ARM2 method will be used to convert NO_X to NO_2. Default minimum and maximum ambient ratios will be utilized.

Table 1 and 2 show the emission sources and stack parameters for the facility. Please note that emissions and stack parameters may vary throughout the development of this application.

Table 1- Emission sources and stack parameters to be included in the air dispersion modeling.

Unit Number	NO_x lb/hr	CO lb/hr	SO_2 lb/hr	PM_{10} lb/hr	$PM_{2.5}$ lb/hr	H_2S lb/hr	Height ft	Temp F	Velocity ft/s	Diam. ft
HT1	1.31	5.33	0.18	0.27	0.27	6.65E-06	15.00	531	44.78	2.50
HT2	1.31	5.33	0.18	0.27	0.27	6.65E-06	15.00	531	44.78	2.50
REBOIL1	0.074	0.062	0.0037	0.0056	0.0056	1.39E-07	13.00	600	9.45	0.83
REBOIL2	0.074	0.062	0.0037	0.0056	0.0056	1.39E-07	13.00	600	9.45	0.83
FL1	9.14	41.66	45.03	-	-	0.045	40.00	1832	65.62	2.58

A downwash analysis using the latest version of BPIP will be conducted and incorporated into the modeling analysis to account for potential effluent downwash due to structures at the facility.

Table 2- Volume Source

Volume Source	H_2S lb/hr	Release Height ft	Initial Lateral Dimension ft	Initial Vertical Dimension ft
FUG1/LOAD	1.20E-04	10	17.44	9.30

Table 3- Building Downwash Structures

Building ID	Building Shape	Height ft	X Length ft	Y Length ft
PDC	Rectangular	11	55	12
TRAILER	Rectangular	8.5	8	40

Table 4- Circular Building Downwash Structures

Building ID	Building Shape	Height ft	X Length ft	Y Length ft
TSLOP	Rectangular	11	55	12

2.2 Receptor Grid Description and Elevation Data

The center point of the facility will be designated at 633,904 meters east and 3,587,902 meters north. This center point will serve as the center point for a variable density circular receptor grid. The facility will be modeled with the following receptor grid design:

- Fenceline: 50 m grid spacing
- Very Fine Grid Resolution: 50 m grid spacing from 0 m to 800 m of center point
- Fine Grid Resolution: 100 m spacing from 800 m to 3,000 m of center point
- Medium Grid Resolution: 250 m spacing from 3,000 m to 6,000 m of center point
- Course Grid Resolution: 500 m spacing from 6,000 m to 10,000 m of center point
- Very Course Grid Resolution: 1,000 m from 10,000 m to 50,000 m of center point

It is expected that the highest impacts from the proposed source will be at or near the facility property.

For the Class I area analysis, a grid spacing of 1000 m is used for receptors over the Class I area. Class I receptors will be obtained through NMED MergeMaster.

The elevations of receptors and facility sources will be determined using the most recent NED data currently available (1/3 arc-second NED).

2.3 Meteorological Data

The Hobbs dataset will be used for five meteorological years (2017-2021) as available on the NMED website.

2.4 Significance Analysis (SIL) and Cumulative Impact Analysis (CIA)

The modeled ground-level concentrations will be compared to the corresponding significant impact levels (SILs) to determine whether any modeled ground-level concentrations at any receptor locations are greater than the SIL (i.e., "significant" receptors). If the significance analysis reveals that modeled ground-level concentrations for a particular pollutant and averaging period are greater than the applicable SIL, a Cumulative Impact Analysis (CIA) will be performed at the significant receptors. The CIA will include impacts from the facility sources, as well as background concentrations and/or surrounding sources, as applicable.

The inclusion of background concentrations will follow the guidance shown in Table 20: "Modeling the Design Value Summary (Default Modeling)" from the Modeling Guidelines[1]. If necessary, the following monitors will be used for background concentrations:

- Del Norte High School (350010023) for CO;
- Hobbs-Jefferson Monitor (5ZS, 350250008) for NO_2;
- Hobbs-Jefferson Monitor (5ZS, 350250008) for $PM_{2.5}$; and
- Hobbs-Jefferson Monitor (5ZS, 350250008) for PM_{10};

Based on the NMED Modeling Guidelines for SO_2 modeling, if the facility is in the Pecos-Permian Basin Intrastate AQCR (AQCR 155), it will be modeled with surrounding sources, as representative monitoring is not available for background data.

