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New Source Permits

AIR NSR P 148

Air #: 106245541 98929

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TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Protecting Texas by Reducing and Preventing Pollution

November 16, 2011

MR ERIK PITONIAK
AIR SPECIALIST
CHEVRON USA INC
1400 SMITH ST
HOUSTON TX 77002-7327

Permit by Rule Registration Number:	98929
Location/City/County:	In Beckville from intersection of FM 959 and 124 go east on FM 124 2.6 miles turn left on private road battery on left in 0.6 miles, Beckville, Panola County
Project Description/Unit:	Davidson Matthews Compressor Station
Regulated Entity Number:	RN106245541
Customer Reference Number:	CN600132484
New or Existing Site:	Existing
Affected Permit (if applicable):	None
Renewal Date (if applicable):	None

Chevron U.S.A. Inc. has registered the emissions associated with the Davidson Matthews Compressor Station under Title 30 Texas Administrative Code § 106.352 (effective 9/4/2000), §106.492(effective 9/4/2000) and 106.512 (effective 6/13/2001). For rule information see:
www.tceq.texas.gov/permitting/air/nav/numerical_index.html
No planned MSS emissions have been represented or reviewed for this registration. The company is also reminded that these facilities may be subject to and must comply with other state and federal air quality requirements. In addition, under the General Requirements for all Permit by Rules, § 106.2 states that particular requirements only apply "where construction is commenced on or after the effective date of the relevant permit by rule."
All analytical data generated by a mobile or stationary laboratory to support the compliance with an air permit must be obtained from a NELAC (National Environmental Laboratory Accreditation Conference) accredited laboratory. For additional information regarding the laboratory accreditation program, please see the following Web site which includes the accreditation and exemption information:
www.tceq.texas.gov/compliance/compliance_support/qa/env_lab_accreditation.html
This registration is taken under the authority delegated by the Executive Director of the TCEQ. If you have questions, please contact Ms. Jameica Hanney at (512) 239-5171.

Sincerely,

Anne M. Inman, P.E., Manager
Rule Registrations Section
Air Permits Division

Represented Sitewide Emissions:

VOC	19.45	tpy
NO_x	2.62	tpy
CO	1.37	tpy
$PM_{10/2.5}$	0.01	tpy
SO_2	<0.01	tpy

cc: Air Section Manager, Region 5 - Tyler

Project Number: 170546

TECHNICAL REVIEW: AIR PERMIT BY RULE

Permit No.:	98929	*Company Name:*	Chevron U.S.A. Inc.	*APD Reviewer:*	Ms. Jameica Hanney
Project No.:	170546	*Unit Name:*	Davidson Matthews Compressor Station	*PBR No(s).:*	106.352 2011-FEB-27, 106.492, 106.512

GENERAL INFORMATION			
Regulated Entity No.:	RN106245541	**Project Type:**	Permit by Rule Application
Customer Reference No.:	CN600132484	**Date Received by TCEQ:**	October 10, 2011
Account No.:	None	**Date Received by Reviewer:**	October 24, 2011
City/County:	Beckville, Panola County	**Physical Location:**	In Beckville from intersection of FM 959 and 124 go east on FM 124 2.6 miles turn left on private road battery on left in 0.6 miles

CONTACT INFORMATION					
Responsible Official/ Primary Contact Name and Title:	Mr. Erik Pitoniak Air Specialist	**Phone No.:** **Fax No.:**	(713) 372-0456 (713) 372-2900	**Email:**	EPIT@CHEVRON.COM
Technical Contact/ Consultant Name and Title:		**Phone No.:** **Fax No.:**		**Email:**	

GENERAL RULES CHECK	YES	NO	COMMENTS
Is confidential information included in the application?		X	There is no confidential information included in the application.
Are there affected NSR or Title V permits for the project?		X	There are no affected NSR or Title V permits for the project.
Is each PBR > 25/250 tpy?		X	
Are PBR sitewide emissions > 25/250 tpy?		X	
Are there permit limits on using PBRs at the site?		X	
Is PSD or Nonattainment netting required?		X	Sitewide emissions are below the federal significance as major sources levels, therefore PSD is not required. Panola County is an attainment county; NA review and netting are not required.
Do NSPS, NESHAP, or MACT standards apply to this registration?		X	NSPS Subpart A: Applies to the flare. __Not applicable__ 40 CFR 63, Subpart MACT HH- Facility does not have a dehy unit. 40 CFR 63, Subpart MACT HHH- Facility does not store and transport natural gas. 40 CFR 60, NSPS Subpart KKK- Facility not an onshore natural gas processing plants. 40 CFR 60, NSPS Subpart LLL- Facility does not produce onshore natural gas processing of SO_2. 40 CFR 60, NSPS Subpart GG- Not a stationary gas turbine. 40 CFR §51.166(b) (23) - Not classified as a PSD major source. 40 CFR 61and 63. Facility not a major source of HAPs, therefore, not subject to NESHAP.
Does NOx Cap and Trade apply to this registration?		X	This facility is not in the HGA area.
Is the facility in compliance with all other applicable rules and regulations?	X		The facility is in compliance with all other applicable rules and regulations.

DESCRIBE OVERALL PROCESS AT THE SITE

The Davidson-Matthews Compressor Station currently receives gas from S.E. Matthews A1 and S.E. Matthews B batteries. Gas is compressed and sent to a sales line via a 60 hp DPC-60 Ajax engine. In addition, the Davidson-Matthews Compressor Station (D-M CS) will receive produced water, gas, and condensate from a newly drilled well which is part of a horizontal well-only drilling program in the Travis Peak formation. Peak liquid throughput at this site will be 300 bbls of condensate per day and 300 bbls of water per day. D-M CS will have one 400 bbl condensate tank, two 500-bbl condensate tanks, one 400-bbl water tank, and one 500-bbl water tank. Flashing losses and working and breathing are anticipated from the condensate tanks. Only working and breathing losses are anticipated from the water tanks. Both condensate and water will be unloaded by truck. An enclosed flare system manufactured by Superior, Inc. will be used to control flashing, working and breathing emissions from the condensate and water tanks. Fugitive emissions at the D-M CS are represented by the EPN FUGD1.

S.E. Matthews A1 Tank Battery is an existing site consisting of only one well, one separator, and one 400bbl condensate tank. Condensate, along with water is sold via truck. The maximum liquid throughput id 5 bbl condensate per day and 10 bbl of water per day. Fugitive emissions at this location are represented by FUGA1. Gas from the S.E. Matthew A1 Tank Battery is sent to the D-M CS for compression and then to a sales line.

S.E. Matthews B Tank Battery is an existing site consisting of only one well, one separator, one 210-bbl condensate tank, and one 210-bbl water tank. Condensate is sold via truck, as is water. The max throughput is 12 bbl condensate per day and 40 bbl of water per day. Fugitive emissions at this location are represented by FUGB1. Gas from the S.E. Matthew B Tank Battery is sent to the D-M CS for compression and then to a sales line.

TECHNICAL REVIEW: AIR PERMIT BY RULE

Permit No.:	98929	*Company Name:*	Chevron U.S.A. Inc.	*APD Reviewer:*	Ms. Jameica Hanney
Project No.:	170546	*Unit Name:*	Davidson Matthews Compressor Station	*PBR No(s).:*	106.352 2011-FEB-27, 106.492, 106.512

DESCRIBE PROJECT AND INVOLVED PROCESS

This registration consists of three independent site within ¼ mile:

- Davidson-Matthews Compressor Station (D-M CS)
- S.E. Matthews A1 Tank Battery
- S.E. Matthews B Tank Battery

The Davidson-Matthews Compressor Station is an existing facility which will add three new tanks and an enclosed flare control device as part of a drilling program. Both the S.E. Matthews A1 Tank Battery and S.E. Matthews B Tank Battery send gas to the compressor station, and are operationally dependent. Therefore, both of these facilities have been included in the registration for the Davidson-Matthews Compressor Station.

The potential air pollutant emission sources include the following:

Davidson-Matthews Compressor Station:

1. One engine (EPN: ENG1)
2. Three condensate tanks (EPNs: TANKD1, TANKD2, TANKD3)
3. Two produced water tanks (EPN: TANKW1, TANKW2)
4. Condensate Truck loading point (EPN: LOADD1)
5. Produced water truck loading point (EPN: LOADDW1)
6. Enclosed flare (EPN: FLR1)
7. Fugitive emissions (EPN: FUGD1)

S.E. Matthews A1 Tank Battery

8. One condensate tank (EPN: TANKA1)
9. Condensate truck loading point (EPN: LOADA1)
10. Fugitive emissions (EPN: FUGA1)

S.E. Matthews B Tank Battery

11. One condensate tank (EPN: TANKB1)
12. One produced water tank (EPN: TANKBW1)
13. Condensate truck loading point (EPN: LOADB1)
14. Produced water truck loading point (EPN: LOADBW1)
15. Fugitive emissions (EPN: FUGB1)

OIL AND GAS FACILITY GENERAL INFORMATION

Natural Gas Throughput (MMSCF/day):		**H_2S Content of Inlet Gas:**	<24 ppmv
Oil/Condensate Throughput (bbl/day):	D-M CS=300 S.E. Matthews A1=5 S.E. Matthews B=12	**Is the gas sweet or sour?**	Sweet
Produced Water Throughput (bbl/day):	D-M CS=300 S.E. Matthews A1=10 S.E. Matthews B=40	**Is this site operational/producing?**	Yes
PI-7 or PI-7 CERT?	PI-7	**Has the site been registered before?**	No

EQUIPMENT/PROCESSES AT SITE

Number of each:	**Compressor Engines:**	1	**Glycol dehydrators:**		**VRU:**	
	Separators:	3	**Amine units:**		**Other:**	
	Storage Tanks:	8	**Heater Treaters:**		**Other:**	
	Truck Loading:	Yes	**Flares:**	1	**Other:**	

30 TAC §106.352 RULE CHECK

REQUIREMENTS	YES, NO, or n/a	OTHER / COMMENTS
If the site conditions the natural gas (with a glycol dehydrator, amine unit, sulfur recovery unit, etc.), it handles less than two long tons per day of sulfur compounds (1 long ton = 2240 pounds). *Long tons per day sulfur compounds* = $\frac{(MMSCF/day\ of\ inlet\ gas)*(MW\ of\ inlet\ gas)*(H_2S\ wt\ fraction)}{(0.84896)}$	Yes	Long tons per day of sulfur compounds = <u><</u>2
(1) All compressors will meet the requirements of 106.512.	Yes	
(1) All flares will meet the requirements of 106.492.	Yes	

Permit No.:	98929	*Company Name:*	Chevron U.S.A. Inc.	*APD Reviewer:*	Ms. Jameica Hanney
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(2) Total emissions, including process fugitives, combustion unit stacks, separator, or other process vents, tank vents, and loading emissions from all such facilities constructed at a site under this section, will be equal to or below 25 tons per year (tpy) each of sulfur dioxide (SO_2), all other sulfur compounds combined, or all volatile organic compounds (VOC) combined; and 250 tpy each of nitrogen oxide and carbon monoxide. Emissions of VOC and sulfur compounds other than SO_2 must include gas lost by equilibrium flash as well as gas lost by conventional evaporation.	Yes	
(3) If the facility handles sour gas, it will be located at least 1/4 mile from any recreational area or residence or other structure not occupied or used solely by the owner or operator of the facility or the owner of the property upon which the facility is located.	Yes	Actual Distance = ≥1,650feet.
(4) Total emissions of sulfur compounds, excluding sulfur oxides, from all vents will be equal to or below 4.0 pounds per hour (lb/hr).	Yes	Actual Sulfur Emissions = ≤4 lb/hr.
(4) The height of each vent emitting sulfur compounds meets the following requirements, and is in no case less than 20 feet: (NOTE: other values may be interpolated) H_2S (lb/hr) — Minimum Vent Height (ft) 0.27 — 20 0.60 — 30 1.94 — 50 3.00 — 60 4.00 — 68	Yes	Actual Vent Height = ______ feet.
(5) If the site handles sour gas, the company will register the site by submitting Form PI-7 or PI-7-CERT before operations begin.	Yes	

STORAGE TANKS

Tank Identifier (EPN)	Capacity of Tank	Throughput (bbl/day)	Contents of Tank	Working and breathing Loss Calculation Method	Flash Loss Calculation Method	Comments
TANKD1	400 bbl	85.7	Condensate	TANKS 4.0	GOR	
TANKD2	500 bbl	107.2	Condensate	TANKS 4.0	GOR	
TANKD3	500 bbl	107.2	Condensate	TANKS 4.0	GOR	
TANKW1	400 bbl	133.30	Condensate	TANKS 4.0	GOR	
TANKW2	500 bbl	166.70	Condensate	TANKS 4.0	GOR	
TANKA1	400 bbl	15	Condensate	TANKS 4.0	GOR	
TANKB1	210 bbl	12	Condensate	TANKS 4.0	GOR	
TANKBW1	210 bbl	40	Condensate	TANKS 4.0	GOR	

TANKS 4.0 SOFTWARE [FOR ESTIMATING WORKING AND BREATHING LOSSES FROM STORAGE TANKS]

Tank Identifier (EPN)	Throughput (gallons/year) *(pg. 1 of report)*	Turnovers per year *(pg. 1 of report)*	Mixture/ Component *(pg. 2 of report)*	Basis for VP Calculations *(pg. 2 of report)*	Vapor MW *(pg. 2 of report)*	Results (lb/year) *(last page of report)*
TANKD1	1,313,781	102.25	Condensate	---	69.57	4,763.74
TANKD2	1,643,376	97.02	Condensate	---	69.57	4,763.74
TANKD3	1,643,376	97.02	Condensate	---	69.57	4,763.74
TANKW1	2,043,489	150.96	Condensate	---	69.57	4,763.74
TANKW2	2,555,511	150.87	Condensate	---	69.57	4,763.74
TANKA1	229, 950	16.99	Condensate	---	69.57	2,266.33
TANKB1	183,960	26.09	Condensate	---	69.57	1,750.61
TANKBW1	613,200	86.98	Condensate	---	69.57	2,486.42
Please explain any controls or reductions in calculated emissions:						

GAS OIL RATIO (G.O.R.) METHOD [FOR ESTIMATING FLASH LOSSES FROM STORAGE TANKS]

Laboratory Analysis Included ("Gas Evolved From HC Liquid Flashed")?	Yes	**Date of Sample:**	3/18/11
Analysis from actual site or representative site?	Representative		
If from representative site, justification as to why appropriate:			

TECHNICAL REVIEW: AIR PERMIT BY RULE

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Project No.:	170546	*Unit Name:*	Davidson Matthews Compressor Station	*PBR No(s).:*	106.352 2011-FEB-27, 106.492, 106.512

Gas-Oil-Ratio (SCF of flash gas per barrel of liquid produced):	36		
Oil or Condensate throughput (bbl/day):	317	Oil/Condensate API Gravity:	42.80
Separator Pressure (psig):	132	RVP:	5.31
Separator Temperature (°F):	70	Flash Gas Molecular Weight (lb/lb-mole):	32.65
Flash Gas VOC content (weight %):	53.26	Flash Gas H_2S content (wt %):	0.001
Flash Gas VOC emissions, lb/hr:	21.79	Flash Gas H_2S emissions, lb/hr:	0.0004
Flash Gas VOC emissions, tpy:	95.44	Flash Gas H_2S emissions, tpy:	0.002

TRUCK LOADING [EMISSIONS CALCULATED USING L_L=(12.46)(S)(P)(M)/(T) EQUATION FROM AP-42, SECTION 5.2-4]

What is being Loaded	S	P (psia)	M (lb/lb-mole)	T (°R)	L_L (lb VOC/1000 gallons loaded)	Hourly Loading Rate (gallons/hour)	Annual Loading Rate (gallons/year)	Hourly Emissions (lb/hr)	Annual Emissions (tpy)
Condensate @ A1 Tank Battery	0.6	4.5274	69.57	540	4.36	7,800	76,650	61.79	0.15
Condensate @ B Tank Battery	0.6	4.5274	69.57	540	4.36	1,840	183,960	58.15	0.36
Water @ B Tank Battery	0.6	4.5274	69.57	540	4.36	6,000	613,200	0.57	0.01
Condensate @ Davidson-Matthews	0.6	4.5274	69.57	540	4.36	4,599	4,599,000	56.43	9.08
Water @ Davidson-Matthews	0.6	4.5274	69.57	540	4.36	4,600	4,599,000	0.20	0.10
Please explain any controls or reductions in calculated emissions:	VOC account for 90% of total HC								

FUGITIVES [EMISSIONS CALCULATED USING EMISSION FACTORS FROM EPA DOCUMENT 4531, R-95-017, Table 2-4]
SE Matthews A1 Tank Battery

	Valves	Flanges	Connectors	Open Ended lines	Pump Seals	Other	VOC content of stream (weight %)	H_2S content of stream (weight %)	VOC Emissions (tpy)	H_2S Emissions (tpy)
Gas Service Component Count	8	24					100%	---	0.438	---
Light Oil Component Count	8	18			1		100%	---	0.337	---
Water/Oil Component Count	9	18			1		100%	---	0.009	---
								TOTAL:	0.78	---

If VOC content of gas stream <100%, was inlet or other laboratory gas analysis included?		Date of Sample:		VOC:TOC ratio from lab analysis (wt %):		H_2S:TOC ratio from lab analysis (wt %):	
If VOC content of liquid stream <100%, was a liquid laboratory analysis included?		Date of Sample:		VOC:TOC ratio from lab analysis (wt %):		H_2S:TOC ratio from lab analysis (wt %):	

FUGITIVES [EMISSIONS CALCULATED USING EMISSION FACTORS FROM EPA DOCUMENT 4531, R-95-017, Table 2-4]
SE Matthews B Tank Battery

	Valves	Flanges	Connectors	Open Ended lines	Pump Seals	Other	VOC content of stream (weight %)	H_2S content of stream (weight %)	VOC Emissions (tpy)	H_2S Emissions (tpy)
Gas Service Component Count	12	34					100%	---	0.649	---
Light Oil Component Count	8	18			1		100%	—	0.337	—
Water/Oil Component Count	14	26			1		100%	—	0.014	---
								TOTAL:	1.00	—

If VOC content of gas stream <100%, was inlet or other laboratory gas analysis included?		Date of Sample:		VOC:TOC ratio from lab analysis (wt %):		H_2S:TOC ratio from lab analysis (wt %):	
If VOC content of liquid stream <100%, was a liquid laboratory analysis included?		Date of Sample:		VOC:TOC ratio from lab analysis (wt %):		H_2S:TOC ratio from lab analysis (wt %):	

FUGITIVES [EMISSIONS CALCULATED USING EMISSION FACTORS FROM EPA DOCUMENT 4531, R-95-017, Table 2-4]
Davidson-Matthews Compressor Station

TECHNICAL REVIEW: AIR PERMIT BY RULE

Permit No.:	98929	*Company Name:*	Chevron U.S.A. Inc.	*APD Reviewer:*	Ms. Jameica Hanney
Project No.:	170546	*Unit Name:*	Davidson Matthews Compressor Station	*PBR No(s).:*	106.352 2011-FEB-27, 106.492, 106.512

	Valves	Flanges	Connectors	Open Ended lines	Pump Seals	Other	VOC content of stream (weight %)	H_2S content of stream (weight %)	VOC Emissions (tpy)	H_2S Emissions (tpy)
Gas Service Component Count	20	63				2	100%	---	1.487	---
Light Oil Component Count	24	54			2		100%	---	0.8867	---
Water/Oil Component Count	32	62			2		100%	---	0.03	---
								TOTAL:	2.406	—

If VOC content of gas stream <100%, was inlet or other laboratory gas analysis included?		**Date of Sample:**		**VOC:TOC ratio from lab analysis (wt %):**		**H_2S:TOC ratio from lab analysis (wt %):**	
If VOC content of liquid stream <100%, was a liquid laboratory analysis included?		**Date of Sample:**		**VOC:TOC ratio from lab analysis (wt %):**		**H_2S:TOC ratio from lab analysis (wt %):**	

30 TAC §106.492 RULE CHECK

REQUIREMENTS	YES, NO, or n/a	OTHER / COMMENTS
(1)(A) The flare will be equipped with a flare tip designed to provide good mixing with air, flame stability, and a tip velocity less than 60 feet per second (ft/sec) for gases having a lower heating value less than 1,000 British thermal units per cubic foot (Btu/ft^3) or a tip velocity less than 400 ft/sec for gases having a lower heating value greater than 1,000 Btu/ft^3.	Yes	Actual gas heating value (Btu/SCF) = 1835. Actual tip velocity (ft/sec) = 173.47.
(1)(B) The flare will be equipped with a continuously burning pilot or other automatic ignition system that assures gas ignition and provides immediate notification of appropriate personnel when the ignition system ceases to function. A gas flare which emits no more than 4.0 pounds per hour (lb/hr) of reduced sulfur compounds, excluding sulfur oxides, is exempted from the immediate notification requirement, provided the emission point height meets the requirements of §106.352(4) of this title (relating to Oil and Gas Production Facilities).	Yes	Continuous pilot (yes/no)? Yes. Automatic ignition (yes/no)? No.
(1)(C) If the flare burns gases containing more than 24 parts per million by volume (ppm$_v$) of sulfur, chlorine, or compounds containing either element, it will be located at least 1/4 mile from any recreational area or residence or other structure not occupied or used solely by the owner or operator of the flare or the owner of the property upon which the flare is located.	Yes	Sulfur Content of Gas = _______ppm$_v$. Chlorine Content of Gas = _______ppm$_v$. Actual Distance = _______feet.
(1)(D) The heat release of a flare (Q_{flare}) which emits sulfur dioxide (SO_2) or hydrogen chloride (HCl) will be greater than or equal to Q_{SO2} and Q_{HCl}. where: Q_{flare} = heat release of flare (BTU/hr), based on lower heating value $Q_{SO2} = 0.53 \times 10^5 \times$ SO_2 emission rate (lb/hr) $Q_{HCl} = 2.73 \times 10^5 \times$ HCl emission rate (lb/hr)	Yes	Q_{flare} (BTU/hr) = 2,100,000. Flare SO_2 emission rate (lb/hr) = <0.01. Q_{SO2} = 5.03. Flare HCl emission rate (lb/hr) = _______. Q_{HCl} = _______.
(2)(A) The flare will burn a combustible mixture of gases containing only carbon, hydrogen, nitrogen, oxygen, sulfur, chlorine, or compounds derived from these elements. When the gas stream to be burned has a net or lower heating value of more than 200 Btu/ft^3 prior to the addition of air, it may be considered combustible.	Yes	
(2)(B) If the flare will burn gases containing more than 24 ppm$_v$ of sulfur, chlorine, or compounds containing either element, the company has registered the flare by submitting Form PI-7 or PI-7-CERT.	Yes	
(2)(C) Under no circumstances will liquids be burned in the flare.	Yes	

FLARE

Process or Emergency flare?	Process	**NOx emission factor used:**	0.068
Steam assisted (yes/no)?	Yes	**CO emissions factor used:**	0.37
VOC Destruction Efficiency: (must justify if over 98%)	98%	**H_2S Destruction Efficiency:**	98%

Sources of emissions routed to flare	Flow Rate of Each Source (SCF/hour)	Heat Content of Each Source (Btu/SCF)	H_2S Emissions From Each Source (lb/hr)	VOC Emissions From Each Source (lb/hr)

TECHNICAL REVIEW: AIR PERMIT BY RULE

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Pilot Fuel	50	1,047.62	---	0.007
Waste Gas Stream 1 (Flash from condensate)	87.5	1,699.58	---	0.079
Waste Gas Stream 2(working and breathing losses)	10.77	3,548.82	---	0.038

30 TAC §106.512 RULE CHECK

REQUIREMENTS	YES, NO, or n/a	OTHER / COMMENTS
(1) The engines or turbines have been registered with Form PI-7 or PI-7-CERT within 10 days of the start of construction. Engines and turbines rated less than 240 horsepower (hp) need not be registered, but must meet paragraphs (5) and (6) of this section, relating to fuel and protection of air quality.	Yes	Horsepower of engine(s) = 60.
(1) Table 29 has been submitted for each proposed gas or liquid fuel-fired stationary internal combustion reciprocating engine.	Yes	
(1) Table 31 has been submitted for each proposed gas turbine.	NA	
(2) Any engines rated greater than 500-hp will meet the requirements of subparagraphs (A) - (C) of this paragraph.	NA	
(5) The gas fuel will be limited to: sweet natural gas or liquid petroleum gas, fuel gas containing no more than ten grains total sulfur per 100 dry standard cubic feet, or field gas.	Yes	Type of fuel= Field gas. Sulfur content of fuel gas (gr/100 dSCF): ______.
(6) Compliance with National Ambient Air Quality Standard (NAAQS) in the area of the proposed facility has been demonstrated.	Yes	Which method was used (A, B, or C)?C. *Delete rows below that are not needed.*

(6)(C) Distance to from all existing and proposed facilities on the property to the nearest property line was used to demonstrate NAAQS:

The total emissions of NO_x (nitrogen oxide plus NO_2) will not exceed the most restrictive of the 250 tpy or the value (0.3125 D) tpy, where D equals the shortest distance in feet from any existing or proposed stack to the nearest property line.