[1] New Mexico Air Quality Bureau Air Dispersion Modeling Guidelines Revised December 2023

For $PM_{2.5}$ and PM_{10} modeling, the facility will be modeled with surrounding sources, and a background concentration and secondary formation (if applicable) will be added to the modeling results. For modeling surrounding sources, all sources within 10 km of the facility will be included in the model. An inventory of the surrounding sources will be obtained from the NMED MergeMaster. Based on EPA's Guidance for $PM_{2.5}$ Permit Modeling and NMED'S Modeling Guidelines, sources that emit at least 40 tons per year of NO_x or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors. Sources with significant increases of $PM_{2.5}$ precursors must qualitatively and/or quantitatively account for the secondary formation of $PM_{2.5}$. The secondary formation of $PM_{2.5}$ will be calculated if the facility emits more than 40 tpy of either NO_x or SO_2.

For H_2S modeling, the only sources at the facility that produced H_2S will be the amine hot oil heaters (Unit HT-1 and HT-2), dehydrator reboilers (Unit REBOIL-1 and REBOIL-2), slop truck loading (Unit S-LOAD), and fugitive equipment emissions (Unit FUG-1). The heaters and reboilers will be modeled as point sources. Fugitives and loading will be modeled as a single volume source at the center of the facility with dimensions determined per Section 4.3.2 of NMED's modeling guidelines. Based on the NMED Modeling Guidelines for H_2S modeling, if the facility is in the Pecos-Permian Basin Intrastate AQCR, H_2S will be modeling using the 1-hour averaging time and compared to the 1/2-hour averaging period.

2.5 PSD Increment Analysis

If the results of the ROI analysis for NO_X, SO_2, $PM_{2.5}$, or PM_{10} indicate concentrations greater than significance levels, PSD increment analysis will be conducted for the appropriate averaging periods. If required, the PSD increment analysis will be conducted including all PSD increment consuming and expanding sources within 25 km of the facility, plus sources emitting over 1000 pounds per hour within 50 km of the facility. The surrounding source information will be obtained from NMED MergeMaster. The predicted maximum concentrations will be compared to the appropriate Class II PSD Standard.

2.6 Class I Areas Analysis

The nearest Class I area is Carlsbad Caverns National Park at 79.2 km from the facility. A Class I area analysis will not need to be performed as the national park is not within the 50 km inclusion zone for PSD minor sources.

Universal Application 4

Air Dispersion Modeling Report

Refer to and complete Section 16 of the Universal Application form (UA3) to assist your determination as to whether modeling is required. If, after filling out Section 16, you are still unsure if modeling is required, e-mail the completed Section 16 to the AQB Modeling Manager for assistance in making this determination. If modeling is required, a modeling protocol would be submitted and approved prior to an application submittal. The protocol should be emailed to the modeling manager. A protocol is recommended but optional for minor sources and is required for new PSD sources or PSD major modifications. Fill out and submit this portion of the Universal Application form (UA4), the "Air Dispersion Modeling Report", only if air dispersion modeling is required for this application submittal. This serves as your modeling report submittal and should contain all the information needed to describe the modeling. No other modeling report or modeling protocol should be submitted with this permit application.

16-A: Identification

1	Name of facility:	Dagger Lake Treating Facility
2	Name of company:	MarkWest Energy West Texas Gas Company, L.L.C
3	Current Permit number:	10187-M1R1
4	Name of applicant's modeler:	Daniel Dolce
5	Phone number of modeler:	(505) 266-6611
6	E-mail of modeler:	Daniel.Dolce@trinityconsultants.com

16-B: Brief

1	Was a modeling protocol submitted and approved?	Yes☒	No☐
2	Why is the modeling being done?	Other (describe below)	
3	Describe the permit changes relevant to the modeling.		
	The facility is changing from a GCP to an NSR facility. The following units will be permitted: two (2) amine treating units (AMINE-1 & AMINE-2), two (2) amine hot oil heaters (HT-1 & HT-2), two (2) TEG dehydrators (DEHY-1 & DEHY-2), two (2) dehydrator reboilers (REBOIL-1 & REBOIL-2), one (1) 500 bbl slop storage tank (T-SLOP), one (1) acid gas flare (FL-1), slop truck loading emissions (S-LOAD), and facility fugitive emissions (FUG).		
4	What geodetic datum was used in the modeling?	WGS84	
5	How long will the facility be at this location?	Longer than 1 year	

6	Is the facility a major source with respect to Prevention of Significant Deterioration (PSD)?	Yes☐	No☒
7	Identify the Air Quality Control Region (AQCR) in which the facility is located	155	
8	List the PSD baseline dates for this region (minor or major, as appropriate).		
	NO2	3/16/1988	
	SO2	7/28/1978	
	PM10	2/20/1979	
	PM2.5	11/13/2013	
9	Provide the name and distance to Class I areas within 50 km of the facility (300 km for PSD permits).		
	N/A		
10	Is the facility located in a non-attainment area? If so describe below	Yes☐	No☒
	N/A		
11	Describe any special modeling requirements, such as streamline permit requirements.		
	N/A		

16-C: Modeling History of Facility

1 — Describe the modeling history of the facility, including the air permit numbers, the pollutants modeled, the National Ambient Air Quality Standards (NAAQS), New Mexico AAQS (NMAAQS), and PSD increments modeled. (Do not include modeling waivers).

Pollutant	Latest permit and modification number that modeled the pollutant facility-wide.	Date of Permit	Comments
CO	N/A	N/A	
NO_2	N/A	N/A	
SO_2	N/A	N/A	
H_2S	N/A	N/A	
PM2.5	N/A	N/A	
PM10	N/A	N/A	
Lead	N/A	N/A	
Ozone (PSD only)	N/A	N/A	
NM Toxic Air Pollutants (20.2.72.402 NMAC)	N/A	N/A	

16-D: Modeling performed for this application

1 — For each pollutant, indicate the modeling performed and submitted with this application.
Choose the most complicated modeling applicable for that pollutant, i.e., culpability analysis assumes ROI and cumulative analysis were also performed.

	Pollutant	ROI	Cumulative analysis	Culpability analysis	Waiver approved	Pollutant not emitted or not changed.
	CO	☒	☐	☐	☐	☐
	NO_2	☐	☒	☐	☐	☐
	SO_2	☐	☒	☐	☐	☐
	H_2S	☐	☒	☐	☐	☐
	PM2.5	☐	☒	☐	☐	☐
	PM10	☒	☐	☐	☐	☐
	Lead	☐	☐	☐	☐	☒
	Ozone	☐	☐	☐	☐	☒
	State air toxic(s) (20.2.72.402 NMAC)	☐	☐	☐	☐	☒

16-E: New Mexico toxic air pollutants modeling

1 List any New Mexico toxic air pollutants (NMTAPs) from Tables A and B in 20.2.72.502 NMAC that are modeled for this application.
N/A- No TAPs were modeled at this facility.

2 List any NMTAPs that are emitted but not modeled because stack height correction factor. Add additional rows to the table below, if required.

Pollutant	Emission Rate (pounds/hour)	Emission Rate Screening Level (pounds/hour)	Stack Height (meters)	Correction Factor	Emission Rate/ Correction Factor
N/A	N/A	N/A	N/A	N/A	N/A

16-F: Modeling options

1	Was the latest version of AERMOD used with regulatory default options? If not explain below.	Yes☒	No☐

16-G: Surrounding source modeling

1	Date of surrounding source retrieval	01/23/2025

2 If the surrounding source inventory provided by the Air Quality Bureau was believed to be inaccurate, describe how the sources modeled differ from the inventory provided. If changes to the surrounding source inventory were made, use the table below to describe them. Add rows as needed.