Distance to nearest Property Line (D) (feet)	Allowable NOx Emission Rate (tpy) 0.3125 X D	Actual NOx emissions (tpy)	Is Actual Emission Rate less than Allowable Emissions Rate?
1495	467.19	2.61	Yes

REQUIREMENTS	YES, NO, or n/a	OTHER / COMMENTS
(7) The engine or turbine will not be used to generate electricity.	No	
(7) If NO to the above question, do any of the following apply? (A) The engines or turbines are used to provide power for the operation of facilities registered under the Air Quality Standard Permit for Concrete Batch Plants; (B) The engines or turbines satisfy the conditions for facilities permitted by rule under Subchapter E of this title (relating to Aggregate and Pavement); (C) The engines or turbines are used exclusively to provide power to electric pumps used for irrigating crops. (D) The engine is for on site use only and it is located where the electric grid is not readily available or where it is not economically feasible to connect to the electric grid.	No	

NATURAL GAS FIRED COMPRESSOR ENGINE

Engine Identifier (EPN / name)	Engine Information		Pollutant	Source of Emission factor	Emission Factor before controls	Type of Control Device	Control efficiency	Emission Factor after controls	Emissions (lb/hr)	Emissions (tpy)
ENG1 / DPC-60 Ajax engine	Horsepower:	60	NMNEHC	Manf Data	0.50 g/hp-hr			0.50 g/hp-hr	0.066	0.289
	Fuel Consumption (Btu/hp-hr):	9,000	NOx	Manf Data	4.40 g/hp-hr			4.40 g/hp-hr	0.58	2.549
	2 or 4 stroke, Rich or Lean Burn:	2 stroke lean burn	CO	Manf Data	1.70 g/hp-hr			1.70 g/hp-hr	0.22	0.985
	Hours of Operation per year:	8760	PM_{10}	AP-42	0.01 lb/MMBtu			0.01 lb/MMBtu	<0.01	0.01
	Vendor Data Sheet Included? (required if ≥ 500-hp)	Yes	SO_2	AP-42	0.000588 lb/MMBtu			0.000588 lb/MMBtu	<0.01	<0.01

TECHNICAL REVIEW: AIR PERMIT BY RULE

Permit No.:	98929	*Company Name:*	Chevron U.S.A. Inc.	*APD Reviewer:*	Ms. Jameica Hanney
Project No.:	170546	*Unit Name:*	Davidson Matthews Compressor Station	*PBR No(s).:*	106.352 2011-FEB-27, 106.492, 106.512

	Date of Manufacture or Reconstruction:	NA	CH_2O	Manf Data	0.30 g/hp-hr			0.30 g/hp-hr	0.04	0.17
Does NSPS, Subpart JJJJ apply?		Yes	**Why or why not? If yes, how will requirements be met?**			No manufacture date provided, it is assumed this standard is applicable.				
Does MACT, Subpart ZZZZ apply?		No	**Why or why not? If yes, how will requirements be met?**							

ESTIMATED EMISSIONS															
EPN / Emission Source	**Specific VOC or Other Pollutants**	**VOC**		**NOx**		**CO**		**PM_{10}**		**$PM_{2.5}$**		**SO_2**		**HAP**	
		lbs/hr	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**	**lbs/hr**	**tpy**
ENG1	CH_2O	0.06	0.29	0.58	2.55	0.22	0.99	<0.01	0.01	<0.01	0.01	<0.01	<0.01	0.04	0.17
TANKA1		0.31	1.38											0.05	0.21
TANKB1		0.35	1.54											0.05	0.22
TANKBW1		0.003	0.01											<0.01	0.002
TANKD1		0.03	0.50											<0.01	0.07
TANKD2		0.04	0.63											0.01	0.09
TANKD3		0.04	0.63											0.01	0.09
TANKW1		<0.01	0.002											<0.01	<0.01
TANKW2		<0.01	0.002											<0.01	<0.01
LOADA1		61.79	0.15											1.81	<0.01
LOADB1		58.14	0.36											1.70	0.02
LOADBW1		0.57	0.01											0.02	<0.01
LOADD1		56.43	9.08											1.65	0.53
LOADDW1		0.56	0.09											0.02	0.01
FLR1		0.13	0.55	0.02	0.07	0.09	0.39							0.02	0.07
FUGA1		0.18	0.78											0.003	0.01
FUGB1		0.23	1.00											0.003	0.01
FUGD1		0.55	2.41											0.01	0.05
TOTAL EMISSIONS (TPY):			19.45		2.62		1.37		0.01		0.01		<0.01		1.56

MAXIMUM OPERATING SCHEDULE:	Hours/Day		Days/Week		Weeks/Year		Hours/Year	8760

SITE REVIEW / DISTANCE LIMIT	Yes	No	Description/Outcome	Date	Reviewed by
Site Review Required?		X	Not required by rule	October 21, 2011	JH
PBR Distance Limits Met?	X		The site is 1200 from the nearest property line and greater than 1650 feet from the nearest offsite receptor.	October 21, 2011	JH

	TECHNICAL REVIEWER	PEER REVIEWER	FINAL REVIEWER
SIGNATURE:			See Hard Copy.
PRINTED NAME:	Ms. Jameica Hanney	Mr. Kevin Whitenight	
DATE:	November 16, 2011	November 16, 2011	

BASIS OF PROJECT POINTS	POINTS
Base Points:106.352	2.0

TECHNICAL REVIEW: AIR PERMIT BY RULE

Permit No.:	98929	*Company Name:*	Chevron U.S.A. Inc.	*APD Reviewer:*	Ms. Jameica Hanney
Project No.:	170546	*Unit Name:*	Davidson Matthews Compressor Station	*PBR No(s).:*	106.352 2011-FEB-27, 106.492, 106.512

Project Complexity Description and Points: Additional PBRs Additional tables Completed by 22 to 30 days	1.0 2.5 0.25
Technical Reviewer Project Points Assessment:	5.75
Final Reviewer Project Points Confirmation:	

11/16/2011 --------------NSR IMS - PROJECT RECORD --

PROJECT#: 170546 PERMIT#: 98929 STATUS: PENDING DISP CODE: C
RECEIVED: 10/10/2011 PROJTYPE: INITIAL AUTHTYPE: PBR ISSUED DT: 11/16/11
RENEWAL:

PROJECT ADMIN NAME: DAVIDSON MATTHEWS COMPRESSOR STATION
PROJECT TECH NAME: DAVIDSON MATTHEWS COMPRESSOR STATION

6.0
RW

Assigned Team: RULE REG SECTION

STAFF ASSIGNED TO PROJECT:

BEATTY , JENNIFER	- REVIEWR1_2 -	AP INITIAL REVIEW
HANNEY , JAMEICA	- REVIEW ENG -	RR TEAM

CUSTOMER INFORMATION (OWNER/OPERATOR DATA)
ISSUED TO: CHEVRON USA INC
COMPANY NAME: Chevron U.S.A. Inc.
CUSTOMER REFERENCE NUMBER: **CN600132484**

REGULATED ENTITY/SITE INFORMATION
REGULATED ENTITY NUMBER: **RN106245541** ACCOUNT:
PERMIT NAME: DAVIDSON MATTHEWS COMPRESSOR STATION

REGULATED ENTITY LOCATION: IN BECKVILLE FROM INTX OF FM 959 AND 124 GO EAST ON FM 124 2.6 MILES TURN LEFT ON PRIVATE ROAD BATTERY ON LEFT IN 0.6 MILES
REGION 05 - TYLER NEAR CITY: BECKVILLE COUNTY: PANOLA

CONTACT DATA

CONTACT NAME: MR ERIK PITONIAK CONTACT ROLE: RESPONSIBLE OFFICIAL
JOB TITLE: AIR SPECIALIST ORGANIZATION: CHEVRON USA INC
MAILING ADDRESS: 1400 SMITH ST , HOUSTON, TX, 77002-7327
PHONE: (713) 372-0456 Ext: 0
FAX: (713) 372-2900 Ext: 0
EMAIL:EPIT@CHEVRON.COM

FEE:

Reference	Fee Receipt Number	Amount	Fee Receipt Date	Fee Payment Type
137709		450.00		ePAY

TRACKING ELEMENTS:

TE Name	Start Date	Complete Date
APIRT RECEIVED PROJECT (DATE)	10/10/2011	
APIRT TRANSFERRED PROJECT TO TECHNICAL STAFF (DATE)	10/11/2011	

CENTRAL REGISTRY UPDATED	10/11/2011	10/11/2011
PROJECT RECEIVED BY ENGINEER (DATE)	10/17/2011	
ENGINEER INITIAL REVIEW COMPLETED (DATE)	10/21/2011	
PEER / MANAGER REVIEW PERIOD	11/16/2011	11/16/2011

UNIT TYPES:

Project Unit Type:

Industry Group	Industry Type	Source Type	Control/BACT Type	Request	Authorization
CHEMICAL	OIL AND GAS				

PROJECT RULES:

Unit Desc	Rule Desc	Request Type	On Application	Approve
OIL AND GAS PRODUCTION FACILITIES	106.352 2011-FEB-27 -	ADD	Y	APPROVE
FLARES	106.492 -	ADD	Y	APPROVE
ENGINES AND TURBINES	106.512 -	ADD	Y	APPROVE

PERMIT RULES:

Unit Desc	Rule Desc	Start Date	End Date

PROJECT ATTRIBUTES:

Attributes	Value
PROJECT POINT	

PROCESS DESCRIPTION

This registration consists of three interdependent sites within ¼ mile:

- Davidson-Matthews Compressor Station (D-M CS)
- S.E. Matthews A1 Tank Battery
- S.E. Matthews B Tank Battery

The Davidson-Matthews Compressor Station currently receives gas from S.E. Matthews A1 and S.E. Matthews B batteries. Gas is compressed and sent to a sales line via a 60 horsepower DPC-60 Ajax engine (EPN: ENG1). In addition, the Davidson-Matthews Compressor Station (D-M CS) will receive produced water, gas, and condensate from a newly drilled well which is part of a horizontal well-only drilling program in the Travis Peak formation. Peak liquid throughput at this site will be 300 barrels of condensate per day and 300 barrels of water per day. D-M CS will have one 400-bbl condensate tank (EPN: TANKD1), two 500-bbl condensate tanks (EPNs: TANKD2, TANKD3), one 400-bbl water tank (EPN: TANKDW1), and one 500-bbl water tank (EPN: TANKDW2). Flashing losses and working and breathing losses are anticipated from the condensate tanks. Only working and breathing losses are anticipated from the water tanks. Both condensate and water will be unloaded by truck (EPNs: LOADD1, LOADDW1). An enclosed flare system manufactured by Superior, Inc. will be used to control flashing, working, and breathing emissions from the condensate and water tanks (EPN: FLR1). Fugitive emissions at the D-M CS are represented by the EPN FUGD1.

S.E. Matthews A1 Tank Battery is an existing site consisting of only one well, one separator, and one 400-bbl condensate tank (EPN: TANKA1). Condensate, along with water is sold via truck (EPN: LOADA1). The maximum liquid throughput is 5 bbl condensate per day and 10 bbl of water per day. Fugitive emissions at this location are represented by FUGA1. Gas from S.E. Matthews A1 Tank Battery is sent to D-M CS for compression and then to a sales line.

S.E. Matthews B Tank Battery is an existing site consisting of only one well, one separator, one 210-bbl condensate tank (EPN: TANKB1), and one 210-bbl water tank. Condensate is sold via truck (EPN: LOADB1), as is water (EPN: LOADBW1). The maximum liquid throughput is 12 bbl condensate per day and 40 bbl of water per day. Fugitive emissions at this location are represented by FUGB1. Gas from S.E. Matthews B Tank Battery is sent to D-M CS for compression and then to a sales line.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 10/1/2011	Permit No.:	Regulated Entity No.:
Area Name: Davidson-Matthews Compressor Station		Customer Reference No.: CN600132484

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) Name		(A) Pound Per Hour	(B) TPY
ENG1	ENG1	Ajax Engine	VOC	0.0662	0.2897
			HAPs	0.0397	0.1738
			NO_X	0.5821	2.5497
			CO	0.2249	0.9851
			PM	0.0054	0.0234
TANKA1	TANKA1	SE Matthews A1	VOC	0.3161	1.3843
		Bty; Cond. tank	HAPs	0.0490	0.2146
TANKB1	TANKB1	SE Matthews B	VOC	0.3517	1.5404
		Bty; Cond. tank	HAPs	0.0511	0.2240

EPN = Emission Point Number
FIN = Facility Identification Number

TCEQ - 10153 (Revised 04/08) Table 1(a)
This form is for use by sources subject to air quality permit requirements and may be revised periodically. (APDG 5178 v5)

TCEQ

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 10/1/2011	**Permit No.:**	**Regulated Entity No.:**
Area Name: Davidson-Matthews Compressor Station		**Customer Reference No.: CN600132484**

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					
1. Emission Point			**2. Component or Air Contaminant Name**	**3. Air Contaminant Emission Rate**	
(A) EPN	**(B) FIN**	**(C) Name**		**(A) Pound Per Hour**	**(B) TPY**
TANKBW1	TANKBW1	SE Matthews B	VOC	0.0027	0.0120
		Bty; Water tank	HAPs	0.0004	0.0020
TANKD1	TANKD1	David-Matt Comp	VOC	0.0332	0.5012
		St.; Cond. tank 1	HAPs	0.0045	0.0682
TANKD2	TANKD2	David-Matt Comp	VOC	0.0420	0.6346
		St.; Cond. tank 2	HAPs	0.0057	0.0866
TANKD3	TANKD3	David-Matt Comp	VOC	0.0420	0.6346
		St.; Cond. tank 3	HAPs	0.0057	0.0866
TANKDW1	TANKDW1	David-Matt Comp	VOC	0.0001	0.0018
		St.; Water tank 1	HAPs	0.0000	0.0003

EPN = Emission Point Number
FIN = Facility Identification Number

TCEQ

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 10/1/2011	Permit No.:	Regulated Entity No.:
Area Name: Davidson-Matthews Compressor Station		Customer Reference No.: CN600132484

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) Name		(A) Pound Per Hour	(B) TPY
TANKDW2	TANKDW2	David-Matt Comp	VOC	0.0001	0.0018
		St.; Water tank 2	HAPs	0.0000	0.0003
LOADA1	LOADA1	SE Matthews A1	VOC	61.7912	0.1545
		Bty; Cond. Load	HAPs	1.8060	0.0090
LOADB1	LOADB1	SE Matthews B	VOC	58.1454	0.3634
		Bty; Cond. Load	HAPs	1.6994	0.0212
LOADBW1	LOADBW1	SE Matthews B	VOC	0.5713	0.0121
		Bty; Water Load	HAPs	0.0167	0.0007
LOADD1	LOADD1	David-Matt Comp	VOC	56.4282	9.0849
		St.; Cond. Load	HAPs	1.6492	0.5311

EPN = Emission Point Number
FIN = Facility Identification Number

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 10/1/2011	Permit No.:	Regulated Entity No.:
Area Name: Davidson-Matthews Compressor Station		Customer Reference No.: CN600132484

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) Name		(A) Pound Per Hour	(B) TPY
LOADDW1	LOADDW1	David-Matt Comp	VOC		
		St; Water Load	HAPs		
FLR1	FLR1	David-Matt Comp	VOC	0.1248	0.5465
		St; Enclosed Flare	HAPs	0.0160	0.0702
			NO_X	0.0163	0.0713
			CO	0.0886	0.3879
FUGA1	FUGA1	SE Matthews A1	VOC	0.1791	0.7846
		Bty; Fugitives	HAPs	0.0027	0.0119
FUGB1	FUGB1	SE Matthews B	VOC	0.2286	1.0011
		Bty; Fugitives	HAPs	0.0027	0.0120

EPN = Emission Point Number
FIN = Facility Identification Number

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 10/1/2011	Permit No.:	Regulated Entity No.:
Area Name: Davidson-Matthews Compressor Station		Customer Reference No.: CN600132484

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA					
1. Emission Point			2. Component or Air Contaminant Name	3. Air Contaminant Emission Rate	
(A) EPN	(B) FIN	(C) Name		(A) Pound Per Hour	(B) TPY
FUGD1	FUGD1	David-Matt Comp	VOC	0.5495	2.4068
		St.; Fugitives	HAPs	0.0104	0.0455

EPN = Emission Point Number
FIN = Facility Identification Number

TCEQ - 10153 (Revised 04/08) Table 1(a)
This form is for use by sources subject to air quality permit requirements and may be revised periodically. (APDG 5178 v5)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

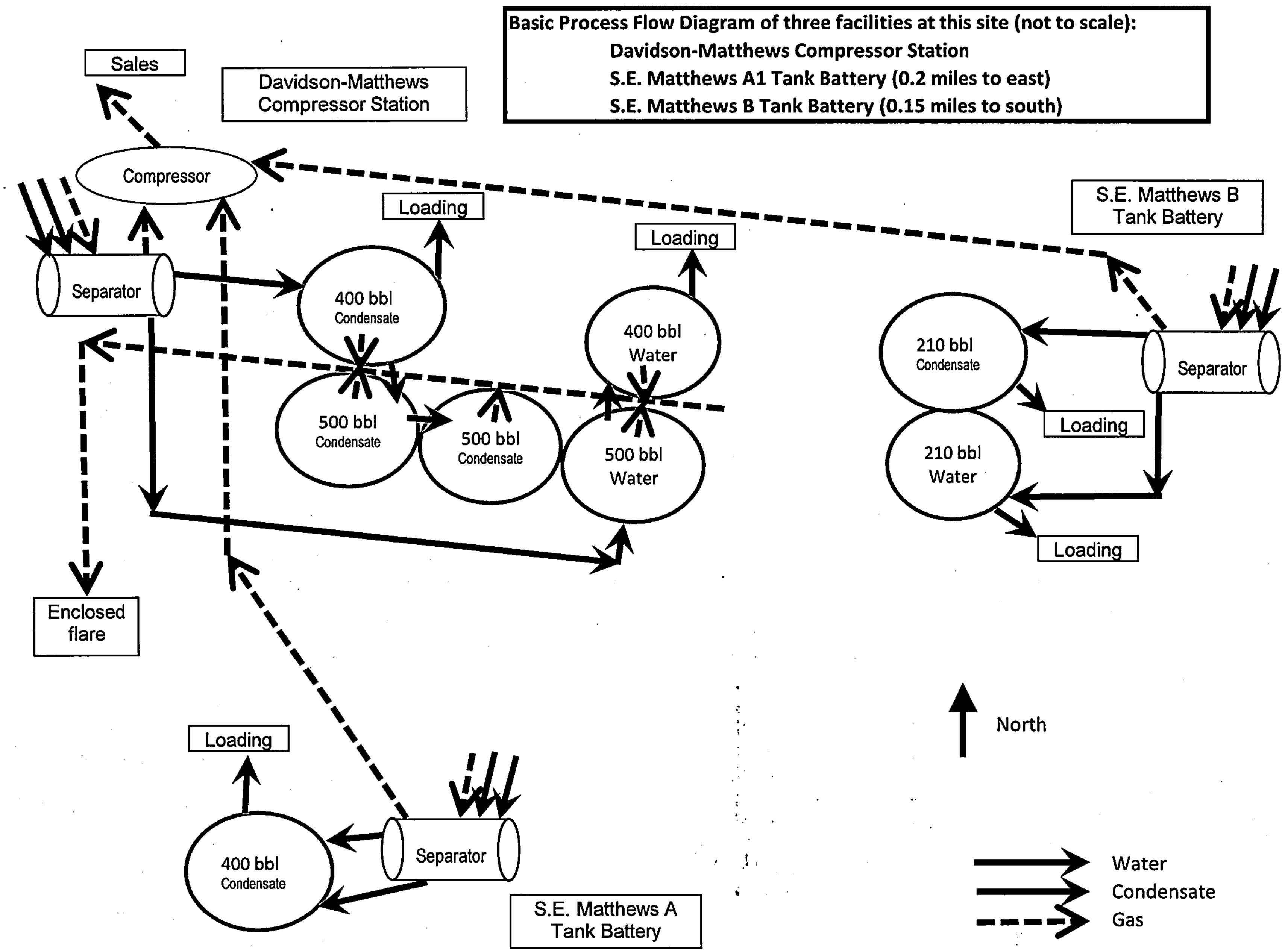
Table 1(a) Emission Point Summary

Date: 10/1/2011	Permit No.:	Regulated Entity No.:
Area Name: Davidson-Matthews Compressor Station		Customer Reference No.: CN600132484

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS							
1. Emission Point			4. UTM Coordinates of Emission Point			Source							
						5. Building Height (Ft.)	6. Height Above Ground (Ft.)	7. Stack Exit Data			8. Fugitives		
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)			(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	(A) Length (Ft.)	(B) Width (Ft.)	(C) Axis Degrees

EPN = Emission Point Number
FIN = Facility Identification Number


Basic Process Flow Diagram of three facilities at this site (not to scale):
Davidson-Matthews Compressor Station
S.E. Matthews A1 Tank Battery (0.2 miles to east)
S.E. Matthews B Tank Battery (0.15 miles to south)
Sales
Davidson-Matthews Compressor Station
Compressor
Separator
Loading
400 bbl Condensate
500 bbl Condensate
500 bbl Condensate
Loading
400 bbl Water
500 bbl Water
Enclosed flare
S.E. Matthews B Tank Battery
210 bbl Condensate
Separator
Loading
210 bbl Water
Loading
North
Loading
400 bbl Condensate
Separator
S.E. Matthews A Tank Battery
Water
Condensate
Gas

EMISSION ESTIMATING METHODOLOGY

The potential air pollutant emission sources include the following:

Davidson-Matthews Compressor Station:
1. One engine (EPN: ENG1)
2. Three condensate tanks (EPNs: TANKD1, TANKD2, TANKD3)
3. Two produced water tanks (EPNs: TANKDW1, TANKDW2)
4. Condensate truck loading point (EPN: LOADD1)
5. Produced water truck loading point (EPN: LOADDW1)
6. Enclosed flare (EPN: FLR1)
7. Fugitive emissions (EPN: FUGD1)

S.E. Matthews A1 Tank Battery:

8. One condensate tank (EPNs: TANKA1)
9. Condensate truck loading point (EPN: LOADA1)
10. Fugitive emissions (EPN: FUGA1)

S.E. Matthews B Tank Battery:

11. One condensate tank (EPNs: TANKB1)
12. One produced water tanks (EPNs: TANKBW1)
13. Condensate truck loading point (EPN: LOADB1)
14. Produced water truck loading point (EPN: LOADBW1)
15. Fugitive emissions (EPN: FUGB1)

Chevron represents that it will not be bound to particular gas and liquid volumes, nor particular gas and liquid compositions; but instead it will be bound by the emissions rates represented by the Table 1(a). Chevron will generate and retain adequate recordkeeping to prove that the represented emission rates are not exceeded.