AQB Source ID	Description of Corrections
722E6	Incorrect coordinates: 630931.986 m E, 3554367.831 m N [34 km away] Corrective action: 630898.07 m E, 3584394.08 m N [4.60 km away] (facility's coordinates)
29590E20	Incorrect coordinates: 569351.587 m E, 3626398.756 m N [75.21 km away] Corrective action: 629926 m E, 3575371 m N [13.11 km away] (facility's coordinates)
29590E21	Incorrect coordinates: 569351.587 m E, 3626398.756 m N [75.21 km away]

		Corrective action: 629926 m E, 3575371 m N [13.11 km away] (facility's coordinates)
	39796E1	Incorrect coordinates: 283005.17 m E, 4067882.789 m N [594.75 km away] Corrective action: 644645.97 m E, 3602742.98 m N [18.35 km away] (facility's coordinates)
	39796E2	Incorrect coordinates: 283005.17 m E, 4067882.789 m N [594.75 km away] Corrective action: 644645.97 m E, 3602742.98 m N [18.35 km away] (facility's coordinates)
	39796E3	Incorrect coordinates: 283005.17 m E, 4067882.789 m N [594.75 km away] Corrective action: 644645.97 m E, 3602742.98 m N [18.35 km away] (facility's coordinates)
	39796E22	Incorrect coordinates: 283005.17 m E, 4067882.789 m N [594.75 km away] Corrective action: 644645.97 m E, 3602742.98 m N [18.35 km away] (facility's coordinates)
	29590E24	Incorrect coordinates: 569351.587 m E, 3626398.756 m N [75.22 km away] Corrective action: 629926.12 m E, 3575371.74 m N [13.11 km away] (facility's coordinates)
	29590E20	Incorrect coordinates: 569351.587 m E, 3626398.756 m N [75.22 km away] Corrective action: 629926.12 m E, 3575371.74 m N [13.11 km away] (facility's coordinates)
	29590E21	Incorrect coordinates: 569351.587 m E, 3626398.756 m N [75.22 km away] Corrective action: 629926.12 m E, 3575371.74 m N [13.11 km away] (facility's coordinates)
	3152E219	Incorrect coordinates: 638260.858 m E, 3563520.142 m N [24.73 km away] Corrective action: 590799.99 m E, 3575390.04 m N [10.03 km away] (facility's coordinates)
	39497E14	Incorrect H2S Emission Rates: [0.44 lb/hr] Corrective action: Updated H2S Emission Rates [0.004371938 lb/hr]
	39497R2	Incorrect H2S Emission Rates: [0.27999999 lb/hr] Corrective action: Updated H2S Emission Rates [0.007 lb/hr]

16-H: Building and structure downwash

1	How many buildings are present at the facility?	2		
2	How many above ground storage tanks are present at the facility?	1		
3	Was building downwash modeled for all buildings and tanks? If not explain why below.		Yes☒	No☐
	N/A			
4	Building comments	There are two (2) rectangular buildings.		

16-I: Receptors and modeled property boundary

1	"Restricted Area" is an area to which public entry is effectively precluded. Effective barriers include continuous fencing, continuous walls, or other continuous barriers approved by the Department, such as rugged physical terrain with a steep grade that would require special equipment to traverse. If a large property is completely enclosed by fencing, a restricted area within the property may be identified with signage only. Public roads cannot be part of a Restricted Area. A Restricted Area is required in order to exclude receptors from the facility property. If the facility does not have a Restricted Area, then receptors shall be placed within the property boundaries of the facility. Describe the fence or other physical barrier at the facility that defines the restricted area		
	The property is enclosed by a fence that surrounds the boundary of the facility. Receptors are placed starting along the fenceline.		
2	Receptors must be placed along publicly accessible roads in the restricted area. Are there public roads passing through the restricted area?	Yes☐	No☒

3	Are restricted area boundary coordinates included in the modeling files?	Yes☒	No☐

4 Describe the receptor grids and their spacing. The table below may be used, adding rows as needed.

Grid Type	Shape	Spacing	Start distance from restricted area or center of facility	End distance from restricted area or center of facility	Comments
Variable Density	Circle	50	0	800	
Variable Density	Circle	100	800	3,000	
Variable Density	Circle	250	3,000	6,000	
Variable Density	Circle	500	6,000	10,000	
Variable Density	Circle	1000	10,000	50,000	

5 Describe receptor spacing along the fence line.

50 m spacing.

6 Describe the PSD Class I area receptors.

N/A – There are no Class I areas within 50 km of the facility.