The methodology and gas and liquid compositions used to calculate emissions are the same for each of these sites except for the following:

- Tank emissions at Davidson-Matthews Compressor Station are controlled by an enclosed flare with an assumed destruction efficiency of 98% and an availability of 95%. Emissions from tanks at the other two facilities are not controlled.

Engine

The engine at the Davidson-Matthews Compressor Station is an Ajax DPC-60, a small 60 horsepower, gas-fired, internal combustion engine, not required to register under 30

TAC 106.512 or under the East Texas Combustion Rule. However, a 106.512 checklist has been included in this application, and the emissions have been calculated and included in this facility's total annual emissions. A potential annual operation of 8,760 hours per year and the maximum expected IC engine horsepower are used as emission estimation bases. The manufacturer's emission factors for NO_X, CO, VOCs, and CH_2O (4.4, 1.7, 0.5, and 0.3 g/hp-hr, respectively) were used to calculate emissions for these species. The latest EPA AP-42 Chapter 3 Table 3.2-2 PM emission factor is used to estimate the potential emissions PM. SO_2 has not been calculated because there is no measurable H_2S in the field gas used to run this engine.

<u>Condensate Tanks</u>

The maximum expected annual average condensate production rate is divided evenly according to the size of the tank for the condensate flowrate through each of the condensate tanks (e.g., a 400-bbl tank has a throughput 80% as much as a 500-bbl tank at the same location).

Since it receives the separated liquids stream from the upstream pressurized low pressure separator, condensate tanks potentially have breathing losses, working losses, and flash emissions.

The associated FESCO Labs flash gas analysis (see discussion below) indicates that up to 7 scf of flash gas may be emitted per barrel of condensate. Based on the associated flash gas analysis rate and compositional information, as well as the maximum expected annual average condensate production rate, the potential flash gas speciated VOC emissions are determined for each condensate tank.

The EPA Tanks 4.0.9d computer program is used, along with the combined condensate and produced water flowrates and compositions, as well as tank attributes, to estimate the potential annual uncontrolled total working and breathing (W&B) loss emissions from the tank. The associated FESCO Labs breathing vapors analysis (see discussion below) is then used to calculate total VOC and speciated working and breathing (W&B) loss emissions from the tank using the Working and Breathing losses spreadsheet. The mole percent of each component of the breathing vapor (*see attached sample*) was multiplied by this volume to calculate the total emissions of VOCs, and HAPs due to Working and Breathing losses.

The estimated flash and W&B emission are summed for the total VOC emissions represented on Figure 1-1 and the Table 1(a) for the condensate tanks.

A flare will be used to control the flash, working and breathing emissions from the crude oil tanks. The controlled emissions were estimated assuming the flare has a 98 percent VOC destruction efficiency and the 95 percent on-line time. The last 4 columns on the included *Vent Gas Quantification* spreadsheets provided the lb/hr and tons/yr emissions for both the uncontrolled and controlled emission scenarios.

Produced Water Tank Emissions

Working and breathing emissions have been estimated for the produced water tanks using Tanks 4.0 and the normalized working and breathing extended analyses obtained from the crude oil tanks. This analysis represents a worst-case analysis for the produced water, and assumes a conservatively high 1% oil content in the water. In order to speciate the produced water tank emissions, the included *Vent Gas Quantification* spreadsheets were used to ratio the vent gas rate such that the mass emission rate on the spreadsheet equaled the mass emission rate indicated by the Tanks 4.0 simulation. The same speciation of breathing vapors (see sample) was used for calculating emissions from both the water tanks and the oil tanks.

The flare used to control the crude oil tank emissions will also be used to control the produced water tank emissions. All tanks are plumbed into a single manifold that is plumbed into the flare.

Truck Loading Facilities

For each of the Condensate Truck Loading Facilities:

The uncontrolled truck loading total emission rates are estimated using the EPA AP-42 Chapter 5.2.2.1.1 liquid loading equation of L = 12.46 x S x P x M / T and associated EPA guidance, as well as the TCEQ October 2000 draft document titled "Air Permit Technical Guidance for Chemical Sources: Loading Operations", where:

1. "L" is the pounds of emissions per 1,000 gallons of liquid loaded
2. "S" is the saturation factor – a saturation factor of 0.6 is used for trucks which are dedicated service trucks with submerged liquid loading lines
3. "P" is the loaded liquid vapor pressure in psia units – the liquid maximum and average vapor pressures from the EPA Tanks calculation are respectively used for hourly and annual loading calculations;

4. "M" is the molecular weight of the vapors in pounds per pound mole (lbs/lb-mol) units – and average vapor pressures from the sample analysis for breathing vapors for were used.
5. "T" is the loaded liquid temperature in degrees Rankine (^{o}R) units – the maximum and average liquid temperatures from the EPA Tanks calculation are respectively used for hourly and annual loading calculations.

The uncontrolled "L" value is multiplied by the number of thousands of gallons of liquid loaded per hour and year to determine the uncontrolled hourly and annual total emission rates. The vapor weight percentages from the tank calculation are multiplied by the total emission rates to determine the speciated hourly and annual emission rates. The VOC component hourly and annual emission rates are summed to determine the total VOC hourly and annual emission rates.

Flaring Emissions

The enclosed flare will combust flashing, working, and breathing emissions from the water and condensate tanks only at Davidson-Matthews Compressor Station. The mass of these emissions plus a pilot gas flow rate of 50 scf/hour was used as the basis to calculate emissions from the flare. A basic field gas sample analysis was used to speciate emissions from the pilot gas while flash gas and breathing vapor analyses were used to speciate emissions due to combustion of emissions from the tanks (see discussion below). A conservatively low figure of 98% VOC destruction efficiency was used to calculate VOC and HAPs emissions from the flare even though the destruction efficiency in practice is likely to exceed 99.5%. AP-42 factors were used to calculate emissions of NO_X and CO from the flare.

Fugitive Emissions

Fugitive emissions have been estimated using the EPA 453/R-95-017 gas and light oil factors. The factors are multiplied by the respective number of fugitive sources, the non-C1/C2 gas fraction, and the run time which is assumed to be 8,760 hours to represent a worst case scenario.

Note on flash gas and breathing vapor analysis:

Sample analysis for the flash gas and the GOR were obtained from the Mae A. Sealy "A" #3 site. This sample was analyzed by FESCO on May 3, 2011, and results were provided to Chevron USA Inc. later in the month. This site was chosen because it is one of the few wells in the Beckville Field (northwest of Carthage, TX) to be designated by our Petroleum Engineers as simply a "Travis Peak" well (Travis Peak is a geological formation). Nearly all of the other wells in the Beckville Field are designated as "Cotton Valley" reservoir wells or commingled between Cotton Valley or other reservoirs. In addition, the initial well which will produce into the Davidson-Matthews Compressor Station is the first well of a Travis Peak Horizontal Well drilling program. The wells in this program will only be horizontal wells, and a drilling program of this kind in this formation has not been undertaken before by Chevron USA Inc. in Panola County, Texas. The production profile, rate of production decline, (high) magnitude of production are all expected to be different than other wells in the area. The Mae A. Sealy "A" #3 site is directly adjacent to one of the new facilities in this program, the "Mae Sealy CDP". Though the Mae A. Sealy "A" #3 site is approximately 8.0 miles from the Davidson-Matthews Compressor Station, it was thought that this would be the most representative for the Travis Peak project sites as a whole for GOR and flash gas composition. Also, the 30 psi pressure drop from the last stage separator for Mae A. Sealy "A" #3 is representative of the 25-30 psi pressure drop for the Davidson-Matthews Compressor Station and other facilities in the Travis Peak program.

This drilling program is expected to quickly progress, with several facilities receiving new production. It is planned to take a sample analysis from the Davidson-Matthews Compressor Station to verify the accuracy of emission calculations at this location; the results of this analysis will also be used to calculate emissions for other facilities in this drilling program.

The only breathing gas analysis available was from the Werner Clarence #6 site, approximately 14.5 miles away. This sample was analyzed on September 14, 2006. The characteristics of this breathing gas analysis – 90.6% VOCs, 60.2% C5 and above, and 70 g/mol molecular weight – are expected to be highly conservative and over-estimate emissions for the Davidson-Matthews Compressor Station for truck loading and working and breathing. Chevron will plan to analyze breathing vapors from the Davidson-Matthews Compressor Station when it commences operation.

The field gas analysis used was from the S.E. Matthews #11 well. This was used only to calculate pilot gas composition for the enclosed flare and to calculate fugitive emissions for gas components. Like all samples in this FMT (Field Management Team – consists of several fields including the Beckville Field, Bethany Field, and Deadwood Field), this sample contains no measurable H_2S (using the standard laboratory techniques). At this point, although the production from the Travis Peak Horizontal Well drilling program is expected to produce significant quantities of oil and water, high production levels of gas are not expected, and existing quantities of gas from S.E. Matthews A1 Battery, S.E. Matthews B Battery, and Davidson-Matthews Compressor Station are expected to be representative; the S.E. Matthews #11 facility, located less than ¼ from Matthews B Battery is from the same zone as existing gas throughput at A1 and B batteries and as Davidson-Matthews Compressor Station.

Title 30 Texas Administrative Code § 106.352
Permit By Rule (PBR) Checklist
Oil and Gas Production Facilities

The following checklist is designed to help you confirm that you meet Title 30 Texas Administrative Code § 106.352 (30 TAC § 106.352) requirements. If you do not meet all the requirements, you may alter the project design or operation in such a way that all the requirements of the PBR are met or you may obtain a construction permit. The PBR forms, tables, checklists and guidance documents are available from the Texas Commission on Environmental Quality (TCEQ), Air Permits Division Web site at www.tceq.state.tx.us/nav/permits/air_permits.html.

CHECK THE MOST APPROPRIATE ANSWER		
	Check the type of facilities covered by this registration(check all that are applicable): ☑ oil or gas production facility ☐ carbon dioxide separation facility ☐ oil or gas pipeline facility	
	The facilities at the site include (check all that apply): ☑ one or more tanks ☑ separators ☐ dehydration units ☑ free water knockouts ☐ gunbarrels ☐ heater treaters ☐ natural gas liquids recovery units ☐ gas sweetening and other gas conditioning facilities ☐ sulfur recovery units	☑ YES ☐ NO
	Will gas sweetening, sulfur recovery, or other gas conditioning facilities only condition gas that contains less than two (2) long tons per day of sulfur compounds as sulfur?	☐ YES ☐ NO
1	Do all compressors and flares fully meet the requirements of 30 TAC § 106.512 and 30 TAC § 106.492, respectively? Attach data showing how the exemptions are met. Checklists are available.	☑ YES ☐ NO
2	Are total emissions from all facilities, including fugitives and loading emissions, less than 25 tpy SO_2, VOC, or 250 tpy of CO or NO_x?	☑ YES ☐ NO
	Have you attached calculations and other data, such as a gas analysis, showing that the emissions limits of the general rule are met?	☑ YES ☐ NO
3	If the facility handles sour gas, is it located at least 1/4 mile from any recreational area, residence, or other structure not occupied or used solely by the owner or operator of the facility or the owner of the property upon which the facility is located? Attach a scaled map.	☐ YES ☐ NO
4	Are total emissions of sulfur compounds, excluding sulfur oxides, less than 4.0 pounds per hour? Attach calculations.	☑ YES ☐ NO
	Does the height of each vent emitting sulfur compounds meet or exceed the minimum vent height stated in 30 TAC § 106.352? List stack height: ☐	☐ YES ☐ NO

PRINT

CONDENSATE TANKS

FLASHING, WORKING, AND BREATHING EMISSIONS

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	S.E. Matthews A1 Tank Battery	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank	
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKA1	
Vent Gas Stream?	Flash Gas	Flash from condensate
Vent Gas Flow Rate? [2]	35	scfd
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?		
Control Device ID (if applicable)?		
Control Device Efficiency (if applicable)?		*(%, non-combustion devices only)*
Control Device On-Line Percentage?		*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions [4] (lb/hr)	Controlled Actual Estimated Vent Emissions [4] (tn/yr)
Carbon Dioxide	CO_2	0.479	0	44.01	0.211		0.649	0.0008	0.0035	N/A	N/A
Nitrogen	N_2	0.995	0	28.01	0.279		0.858	0.0011	0.0047	N/A	N/A
Methane	CH_4	44.520	909.4	16.04	7.141	404.865	21.989	0.0274	0.1200	N/A	N/A
Ethane	C_2H_6	25.361	1618.7	30.07	7.626	410.519	23.483	0.0293	0.1282	N/A	N/A
Propane	C_3H_8	10.635	2314.9	44.1	4.690	246.190	14.442	0.0180	0.0788	N/A	N/A
iso-Butane	C_4H_{10}	3.754	3000.4	58.12	2.182	112.635	6.718	0.0084	0.0367	N/A	N/A
n-Butane	C_4H_{10}	4.701	3010.8	58.12	2.732	141.538	8.413	0.0105	0.0459	N/A	N/A
Cyclopentane	C_5H_{10}	0.014	3513.2	70.13	0.010	0.492	0.030	0.0000	0.0002	N/A	N/A
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.169	3682.9	72.15	0.122	6.224	0.375	0.0005	0.0020	N/A	N/A
iso-Pentane	C_5H_{10}	1.988	3699	72.15	1.434	73.536	4.417	0.0055	0.0241	N/A	N/A
n-Pentane	C_5H_{12}	2.419	3706.9	72.15	1.745	89.670	5.374	0.0067	0.0293	N/A	N/A
Benzene	C_6H_6	1.283	3590.9	78.11	1.002	46.071	3.086	0.0038	0.0168	N/A	N/A
Cyclohexane	C_6H_{12}	0.129	4179.7	84.16	0.109	5.392	0.334	0.0004	0.0018	N/A	N/A
Methylcyclopentane	C_6H_{12}	0.066	4199	84.16	0.056	2.771	0.171	0.0002	0.0009	N/A	N/A
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.251	4384	86.18	0.216	11.004	0.666	0.0008	0.0036	N/A	N/A
2,3 Dimethylbutane	C_6H_{14}	0.148	4392.7	86.18	0.128	6.501	0.393	0.0005	0.0021	N/A	N/A
2 Methylpentane	C_6H_{14}	0.670	4395.2	86.18	0.577	29.448	1.778	0.0022	0.0097	N/A	N/A
3 Methylpentane	C_6H_{14}	0.368	4398.1	86.18	0.317	16.185	0.977	0.0012	0.0053	N/A	N/A
n-Hexane	C_6H_{14}	1.250	4403.8	86.18	1.077	55.048	3.317	0.0041	0.0181	N/A	N/A
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	0.416	5100	100.2	0.417	21.216	1.284	0.0016	0.0070	N/A	N/A
Methylcyclohexane	C_7H_{14}	0.046	4863.6	98.188	0.045	2.237	0.139	0.0002	0.0008	N/A	N/A
Toluene	C_7H_8	0.035	4273.6	92.14	0.032	1.496	0.099	0.0001	0.0005	N/A	N/A
2-Methylhexane	C_7H_{16}	0.171	5092.2	100.204	0.171	8.708	0.528	0.0007	0.0029	N/A	N/A
3-Methylhexane	C_7H_{16}	0.005	5096	100.204	0.005	0.255	0.015	0.0000	0.0001	N/A	N/A
Xylenes	C_8H_{10}	0.012	4957	106.17	0.013	0.595	0.039	0.0000	0.0002	N/A	N/A
Ethylbenzene	C_8H_{10}	0.003	4970.5	106.17	0.003	0.149	0.010	0.0000	0.0001	N/A	N/A
Octanes +	C_8H_{18}	0.080	5796.1	114.231	0.091	4.637	0.281	0.0004	0.0015	N/A	N/A
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.020	6493.2	128.258	0.026	1.299	0.079	0.0001	0.0004	N/A	N/A
Decanes+	$C_{10}H_{22}$	0.006	7189.6	142.285	0.009	0.431	0.026	0.0000	0.0001	N/A	N/A
Undecanes+ [3]	$C_{11}H_{24}$	0.006	7825.9	156.31	0.009	0.470	0.029	0.0000	0.0002	N/A	N/A
Hydrogen Sulfide	H_2S	0.000	586.8	34.08						N/A	N/A
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		32.48	1699.58	100.00	0.1246	0.5459	0.0000	0.0000
TOTAL VOCs (C3+)		28.65			17.22	884.20	53.02	0.0661	0.2894	N/A	N/A
TOTAL HAPs		2.58			2.13	103.36	6.55	0.0082	0.0358	N/A	N/A
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	N/A	N/A
TOTAL GREENHOUSE GAS (CH4 and CO2)		45.00			7.352	404.865	22.638	0.0282	0.1236	N/A	N/A

CHEVRON USA, INC. Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume[-1] (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)			
Propane Example	4.690	x	0.00263	x	35	x	0.04166667	=	0.0180	lb/hr

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0180	x	8760	x	0.0005	=	0.0788	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.0180	x	0.020	=	0.0004	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0004	x	8760	x	0.98	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0180	x	8760	x	0.02	x	0.0005	=	0.0031	tn/yr

CHEVRON USA, INC.

Date: 10/1/2011

Chevron

VENT GAS QUANTIFICATION [1]

Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	S.E. Matthews B1 Tank Battery	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank	
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKB1	
Vent Gas Stream?	Flash Gas	Flash from condensate
Vent Gas Flow Rate?[2]	84 scfd	
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?		
Control Device ID (if applicable)?		
Control Device Efficiency (if applicable)?		*(%, non-combustion devices only)*
Control Device On-Line Percentage?		*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.479	0	44.01	0.211		0.649	0.0019	0.0085	N/A	N/A
Nitrogen	N_2	0.995	0	28.01	0.279		0.858	0.0026	0.0112	N/A	N/A
Methane	CH_4	44.520	909.4	16.04	7.141	404.865	21.989	0.0658	0.2881	N/A	N/A
Ethane	C_2H_6	25.361	1618.7	30.07	7.626	410.519	23.483	0.0702	0.3077	N/A	N/A
Propane	C_3H_8	10.635	2314.9	44.1	4.690	248.190	14.442	0.0432	0.1892	N/A	N/A
iso-Butane	C_4H_{10}	3.764	3000.4	58.12	2.182	112.635	6.718	0.0201	0.0880	N/A	N/A
n-Butane	C_4H_{10}	4.701	3010.8	58.12	2.732	141.538	8.413	0.0252	0.1102	N/A	N/A
Cyclopentane	C_5H_{10}	0.014	3513.2	70.13	0.010	0.492	0.030	0.0001	0.0004	N/A	N/A
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.169	3682.9	72.15	0.122	6.224	0.375	0.0011	0.0049	N/A	N/A
iso-Pentane	C_5H_{10}	1.988	3699	72.15	1.434	73.536	4.417	0.0132	0.0579	N/A	N/A
n-Pentane	C_5H_{12}	2.419	3706.9	72.15	1.745	89.670	5.374	0.0161	0.0704	N/A	N/A
Benzene	C_6H_6	1.283	3590.9	78.11	1.002	46.071	3.086	0.0092	0.0404	N/A	N/A
Cyclohexane	C_6H_{12}	0.129	4179.7	84.16	0.109	5.392	0.334	0.0010	0.0044	N/A	N/A
Methylcyclopentane	C_6H_{12}	0.066	4199	84.16	0.058	2.771	0.171	0.0005	0.0022	N/A	N/A
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.251	4384	86.18	0.216	11.004	0.666	0.0020	0.0087	N/A	N/A
2,3 Dimethylbutane	C_6H_{14}	0.148	4392.7	86.18	0.128	6.501	0.393	0.0012	0.0051	N/A	N/A
2 Methylpentane	C_6H_{14}	0.670	4395.2	86.18	0.577	29.448	1.778	0.0053	0.0233	N/A	N/A
3 Methylpentane	C_6H_{14}	0.368	4398.1	86.18	0.317	16.185	0.977	0.0029	0.0128	N/A	N/A
n-Hexane	C_6H_{14}	1.250	4403.8	86.18	1.077	55.048	3.317	0.0099	0.0435	N/A	N/A
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	0.416	5100	100.2	0.417	21.216	1.284	0.0038	0.0168	N/A	N/A
Methylcyclohexane	C_7H_{14}	0.046	4863.6	98.188	0.045	2.237	0.139	0.0004	0.0018	N/A	N/A
Toluene	C_7H_8	0.035	4273.6	92.14	0.032	1.496	0.099	0.0003	0.0013	N/A	N/A
2-Methylhexane	C_7H_{16}	0.171	5092.2	100.204	0.171	8.708	0.528	0.0016	0.0069	N/A	N/A
3-Methylhexane	C_7H_{16}	0.005	5096	100.204	0.005	0.255	0.015	0.0000	0.0002	N/A	N/A
Xylenes	C_8H_{10}	0.012	4957	106.17	0.013	0.595	0.039	0.0001	0.0005	N/A	N/A
Ethylbenzene	C_8H_{10}	0.003	4970.5	106.17	0.003	0.149	0.010	0.0000	0.0001	N/A	N/A
Octanes +	C_8H_{18}	0.080	5796.1	114.231	0.091	4.637	0.281	0.0008	0.0037	N/A	N/A
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.020	6493.2	128.258	0.026	1.299	0.079	0.0002	0.0010	N/A	N/A
Decanes+	$C_{10}H_{22}$	0.006	7189.6	142.285	0.009	0.431	0.026	0.0001	0.0003	N/A	N/A
Undecanes+[3]	$C_{11}H_{24}$	0.006	7825.9	156.31	0.009	0.470	0.029	0.0001	0.0004	N/A	N/A
Hydrogen Sulfide	H_2S	0.000	586.8	34.08						N/A	N/A
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		32.48	1699.58	100.00	0.2991	1.3101	0.0000	0.0000
TOTAL VOCs (C3+)		28.65			17.22	884.20	53.02	0.1586	0.6946	N/A	N/A
TOTAL HAPs		2.58			2.13	103.36	6.55	0.0196	0.0858	N/A	N/A
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	N/A	N/A
TOTAL GREENHOUSE GAS (CH4 and CO2)		45.00			7.352	404.865	22.638	0.0677	0.2966	N/A	N/A

CHEVRON USA, INC. Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume[-1] (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)			
Propane Example	4.690	x	0.00263	x	84	x	0.04166667	=	0.0432	lb/hr

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0432	x	8760	x	0.0005	=	0.1892	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.0432	x	0.020	=	0.0009	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0009	x	8760	x	0.98	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0432	x	8760	x	0.02	x	0.0005	=	0.0075	tn/yr

CHEVRON USA, INC.

Date: 10/1/2011

Chevron

VENT GAS QUANTIFICATION [1]

Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	Davidson-Matthews Comp Station	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank	
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKD1	
Vent Gas Stream?	Flash Gas	Flash from condensate
Vent Gas Flow Rate?[2]	600	scfd
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?	Flare	
Control Device ID (if applicable)?	FLR1	
Control Device Efficiency (if applicable)?	98	*(%, non-combustion devices only)*
Control Device On-Line Percentage?	95	*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.479	0	44.01	0.211		0.649	0.0139	0.0607	0.0003	0.0042
Nitrogen	N_2	0.995	0	28.01	0.279		0.858	0.0183	0.0803	0.0004	0.0055
Methane	CH_4	44.520	909.4	16.04	7.141	404.865	21.989	0.4698	2.0577	0.0094	0.1420
Ethane	C_2H_6	25.361	1618.7	30.07	7.626	410.519	23.483	0.5017	2.1975	0.0100	0.1516
Propane	C_3H_8	10.635	2314.9	44.1	4.690	246.190	14.442	0.3086	1.3515	0.0062	0.0933
iso-Butane	C_4H_{10}	3.764	3000.4	58.12	2.182	112.635	6.718	0.1435	0.6287	0.0029	0.0434
n-Butane	C_4H_{10}	4.701	3010.8	58.12	2.732	141.538	8.413	0.1798	0.7873	0.0036	0.0543
Cyclopentane	C_5H_{10}	0.014	3513.2	70.13	0.010	0.492	0.030	0.0006	0.0028	0.0000	0.0002
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.169	3682.9	72.15	0.122	6.224	0.375	0.0080	0.0351	0.0002	0.0024
iso-Pentane	C_5H_{10}	1.988	3699	72.15	1.434	73.536	4.417	0.0944	0.4133	0.0019	0.0285
n-Pentane	C_5H_{12}	2.419	3706.9	72.15	1.745	89.670	5.374	0.1148	0.5029	0.0023	0.0347
Benzene	C_6H_6	1.283	3590.9	78.11	1.002	46.071	3.086	0.0659	0.2888	0.0013	0.0199
Cyclohexane	C_6H_{12}	0.129	4179.7	84.16	0.109	5.392	0.334	0.0071	0.0313	0.0001	0.0022
Methylcyclopentane	C_6H_{12}	0.066	4199	84.16	0.056	2.771	0.171	0.0037	0.0160	0.0001	0.0011
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.251	4384	86.18	0.216	11.004	0.666	0.0142	0.0623	0.0003	0.0043
2,3 Dimethylbutane	C_6H_{14}	0.148	4392.7	86.18	0.128	6.501	0.393	0.0084	0.0368	0.0002	0.0025
2 Methylpentane	C_6H_{14}	0.670	4395.2	86.18	0.577	29.448	1.778	0.0380	0.1664	0.0008	0.0115
3 Methylpentane	C_6H_{14}	0.368	4398.1	86.18	0.317	16.185	0.977	0.0209	0.0914	0.0004	0.0063
n-Hexane	C_6H_{14}	1.250	4403.8	86.18	1.077	55.048	3.317	0.0709	0.3104	0.0014	0.0214
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	0.416	5100	100.2	0.417	21.216	1.284	0.0274	0.1201	0.0005	0.0083
Methylcyclohexane	C_7H_{14}	0.046	4863.6	98.188	0.045	2.237	0.139	0.0030	0.0130	0.0001	0.0009
Toluene	C_7H_8	0.035	4273.6	92.14	0.032	1.496	0.099	0.0021	0.0093	0.0000	0.0006
2-Methylhexane	C_7H_{16}	0.171	5092.2	100.204	0.171	8.708	0.528	0.0113	0.0494	0.0002	0.0034
3-Methylhexane	C_7H_{16}	0.005	5096	100.204	0.005	0.255	0.015	0.0003	0.0014	0.0000	0.0001
Xylenes	C_8H_{10}	0.012	4957	106.17	0.013	0.595	0.039	0.0008	0.0037	0.0000	0.0003
Ethylbenzene	C_8H_{10}	0.003	4970.5	106.17	0.003	0.149	0.010	0.0002	0.0009	0.0000	0.0001
Octanes +	C_8H_{18}	0.080	5796.1	114.231	0.091	4.637	0.281	0.0060	0.0263	0.0001	0.0018
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.020	6493.2	128.258	0.026	1.299	0.079	0.0017	0.0074	0.0000	0.0005
Decanes+	$C_{10}H_{22}$	0.006	7189.6	142.285	0.009	0.431	0.026	0.0006	0.0025	0.0000	0.0002
Undecanes+[3]	$C_{11}H_{24}$	0.006	7825.9	156.31	0.009	0.470	0.029	0.0006	0.0027	0.0000	0.0002
Hydrogen Sulfide	H_2S	0.000	586.8	34.08						0.0000	0.0000
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		32.48	1699.58	100.00	2.1365	9.3581	0.0427	0.6457
TOTAL VOCs (C3+)		28.65			17.22	884.20	53.02	1.1328	4.9618	0.0227	0.3424
TOTAL HAPs		2.58			2.13	103.36	6.55	0.1400	0.6131	0.0028	0.0423
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
TOTAL GREENHOUSE GAS (CH4 and CO2)		45.00			7.352	404.865	22.638	0.4837	2.1185	0.0097	0.1462

CHEVRON USA, INC. — Date: 10/1/2011

VENT GAS QUANTIFICATION[1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume[-1] (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)				
Propane Example	4.690	x	0.00263	x	600	x	0.04166667	=	0.3086	lb/hr	

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.3086	x	8760	x	0.0005	=	1.3515	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.3086	x	0.020	=	0.0062	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0062	x	8760	x	0.95	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.3086	x	8760	x	0.05	x	0.0005	=	0.0933	tn/yr

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	Davidson-Matthews Comp Station	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank	
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKD2	
Vent Gas Stream?	Flash Gas	Flash from condensate
Vent Gas Flow Rate?[2]	750 scfd	
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?	Flare	
Control Device ID (if applicable)?	FLR1	
Control Device Efficiency (if applicable)?	98	*(%, non-combustion devices only)*
Control Device On-Line Percentage?	95	*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.479	0	44.01	0.211		0.649	0.0173	0.0759	0.0003	0.0052
Nitrogen	N_2	0.995	0	28.01	0.279		0.858	0.0229	0.1004	0.0005	0.0069
Methane	CH_4	44.520	909.4	16.04	7.141	404.865	21.989	0.5873	2.5722	0.0117	0.1775
Ethane	C_2H_6	25.361	1618.7	30.07	7.626	410.519	23.483	0.6271	2.7469	0.0125	0.1895
Propane	C_3H_8	10.635	2314.9	44.1	4.690	246.190	14.442	0.3857	1.6893	0.0077	0.1166
iso-Butane	C_4H_{10}	3.754	3000.4	58.12	2.182	112.635	6.718	0.1794	0.7859	0.0036	0.0542
n-Butane	C_4H_{10}	4.701	3010.8	58.12	2.732	141.538	8.413	0.2247	0.9841	0.0045	0.0679
Cyclopentane	C_5H_{10}	0.014	3513.2	70.13	0.010	0.492	0.030	0.0008	0.0035	0.0000	0.0002
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.169	3682.9	72.15	0.122	6.224	0.375	0.0100	0.0439	0.0002	0.0030
iso-Pentane	C_5H_{10}	1.988	3699	72.15	1.434	73.536	4.417	0.1180	0.5166	0.0024	0.0356
n-Pentane	C_5H_{12}	2.419	3706.9	72.15	1.745	89.670	5.374	0.1435	0.6287	0.0029	0.0434
Benzene	C_6H_6	1.283	3590.9	78.11	1.002	46.071	3.086	0.0824	0.3610	0.0016	0.0249
Cyclohexane	C_6H_{12}	0.129	4179.7	84.16	0.109	5.392	0.334	0.0089	0.0391	0.0002	0.0027
Methylcyclopentane	C_6H_{12}	0.066	4199	84.16	0.056	2.771	0.171	0.0046	0.0200	0.0001	0.0014
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.251	4384	86.18	0.216	11.004	0.666	0.0178	0.0779	0.0004	0.0054
2,3 Dimethylbutane	C_6H_{14}	0.148	4392.7	86.18	0.128	6.501	0.393	0.0105	0.0459	0.0002	0.0032
2 Methylpentane	C_6H_{14}	0.670	4395.2	86.18	0.577	29.448	1.778	0.0475	0.2080	0.0009	0.0144
3 Methylpentane	C_6H_{14}	0.368	4398.1	86.18	0.317	16.185	0.977	0.0261	0.1142	0.0005	0.0079
n-Hexane	C_6H_{14}	1.250	4403.8	86.18	1.077	55.048	3.317	0.0886	0.3880	0.0018	0.0268
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	0.416	5100	100.2	0.417	21.216	1.284	0.0343	0.1501	0.0007	0.0104
Methylcyclohexane	C_7H_{14}	0.046	4863.6	98.188	0.045	2.237	0.139	0.0037	0.0163	0.0001	0.0011
Toluene	C_7H_8	0.035	4273.6	92.14	0.032	1.496	0.099	0.0027	0.0116	0.0001	0.0008
2-Methylhexane	C_7H_{16}	0.171	5092.2	100.204	0.171	8.708	0.528	0.0141	0.0617	0.0003	0.0043
3-Methylhexane	C_7H_{16}	0.005	5096	100.204	0.005	0.255	0.015	0.0004	0.0018	0.0000	0.0001
Xylenes	C_8H_{10}	0.012	4957	106.17	0.013	0.595	0.039	0.0010	0.0046	0.0000	0.0003
Ethylbenzene	C_8H_{10}	0.003	4970.5	106.17	0.003	0.149	0.010	0.0003	0.0011	0.0000	0.0001
Octanes +	C_8H_{18}	0.080	5796.1	114.231	0.091	4.637	0.281	0.0075	0.0329	0.0002	0.0023
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.020	6493.2	128.258	0.026	1.299	0.079	0.0021	0.0092	0.0000	0.0006
Decanes+	$C_{10}H_{22}$	0.006	7189.6	142.285	0.009	0.431	0.026	0.0007	0.0031	0.0000	0.0002
Undecanes+[3]	$C_{11}H_{24}$	0.006	7825.9	156.31	0.009	0.470	0.029	0.0008	0.0034	0.0000	0.0002
Hydrogen Sulfide	H_2S	0.000	586.8	34.08						0.0000	0.0000
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		32.48	1699.58	100.00	2.6707	11.6976	0.0534	0.8071
TOTAL VOCs (C3+)		28.65			17.22	884.20	53.02	1.4160	6.2022	0.0283	0.4280
TOTAL HAPs		2.56			2.13	103.36	6.55	0.1750	0.7663	0.0035	0.0529
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
TOTAL GREENHOUSE GAS (CH4 and CO2)		45.00			7.352	404.865	22.638	0.6046	2.6481	0.0121	0.1827

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume[-1] (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)			
Propane Example	4.690	x	0.00263	x	750	x	0.04166667	=	0.3857	lb/hr

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.3857	x	8760	x	0.0005	=	1.6893	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.3857	x	0.020	=	0.0077	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0077	x	8760	x	0.95	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.3857	x	8760	x	0.05	x	0.0005	=	0.1166	tn/yr

CHEVRON USA, INC.

Date: 10/1/2011

Chevron

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	Davidson-Matthews Comp Station		
County and State?	Panola County, Texas		
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank		
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank Vent		
Emission Point ID? (i.e., TANK1VENT)	TANKD3		
Vent Gas Stream?	Flash Gas	Flash from condensate	
Vent Gas Flow Rate?[2]	750	scfd	
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*	
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*	

Control Device Name (if applicable)?	Flare	
Control Device ID (if applicable)?	FLR1	
Control Device Efficiency (if applicable)?	98	*(%, non-combustion devices only)*
Control Device On-Line Percentage?	95	*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.479	0	44.01	0.211		0.649	0.0173	0.0759	0.0003	0.0052
Nitrogen	N_2	0.995	0	28.01	0.279		0.858	0.0229	0.1004	0.0005	0.0069
Methane	CH_4	44.520	909.4	16.04	7.141	404.865	21.989	0.5873	2.5722	0.0117	0.1775
Ethane	C_2H_6	25.361	1618.7	30.07	7.626	410.519	23.483	0.6271	2.7469	0.0125	0.1895
Propane	C_3H_8	10.635	2314.9	44.1	4.690	246.190	14.442	0.3857	1.6893	0.0077	0.1166
iso-Butane	C_4H_{10}	3.754	3000.4	58.12	2.182	112.635	6.718	0.1794	0.7859	0.0036	0.0542
n-Butane	C_4H_{10}	4.701	3010.8	58.12	2.732	141.538	8.413	0.2247	0.9841	0.0045	0.0679
Cyclopentane	C_5H_{10}	0.014	3513.2	70.13	0.010	0.492	0.030	0.0008	0.0035	0.0000	0.0002
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.169	3682.9	72.15	0.122	6.224	0.375	0.0100	0.0439	0.0002	0.0030
iso-Pentane	C_5H_{10}	1.988	3699	72.15	1.434	73.536	4.417	0.1180	0.5166	0.0024	0.0356
n-Pentane	C_5H_{12}	2.419	3706.9	72.15	1.745	89.670	5.374	0.1435	0.6287	0.0029	0.0434
Benzene	C_6H_6	1.283	3590.9	78.11	1.002	46.071	3.086	0.0824	0.3610	0.0016	0.0249
Cyclohexane	C_6H_{12}	0.129	4179.7	84.16	0.109	5.392	0.334	0.0089	0.0391	0.0002	0.0027
Methylcyclopentane	C_6H_{12}	0.066	4199	84.16	0.056	2.771	0.171	0.0046	0.0200	0.0001	0.0014
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.251	4384	86.18	0.216	11.004	0.666	0.0178	0.0779	0.0004	0.0054
2,3 Dimethylbutane	C_6H_{14}	0.148	4392.7	86.18	0.128	6.501	0.393	0.0105	0.0459	0.0002	0.0032
2 Methylpentane	C_6H_{14}	0.670	4395.2	86.18	0.577	29.448	1.778	0.0475	0.2080	0.0009	0.0144
3 Methylpentane	C_6H_{14}	0.368	4398.1	86.18	0.317	16.185	0.977	0.0261	0.1142	0.0005	0.0079
n-Hexane	C_6H_{14}	1.250	4403.8	86.18	1.077	55.048	3.317	0.0886	0.3880	0.0018	0.0268
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	0.416	5100	100.2	0.417	21.216	1.284	0.0343	0.1501	0.0007	0.0104
Methylcyclohexane	C_7H_{14}	0.046	4863.6	98.188	0.045	2.237	0.139	0.0037	0.0163	0.0001	0.0011
Toluene	C_7H_8	0.035	4273.6	92.14	0.032	1.496	0.099	0.0027	0.0116	0.0001	0.0008
2-Methylhexane	C_7H_{16}	0.171	5092.2	100.204	0.171	8.708	0.528	0.0141	0.0617	0.0003	0.0043
3-Methylhexane	C_7H_{16}	0.005	5096	100.204	0.005	0.255	0.015	0.0004	0.0018	0.0000	0.0001
Xylenes	C_8H_{10}	0.012	4957	106.17	0.013	0.595	0.039	0.0010	0.0046	0.0000	0.0003
Ethylbenzene	C_8H_{10}	0.003	4970.5	106.17	0.003	0.149	0.010	0.0003	0.0011	0.0000	0.0001
Octanes +	C_8H_{18}	0.080	5796.1	114.231	0.091	4.637	0.281	0.0075	0.0329	0.0002	0.0023
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.020	6493.2	128.258	0.026	1.299	0.079	0.0021	0.0092	0.0000	0.0006
Decanes+	$C_{10}H_{22}$	0.006	7189.6	142.285	0.009	0.431	0.026	0.0007	0.0031	0.0000	0.0002
Undecanes+[3]	$C_{11}H_{24}$	0.006	7825.9	156.31	0.009	0.470	0.029	0.0008	0.0034	0.0000	0.0002
Hydrogen Sulfide	H_2S	0.000	586.8	34.08						0.0000	0.0000
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		32.48	1699.58	100.00	2.6707	11.6976	0.0534	0.8071
TOTAL VOCs (C3+)		28.65			17.22	884.20	53.02	1.4160	6.2022	0.0283	0.4280
TOTAL HAPs		2.58			2.13	103.36	6.55	0.1750	0.7663	0.0035	0.0529
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
TOTAL GREENHOUSE GAS (CH4 and CO2)		45.00			7.352	404.865	22.638	0.6046	2.6481	0.0121	0.1827

CHEVRON USA, INC.

Date: 10/1/2011

Chevron

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume[-1] (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)				
Propane Example	4.690	x	0.00263	x	750	x	0.04166667	=	0.3857	lb/hr	

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.3857	x	8760	x	0.0005	=	1.6893	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.3857	x	0.020	=	0.0077	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0077	x	8760	x	0.95	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.3857	x	8760	x	0.05	x	0.0005	=	0.1166	tn/yr

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

Identification		
User Identification:	S.E. Matthews A1 Tank Battery-oil tank	
City:	Beckville	
State:	Texas	
Company:	Chevron USA Inc	
Type of Tank:	Vertical Fixed Roof Tank	
Description:		
Tank Dimensions		
Shell Height (ft):		20.00
Diameter (ft):		12.00
Liquid Height (ft) :		16.00
Avg. Liquid Height (ft):		10.00
Volume (gallons):		13,536.47
Turnovers:		16.99
Net Throughput(gal/yr):		229,950.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	White/White	
Shell Condition	Good	
Roof Color/Shade:	White/White	
Roof Condition:	Good	
Roof Characteristics		
Type:	Cone	
Height (ft)		1.00
Slope (ft/ft) (Cone Roof)		0.17
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.22

Meterological Data used in Emissions Calculations: Shreveport, Louisiana (Avg Atmospheric Pressure = 14.62 psia)

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

S.E. Matthews A1 Tank Battery-oil tank - Vertical Fixed Roof Tank
Beckville, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate (RVP 4.5274)	All	67.14	61.45	72.83	65.19	4.5274	4.0000	5.2500	69.5700			176.20	

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

S.E. Matthews A1 Tank Battery-oil tank - Vertical Fixed Roof Tank
Beckville, Texas

Annual Emission Calcaulations	
Standing Losses (lb):	972.9821
Vapor Space Volume (cu ft):	1,168.6725
Vapor Density (lb/cu ft):	0.0557
Vapor Space Expansion Factor:	0.1424
Vented Vapor Saturation Factor:	0.2874
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,168.6725
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	10.3333
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	10.0000

Roof Outage (ft):	0.3333
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.3333
Roof Height (ft):	1.0000
Roof Slope (ft/ft):	0.1700
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0557
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Daily Avg. Liquid Surface Temp. (deg. R):	526.8108
Daily Average Ambient Temp. (deg. F):	65.1667
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	524.8567
Tank Paint Solar Absorptance (Shell):	0.1700
Tank Paint Solar Absorptance (Roof):	0.1700
Daily Total Solar Insulation Factor (Btu/sqft day):	1,461.6100
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1424
Daily Vapor Temperature Range (deg. R):	22.7733
Daily Vapor Pressure Range (psia):	1.2500
Breather Vent Press. Setting Range(psia):	0.2490
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.2500
Daily Avg. Liquid Surface Temp. (deg R):	526.8108
Daily Min. Liquid Surface Temp. (deg R):	521.1175
Daily Max. Liquid Surface Temp. (deg R):	532.5041
Daily Ambient Temp. Range (deg. R):	21.9667
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.2874
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	4.5274
Vapor Space Outage (ft):	10.3333
Working Losses (lb):	1,293.3506
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Annual Net Throughput (gal/yr.):	229,950.0000
Annual Turnovers:	16.9874
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	13,536.4740
Maximum Liquid Height (ft):	16.0000
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	0.7500
Total Losses (lb):	2,266.3326

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

Emissions Report for: Annual

S.E. Matthews A1 Tank Battery-oil tank - Vertical Fixed Roof Tank
Beckville, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate (RVP 4.5274)	1,293.35	972.98	2,266.33

CHEVRON USA, INC. Date: 10/1/2011

VENT GAS QUANTIFICATION [1]

Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	S.E. Matthews A1 Tank Battery	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank 1	
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank 1 Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKA1	
Vent Gas Stream?	Working & Breathing	
Vent Gas Flow Rate?[2]	33.9150043	scfd
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?		
Control Device ID (if applicable)?		
Control Device Efficiency (if applicable)?		*(%, non-combustion devices only)*
Control Device On-Line Percentage?		*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.480	0	44.01	0.211		0.303	0.0008	0.0034	N/A	N/A
Nitrogen	N_2	0.000	0	28.01						N/A	N/A
Methane	CH_4	3.127	909.4	16.04	0.502	28.437	0.720	0.0019	0.0082	N/A	N/A
Ethane	C_2H_6	5.790	1618.7	30.07	1.741	93.723	2.499	0.0065	0.0284	N/A	N/A
Propane	C_3H_8	8.554	2314.9	44.1	3.772	198.017	5.414	0.0140	0.0614	N/A	N/A
iso-Butane	C_4H_{10}	5.937	3000.4	58.12	3.451	178.134	4.952	0.0128	0.0562	N/A	N/A
n-Butane	C_4H_{10}	15.890	3010.8	58.12	9.235	478.416	13.255	0.0343	0.1504	N/A	N/A
Cyclopentane	C_5H_{10}		3513.2	70.13							
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.025	3682.9	72.15	0.018	0.921	0.026	0.0001	0.0003	N/A	N/A
iso-Pentane	C_5H_{10}	9.383	3699	72.15	6.770	347.077	9.716	0.0252	0.1103	N/A	N/A
n-Pentane	C_5H_{12}	13.697	3706.9	72.15	9.882	507.734	14.183	0.0368	0.1610	N/A	N/A
Benzene	C_6H_6	4.225	3590.9	78.11	3.300	151.716	4.736	0.0123	0.0538	N/A	N/A
Cyclohexane	C_6H_{12}	0.897	4179.7	84.16	0.755	37.492	1.083	0.0028	0.0123	N/A	N/A
Methylcyclopentane	C_6H_{12}	0.393	4199	84.16	0.331	16.502	0.475	0.0012	0.0054	N/A	N/A
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.737	4384	86.18	0.635	32.310	0.912	0.0024	0.0103	N/A	N/A
2,3 Dimethylbutane	C_6H_{14}	0.952	4392.7	86.18	0.820	41.819	1.178	0.0031	0.0134	N/A	N/A
2 Methylpentane	C_6H_{14}	5.629	4395.2	86.18	4.851	247.406	6.962	0.0180	0.0790	N/A	N/A
3 Methylpentane	C_6H_{14}	2.816	4398.1	86.18	2.427	123.850	3.483	0.0090	0.0395	N/A	N/A
n-Hexane	C_6H_{14}	8.610	4403.8	86.18	7.420	379.167	10.650	0.0276	0.1209	N/A	N/A
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	4.339	5100	100.2	4.348	221.289	6.240	0.0162	0.0708	N/A	N/A
Methylcyclohexane	C_7H_{14}	1.129	4863.6	98.188	1.109	54.910	1.591	0.0041	0.0181	N/A	N/A
Toluene	C_7H_8	0.152	4273.6	92.14	0.140	6.496	0.201	0.0005	0.0023	N/A	N/A
2-Methylhexane	C_7H_{16}	1.907	5092.2	100.204	1.911	97.108	2.743	0.0071	0.0311	N/A	N/A
3-Methylhexane	C_7H_{16}	1.421	5096	100.204	1.424	72.414	2.044	0.0053	0.0232	N/A	N/A
Xylenes	C_8H_{10}	0.096	4957	106.17	0.102	4.759	0.146	0.0004	0.0017	N/A	N/A
Ethylbenzene	C_8H_{10}	0.017	4970.5	106.17	0.018	0.845	0.026	0.0001	0.0003	N/A	N/A
Octanes +	C_8H_{18}	2.845	5796.1	114.231	3.250	164.899	4.664	0.0121	0.0529	N/A	N/A
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.747	6493.2	128.258	0.958	48.504	1.375	0.0036	0.0156	N/A	N/A
Decanes+	$C_{10}H_{22}$	0.184	7189.6	142.285	0.262	13.229	0.376	0.0010	0.0043	N/A	N/A
Undecanes+[3]	$C_{11}H_{24}$	0.021	7825.9	156.31	0.033	1.643	0.047	0.0001	0.0005	N/A	N/A
Hydrogen Sulfide	H_2S		586.8	34.08							
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		69.68	3548.82	100.00	0.2591	1.1349	0.0000	0.0000
TOTAL VOCs (C3+)		90.60			67.22	3426.66	96.48	0.2500	1.0949	N/A	N/A
TOTAL HAPs		13.10			10.98	542.98	15.76	0.0408	0.1788	N/A	N/A
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	N/A	N/A
TOTAL GREENHOUSE GAS (CH4 and CO2)		3.61			0.713	28.437	1.023	0.0027	0.0116	N/A	N/A