16-J: Modeling Scenarios

1 Identify, define, and describe all modeling scenarios. Examples of modeling scenarios include using different production rates, times of day, times of year, simultaneous or alternate operation of old and new equipment during transition periods, etc. Alternative operating scenarios should correspond to all parts of the Universal Application and should be fully described in Section 15 of the Universal Application (UA3).

N/A

2 Which scenario produces the highest concentrations? Why?

N/A

3	Were emission factor sets used to limit emission rates or hours of operation? (This question pertains to the "SEASON", "MONTH", "HROFDY" and related factor sets, not to the factors used for calculating the maximum emission rate.)	Yes☐	No☒

4 If so, describe factors for each group of sources. List the sources in each group before the factor table for that group. (Modify or duplicate table as necessary. It's ok to put the table below section 16-K if it makes formatting easier.)

	Sources: N/A											
5	Hour of Day	Factor	Hour of Day	Factor								
	1		13									
	2		14									
	3		15									
	4		16									
	5		17									
	6		18									
	7		19									
	8		20									
	9		21									
	10		22									
	11		23									
	12		24									
	If hourly, variable emission rates were used that were not described above, describe them below.											
	N/A											

6	Were different emission rates used for short-term and annual modeling? If so describe below.	Yes☐	No☒
	N/A		

16-K: NO_2 Modeling

1	Which types of NO_2 modeling were used? Check all that apply.	
	☒	ARM2
	☐	100% NO_X to NO_2 conversion
	☐	PVMRM
	☐	OLM
	☐	Other:
2	Describe the NO_2 modeling.	
	The ARM2 Methodology was used with the default maximum and minimum ambient ratios.	

3	Were default NO_2/NO_X ratios (0.5 minimum, 0.9 maximum or equilibrium) used? If not describe and justify the ratios used below.	Yes☒	No☐
	N/A		
4	Describe the design value used for each averaging period modeled.		
	1-hour: High eighth high Annual Other (Describe): : Five Year Annual Average		

16-L: Ozone Analysis

1	NMED has performed a generic analysis that demonstrates sources that are minor with respect to PSD do not cause or contribute to any violations of ozone NAAQS. The analysis follows. The basis of the ozone SIL is documented in *Guidance on Significant Impact Levels for Ozone and Fine Particles in the Prevention of Significant Deterioration Permitting Program*, EPA, April 17, 2018 and associated documents. NMED accepts this SIL basis and incorporates it into this permit record by reference. Complete documentation of the ozone concentration analysis using MERPS is included in the New Mexico Air Quality Bureau Air Dispersion Modeling Guidelines.
2	The MERP values presented in Table 10 and Table 11 of the NM AQB Modeling Guidelines that produce the highest concentrations indicate that facilities emitting no more than 250 tons/year of NO_X and no more than 250 tons/year of VOCs will cause less formation of O_3 than the O_3 significance level. $$[O_3]_{8-hour} = \left(\frac{250 \frac{ton}{yr}}{340_{MERP_{NOX}}} + \frac{250 \frac{ton}{yr}}{4679_{MERP_{VOC}}} \right) \times 1.96\ \mu g/m^3$$ =1.546 µg/m^3, which is below the significance level of 1.96 µg/m^3. Sources that produce ozone concentrations below the ozone SIL do not cause or contribute to air contaminant levels exceeding the ozone NAAQS.

3	Does the facility emit at least 250 tons per year of NO_X or at least 250 tons per year of VOCs? Sources that emit at least 250 tons per year of NO_X or at least 250 tons per year of VOCs are covered by the analysis above and require an individual analysis.	Yes☐	No☒

5 For new PSD Major Sources or PSD major modifications, if MERPs were used to account for ozone fill out the information below. If another method was used describe below.

NO_X (ton/yr)	$MERP_{NOX}$	VOCs (ton/yr)	$MERP_{VOC}$	$[O_3]_{8\text{-hour}}$
N/A	N/A	N/A	N/A	N/A

N/A

16-M: Particulate Matter Modeling

1 Select the pollutants for which plume depletion modeling was used.

☐	PM2.5
☐	PM10
☒	None

2 Describe the particle size distributions used. Include the source of information.

N/A

3	Does the facility emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2? Sources that emit at least 40 tons per year of NO_X or at least 40 tons per year of SO_2 are considered to emit significant amounts of precursors and must account for secondary formation of PM2.5.	Yes☒	No☐
4	Was secondary PM modeled for PM2.5?	Yes☐	No☒

5 If MERPs were used to account for secondary PM2.5 fill out the information below. If another method was used describe below.