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION[1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume[-1] (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)			
Propane Example	3.772	x	0.00263	x	33.9150043	x	0.04166667	=	0.0140	lb/hr

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0140	x	8760	x	0.0005	=	0.0614	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.0140	x	0.020	=	0.0003	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0003	x	8760	x	0.98	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0140	x	8760	x	0.02	x	0.0005	=	0.0024	tn/yr

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

Identification	
User Identification:	S.E. Matthews B Tank Battery-oil tank
City:	Carthage
State:	Texas
Company:	Chevron USA Inc
Type of Tank:	Vertical Fixed Roof Tank
Description:	Oil tank only
Tank Dimensions	
Shell Height (ft):	15.00
Diameter (ft):	10.00
Liquid Height (ft) :	12.00
Avg. Liquid Height (ft):	8.00
Volume (gallons):	7,050.25
Turnovers:	26.09
Net Throughput(gal/yr):	183,960.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	1.00
Slope (ft/ft) (Cone Roof)	0.20
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.22

Meterological Data used in Emissions Calculations: Shreveport, Louisiana (Avg Atmospheric Pressure = 14.62 psia)

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

S.E. Matthews B Tank Battery-oil tank - Vertical Fixed Roof Tank
Carthage, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate (RVP 4.5274)	All	72.66	63.18	82.14	67.41	4.5274	4.0000	5.2500	69.5700			176.20	

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

S.E. Matthews B Tank Battery-oil tank - Vertical Fixed Roof Tank
Carthage, Texas

Annual Emission Calcaulations	
Standing Losses (lb):	715.9331
Vapor Space Volume (cu ft):	575.9587
Vapor Density (lb/cu ft):	0.0551
Vapor Space Expansion Factor:	0.1704
Vented Vapor Saturation Factor:	0.3624
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	575.9587
Tank Diameter (ft):	10.0000
Vapor Space Outage (ft):	7.3333
Tank Shell Height (ft):	15.0000
Average Liquid Height (ft):	8.0000

Roof Outage (ft):	0.3333
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.3333
Roof Height (ft):	1.0000
Roof Slope (ft/ft):	0.2000
Shell Radius (ft):	5.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0551
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Daily Avg. Liquid Surface Temp. (deg. R):	532.3263
Daily Average Ambient Temp. (deg. F):	65.1667
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	527.0767
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,461.6100
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1704
Daily Vapor Temperature Range (deg. R):	37.9155
Daily Vapor Pressure Range (psia):	1.2500
Breather Vent Press. Setting Range(psia):	0.2490
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.2500
Daily Avg. Liquid Surface Temp. (deg R):	532.3263
Daily Min. Liquid Surface Temp. (deg R):	522.8474
Daily Max. Liquid Surface Temp. (deg R):	541.8052
Daily Ambient Temp. Range (deg. R):	21.9667
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3624
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	4.5274
Vapor Space Outage (ft):	7.3333
Working Losses (lb):	1,034.6805
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Annual Net Throughput (gal/yr.):	183,960.0000
Annual Turnovers:	26.0927
Turnover Factor:	1.0000
Maximum Liquid Volume (gal):	7,050.2469
Maximum Liquid Height (ft):	12.0000
Tank Diameter (ft):	10.0000
Working Loss Product Factor:	0.7500
Total Losses (lb):	1,750.6136

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

Emissions Report for: Annual

S.E. Matthews B Tank Battery-oil tank - Vertical Fixed Roof Tank
Carthage, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate (RVP 4.5274)	1,034.68	715.93	1,750.61

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	S.E. Matthews B Tank Battery	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank 1	
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank 1 Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKB1	
Vent Gas Stream?	Working & Breathing	
Vent Gas Flow Rate?[2]	26.19739653	scfd
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?		
Control Device ID (if applicable)?		
Control Device Efficiency (if applicable)?		*(%, non-combustion devices only)*
Control Device On-Line Percentage?		*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.480	0	44.01	0.211		0.303	0.0006	0.0027	N/A	N/A
Nitrogen	N_2	0.000	0	28.01						N/A	N/A
Methane	CH_4	3.127	909.4	16.04	0.502	28.437	0.720	0.0014	0.0063	N/A	N/A
Ethane	C_2H_6	5.790	1618.7	30.07	1.741	93.723	2.499	0.0050	0.0219	N/A	N/A
Propane	C_3H_8	8.554	2314.9	44.1	3.772	198.017	5.414	0.0108	0.0475	N/A	N/A
iso-Butane	C_4H_{10}	5.937	3000.4	58.12	3.451	178.134	4.952	0.0099	0.0434	N/A	N/A
n-Butane	C_4H_{10}	15.890	3010.8	58.12	9.235	478.416	13.255	0.0265	0.1162	N/A	N/A
Cyclopentane	C_5H_{10}		3513.2	70.13							
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.025	3682.9	72.15	0.018	0.921	0.026	0.0001	0.0002	N/A	N/A
iso-Pentane	C_5H_{10}	9.383	3699	72.15	6.770	347.077	9.716	0.0194	0.0852	N/A	N/A
n-Pentane	C_5H_{12}	13.697	3706.9	72.15	9.882	507.734	14.183	0.0284	0.1243	N/A	N/A
Benzene	C_6H_6	4.225	3590.9	78.11	3.300	151.716	4.736	0.0095	0.0415	N/A	N/A
Cyclohexane	C_6H_{12}	0.897	4179.7	84.16	0.755	37.492	1.083	0.0022	0.0095	N/A	N/A
Methylcyclopentane	C_6H_{12}	0.393	4199	84.16	0.331	16.502	0.475	0.0010	0.0042	N/A	N/A
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.737	4384	86.18	0.635	32.310	0.912	0.0018	0.0080	N/A	N/A
2,3 Dimethylbutane	C_6H_{14}	0.952	4392.7	86.18	0.820	41.819	1.178	0.0024	0.0103	N/A	N/A
2 Methylpentane	C_6H_{14}	5.629	4395.2	86.18	4.851	247.406	6.962	0.0139	0.0610	N/A	N/A
3 Methylpentane	C_6H_{14}	2.816	4398.1	86.18	2.427	123.850	3.483	0.0070	0.0305	N/A	N/A
n-Hexane	C_6H_{14}	8.610	4403.8	86.18	7.420	379.167	10.650	0.0213	0.0934	N/A	N/A
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	4.339	5100	100.2	4.348	221.289	6.240	0.0125	0.0547	N/A	N/A
Methylcyclohexane	C_7H_{14}	1.129	4863.6	98.188	1.109	54.910	1.591	0.0032	0.0139	N/A	N/A
Toluene	C_7H_8	0.152	4273.6	92.14	0.140	6.496	0.201	0.0004	0.0018	N/A	N/A
2-Methylhexane	C_7H_{16}	1.907	5092.2	100.204	1.911	97.108	2.743	0.0055	0.0240	N/A	N/A
3-Methylhexane	C_7H_{16}	1.421	5096	100.204	1.424	72.414	2.044	0.0041	0.0179	N/A	N/A
Xylenes	C_8H_{10}	0.096	4957	106.17	0.102	4.759	0.146	0.0003	0.0013	N/A	N/A
Ethylbenzene	C_8H_{10}	0.017	4970.5	106.17	0.018	0.845	0.026	0.0001	0.0002	N/A	N/A
Octanes +	C_8H_{18}	2.845	5796.1	114.231	3.250	164.899	4.664	0.0093	0.0409	N/A	N/A
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.747	6493.2	128.258	0.958	48.504	1.375	0.0028	0.0121	N/A	N/A
Decanes+	$C_{10}H_{22}$	0.184	7189.6	142.285	0.262	13.229	0.376	0.0008	0.0033	N/A	N/A
Undecanes+[3]	$C_{11}H_{24}$	0.021	7825.9	156.31	0.033	1.643	0.047	0.0001	0.0004	N/A	N/A
Hydrogen Sulfide	H_2S		586.8	34.08							
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		69.68	3548.82	100.00	0.2001	0.8766	0.0000	0.0000
TOTAL VOCs (C3+)		90.60			67.22	3426.66	96.48	0.1931	0.8458	N/A	N/A
TOTAL HAPs		13.10			10.98	542.98	15.76	0.0315	0.1381	N/A	N/A
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	N/A	N/A
TOTAL GREENHOUSE GAS (CH4 and CO2)		3.61			0.713	28.437	1.023	0.0020	0.0090	N/A	N/A

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume^{-1} (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)			
Propane Example	3.772	x	0.00263	x	26.19739653	x	0.04166667	=	0.0108	lb/hr

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0108	x	8760	x	0.0005	=	0.0475	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)	=		
Propane Example	0.0108	x	0.020	=	0.0002	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0002	x	8760	x	0.98	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0108	x	8760	x	0.02	x	0.0005	=	0.0019	tn/yr

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

Identification

User Identification:	S.E. Matthews B Tank Battery-water tank
City:	Carthage
State:	Texas
Company:	Chevron USA Inc
Type of Tank:	Vertical Fixed Roof Tank
Description:	Water tank only

Tank Dimensions

Shell Height (ft):	15.00
Diameter (ft):	10.00
Liquid Height (ft) :	12.00
Avg. Liquid Height (ft):	8.00
Volume (gallons):	7,050.25
Turnovers:	86.98
Net Throughput(gal/yr):	613,200.00
Is Tank Heated (y/n):	N

Paint Characteristics

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

Roof Characteristics

Type:	Dome
Height (ft)	1.00
Radius (ft) (Dome Roof)	10.00

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.22

Meterological Data used in Emissions Calculations: Shreveport, Louisiana (Avg Atmospheric Pressure = 14.62 psia)

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

S.E. Matthews B Tank Battery-water tank - Vertical Fixed Roof Tank
Carthage, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate (RVP 4.5274)	All	72.66	63.18	82.14	67.41	4.5274	4.0000	5.2500	69.5700			176.20	

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

S.E. Matthews B Tank Battery-water tank - Vertical Fixed Roof Tank
Carthage, Texas

Annual Emission Calcaulations	
Standing Losses (lb):	721.9740
Vapor Space Volume (cu ft):	589.5722
Vapor Density (lb/cu ft):	0.0551
Vapor Space Expansion Factor:	0.1704
Vented Vapor Saturation Factor:	0.3570
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	589.5722
Tank Diameter (ft):	10.0000
Vapor Space Outage (ft):	7.5067
Tank Shell Height (ft):	15.0000
Average Liquid Height (ft):	8.0000

Roof Outage (ft):	0.5067
Roof Outage (Dome Roof)	
Roof Outage (ft):	0.5067
Dome Radius (ft):	10.0000
Shell Radius (ft):	5.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0551
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Daily Avg. Liquid Surface Temp. (deg. R):	532.3263
Daily Average Ambient Temp. (deg. F):	65.1667
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	527.0767
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,461.6100
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1704
Daily Vapor Temperature Range (deg. R):	37.9155
Daily Vapor Pressure Range (psia):	1.2500
Breather Vent Press. Setting Range(psia):	0.2490
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.2500
Daily Avg. Liquid Surface Temp. (deg R):	532.3263
Daily Min. Liquid Surface Temp. (deg R):	522.8474
Daily Max. Liquid Surface Temp. (deg R):	541.8052
Daily Ambient Temp. Range (deg. R):	21.9667
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3570
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	4.5274
Vapor Space Outage (ft):	7.5067
Working Losses (lb):	1,764.4429
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Annual Net Throughput (gal/yr.):	613,200.0000
Annual Turnovers:	86.9757
Turnover Factor:	0.5116
Maximum Liquid Volume (gal):	7,050.2469
Maximum Liquid Height (ft):	12.0000
Tank Diameter (ft):	10.0000
Working Loss Product Factor:	0.7500
Total Losses (lb):	2,486.4170

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

Emissions Report for: Annual

S.E. Matthews B Tank Battery-water tank - Vertical Fixed Roof Tank
Carthage, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate (RVP 4.5274)	1,764.44	721.97	2,486.42

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	S.E. Matthews B Tank Battery	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Water Tank 1	
Emission Point Name? (i.e., Tank 1 Vent)	Water Tank 1 Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKBW1	
Vent Gas Stream?	Working & Breathing	
Vent Gas Flow Rate?[2]	0.372085905	scfd
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?		
Control Device ID (if applicable)?		
Control Device Efficiency (if applicable)?		*(%, non-combustion devices only)*
Control Device On-Line Percentage?		*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.480	0	44.01	0.211		0.303	0.0000	0.0000	N/A	N/A
Nitrogen	N_2	0.000	0	28.01						N/A	N/A
Methane	CH_4	3.127	909.4	16.04	0.502	28.437	0.720	0.0000	0.0001	N/A	N/A
Ethane	C_2H_6	5.790	1618.7	30.07	1.741	93.723	2.499	0.0001	0.0003	N/A	N/A
Propane	C_3H_8	8.554	2314.9	44.1	3.772	198.017	5.414	0.0002	0.0007	N/A	N/A
iso-Butane	C_4H_{10}	5.937	3000.4	58.12	3.451	178.134	4.952	0.0001	0.0006	N/A	N/A
n-Butane	C_4H_{10}	15.890	3010.8	58.12	9.235	478.416	13.255	0.0004	0.0017	N/A	N/A
Cyclopentane	C_5H_{10}		3513.2	70.13							
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.025	3682.9	72.15	0.018	0.921	0.026	0.0000	0.0000	N/A	N/A
iso-Pentane	C_5H_{10}	9.383	3699	72.15	6.770	347.077	9.716	0.0003	0.0012	N/A	N/A
n-Pentane	C_5H_{12}	13.697	3706.9	72.15	9.882	507.734	14.183	0.0004	0.0018	N/A	N/A
Benzene	C_6H_6	4.225	3590.9	78.11	3.300	151.716	4.736	0.0001	0.0006	N/A	N/A
Cyclohexane	C_6H_{12}	0.897	4179.7	84.16	0.755	37.492	1.083	0.0000	0.0001	N/A	N/A
Methylcyclopentane	C_6H_{12}	0.393	4199	84.16	0.331	16.502	0.475	0.0000	0.0001	N/A	N/A
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.737	4384	86.18	0.635	32.310	0.912	0.0000	0.0001	N/A	N/A
2,3 Dimethylbutane	C_6H_{14}	0.952	4392.7	86.18	0.820	41.819	1.178	0.0000	0.0001	N/A	N/A
2 Methylpentane	C_6H_{14}	5.629	4395.2	86.18	4.851	247.406	6.962	0.0002	0.0009	N/A	N/A
3 Methylpentane	C_6H_{14}	2.816	4398.1	86.18	2.427	123.850	3.483	0.0001	0.0004	N/A	N/A
n-Hexane	C_6H_{14}	8.610	4403.8	86.18	7.420	379.167	10.650	0.0003	0.0013	N/A	N/A
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	4.339	5100	100.2	4.348	221.289	6.240	0.0002	0.0008	N/A	N/A
Methylcyclohexane	C_7H_{14}	1.129	4863.6	98.188	1.109	54.910	1.591	0.0000	0.0002	N/A	N/A
Toluene	C_7H_8	0.152	4273.6	92.14	0.140	6.496	0.201	0.0000	0.0000	N/A	N/A
2-Methylhexane	C_7H_{16}	1.907	5092.2	100.204	1.911	97.108	2.743	0.0001	0.0003	N/A	N/A
3-Methylhexane	C_7H_{16}	1.421	5096	100.204	1.424	72.414	2.044	0.0001	0.0003	N/A	N/A
Xylenes	C_8H_{10}	0.096	4957	106.17	0.102	4.759	0.146	0.0000	0.0000	N/A	N/A
Ethylbenzene	C_8H_{10}	0.017	4970.5	106.17	0.018	0.845	0.026	0.0000	0.0000	N/A	N/A
Octanes +	C_8H_{18}	2.845	5796.1	114.231	3.250	164.899	4.664	0.0001	0.0006	N/A	N/A
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.747	6493.2	128.258	0.958	48.504	1.375	0.0000	0.0002	N/A	N/A
Decanes+	$C_{10}H_{22}$	0.184	7189.6	142.285	0.262	13.229	0.376	0.0000	0.0000	N/A	N/A
Undecanes+[3]	$C_{11}H_{24}$	0.021	7825.9	156.31	0.033	1.643	0.047	0.0000	0.0000	N/A	N/A
Hydrogen Sulfide	H_2S		586.8	34.08							
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		69.68	3548.82	100.00	0.0028	0.0125	0.0000	0.0000
TOTAL VOCs (C3+)		90.60			67.22	3426.66	96.48	0.0027	0.0120	N/A	N/A
TOTAL HAPs		13.10			10.98	542.98	15.76	0.0004	0.0020	N/A	N/A
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	N/A	N/A
TOTAL GREENHOUSE GAS (CH4 and CO2)		3.61			0.713	28.437	1.023	0.0000	0.0001	N/A	N/A

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION[1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume^{-1} (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)			
Propane Example	3.772	x	0.00263	x	0.372085905	x	0.04166667	=	0.0002	lb/hr

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0002	x	8760	x	0.0005	=	0.0007	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.0002	x	0.020	=	0.0000	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0000	x	8760	x	0.98	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0002	x	8760	x	0.02	x	0.0005	=	0.0000	tn/yr

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

Identification

User Identification:	Davidson-Matthews Comp St-oil tank-existing
City:	Carthage
State:	Texas
Company:	Chevron USA Inc
Type of Tank:	Vertical Fixed Roof Tank
Description:	Existing 400 bbl oil tank, 16 ft. tall, 13.5 ft. diam

Tank Dimensions

Shell Height (ft):	16.00
Diameter (ft):	13.50
Liquid Height (ft) :	12.00
Avg. Liquid Height (ft):	8.00
Volume (gallons):	12,849.07
Turnovers:	102.25
Net Throughput(gal/yr):	1,313,781.00
Is Tank Heated (y/n):	N

Paint Characteristics

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

Roof Characteristics

Type:	Cone
Height (ft)	1.00
Slope (ft/ft) (Cone Roof)	0.15

Breather Vent Settings

Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.22

Meterological Data used in Emissions Calculations: Shreveport, Louisiana (Avg Atmospheric Pressure = 14.62 psia)

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

Davidson-Matthews Comp St-oil tank-existing - Vertical Fixed Roof Tank
Carthage, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate (RVP 4.5274)	All	72.66	63.18	82.14	67.41	4.5274	4.0000	5.2500	69.5700			176.20	

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

Davidson-Matthews Comp St-oil tank-existing - Vertical Fixed Roof Tank
Carthage, Texas

Annual Emission Calcaulations	
Standing Losses (lb):	1,364.1046
Vapor Space Volume (cu ft):	1,192.8235
Vapor Density (lb/cu ft):	0.0551
Vapor Space Expansion Factor:	0.1704
Vented Vapor Saturation Factor:	0.3334
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,192.8235
Tank Diameter (ft):	13.5000
Vapor Space Outage (ft):	8.3333
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	8.0000

Roof Outage (ft):	0.3333
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.3333
Roof Height (ft):	1.0000
Roof Slope (ft/ft):	0.1500
Shell Radius (ft):	6.7500
Vapor Density	
Vapor Density (lb/cu ft):	0.0551
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Daily Avg. Liquid Surface Temp. (deg. R):	532.3263
Daily Average Ambient Temp. (deg. F):	65.1667
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	527.0767
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,461.6100
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1704
Daily Vapor Temperature Range (deg. R):	37.9155
Daily Vapor Pressure Range (psia):	1.2500
Breather Vent Press. Setting Range(psia):	0.2490
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.2500
Daily Avg. Liquid Surface Temp. (deg R):	532.3263
Daily Min. Liquid Surface Temp. (deg R):	522.8474
Daily Max. Liquid Surface Temp. (deg R):	541.8052
Daily Ambient Temp. Range (deg. R):	21.9667
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3334
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	4.5274
Vapor Space Outage (ft):	6.3333
Working Losses (lb):	3,399.6404
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Annual Net Throughput (gal/yr.):	1,313,781.0000
Annual Turnovers:	102.2471
Turnover Factor:	0.4601
Maximum Liquid Volume (gal):	12,849.0749
Maximum Liquid Height (ft):	12.0000
Tank Diameter (ft):	13.5000
Working Loss Product Factor:	0.7500
Total Losses (lb):	4,763.7450

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

Emissions Report for: Annual

Davidson-Matthews Comp St-oil tank-existing - Vertical Fixed Roof Tank
Carthage, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate (RVP 4.5274)	3,399.64	1,364.10	4,763.74