Pollutant	NO_X	SO_2		$[PM2.5]_{24\text{-hour}}$

	$MERP_{annual}$	26780	14978		0.00679
	$MERP_{24\text{-}hour}$	7331	1981		$[PM2.5]_{annual}$
	Emission rate (ton/yr)	52.54	72.27		0.04365

16-N: Setback Distances

1	Portable sources or sources that need flexibility in their site configuration requires that setback distances be determined between the emission sources and the restricted area boundary (e.g. fence line) for both the initial location and future locations. Describe the setback distances for the initial location.
	N/A
2	Describe the requested, modeled, setback distances for future locations, if this permit is for a portable stationary source. Include a haul road in the relocation modeling.
	N/A

16-O: PSD Increment and Source IDs

1	The unit numbers in the Tables 2-A, 2-B, 2-C, 2-E, 2-F, and 2-I should match the ones in the modeling files. Do these match? If not, provide a cross-reference table between unit numbers if they do not match below.	Yes☒	No☐

Unit Number in UA-2	Unit Number in Modeling Files
N/A	N/A

2	The emission rates in the Tables 2-E and 2-F should match the ones in the modeling files. Do these match? If not, explain why below.	Yes☒	No☐
	N/A		
3	Have the minor NSR exempt sources or Title V Insignificant Activities" (Table 2-B) sources been modeled?	Yes☐	No☒

4 Which units consume increment for which pollutants?
All units at this facility consume increment for all pollutants identified below.

Unit ID	NO_2	SO_2	PM10	PM2.5
RBL1	X	X	X	X
RBL2	X	X	X	X
HT1	X	X	X	X
HT2	X	X	X	X
FL1	X	X	X	X
TLF				

5	PSD increment description for sources. (for unusual cases, i.e., baseline unit expanded emissions after baseline date).	N/A

6	Are all the actual installation dates included in Table 2A of the application form, as required? This is necessary to verify the accuracy of PSD increment modeling. If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐

16-P: Flare Modeling

1	For each flare or flaring scenario, complete the following			
	Flare ID (and scenario)	Average Molecular Weight (g/mol)	Gross Heat Release (cal/s)	Effective Flare Diameter (m)
	FL-1	36.79	9,493,502	2.594

16-Q: Volume and Related Sources

1	Were the dimensions of volume sources different from standard dimensions in the Air Quality Bureau (AQB) Modeling Guidelines? If not please explain how increment consumption status is determined for the missing installation dates below.	Yes☒	No☐
	N/A		
2	Describe the determination of sigma-Y and sigma-Z for fugitive sources.		
	Sigma-Y and sigma-z were determined by following the Section 5.3.2 guidance in the NMED Modeling Guidelines (revised June 2024).		
3	Describe how the volume sources are related to unit numbers. Or say they are the same.		
	TLF is the combined emissions from the slop tank (T-SLOP), slop loading (S-LOAD), fugitives (FUG-1), and vented SSM (SSM).		
4	Describe any open pits.		
	N/A		
5	Describe emission units included in each open pit.		
	N/A		

16-R: Background Concentrations

1	Were NMED provided background concentrations used? Identify the background station used below. If non-NMED provided background concentrations were used describe the data that was used.	Yes☒	No☐
	CO: N/A		
	NO_2: Hobbs-Jefferson (350250008)		
	PM2.5: Hobbs-Jefferson (350450019)		
	PM10: Hobbs-Jefferson (350250008)		
	SO_2: N/A		
	Other: N/A		

	Comments:	For PM2.5, background concentrations were determined for the most recent three years, 2021 to 2023. The weighted annual mean concentration, averaged over the 3-year period was used, based on the methodology identified in 40 CFR 50, Appendix N.