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION[1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	Davidson-Matthews Comp. Station	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank 1	
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank 1 Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKD1	
Vent Gas Stream?	Working & Breathing	
Vent Gas Flow Rate?[2]	71.28805717	scfd
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?	Flare	
Control Device ID (if applicable)?	FLR1	
Control Device Efficiency (if applicable)?	98	*(%, non-combustion devices only)*
Control Device On-Line Percentage?	95	*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.480	0	44.01	0.211		0.303	0.0017	0.0072	0.0000	0.0005
Nitrogen	N_2	0.000	0	28.01						0.0000	0.0000
Methane	CH_4	3.127	909.4	16.04	0.502	28.437	0.720	0.0039	0.0172	0.0001	0.0012
Ethane	C_2H_6	5.790	1618.7	30.07	1.741	93.723	2.499	0.0136	0.0596	0.0003	0.0041
Propane	C_3H_8	8.554	2314.9	44.1	3.772	198.017	5.414	0.0295	0.1292	0.0006	0.0089
iso-Butane	C_4H_{10}	5.937	3000.4	58.12	3.451	178.134	4.952	0.0270	0.1181	0.0005	0.0082
n-Butane	C_4H_{10}	15.890	3010.8	58.12	9.235	478.416	13.255	0.0722	0.3162	0.0014	0.0218
Cyclopentane	C_5H_{10}		3513.2	70.13							
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.025	3682.9	72.15	0.018	0.921	0.026	0.0001	0.0006	0.0000	0.0000
iso-Pentane	C_5H_{10}	9.383	3699	72.15	6.770	347.077	9.716	0.0529	0.2318	0.0011	0.0160
n-Pentane	C_5H_{12}	13.697	3706.9	72.15	9.882	507.734	14.183	0.0772	0.3383	0.0015	0.0233
Benzene	C_6H_6	4.225	3590.9	78.11	3.300	151.716	4.736	0.0258	0.1130	0.0005	0.0078
Cyclohexane	C_6H_{12}	0.897	4179.7	84.16	0.755	37.492	1.083	0.0059	0.0258	0.0001	0.0018
Methylcyclopentane	C_6H_{12}	0.393	4199	84.16	0.331	16.502	0.475	0.0026	0.0113	0.0001	0.0008
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.737	4384	86.18	0.635	32.310	0.912	0.0050	0.0217	0.0001	0.0015
2,3 Dimethylbutane	C_6H_{14}	0.952	4392.7	86.18	0.820	41.819	1.178	0.0064	0.0281	0.0001	0.0019
2 Methylpentane	C_6H_{14}	5.629	4395.2	86.18	4.851	247.406	6.962	0.0379	0.1661	0.0008	0.0115
3 Methylpentane	C_6H_{14}	2.816	4398.1	86.18	2.427	123.850	3.483	0.0190	0.0831	0.0004	0.0057
n-Hexane	C_6H_{14}	8.610	4403.8	86.18	7.420	379.167	10.650	0.0580	0.2540	0.0012	0.0175
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	4.339	5100	100.2	4.348	221.289	6.240	0.0340	0.1489	0.0007	0.0103
Methylcyclohexane	C_7H_{14}	1.129	4863.6	98.188	1.109	54.910	1.591	0.0087	0.0380	0.0002	0.0026
Toluene	C_7H_8	0.152	4273.6	92.14	0.140	6.496	0.201	0.0011	0.0048	0.0000	0.0003
2-Methylhexane	C_7H_{16}	1.907	5092.2	100.204	1.911	97.108	2.743	0.0149	0.0654	0.0003	0.0045
3-Methylhexane	C_7H_{16}	1.421	5096	100.204	1.424	72.414	2.044	0.0111	0.0488	0.0002	0.0034
Xylenes	C_8H_{10}	0.096	4957	106.17	0.102	4.759	0.146	0.0008	0.0035	0.0000	0.0002
Ethylbenzene	C_8H_{10}	0.017	4970.5	106.17	0.018	0.845	0.026	0.0001	0.0006	0.0000	0.0000
Octanes +	C_8H_{18}	2.845	5796.1	114.231	3.250	164.899	4.664	0.0254	0.1113	0.0005	0.0077
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.747	6493.2	128.258	0.958	48.504	1.375	0.0075	0.0328	0.0001	0.0023
Decanes+	$C_{10}H_{22}$	0.184	7189.6	142.285	0.262	13.229	0.376	0.0020	0.0090	0.0000	0.0006
Undecanes+[3]	$C_{11}H_{24}$	0.021	7825.9	156.31	0.033	1.643	0.047	0.0003	0.0011	0.0000	0.0001
Hydrogen Sulfide	H_2S		586.8	34.08							
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		69.68	3548.82	100.00	0.5446	2.3855	0.0109	0.1646
TOTAL VOCs (C3+)		90.60			67.22	3426.66	96.48	0.5254	2.3015	0.0105	0.1588
TOTAL HAPs		13.10			10.98	542.98	15.76	0.0858	0.3759	0.0017	0.0259
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
TOTAL GREENHOUSE GAS (CH4 and CO2)		3.61			0.713	28.437	1.023	0.0056	0.0244	0.0001	0.0017

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume[-1] (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)			
Propane Example	3.772	x	0.00263	x	71.28805717	x	0.04166667	=	0.0295	lb/hr

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0295	x	8760	x	0.0005	=	0.1292	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.0295	x	0.020	=	0.0006	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0006	x	8760	x	0.95	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0295	x	8760	x	0.05	x	0.0005	=	0.0089	tn/yr

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

Identification		
User Identification:	Davidson-Matthews Comp St-new oil tank	
City:	Carthage	
State:	Texas	
Company:	Chevron USA Inc	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	For 1 new oil tank (1 of 2), 500 bbl, 16 ft. tall, 15.5 diam	
Tank Dimensions		
Shell Height (ft):		16.00
Diameter (ft):		15.50
Liquid Height (ft) :		12.00
Avg. Liquid Height (ft):		8.00
Volume (gallons):		16,938.22
Turnovers:		97.02
Net Throughput(gal/yr):		1,643,376.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Roof Color/Shade:	Gray/Light	
Roof Condition:	Good	
Roof Characteristics		
Type:	Cone	
Height (ft)		1.00
Slope (ft/ft) (Cone Roof)		0.13
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.22

Meterological Data used in Emissions Calculations: Shreveport, Louisiana (Avg Atmospheric Pressure = 14.62 psia)

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

Davidson-Matthews Comp St-new oil tank - Vertical Fixed Roof Tank
Carthage, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate (RVP 4.5274)	All	72.66	63.18	82.14	67.41	4.5274	4.0000	5.2500	69.5700			176.20	

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

Davidson-Matthews Comp St-new oil tank - Vertical Fixed Roof Tank
Carthage, Texas

Annual Emission Calcaulations	
Standing Losses (lb):	1,798.2229
Vapor Space Volume (cu ft):	1,572.4326
Vapor Density (lb/cu ft):	0.0551
Vapor Space Expansion Factor:	0.1704
Vented Vapor Saturation Factor:	0.3334
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,572.4326
Tank Diameter (ft):	15.5000
Vapor Space Outage (ft):	8.3333
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	8.0000

Roof Outage (ft):	0.3333
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.3333
Roof Height (ft):	1.0000
Roof Slope (ft/ft):	0.1300
Shell Radius (ft):	7.7500
Vapor Density	
Vapor Density (lb/cu ft):	0.0551
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Daily Avg. Liquid Surface Temp. (deg. R):	532.3263
Daily Average Ambient Temp. (deg. F):	65.1667
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	527.0767
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,461.6100
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1704
Daily Vapor Temperature Range (deg. R):	37.9155
Daily Vapor Pressure Range (psia):	1.2500
Breather Vent Press. Setting Range(psia):	0.2490
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.2500
Daily Avg. Liquid Surface Temp. (deg R):	532.3263
Daily Min. Liquid Surface Temp. (deg R):	522.8474
Daily Max. Liquid Surface Temp. (deg R):	541.8052
Daily Ambient Temp. Range (deg. R):	21.9667
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3334
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	4.5274
Vapor Space Outage (ft):	8.3333
Working Losses (lb):	4,398.5874
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Annual Net Throughput (gal/yr.):	1,643,376.0000
Annual Turnovers:	97.0218
Turnover Factor:	0.4759
Maximum Liquid Volume (gal):	16,938.2181
Maximum Liquid Height (ft):	12.0000
Tank Diameter (ft):	15.5000
Working Loss Product Factor:	0.7500
Total Losses (lb):	6,196.8102

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

Emissions Report for: Annual

Davidson-Matthews Comp St-new oil tank - Vertical Fixed Roof Tank
Carthage, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate (RVP 4.5274)	4,398.59	1,798.22	6,196.81

CHEVRON USA, INC.

Date: 10/1/2011

Chevron

VENT GAS QUANTIFICATION[1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	Davidson-Matthews Comp. Station	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank 2	
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank 2 Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKD2	
Vent Gas Stream?	Working & Breathing	
Vent Gas Flow Rate?[2]	92.73355505	scfd
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?	Flare	
Control Device ID (if applicable)?	FLR1	
Control Device Efficiency (if applicable)?	98	*(%, non-combustion devices only)*
Control Device On-Line Percentage?	95	*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.480	0	44.01	0.211		0.303	0.0021	0.0094	0.0000	0.0006
Nitrogen	N_2	0.000	0	28.01						0.0000	0.0000
Methane	CH_4	3.127	909.4	16.04	0.502	28.437	0.720	0.0051	0.0223	0.0001	0.0015
Ethane	C_2H_6	5.790	1618.7	30.07	1.741	93.723	2.499	0.0177	0.0775	0.0004	0.0054
Propane	C_3H_8	8.554	2314.9	44.1	3.772	198.017	5.414	0.0384	0.1680	0.0008	0.0116
iso-Butane	C_4H_{10}	5.937	3000.4	58.12	3.451	178.134	4.952	0.0351	0.1537	0.0007	0.0106
n-Butane	C_4H_{10}	15.890	3010.8	58.12	9.235	478.416	13.255	0.0939	0.4113	0.0019	0.0284
Cyclopentane	C_5H_{10}		3513.2	70.13							
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.025	3882.9	72.15	0.018	0.921	0.026	0.0002	0.0008	0.0000	0.0001
iso-Pentane	C_5H_{10}	9.383	3699	72.15	6.770	347.077	9.716	0.0688	0.3015	0.0014	0.0208
n-Pentane	C_5H_{12}	13.697	3706.9	72.15	9.882	507.734	14.183	0.1005	0.4401	0.0020	0.0304
Benzene	C_6H_6	4.225	3590.9	78.11	3.300	151.716	4.736	0.0336	0.1470	0.0007	0.0101
Cyclohexane	C_6H_{12}	0.897	4179.7	84.16	0.755	37.492	1.083	0.0077	0.0336	0.0002	0.0023
Methylcyclopentane	C_6H_{12}	0.393	4199	84.16	0.331	16.502	0.475	0.0034	0.0147	0.0001	0.0010
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.737	4384	86.18	0.635	32.310	0.912	0.0065	0.0283	0.0001	0.0020
2,3 Dimethylbutane	C_6H_{14}	0.952	4392.7	86.18	0.820	41.819	1.178	0.0083	0.0365	0.0002	0.0025
2 Methylpentane	C_6H_{14}	5.629	4395.2	86.18	4.851	247.406	6.962	0.0493	0.2160	0.0010	0.0149
3 Methylpentane	C_6H_{14}	2.816	4398.1	86.18	2.427	123.850	3.483	0.0247	0.1081	0.0005	0.0075
n-Hexane	C_6H_{14}	8.610	4403.8	86.18	7.420	379.167	10.650	0.0754	0.3305	0.0015	0.0228
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	4.339	5100	100.2	4.348	221.289	6.240	0.0442	0.1936	0.0009	0.0134
Methylcyclohexane	C_7H_{14}	1.129	4863.6	98.188	1.109	54.910	1.591	0.0113	0.0494	0.0002	0.0034
Toluene	C_7H_8	0.152	4273.6	92.14	0.140	6.496	0.201	0.0014	0.0062	0.0000	0.0004
2-Methylhexane	C_7H_{16}	1.907	5092.2	100.204	1.911	97.108	2.743	0.0194	0.0851	0.0004	0.0059
3-Methylhexane	C_7H_{16}	1.421	5096	100.204	1.424	72.414	2.044	0.0145	0.0634	0.0003	0.0044
Xylenes	C_8H_{10}	0.096	4957	106.17	0.102	4.759	0.146	0.0010	0.0045	0.0000	0.0003
Ethylbenzene	C_8H_{10}	0.017	4970.5	106.17	0.018	0.845	0.026	0.0002	0.0008	0.0000	0.0001
Octanes +	C_8H_{18}	2.845	5796.1	114.231	3.250	164.899	4.664	0.0330	0.1447	0.0007	0.0100
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.747	6493.2	128.258	0.958	48.504	1.375	0.0097	0.0427	0.0002	0.0029
Decanes+	$C_{10}H_{22}$	0.184	7189.6	142.285	0.262	13.229	0.376	0.0027	0.0117	0.0001	0.0008
Undecanes+[3]	$C_{11}H_{24}$	0.021	7825.9	156.31	0.033	1.643	0.047	0.0003	0.0015	0.0000	0.0001
Hydrogen Sulfide	H_2S		586.8	34.08							
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		69.68	3548.82	100.00	0.7085	3.1031	0.0142	0.2141
TOTAL VOCs (C3+)		90.60			67.22	3426.66	96.48	0.6835	2.9938	0.0137	0.2066
TOTAL HAPs		13.10			10.98	542.98	15.76	0.1116	0.4890	0.0022	0.0337
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
TOTAL GREENHOUSE GAS (CH4 and CO2)		3.61			0.713	28.437	1.023	0.0072	0.0317	0.0001	0.0022

CHEVRON USA, INC. Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume[-1] (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)			
Propane Example	3.772	x	0.00263	x	92.73355505	x	0.04166667	=	0.0384	lb/hr

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0384	x	8760	x	0.0005	=	0.1680	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.0384	x	0.020	=	0.0008	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0008	x	8760	x	0.95	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0384	x	8760	x	0.05	x	0.0005	=	0.0116	tn/yr

CHEVRON USA, INC.

Date: 10/1/2011

VENT GAS QUANTIFICATION[1]

Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	Davidson-Matthews Comp. Station	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Condensate Tank 3	
Emission Point Name? (i.e., Tank 1 Vent)	Condensate Tank 3 Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKD3	
Vent Gas Stream?	Working & Breathing	
Vent Gas Flow Rate?[2]	92.73355505	scfd
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?	Flare	
Control Device ID (if applicable)?	FLR1	
Control Device Efficiency (if applicable)?	98	*(%, non-combustion devices only)*
Control Device On-Line Percentage?	95	*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.480	0	44.01	0.211		0.303	0.0021	0.0094	0.0000	0.0006
Nitrogen	N_2	0.000	0	28.01						0.0000	0.0000
Methane	CH_4	3.127	909.4	16.04	0.502	28.437	0.720	0.0051	0.0223	0.0001	0.0015
Ethane	C_2H_6	5.790	1618.7	30.07	1.741	93.723	2.499	0.0177	0.0775	0.0004	0.0054
Propane	C_3H_8	8.554	2314.9	44.1	3.772	198.017	5.414	0.0384	0.1680	0.0008	0.0116
iso-Butane	C_4H_{10}	5.937	3000.4	58.12	3.451	178.134	4.952	0.0351	0.1537	0.0007	0.0106
n-Butane	C_4H_{10}	15.890	3010.8	58.12	9.235	478.416	13.255	0.0939	0.4113	0.0019	0.0284
Cyclopentane	C_5H_{10}		3513.2	70.13							
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.025	3682.9	72.15	0.018	0.921	0.026	0.0002	0.0008	0.0000	0.0001
iso-Pentane	C_5H_{10}	9.383	3699	72.15	6.770	347.077	9.716	0.0688	0.3015	0.0014	0.0208
n-Pentane	C_5H_{12}	13.697	3706.9	72.15	9.882	507.734	14.183	0.1005	0.4401	0.0020	0.0304
Benzene	C_6H_6	4.225	3590.9	78.11	3.300	151.716	4.736	0.0336	0.1470	0.0007	0.0101
Cyclohexane	C_6H_{12}	0.897	4179.7	84.16	0.755	37.492	1.083	0.0077	0.0336	0.0002	0.0023
Methylcyclopentane	C_6H_{12}	0.393	4199	84.16	0.331	16.502	0.475	0.0034	0.0147	0.0001	0.0010
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.737	4384	86.18	0.635	32.310	0.912	0.0065	0.0283	0.0001	0.0020
2,3 Dimethylbutane	C_6H_{14}	0.952	4392.7	86.18	0.820	41.819	1.178	0.0083	0.0365	0.0002	0.0025
2 Methylpentane	C_6H_{14}	5.629	4395.2	86.18	4.851	247.406	6.962	0.0493	0.2160	0.0010	0.0149
3 Methylpentane	C_6H_{14}	2.816	4398.1	86.18	2.427	123.850	3.483	0.0247	0.1081	0.0005	0.0075
n-Hexane	C_6H_{14}	8.610	4403.8	86.18	7.420	379.167	10.650	0.0754	0.3305	0.0015	0.0228
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	4.339	5100	100.2	4.348	221.289	6.240	0.0442	0.1936	0.0009	0.0134
Methylcyclohexane	C_7H_{14}	1.129	4863.6	98.188	1.109	54.910	1.591	0.0113	0.0494	0.0002	0.0034
Toluene	C_7H_8	0.152	4273.6	92.14	0.140	6.496	0.201	0.0014	0.0062	0.0000	0.0004
2-Methylhexane	C_7H_{16}	1.907	5092.2	100.204	1.911	97.108	2.743	0.0194	0.0851	0.0004	0.0059
3-Methylhexane	C_7H_{16}	1.421	5096	100.204	1.424	72.414	2.044	0.0145	0.0634	0.0003	0.0044
Xylenes	C_8H_{10}	0.096	4957	106.17	0.102	4.759	0.146	0.0010	0.0045	0.0000	0.0003
Ethylbenzene	C_8H_{10}	0.017	4970.5	106.17	0.018	0.845	0.026	0.0002	0.0008	0.0000	0.0001
Octanes +	C_8H_{18}	2.845	5796.1	114.231	3.250	164.899	4.664	0.0330	0.1447	0.0007	0.0100
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.747	6493.2	128.258	0.958	48.504	1.375	0.0097	0.0427	0.0002	0.0029
Decanes+	$C_{10}H_{22}$	0.184	7189.6	142.285	0.262	13.229	0.376	0.0027	0.0117	0.0001	0.0008
Undecanes+[3]	$C_{11}H_{24}$	0.021	7825.9	156.31	0.033	1.643	0.047	0.0003	0.0015	0.0000	0.0001
Hydrogen Sulfide	H_2S		586.8	34.08							
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		69.68	3548.82	100.00	0.7085	3.1031	0.0142	0.2141
TOTAL VOCs (C3+)		90.60			67.22	3426.66	96.48	0.6835	2.9938	0.0137	0.2066
TOTAL HAPs		13.10			10.98	542.98	15.76	0.1116	0.4890	0.0022	0.0337
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
TOTAL GREENHOUSE GAS (CH4 and CO2)		3.61			0.713	28.437	1.023	0.0072	0.0317	0.0001	0.0022

CHEVRON USA, INC.

Date: 10/1/2011

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CALCULATION METHODOLOGY

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Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0384	x	8760	x	0.0005	=	0.1680	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.0384	x	0.020	=	0.0008	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0008	x	8760	x	0.95	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0384	x	8760	x	0.05	x	0.0005	=	0.0116	tn/yr

PRODUCED WATER TANKS

WORKING AND BREATHING EMISSIONS

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

Identification	
User Identification:	Davidson-Matthews Comp St-existing water tank
City:	Carthage
State:	Texas
Company:	Chevron USA Inc
Type of Tank:	Vertical Fixed Roof Tank
Description:	Existing water tank, 400 bbl, 20 ft. tall, 12 ft. diameter
Tank Dimensions	
Shell Height (ft):	20.00
Diameter (ft):	12.00
Liquid Height (ft) :	16.00
Avg. Liquid Height (ft):	10.00
Volume (gallons):	13,536.47
Turnovers:	150.96
Net Throughput(gal/yr):	2,043,489.00
Is Tank Heated (y/n):	N
Paint Characteristics	
Shell Color/Shade:	Gray/Light
Shell Condition	Good
Roof Color/Shade:	Gray/Light
Roof Condition:	Good
Roof Characteristics	
Type:	Cone
Height (ft)	1.00
Slope (ft/ft) (Cone Roof)	0.17
Breather Vent Settings	
Vacuum Settings (psig):	-0.03
Pressure Settings (psig)	0.22

Meterological Data used in Emissions Calculations: Shreveport, Louisiana (Avg Atmospheric Pressure = 14.62 psia)

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

Davidson-Matthews Comp St-existing water tank - Vertical Fixed Roof Tank
Carthage, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate (RVP 4.5274)	All	72.66	63.18	82.14	67.41	4.5274	4.0000	5.2500	69.5700			176.20	

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

Davidson-Matthews Comp St-existing water tank - Vertical Fixed Roof Tank
Carthage, Texas

Annual Emission Calcaulations	
Standing Losses (lb):	1,152.1533
Vapor Space Volume (cu ft):	1,168.6725
Vapor Density (lb/cu ft):	0.0551
Vapor Space Expansion Factor:	0.1704
Vented Vapor Saturation Factor:	0.2874
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,168.6725
Tank Diameter (ft):	12.0000
Vapor Space Outage (ft):	10.3333
Tank Shell Height (ft):	20.0000
Average Liquid Height (ft):	10.0000

Roof Outage (ft):	0.3333
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.3333
Roof Height (ft):	1.0000
Roof Slope (ft/ft):	0.1700
Shell Radius (ft):	6.0000
Vapor Density	
Vapor Density (lb/cu ft):	0.0551
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Daily Avg. Liquid Surface Temp. (deg. R):	532.3263
Daily Average Ambient Temp. (deg. F):	65.1667
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	527.0767
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,461.6100
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1704
Daily Vapor Temperature Range (deg. R):	37.9155
Daily Vapor Pressure Range (psia):	1.2500
Breather Vent Press. Setting Range(psia):	0.2490
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.2500
Daily Avg. Liquid Surface Temp. (deg R):	532.3263
Daily Min. Liquid Surface Temp. (deg R):	522.8474
Daily Max. Liquid Surface Temp. (deg R):	541.8052
Daily Ambient Temp. Range (deg. R):	21.9667
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.2874
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	4.5274
Vapor Space Outage (ft):	10.3333
Working Losses (lb):	4,199.6672
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Annual Net Throughput (gal/yr.):	2,043,489.0000
Annual Turnovers:	150.9617
Turnover Factor:	0.3654
Maximum Liquid Volume (gal):	13,536.4740
Maximum Liquid Height (ft):	16.0000
Tank Diameter (ft):	12.0000
Working Loss Product Factor:	0.7500
Total Losses (lb):	5,351.8205

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

Emissions Report for: Annual

Davidson-Matthews Comp St-existing water tank - Vertical Fixed Roof Tank
Carthage, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate (RVP 4.5274)	4,199.67	1,152.15	5,351.82

CHEVRON USA, INC.

Date: 10/1/2011

Chevron

VENT GAS QUANTIFICATION [1]

Version 3.1 10-07-2009

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Site/Location Name?	Davidson-Matthews Comp. Station		
County and State?	Panola County, Texas		
Emission Source? (i.e., Crude Oil Tank)	Water Tank 1		
Emission Point Name? (i.e., Tank 1 Vent)	Water Tank 1 Vent		
Emission Point ID? (i.e., TANK1VENT)	TANKDW1		
Vent Gas Stream?	Working & Breathing		
Vent Gas Flow Rate?[2]	0.800885124	scfd	
What is Molar Volume?	380	(scf/lb-mole, default is 379.5)	
Hours Vented?	8760	(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)	

Control Device Name (if applicable)?	Flare	
Control Device ID (if applicable)?	FLR1	
Control Device Efficiency (if applicable)?	98	(%, non-combustion devices only)
Control Device On-Line Percentage?	95	(%, default value is 0%)

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.480	0	44.01	0.211		0.303	0.0000	0.0001	0.0000	0.0000
Nitrogen	N_2	0.000	0	28.01						0.0000	0.0000
Methane	CH_4	3.127	909.4	16.04	0.502	28.437	0.720	0.0000	0.0002	0.0000	0.0000
Ethane	C_2H_6	5.790	1618.7	30.07	1.741	93.723	2.499	0.0002	0.0007	0.0000	0.0000
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iso-Pentane	C_5H_{10}	9.383	3699	72.15	6.770	347.077	9.716	0.0006	0.0026	0.0000	0.0002
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Cyclohexane	C_6H_{12}	0.897	4179.7	84.16	0.755	37.492	1.083	0.0001	0.0003	0.0000	0.0000
Methylcyclopentane	C_6H_{12}	0.393	4199	84.16	0.331	16.502	0.475	0.0000	0.0001	0.0000	0.0000
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.737	4384	86.18	0.635	32.310	0.912	0.0001	0.0002	0.0000	0.0000
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2 Methylpentane	C_6H_{14}	5.629	4395.2	86.18	4.851	247.406	6.962	0.0004	0.0019	0.0000	0.0001
3 Methylpentane	C_6H_{14}	2.816	4398.1	86.18	2.427	123.850	3.483	0.0002	0.0009	0.0000	0.0001
n-Hexane	C_6H_{14}	8.610	4403.8	86.18	7.420	379.167	10.650	0.0007	0.0029	0.0000	0.0002
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	4.339	5100	100.2	4.348	221.289	6.240	0.0004	0.0017	0.0000	0.0001
Methylcyclohexane	C_7H_{14}	1.129	4863.6	98.188	1.109	54.910	1.591	0.0001	0.0004	0.0000	0.0000
Toluene	C_7H_8	0.152	4273.6	92.14	0.140	6.496	0.201	0.0000	0.0001	0.0000	0.0000
2-Methylhexane	C_7H_{16}	1.907	5092.2	100.204	1.911	97.108	2.743	0.0002	0.0007	0.0000	0.0001
3-Methylhexane	C_7H_{16}	1.421	5096	100.204	1.424	72.414	2.044	0.0001	0.0005	0.0000	0.0000
Xylenes	C_8H_{10}	0.096	4957	106.17	0.102	4.759	0.146	0.0000	0.0000	0.0000	0.0000
Ethylbenzene	C_8H_{10}	0.017	4970.5	106.17	0.018	0.845	0.026	0.0000	0.0000	0.0000	0.0000
Octanes +	C_8H_{18}	2.845	5796.1	114.231	3.250	164.899	4.664	0.0003	0.0013	0.0000	0.0001
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.747	6493.2	128.258	0.958	48.504	1.375	0.0001	0.0004	0.0000	0.0000
Decanes+	$C_{10}H_{22}$	0.184	7189.6	142.285	0.262	13.229	0.376	0.0000	0.0001	0.0000	0.0000
Undecanes+[3]	$C_{11}H_{24}$	0.021	7825.9	156.31	0.033	1.643	0.047	0.0000	0.0000	0.0000	0.0000
Hydrogen Sulfide	H_2S		586.8	34.08							
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		69.68	3548.82	100.00	0.0061	0.0268	0.0001	0.0018
TOTAL VOCs (C3+)		90.60			67.22	3426.66	96.48	0.0059	0.0259	0.0001	0.0018
TOTAL HAPs		13.10			10.98	542.98	15.76	0.0010	0.0042	0.0000	0.0003
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
TOTAL GREENHOUSE GAS (CH4 and CO2)		3.61			0.713	28.437	1.023	0.0001	0.0003	0.0000	0.0000

CHEVRON USA, INC.