2	Were background concentrations refined to monthly or hourly values? If so describe below.	Yes☐	No☒
	N/A		

16-S: Meteorological Data

1	Was NMED provided meteorological data used? If so select the station used. Hobbs	Yes☒	No☐
2	If NMED provided meteorological data was not used describe the data set(s) used below. Discuss how missing data were handled, how stability class was determined, and how the data were processed.		
	N/A		

16-T: Terrain

1	Was complex terrain used in the modeling? If not, describe why below.	Yes☒	No☐
	N/A		
2	What was the source of the terrain data?		
	Terrain was incorporated into the modeling analysis through the use of AERMAP with the most recent 1/3 degree NED data currently available from https://apps.nationalmap.gov/downloader/#/		

16-U: Modeling Files

1 Describe the modeling files:

File name (or folder and file name)	Pollutant(s)	Purpose (ROI/SIA, cumulative, culpability analysis, other)
Dagger_CO SIL_v1.0_2025 0630	CO (8-hour, 1-hour)	ROI/SIA
Dagger_H2S SIL_v1.0_2025 0630	H2S (1/2-hour)	ROI/SIA
Dagger_NO2 SIL_v1.0_2025 0630	NO2 (Annual, 24-hour, 1-hour)	ROI/SIA
Dagger_PM25 SIL_v1.0_2025 0630	PM2.5 (Annual, 24-hour)	ROI/SIA
Dagger_PM10 SIL_v1.0_2025 0630	PM10 (Annual (24-hour)	ROI/SIA
Dagger_SO2 SIL_v1.0_2025 0630	SO2 (Annual, 24-hour, 3-hour, 1-hour)	ROI/SIA
Dagger_H2S CIA_v1.0_2025 0630	H2S (1/2-hour)	Cumulative – NMAAQs
Dagger_NO2 CIA Annual_v1.0_2025 0630	NO2 (Annual)	Cumulative – NMAAQS Cumulative – PSD Inc. Class II
Dagger_NO2 CIA 1hr_v1.0_2025 0630	NO2 (1-hour)	Cumulative – NAAQS
Dagger_PM25 CIA Annual_v1.0_2025 0630	PM2.5 (Annual)	Cumulative – NAAQS Cumulative – PSD Inc. Class II
Dagger_PM25 CIA 24hr_v1.0_2025 0630	PM2.5 (24-hour)	Cumulative – NAAQS Cumulative – PSD Inc. Class II
Dagger_SO2 CIA 1hr_v1.0_2025 0630	SO2 (1-hour)	Cumulative – NAAQS

16-V: PSD New or Major Modification Applications

1	A new PSD major source or a major modification to an existing PSD major source requires additional analysis. Was preconstruction monitoring done (see 20.2.74.306 NMAC and PSD Preapplication Guidance on the AQB website)?	Yes☐	No☒
2	If not, did AQB approve an exemption from preconstruction monitoring?	Yes☐	No☒
3	Describe how preconstruction monitoring has been addressed or attach the approved preconstruction monitoring or monitoring exemption.		
	N/A		
4	Describe the additional impacts analysis required at 20.2.74.304 NMAC.		
	N/A		
5	If required, have ozone and secondary PM2.5 ambient impacts analyses been completed? If so describe below.	Yes☐	No☒
	N/A		

16-W: Modeling Results

1	If ambient standards are exceeded because of surrounding sources, a culpability analysis is required for the source to show that the contribution from this source is less than the significance levels for the specific pollutant. Was culpability analysis performed? If so describe below.	Yes☐	No☒
	N/A – no culpability analysis was performed.		
2	Identify the maximum concentrations from the modeling analysis. Rows may be modified, added and removed from the table below as necessary.		

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
CO 8-hr SIL	90.72	-	-	-	90.72	500	18.1%	633854	3587752	3640.88
CO 1-hr SIL	208.62	-	-	-	208.62	2000	10.4%	633804	3587902	3641.90
H_2S 1/2-hr SIL	88.66		-	-	88.66	5	Significant	633854	3587902	3641.37
NO_2 Annual SIL	1.47	-	-	-	1.47	1	Significant	633858	3587974	3640.19
NO_2 24-hr SIL	11.63	-	-	-	11.63	5	Significant	633854	3587802	3640.65
NO_2 1-hr SIL	49.46	-	-	-	49.46	7.52	Significant	633804	3587902	3641.90
$PM_{2.5}$ Annual SIL	0.22	-	-	-	0.22	0.13	Significant	633858	3587974	3640.19
$PM_{2.5}$ 24-hr SIL	1.71	-	-	-	1.71	1.2	Significant	633854	3587802	3640.65
PM_{10} Annual SIL	0.22	-	-	-	0.22	1	22.1%	633858	3587974	3640.19
PM_{10} 24-hr SIL	2.32	-	-	-	2.32	5	46.4%	633854	3587752	3640.88
SO_2 Annual SIL	0.25	-	-	-	0.25	1	25.4%	633904	3588152	3639.21
SO_2 24-hr SIL	1.81	-	-	-	1.81	5	36.3%	633754	3587752	3644.62

Pollutant, Time Period and Standard	Modeled Facility Concentration (µg/m3)	Modeled Concentration with Surrounding Sources (µg/m3)	Secondary PM (µg/m3)	Background Concentration (µg/m3)	Cumulative Concentration (µg/m3)	Value of Standard (µg/m3)	Percent of Standard	Location		
								UTM E (m)	UTM N (m)	Elevation (ft)
SO_2 3-hr SIL	7.14	-	-	-	7.14	25	28.6%	634154	3588152	3630.25
SO_2 1-hr SIL	11.97	-	-	-	11.97	7.8	Significant	634254	3587952	3626.35
H_2S 1/2-hr NMAAQS	88.66	108.32	-	-	108.32	139.3	77.8%	633858	3587974	3640.19
NO_2 Annual PSD Class II Increment	1.47	-	-	9.3	10.77	25	43.1%	633858	3587974	3640.19
NO_2 Annual NMAAQS	1.47	-	-	9.3	10.77	94.02	11.5%	633858	3587974	3640.19
NO_2 1-hr NAAQS	18.74	-	-	65.8	84.54	188.03	45.0%	633804	3587752	3642.45
$PM_{2.5}$ Annual PSD Class II Increment	0.22	1.75	0.04365	-	1.79	4	44.8%	633957	3587954	3636.65
$PM_{2.5}$ Annual NAAQS	0.22	1.89	0.04365	6.6	8.54	9	94.9%	633957	3587954	3636.65
$PM_{2.5}$ 24-hr PSD Class II Increment	1.48	4.97	0.007	-	4.97	9	55.3%	633804	3587702	3643.34
$PM_{2.5}$ 24-hr NAAQS	0.80	4.27	0.007	16.5	20.78	35	59.4%	634004	3587952	3634.74
SO_2 1-hr NAAQS	4.88	126.87	-	-	126.87	196.4	64.6%	634304	3587602	3628.22

16-X: Summary/conclusions

1	A statement that modeling requirements have been satisfied and that the permit can be issued.
	MarkWest Energy West Texas Gas Company, L.L.C has demonstrated that the proposed changes to GCP Permit 10187M1R1 would neither cause nor contribute to an exceedance of the standards for H_2S, CO, NO_2, $PM_{2.5}$, PM_{10}, and SO_2.

Section 17

Compliance Test History

(Submitting under 20.2.70, 20.2.72, 20.2.74 NMAC)

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

Compliance Test History Table

Unit No.	Test Description	Test Date
HT-1	Emission Testing per 20.2.50.119 NMAC	2/4/2025
HT-2	Emission Testing per 20.2.50.119 NMAC	2/7/2025

Section 20

Other Relevant Information

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

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

There is no other information needed for this application.

Section 22: Certification

Company Name: MPLX

I, Jay Schofield, 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 20 day of March, 2025, upon my oath or affirmation, before a notary of the State of Texas.

*Signature

3-20-25
Date

Jay Schofield
Printed Name

Director of Operations
Title

Scribed and sworn before me on this 20th day of March, 2025.

My authorization as a notary of the State of Texas expires on the 14th day of December, 2028.

Notary's Signature

March 20, 2025
Date

Lourdes Wiggins
Notary's Printed Name

LOURDES WIGGINS
My Notary ID # 8496022
Expires December 14, 2028

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