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[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume^{-1} (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)				
Propane Example	3.772	x	0.00263	x	0.800885124	x	0.04166667	=	0.0003	lb/hr	

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0003	x	8760	x	0.0005	=	0.0015	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.0003	x	0.020	=	0.0000	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0000	x	8760	x	0.95	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0003	x	8760	x	0.05	x	0.0005	=	0.0001	tn/yr

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

Identification		
User Identification:	Davidson-Matthews Comp St-new water tank	
City:	Carthage	
State:	Texas	
Company:	Chevron USA Inc	
Type of Tank:	Vertical Fixed Roof Tank	
Description:	New water tank, 500 bbl, 16 ft. tall, 15.5 ft. diameter	
Tank Dimensions		
Shell Height (ft):		16.00
Diameter (ft):		15.50
Liquid Height (ft) :		12.00
Avg. Liquid Height (ft):		8.00
Volume (gallons):		16,938.22
Turnovers:		150.87
Net Throughput(gal/yr):		2,555,511.00
Is Tank Heated (y/n):	N	
Paint Characteristics		
Shell Color/Shade:	Gray/Light	
Shell Condition	Good	
Roof Color/Shade:	Gray/Light	
Roof Condition:	Good	
Roof Characteristics		
Type:	Cone	
Height (ft)		1.00
Slope (ft/ft) (Cone Roof)		0.13
Breather Vent Settings		
Vacuum Settings (psig):		-0.03
Pressure Settings (psig)		0.22

Meterological Data used in Emissions Calculations: Shreveport, Louisiana (Avg Atmospheric Pressure = 14.62 psia)

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

Davidson-Matthews Comp St-new water tank - Vertical Fixed Roof Tank
Carthage, Texas

Mixture/Component	Month	Daily Liquid Surf. Temperature (deg F) Avg.	Min.	Max.	Liquid Bulk Temp (deg F)	Vapor Pressure (psia) Avg.	Min.	Max.	Vapor Mol. Weight.	Liquid Mass Fract.	Vapor Mass Fract.	Mol. Weight	Basis for Vapor Pressure Calculations
Condensate (RVP 4.5274)	All	72.66	63.18	82.14	67.41	4.5274	4.0000	5.2500	69.5700			176.20	

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

Davidson-Matthews Comp St-new water tank - Vertical Fixed Roof Tank
Carthage, Texas

Annual Emission Calcaulations	
Standing Losses (lb):	1,798.2229
Vapor Space Volume (cu ft):	1,572.4326
Vapor Density (lb/cu ft):	0.0551
Vapor Space Expansion Factor:	0.1704
Vented Vapor Saturation Factor:	0.3334
Tank Vapor Space Volume:	
Vapor Space Volume (cu ft):	1,572.4326
Tank Diameter (ft):	15.5000
Vapor Space Outage (ft):	8.3333
Tank Shell Height (ft):	16.0000
Average Liquid Height (ft):	8.0000

Roof Outage (ft):	0.3333
Roof Outage (Cone Roof)	
Roof Outage (ft):	0.3333
Roof Height (ft):	1.0000
Roof Slope (ft/ft):	0.1300
Shell Radius (ft):	7.7500
Vapor Density	
Vapor Density (lb/cu ft):	0.0551
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Daily Avg. Liquid Surface Temp. (deg. R):	532.3263
Daily Average Ambient Temp. (deg. F):	65.1667
Ideal Gas Constant R (psia cuft / (lb-mol-deg R)):	10.731
Liquid Bulk Temperature (deg. R):	527.0767
Tank Paint Solar Absorptance (Shell):	0.5400
Tank Paint Solar Absorptance (Roof):	0.5400
Daily Total Solar Insulation Factor (Btu/sqft day):	1,461.6100
Vapor Space Expansion Factor	
Vapor Space Expansion Factor:	0.1704
Daily Vapor Temperature Range (deg. R):	37.9155
Daily Vapor Pressure Range (psia):	1.2500
Breather Vent Press. Setting Range(psia):	0.2490
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Vapor Pressure at Daily Minimum Liquid Surface Temperature (psia):	4.0000
Vapor Pressure at Daily Maximum Liquid Surface Temperature (psia):	5.2500
Daily Avg. Liquid Surface Temp. (deg R):	532.3263
Daily Min. Liquid Surface Temp. (deg R):	522.8474
Daily Max. Liquid Surface Temp. (deg R):	541.8052
Daily Ambient Temp. Range (deg. R):	21.9667
Vented Vapor Saturation Factor	
Vented Vapor Saturation Factor:	0.3334
Vapor Pressure at Daily Average Liquid: Surface Temperature (psia):	4.5274
Vapor Space Outage (ft):	8.3333
Working Losses (lb):	5,253.6358
Vapor Molecular Weight (lb/lb-mole):	69.5700
Vapor Pressure at Daily Average Liquid Surface Temperature (psia):	4.5274
Annual Net Throughput (gal/yr.):	2,555,511.0000
Annual Turnovers:	150.8725
Turnover Factor:	0.3655
Maximum Liquid Volume (gal):	16,938.2181
Maximum Liquid Height (ft):	12.0000
Tank Diameter (ft):	15.5000
Working Loss Product Factor:	0.7500
Total Losses (lb):	7,051.8587

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

Emissions Report for: Annual

Davidson-Matthews Comp St-new water tank - Vertical Fixed Roof Tank
Carthage, Texas

	Losses(lbs)		
Components	Working Loss	Breathing Loss	Total Emissions
Condensate (RVP 4.5274)	5,253.64	1,798.22	7,051.86

CHEVRON USA, INC.

Date: 10/1/2011

Chevron

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

Site/Location Name?	Davidson-Matthews Comp. Station	
County and State?	Panola County, Texas	
Emission Source? (i.e., Crude Oil Tank)	Water Tank 2	
Emission Point Name? (i.e., Tank 1 Vent)	Water Tank 2 Vent	
Emission Point ID? (i.e., TANK1VENT)	TANKDW2	
Vent Gas Stream?	Working & Breathing	
Vent Gas Flow Rate?[2]	1.055291428	scfd
What is Molar Volume?	380	*(scf/lb-mole, default is 379.5)*
Hours Vented?	8760	*(use 8,760 hr for annual emission estimate or actual hours for emission event or part-time venting)*

Control Device Name (if applicable)?	Flare	
Control Device ID (if applicable)?	FLR1	
Control Device Efficiency (if applicable)?	98	*(%, non-combustion devices only)*
Control Device On-Line Percentage?	95	*(%, default value is 0%)*

VENT GAS EMISSIONS

Vent Gas Component	Formula	Mole %	LHV (btu/scf)	Molecular Wt. (lb/lb-mole)	Net Molecular Wt. (lb/lb-mole)	Net LHV (btu/scf)	Molecular Weight %	Uncontrolled Vent Emissions (lb/hr)	Uncontrolled Vent Emissions (tn/yr)	Controlled Actual Estimated Vent Emissions[4] (lb/hr)	Controlled Actual Estimated Vent Emissions[4] (tn/yr)
Carbon Dioxide	CO_2	0.480	0	44.01	0.211		0.303	0.0000	0.0001	0.0000	0.0000
Nitrogen	N_2	0.000	0	28.01						0.0000	0.0000
Methane	CH_4	3.127	909.4	16.04	0.502	28.437	0.720	0.0001	0.0003	0.0000	0.0000
Ethane	C_2H_6	5.790	1618.7	30.07	1.741	93.723	2.499	0.0002	0.0009	0.0000	0.0001
Propane	C_3H_8	8.554	2314.9	44.1	3.772	198.017	5.414	0.0004	0.0019	0.0000	0.0001
iso-Butane	C_4H_{10}	5.937	3000.4	58.12	3.451	178.134	4.952	0.0004	0.0017	0.0000	0.0001
n-Butane	C_4H_{10}	15.890	3010.8	58.12	9.235	478.416	13.255	0.0011	0.0047	0.0000	0.0003
Cyclopentane	C_5H_{10}		3513.2	70.13							
Neopentane (2,2, Dimethylpropane)	C_5H_{10}	0.025	3682.9	72.15	0.018	0.921	0.026	0.0000	0.0000	0.0000	0.0000
iso-Pentane	C_5H_{10}	9.383	3699	72.15	6.770	347.077	9.716	0.0008	0.0034	0.0000	0.0002
n-Pentane	C_5H_{12}	13.697	3706.9	72.15	9.882	507.734	14.183	0.0011	0.0050	0.0000	0.0003
Benzene	C_6H_6	4.225	3590.9	78.11	3.300	151.716	4.736	0.0004	0.0017	0.0000	0.0001
Cyclohexane	C_6H_{12}	0.897	4179.7	84.16	0.755	37.492	1.083	0.0001	0.0004	0.0000	0.0000
Methylcyclopentane	C_6H_{12}	0.393	4199	84.16	0.331	16.502	0.475	0.0000	0.0002	0.0000	0.0000
Neohexane (2,2, Dimethylbutane)	C_6H_{14}	0.737	4384	86.18	0.635	32.310	0.912	0.0001	0.0003	0.0000	0.0000
2,3 Dimethylbutane	C_6H_{14}	0.952	4392.7	86.18	0.820	41.819	1.178	0.0001	0.0004	0.0000	0.0000
2 Methylpentane	C_6H_{14}	5.629	4395.2	86.18	4.851	247.406	6.962	0.0006	0.0025	0.0000	0.0002
3 Methylpentane	C_6H_{14}	2.816	4398.1	86.18	2.427	123.850	3.483	0.0003	0.0012	0.0000	0.0001
n-Hexane	C_6H_{14}	8.610	4403.8	86.18	7.420	379.167	10.650	0.0009	0.0038	0.0000	0.0003
Hexanes +	C_6H_{14}		4403.8	86.18							
Heptanes +	C_7H_{16}	4.339	5100	100.2	4.348	221.289	6.240	0.0005	0.0022	0.0000	0.0002
Methylcyclohexane	C_7H_{14}	1.129	4863.6	98.188	1.109	54.910	1.591	0.0001	0.0006	0.0000	0.0000
Toluene	C_7H_8	0.152	4273.6	92.14	0.140	6.496	0.201	0.0000	0.0001	0.0000	0.0000
2-Methylhexane	C_7H_{16}	1.907	5092.2	100.204	1.911	97.108	2.743	0.0002	0.0010	0.0000	0.0001
3-Methylhexane	C_7H_{16}	1.421	5096	100.204	1.424	72.414	2.044	0.0002	0.0007	0.0000	0.0000
Xylenes	C_8H_{10}	0.096	4957	106.17	0.102	4.759	0.146	0.0000	0.0001	0.0000	0.0000
Ethylbenzene	C_8H_{10}	0.017	4970.5	106.17	0.018	0.845	0.026	0.0000	0.0000	0.0000	0.0000
Octanes +	C_8H_{18}	2.845	5796.1	114.231	3.250	164.899	4.664	0.0004	0.0016	0.0000	0.0001
iso-Octane (2,2,4 Trimethylpentane)	C_8H_{18}		5778.8	114.231							
Nonanes+	C_9H_{20}	0.747	6493.2	128.258	0.958	48.504	1.375	0.0001	0.0005	0.0000	0.0000
Decanes+	$C_{10}H_{22}$	0.184	7189.6	142.285	0.262	13.229	0.376	0.0000	0.0001	0.0000	0.0000
Undecanes+[3]	$C_{11}H_{24}$	0.021	7825.9	156.31	0.033	1.643	0.047	0.0000	0.0000	0.0000	0.0000
Hydrogen Sulfide	H_2S		586.8	34.08							
Sulfur Dioxide	SO_2		0	64.065							
Nitrogen Oxides (as NO_2)	NO_2		0	46.05							
Carbon Monoxide	CO		320.5	28.01							
Water	H_2O		0	18.02							
Oxygen	O_2		0	32							
Totals		100.00	(must equal 100)		69.68	3548.82	100.00	0.0081	0.0353	0.0002	0.0024
TOTAL VOCs (C3+)		90.60			67.22	3426.66	96.48	0.0078	0.0341	0.0002	0.0024
TOTAL HAPs		13.10			10.98	542.98	15.76	0.0013	0.0056	0.0000	0.0004
TOTAL H2S		0.00			0.00	0.00	0.00	0.0000	0.0000	0.0000	0.0000
TOTAL GREENHOUSE GAS (CH4 and CO2)		3.61			0.713	28.437	1.023	0.0001	0.0004	0.0000	0.0000

CHEVRON USA, INC. Date: 10/1/2011

VENT GAS QUANTIFICATION [1]
Version 3.1 10-07-2009

Note: This spreadsheet can be used to quantify and speciate emissions from vent sources and post-combustion sources only. It is not designed to calculate products of combustion.

NOTES:

[1]Vent Gas Calculation requires vent gas analysis obtained from actual sample or from simulation such as EP Tanks.
[2]Vent gas flow rate is obtained from direct measurement, derived from laboratory or calculated GOR, or obtained from simulation such as EP Tanks.
[3]Default molecular weight from National Institute of Standards and Technology. Use actual molecular weight when available as results can vary significantly.
[4]The Controlled Actual Estimated Vent Emissions lb/hr rate shown is based on the control device efficiency. The "equivalent" tn/yr rate shown incorporates both control device efficiency and control device on-line percent.

CALCULATION METHODOLOGY

Uncontrolled Hourly Rate:	Net MW (lb/lb-mole)	x	Molar Volume^{-1} (lb-mole/scf)	x	Flow Rate scfd	x	Conv. Factor (to hours)				
Propane Example	3.772	x	0.00263	x	1.055291428	x	0.04166667	=	0.0004	lb/hr	

Uncontrolled Ton/Year Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Conversion (1 tn/2000 lb)			
Propane Example	0.0004	x	8760	x	0.0005	=	0.0019	tn/yr

Controlled Hourly Rate:	Uncontrolled Hourly Rate (lb/hr)	x	Control Efficiency 1-(% eff/100)			
Propane Example	0.0004	x	0.020	=	0.0000	lb/hr

Controlled Ton/Year Rate:	Controlled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	Ctrl Device Online Fraction (%/100)	x	Conversion (1 tn/2000 lb)	+		
Propane Example	0.0000	x	8760	x	0.95	x	0.0005	+		
	Uncontrolled Hourly Rate (lb/hr)	x	Hours Vented (hr)	x	1-Ctrl Device Online Fraction 1-(%/100)	x	Conversion (1 tn/2000 lb)			
Propane Example (continued)	0.0004	x	8760	x	0.05	x	0.0005	=	0.0001	tn/yr

TRUCK LOADING EMISSIONS

Caveat: *Works only for Reid Vapor Pressure of crude oil between 2 and 15 psi.*

Enter:

RVP =	5.31	psi	Enter the Reid Vapor Pressure in psi.
Temp =	80	F	Enter the Temperature in Fahrenheit.

P_v = 4.527379 psi

Source of equation:
http://www.epa.gov/ttn/chief/ap42/ch07/final/c07s01.pdf Page 56

May 16, 2011

FESCO, Ltd.
1100 Fesco Avenue - Alice, Texas 78332
361-661-7015

FESCO PETROLEUM ENGINEERS

For: Chevron

Date Sampled: 03/18/2011

Date Analyzed: 05/03/2011

Job Number: J11807

Sample: Mae A. Sealy "A" No. 3

FLASH LIBERATION OF HYDROCARBON LIQUID					
	1st Stage Separator	2nd Stage Separator	3rd Stage Separator	Stock Tank	Total
Pressure, psig	132	100	30	0	-----
Temperature, °F	70	100	85	70	-----
Gas Oil Ratio (1)	------	12	18	7	36
Gas Specific Gravity (2)	------	0.933	1.266	1.132	-----
Separator Volume Factor (3)	1.0205	------	------	1.000	------

STOCK TANK FLUID PROPERTIES & SHRINKAGE FACTORS	
Shrinkage Recovery Factor (4)	0.9799
Oil API Garvity at 60 °F	42.80
Reid Vapor Pressure, psi (5)	5.31

QUALITY CONTROL CHECK			
	Sampling Conditions	Test Sample	
Cylinder Number	------	W-112*	W-803
Pressure, psig	132	146	136
Temperature, °F	70	64	64

(1) - Scf of flashed vapor per barrel of stock tank oil
(2) - Air = 1.000
(3) - Separator Volume / Stock Tank volume
(4) - Fraction of first stsge liquid
(5) - Absolute Pressure at 100 deg F
Analyst: D. V.
* Sampled used For Flash Study

Base Conditions: 14.65 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

David Dannhaus 361-661-7015

April 27, 2011

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

For: Chevron North America Exploration and Production Company
P. O. Box 337
Cayuga, Texas 75832-0337

Sample: Mae A. Sealy "A" No. 3
Gas Evolved from Hydrocarbon Liquid Flashed
From 30 psig & 85 °F to 0 psig & 70 °F

Date Sampled: 03/18/2011 Job Number: 11807.031

CHROMATOGRAPH EXTENDED ANALYSIS - SUMMATION REPORT

COMPONENT	MOL%	GPM
Hydrogen Sulfide*	< 0.001	
Nitrogen	0.995	
Carbon Dioxide	0.479	
Methane	44.520	
Ethane	25.361	6.744
Propane	10.635	2.913
Isobutane	3.754	1.221
n-Butane	4.701	1.474
2-2 Dimethylpropane	0.169	0.064
Isopentane	1.988	0.723
n-Pentane	2.419	0.872
Hexanes	2.701	1.107
Heptanes Plus	2.278	0.779
Totals	100.000	15.898

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.034	(Air=1)
Molecular Weight	87.02	
Gross Heating Value	4372	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.132	(Air=1)
Compressibility (Z)	0.9902	
Molecular Weight	32.47	
Gross Heating Value		
Dry Basis	1866	BTU/CF
Saturated Basis	1834	BTU/CF

*Hydrogen Sulfide tested in laboratory by Stained Tube Method (GPA 2377)
Results: <0.013 Gr/100 CF, <0.2 PPMV or <0.001 Mol %

Base Conditions: 14.650 PSI & 60 Deg F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: PB
Processor: MRF
Cylinder ID: FL-6

David Dannhaus 361-661-7015

CHROMATOGRAPH EXTENDED ANALYSIS
TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Hydrogen Sulfide*	< 0.001		< 0.001
Nitrogen	0.995		0.858
Carbon Dioxide	0.479		0.649
Methane	44.520		21.998
Ethane	25.361	6.744	23.485
Propane	10.635	2.913	14.442
Isobutane	3.754	1.221	6.720
n-Butane	4.701	1.474	8.415
2,2 Dimethylpropane	0.169	0.064	0.376
Isopentane	1.988	0.723	4.417
n-Pentane	2.419	0.872	5.375
2,2 Dimethylbutane	0.251	0.104	0.666
Cyclopentane	0.014	0.006	0.030
2,3 Dimethylbutane	0.148	0.060	0.393
2 Methylpentane	0.670	0.277	1.778
3 Methylpentane	0.368	0.149	0.977
n-Hexane	1.250	0.511	3.317
Methylcyclopentane	0.066	0.023	0.171
Benzene	1.283	0.357	3.086
Cyclohexane	0.129	0.044	0.334
2-Methylhexane	0.171	0.079	0.528
3-Methylhexane	0.005	0.002	0.015
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C7's	0.283	0.122	0.865
n-Heptane	0.133	0.061	0.410
Methylcyclohexane	0.046	0.018	0.139
Toluene	0.035	0.012	0.099
Other C8's	0.060	0.028	0.204
n-Octane	0.020	0.010	0.070
Ethylbenzene	0.003	0.001	0.010
M & P Xylenes	0.010	0.004	0.033
O-Xylene	0.002	0.001	0.007
Other C9's	0.016	0.008	0.062
n-Nonane	0.004	0.002	0.016
Other C10's	0.005	0.003	0.022
n-Decane	0.001	0.001	0.004
Undecanes (11)	0.006	0.004	0.029
Totals	100.000	15.898	100.000

Computed Real Characteristics Of Total Sample:

Specific Gravity	1.132	(Air=1)
Compressibility (Z)	0.9902	
Molecular Weight	32.47	
Gross Heating Value		
Dry Basis	1866	BTU/CF
Saturated Basis	1834	BTU/CF

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

14-Sep-06

For: Chevron North America Exploration and Production Company
P.O. Box 36366
Houston, Texas 77236-6366

Sample: Werner Clarence No. 6
Breathing Vapors
Gas Evolved From Hydrcarbon Liquid Flashed
From 0 PSIG & 70°F to 0 PSIG & 100°F

Date Sampled: 08/30/2006

Job Number: 64718.008

CHROMATOGRAPH EXTENDED ANALYSIS - SUMMATION REPORT

COMPONENT	MOL%	GPM
Nitrogen	0	
Carbon Dioxide	0.48	
Methane	3.127	
Ethane	5.79	1.54
Propane	8.554	2.344
Isobutane	5.937	1.932
n-Butane	15.89	4.983
2-2 Dimethylpropane	0.025	0.009
Isopentane	9.383	3.416
n-Pentane	13.697	4.934
Hexanes	18.744	7.681
Heptanes Plus	18.373	7.503
Totals	100	34.342

Computed Real Characteristics Of Heptanes Plus:

Specific Gravity	3.527	(Air=1)
Molecular Weight	97.06	
Gross Heating Value	5045	BTU/CF

Computed Real Characteristics Of Total Sample:

Specific Gravity	2.528	(Air=1)
Compressibility (Z)	0.9502	
Molecular Weight	69.57	
Gross Heating Value		
Dry Basis	3994	BTU/CF
Saturated Basis	3925	BTU/CF

Base Conditions: 14.650 PSI & 60 Deg F

CHROMATOGRAPH EXTENDED ANALYSIS   Job Number: 64718.008

TOTAL REPORT

COMPONENT	MOL %	GPM	WT %
Nitrogen	0		0
Carbon Dioxide	0.48		0.304
Methane	3.127		0.722
Ethane	5.79	1.54	2.503
Propane	8.554	2.344	5.422
Isobutane	5.937	1.932	4.96
n-Butane	15.89	4.983	13.276
2,2 Dimethylpropane	0.025	0.009	0.026
Isopentane	9.383	3.416	9.731
n-Pentane	13.697	4.934	14.205
2,2 Dimethylbutane	0.737	0.306	0.913
Cyclopentane	0	0	0
2,3 Dimethylbutane	0.952	0.388	1.179
2 Methylpentane	5.629	2.323	6.973
3 Methylpentane	2.816	1.143	3.488
n-Hexane	8.61	3.521	10.666
Methylcyclopentane	0.393	0.135	0.475
Benzene	4.225	1.176	4.744
Cyclohexane	0.897	0.304	1.085
2-Methylhexane	1.907	0.881	2.747
3-Methylhexane	1.421	0.644	2.047
2,2,4 Trimethylpentane	0	0	0
Other C7's	1.223	0.529	1.744
n-Heptane	3.116	1.429	4.488
Methylcyclohexane	1.129	0.451	1.593
Toluene	0.152	0.051	0.201
Other C8's	2.034	0.941	3.222
n-Octane	0.811	0.413	1.332
Ethylbenzene	0.017	0.007	0.026
M & P Xylenes	0.079	0.03	0.121
O-Xylene	0.017	0.007	0.026
Other C9's	0.57	0.288	1.034
n-Nonane	0.177	0.099	0.326
Other C10's	0.157	0.091	0.319
n-Decane	0.027	0.016	0.055
Undecanes Plus	0.021	0.013	0.047
Totals	100	34.342	100

Computed Real Characteristics of Total Sample

Specific Gravity ---------------------- 2.528 (Air=1)

Compressibility (Z) ------------------ 0.9502

Molecular Weight -------------------- 69.57

Gross Heating Value

Dry Basis -------------------------- 3994 BTU/CF

Saturated Basis ------------------ 3925 BTU/CF

SOUTHERN PETROLEUM LABORATORIES, INC.

Certificate of Analysis No. C-64520

Company:	TEXACO E & P, INC.
Meter Number:	1525H
Location:	MATTHEWS S.E. #11
Field:	CARTHAGE
Sample point:	FULL SCALE SEPARATOR METER RUN
Sample of:	FULL SCALE SEPARATOR GAS
Conditions:	231 psig at 84 deg. F.
Sampled by:	BLANTON RICH
Sample date:	08/14/97

AUGUST 18, 1997

Analysis:

	Mol %	GPM at 14.650 psia
Nitrogen	0.21	
Carbon dioxide	1.26	
Methane	86.47	
Ethane	7.21	1.918
Propane	2.36	0.647
Iso-butane	0.60	0.195
N-butane	0.70	0.220
Iso-pentane	0.35	0.127
N-pentane	0.20	0.072
Hexanes	0.31	0.127
Heptanes plus	0.33	0.159
	100.00	3.465

Specific Gravity at 60 deg.F. (air=1) 0.6739

Calculated B.T.U./cu. ft. @ 14.650 psia and 60 deg.F.

Dry basis 1159

Wet basis 1139

Z factor 0.9970

Southern Petroleum Laboratories, Inc.

JOE WOOLEY

1- 87

March 16, 2011

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

For: Chevron North America Exploration and Production Company
P. O. Box 337
Cayuga, Texas 75832-0337

Sample: Hicks No. 6
High Pressure Separator Hydrocarbon Liquid
Sampled @ 150 psig & 64°F

Date Sampled: 02/28/2011

Job Number: 11229.002

CHROMATOGRAPH EXTENDED ANALYSIS - SUMMATION REPORT

COMPONENT	MOL %	LIQ VOL %	WT %
Nitrogen	0.038	0.006	0.006
Carbon Dioxide	0.105	0.026	0.026
Methane	5.072	1.232	0.462
Ethane	1.957	0.750	0.334
Propane	1.852	0.731	0.464
Isobutane	1.151	0.540	0.380
n-Butane	2.163	0.977	0.713
2,2 Dimethylpropane	0.025	0.014	0.010
Isopentane	1.744	0.914	0.714
n-Pentane	2.331	1.211	0.955
2,2 Dimethylbutane	0.193	0.115	0.094
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.268	0.157	0.131
2 Methylpentane	1.220	0.726	0.597
3 Methylpentane	0.727	0.425	0.356
n-Hexane	2.307	1.359	1.128
Heptanes Plus	78.848	90.816	93.630
Totals:	100.000	100.000	100.000

Characteristics of Heptanes Plus:

Specific Gravity -------------------------------	0.8248	(Water=1)
°API Gravity -----------------------------------	40.05	@ 60°F
Molecular Weight ----------------------------	209.2	
Vapor Volume ---------------------------------	12.51	CF/Gal
Weight --	6.87	Lbs/Gal

Characteristics of Total Sample:

Specific Gravity -------------------------------	0.8000	(Water=1)
°API Gravity -----------------------------------	45.36	@ 60°F
Molecular Weight-----------------------------	176.2	
Vapor Volume ---------------------------------	14.41	CF/Gal
Weight --	6.67	Lbs/Gal

Base Conditions: 14.650 PSI & 60 °F

Certified: FESCO, Ltd. - Alice, Texas

Analyst: LAW
Processor: LAWdjv
Cylinder ID: W-111

David Dannhaus 361-661-7015

FESCO, Ltd. Job Number: 11229.002

TOTAL EXTENDED REPORT

COMPONENT	Mol %	LiqVol %	Wt %
Nitrogen	0.038	0.006	0.006
Carbon Dioxide	0.105	0.026	0.026
Methane	5.072	1.232	0.462
Ethane	1.957	0.750	0.334
Propane	1.852	0.731	0.464
Isobutane	1.151	0.540	0.380
n-Butane	2.163	0.977	0.713
2,2 Dimethylpropane	0.025	0.014	0.010
Isopentane	1.744	0.914	0.714
n-Pentane	2.331	1.211	0.955
2,2 Dimethylbutane	0.193	0.115	0.094
Cyclopentane	0.000	0.000	0.000
2,3 Dimethylbutane	0.268	0.157	0.131
2 Methylpentane	1.220	0.726	0.597
3 Methylpentane	0.727	0.425	0.356
n-Hexane	2.307	1.359	1.128
Methylcyclopentane	0.219	0.111	0.105
Benzene	2.949	1.183	1.308
Cyclohexane	0.634	0.309	0.303
2-Methylhexane	0.914	0.609	0.520
3-Methylhexane	0.930	0.612	0.529
2,2,4 Trimethylpentane	0.000	0.000	0.000
Other C-7's	1.109	0.712	0.624
n-Heptane	1.985	1.312	1.129
Methylcyclohexane	0.960	0.553	0.535
Toluene	0.769	0.369	0.402
Other C-8's	4.608	3.189	2.883
n-Octane	2.390	1.754	1.549
E-Benzene	0.342	0.189	0.206
M & P Xylenes	0.646	0.359	0.389
O-Xylene	0.591	0.322	0.356
Other C-9's	3.789	2.928	2.715
n-Nonane	1.792	1.445	1.305
Other C-10's	4.366	3.708	3.501
n-decane	1.612	1.418	1.302
Undecanes(11)	5.065	4.414	4.226
Dodecanes(12)	4.506	4.242	4.118
Tridecanes(13)	4.448	4.489	4.418
Tetradecanes(14)	3.936	4.255	4.245
Pentadecanes(15)	3.655	4.233	4.274
Hexadecanes(16)	3.044	3.767	3.836
Heptadecanes(17)	2.732	3.575	3.675
Octadecanes(18)	2.593	3.572	3.694
Nonadecanes(19)	2.240	3.216	3.345
Eicosanes(20)	1.864	2.782	2.910
Heneicosanes(21)	1.572	2.468	2.597
Docosanes(22)	1.393	2.279	2.411
Tricosanes(23)	1.227	2.081	2.215
Tetracosanes(24)	1.082	1.902	2.034
Pentacosanes(25)	0.956	1.743	1.872
Hexacosanes(26)	0.910	1.720	1.855
Heptacosanes(27)	0.780	1.528	1.656
Octacosanes(28)	0.769	1.558	1.694
Nonacosanes(29)	0.763	1.596	1.741
Triacontanes(30)	0.607	1.309	1.433
Hentriacontanes Plus(31+)	4.102	13.005	15.719
Total	100.000	100.000	100.000

PETROLEUM LIQUID LOADING LOSS CALCULATION[1]

VERSION 2.01

Chevron

Facility Name: **S.E. Matthews A1 Tank Battery**

Product Loaded: **Condensate** True Vapor Pressure: **4.5274** psia MW: **69.57** lb/lb-mole

Loading Method: **Submerged Loading - Dedicated Tank Truck in Normal Service**

Bulk Loaded Liquid Temperature: **80** deg F

Vapor Recovery System Efficiency, if any: *(90 - 99+ % is typical)*

EMISSION CALCULATION

Loading Losses = (12.46*S*P*M/T)(1-eff/100)

where:

S=Saturation factor (Table 5.2-1)	=	**0.6**
P=True vapor pressure (psia)	=	**4.5274**
M=Molecular weight of vapors (lb/lb-mol)	=	**69.57**
T=Temperature (deg. R)	=	**540**
Calculated Loading Loss (lb/Mgal loaded)	=	**4.3606**
10^3 gallons loaded		**78**
Losses (lb/yr) = (Loading loss) * (10^3 gallons loaded / yr)	=	**341**
Losses (TPY)	=	**0.1705**

Total Loading Losses = 0.17 TPY

hourly loading rate = 7,800 gal/hr
annual " " = 78,000 gallons

lb/hr = 34.01
tpy = 0.17 HC

[1]Methodology used for calculations is AP-42, Chapter 5.2, June 2008.
[2]True Vapor Pressure obtained from AP-42, Table 7.1-2, November 2006.

S.E. Mathews A1 Tank Battery
Loading losses speciation and HAPs

EPN:	LOADA1
Condensate tanks loading losses	
Annual HC emissions (tpy):	0.1705

5 bbl/day x 365day/1yr x 42gal/1bbl = 76650

Truck loading duration (min.):	30	
Capacity of truck (bbl):	170	
Condensate throughput (bcpd):	5	
Truck loads per year:	10	(=Daily throughput*365/capacity of truck)
lbs. HCs per truck load:	34.1000	(=2000*Annual VOC emissions/#Truck loads)
lbs. HCs per hour:	**68.2000**	

		mol % of breathing vapors	mol % of total VOCs	MW (lb/lb-mol)	MW, normalized	wt % of total VOCs	tpy	lbs/hr
Carbon Dioxide	CO2	0.480						
Nitrogen	N2	0.000						
Methane	CH4	3.127						
Ethane	C2H6	5.790						
Propane	C3H8	8.554	9.441	44.10	416.356	5.612	0.010	3.827
iso-Butane	C4H10	5.937	6.553	58.12	380.847	5.133	0.009	3.501
n-Butane	C4H10	15.890	17.538	58.12	1019.312	13.739	0.023	9.370
Cyclopentane	C5H10			70.13				
Neopentane (2,2, Dimethylpropane)	C5H10	0.025	0.028	72.15	1.991	0.027	0.000	0.018
iso-Pentane	C5H10	9.383	10.356	72.15	747.198	10.071	0.017	6.868
n-Pentane	C5H12	13.697	15.118	72.15	1090.735	14.701	0.025	10.026
Benzene	C6H6	4.225	4.663	78.11	364.243	4.909	0.008	3.348
Cyclohexane	C6H12	0.897	0.990	84.16	83.321	1.123	0.002	0.766
Methylcyclopentane	C6H12	0.393	0.434	84.16	36.505	0.492	0.001	0.336
Neohexane (2,2, Dimethylbutane)	C6H14	0.737	0.813	86.18	70.102	0.945	0.002	0.644

2,3 Dimethylbutane	C6H14	0.952	1.051	86.18	90.553	1.220	0.002	0.832
2 Methylpentane	C6H14	5.629	6.213	86.18	535.421	7.217	0.012	4.922
3 Methylpentane	C6H14	2.816	3.108	86.18	267.853	3.610	0.006	2.462
n-Hexane	C6H14	8.610	9.503	86.18	818.968	11.038	0.019	7.528
Hexanes +	C6H14			86.18				
Heptanes +	C7H16	4.339	4.789	100.20	479.860	6.468	0.011	4.411
Methylcyclohexane	C7H14	1.129	1.246	98.19	122.352	1.649	0.003	1.125
Toluene	C7H8	0.152	0.168	92.14	15.458	0.208	0.000	0.142
2-Methylhexane	C7H16	1.907	2.105	100.20	210.908	2.843	0.005	1.939
3-Methylhexane	C7H16	1.421	1.568	100.20	157.158	2.118	0.004	1.445
Xylenes	C8H10	0.096	0.106	106.17	11.249	0.152	0.000	0.103
Ethylbenzene	C8H10	0.017	0.019	106.17	1.992	0.027	0.000	0.018
Octanes +	C8H18	2.845	3.140	114.23	358.694	4.835	0.008	3.297
iso-Octane (2,2,4 Trimethylpentane)	C8H18			114.23				
Nonanes+	C9H20	0.747	0.824	128.26	105.746	1.425	0.002	0.972
Decanes+	C10H22	0.184	0.203	142.29	28.896	0.389	0.001	0.266
Undecanes+3	C11H24	0.021	0.023	158.00	3.662	0.049	0.000	0.034
Hydrogen Sulfide	H2S							
Sulfur Dioxide	SO2							
Nitrogen Oxides (as NO2)	NO2							
Carbon Monoxide	CO							
Water	H2O							
Oxygen	O2							
	Total	100.00						
	Total % VOCs	90.603			7419.378	100	0.171	

VOCs (tpy):	0.1545
VOCs (lbs./hr):	61.7912

HAPs (tpy):	0.0090
HAPs (lbs./hr):	1.8060

PETROLEUM LIQUID LOADING LOSS CALCULATION[1]

VERSION 2.01

Chevron

Facility Name: **S.E. Matthews B Tank Battery**

Product Loaded: **Condensate** True Vapor Pressure: **4.5274** psia MW: **69.57** lb/lb-mole

Loading Method: **Submerged Loading - Dedicated Tank Truck in Normal Service**

Bulk Loaded Liquid Temperature: **80** deg F

Vapor Recovery System Efficiency, if any: *(90 - 99+ % is typical)*

EMISSION CALCULATION

Loading Losses = (12.46*S*P*M/T)(1-eff/100)

where:

S=Saturation factor (Table 5.2-1)	=	**0.6**
P=True vapor pressure (psia)	=	**4.5274**
M=Molecular weight of vapors (lb/lb-mol)	=	**69.57**
T=Temperature (deg. R)	=	**540**

11b/hr = 34.88

Calculated Loading Loss (lb/Mgal loaded)	=	**4.3606**
10^3 gallons loaded		**184**
Losses (lb/yr) = (Loading loss) * (10^3 gallons loaded / yr)	=	**802**
Losses (TPY)	=	**0.4011**

Total Loading Losses = 0.40 TPY

[1]Methodology used for calculations is AP-42, Chapter 5.2, June 2008.

[2]True Vapor Pressure obtained from AP-42, Table 7.1-2, November 2006.

S.E. Mathews B Tank Battery
Loading losses speciation and HAPs

EPN:	LOADB1
Condensate tanks loading losses	
Annual HC emissions (tpy):	0.4011

12 bbl/day = 183960 gal/yr

Truck loading duration (min.):	30	
Capacity of truck (bbl):	170	
Condensate throughput (bcpd):	12	
Truck loads per year:	25	(=Daily throughput*365/capacity of truck)
lbs. HCs per truck load:	32.0880	(=2000*Annual VOC emissions/#Truck loads)
lbs. HCs per hour:	**64.1760**	

		mol % of breathing vapors	mol % of total VOCs	MW (lb/lb-mol)	MW, normalized	wt % of total VOCs	tpy	lbs/hr
Carbon Dioxide	CO2	0.480						
Nitrogen	N2	0.000						
Methane	CH4	3.127						
Ethane	C2H6	5.790						
Propane	C3H8	8.554	9.441	44.10	416.356	5.612	0.023	3.601
iso-Butane	C4H10	5.937	6.553	58.12	380.847	5.133	0.021	3.294
n-Butane	C4H10	15.890	17.538	58.12	1019.312	13.739	0.055	8.817
Cyclopentane	C5H10			70.13				
Neopentane (2,2, Dimethylpropane)	C5H10	0.025	0.028	72.15	1.991	0.027	0.000	0.017
iso-Pentane	C5H10	9.383	10.356	72.15	747.198	10.071	0.040	6.463
n-Pentane	C5H12	13.697	15.118	72.15	1090.735	14.701	0.059	9.435
Benzene	C6H6	4.225	4.663	78.11	364.243	4.909	0.020	3.151
Cyclohexane	C6H12	0.897	0.990	84.16	83.321	1.123	0.005	0.721
Methylcyclopentane	C6H12	0.393	0.434	84.16	36.505	0.492	0.002	0.316
Neohexane (2,2, Dimethylbutane)	C6H14	0.737	0.813	86.18	70.102	0.945	0.004	0.606

2,3 Dimethylbutane	C6H14	0.952	1.051	86.18	90.553	1.220	0.005	0.783
2 Methylpentane	C6H14	5.629	6.213	86.18	535.421	7.217	0.029	4.631
3 Methylpentane	C6H14	2.816	3.108	86.18	267.853	3.610	0.014	2.317
n-Hexane	C6H14	8.610	9.503	86.18	818.968	11.038	0.044	7.084
Hexanes +	C6H14			86.18				
Heptanes +	C7H16	4.339	4.789	100.20	479.860	6.468	0.026	4.151
Methylcyclohexane	C7H14	1.129	1.246	98.19	122.352	1.649	0.007	1.058
Toluene	C7H8	0.152	0.168	92.14	15.458	0.208	0.001	0.134
2-Methylhexane	C7H16	1.907	2.105	100.20	210.908	2.843	0.011	1.824
3-Methylhexane	C7H16	1.421	1.568	100.20	157.158	2.118	0.008	1.359
Xylenes	C8H10	0.096	0.106	106.17	11.249	0.152	0.001	0.097
Ethylbenzene	C8H10	0.017	0.019	106.17	1.992	0.027	0.000	0.017
Octanes +	C8H18	2.845	3.140	114.23	358.694	4.835	0.019	3.103
iso-Octane (2,2,4 Trimethylpentane)	C8H18			114.23				
Nonanes+	C9H20	0.747	0.824	128.26	105.746	1.425	0.006	0.915
Decanes+	C10H22	0.184	0.203	142.29	28.896	0.389	0.002	0.250
Undecanes+3	C11H24	0.021	0.023	158.00	3.662	0.049	0.000	0.032
Hydrogen Sulfide	H2S							
Sulfur Dioxide	SO2							
Nitrogen Oxides (as NO2)	NO2							
Carbon Monoxide	CO							
Water	H2O							
Oxygen	O2							
	Total	100						
	Total % VOCs	90.603			7419.378	100	0.401	

VOCs (tpy):	**0.3634**
VOCs (lbs./hr):	**58.1454**

HAPs (tpy):	**0.0212**
HAPs (lbs./hr):	**1.6994**

PETROLEUM LIQUID LOADING LOSS CALCULATION[1]

VERSION 2.01

Chevron

Facility Name: **S.E. Matthews B Tank Battery**

Product Loaded: **Condensate** True Vapor Pressure: **4.5274** psia MW: **69.57** lb/lb-mole

Loading Method: **Submerged Loading - Dedicated Tank Truck in Normal Service**

Bulk Loaded Liquid Temperature: **80** deg F

Vapor Recovery System Efficiency, if any: *(90 - 99+ % is typical)*

EMISSION CALCULATION

Loading Losses = (12.46*S*P*M/T)(1-eff/100)

where:

S=Saturation factor (Table 5.2-1)	=	**0.6**
P=True vapor pressure (psia)	=	**4.5274**
M=Molecular weight of vapors (lb/lb-mol)	=	**69.57**
T=Temperature (deg. R)	=	**540**
Calculated Loading Loss (lb/Mgal loaded)	=	**4.3606**
10^3 gallons loaded		**6**
Losses (lb/yr) = (Loading loss) * (10^3 gallons loaded / yr)	=	**27**
Losses (TPY)	=	**0.0134**

6000 gal/hr
lb/hr = 26.16

Total Loading Losses = 0.01 TPY

[1]Methodology used for calculations is AP-42, Chapter 5.2, June 2008.
[2]True Vapor Pressure obtained from AP-42, Table 7.1-2, November 2006.

EPN:	LOADBW1
Water tank loading losses	
Annual HC emissions (tpy):	0.0134

Truck loading duration (min.):	30	40bbl/day = 613200 gal/yr
Capacity of truck (bbl):	170	
Water throughput (bwpd):	40	
Truck loads per year:	85	(=Daily throughput*365/capacity of truck)
lbs. HCs per truck load:	0.3153	(=2000*Annual VOC emissions/#Truck loads)
lbs. HCs per hour:	**0.6306**	

		mol % of breathing vapors	mol % of total VOCs	MW (lb/lb-mol)	MW, normalized	wt % of total VOCs	tpy	lbs/hr
Carbon Dioxide	CO2	0.480						
Nitrogen	N2	0.000						
Methane	CH4	3.127						
Ethane	C2H6	5.790						
Propane	C3H8	8.554	9.441	44.10	416.356	5.612	0.001	0.035
iso-Butane	C4H10	5.937	6.553	58.12	380.847	5.133	0.001	0.032
n-Butane	C4H10	15.890	17.538	58.12	1019.312	13.739	0.002	0.087
Cyclopentane	C5H10			70.13				
Neopentane (2,2, Dimethylpropane)	C5H10	0.025	0.028	72.15	1.991	0.027	0.000	0.000
iso-Pentane	C5H10	9.383	10.356	72.15	747.198	10.071	0.001	0.064
n-Pentane	C5H12	13.697	15.118	72.15	1090.735	14.701	0.002	0.093
Benzene	C6H6	4.225	4.663	78.11	364.243	4.909	0.001	0.031
Cyclohexane	C6H12	0.897	0.990	84.16	83.321	1.123	0.000	0.007
Methylcyclopentane	C6H12	0.393	0.434	84.16	36.505	0.492	0.000	0.003
Neohexane (2,2, Dimethylbutane)	C6H14	0.737	0.813	86.18	70.102	0.945	0.000	0.006
2,3 Dimethylbutane	C6H14	0.952	1.051	86.18	90.553	1.220	0.000	0.008
2 Methylpentane	C6H14	5.629	6.213	86.18	535.421	7.217	0.001	0.046

3 Methylpentane	C6H14	2.816	3.108	86.18	267.853	3.610	0.000	0.023
n-Hexane	C6H14	8.610	9.503	86.18	818.968	11.038	0.001	0.070
Hexanes +	C6H14			86.18				
Heptanes +	C7H16	4.339	4.789	100.20	479.860	6.468	0.001	0.041
Methylcyclohexane	C7H14	1.129	1.246	98.19	122.352	1.649	0.000	0.010
Toluene	C7H8	0.152	0.168	92.14	15.458	0.208	0.000	0.001
2-Methylhexane	C7H16	1.907	2.105	100.20	210.908	2.843	0.000	0.018
3-Methylhexane	C7H16	1.421	1.568	100.20	157.158	2.118	0.000	0.013
Xylenes	C8H10	0.096	0.106	106.17	11.249	0.152	0.000	0.001
Ethylbenzene	C8H10	0.017	0.019	106.17	1.992	0.027	0.000	0.000
Octanes +	C8H18	2.845	3.140	114.23	358.694	4.835	0.001	0.030
iso-Octane (2,2,4 Trimethylpentane)	C8H18			114.23				
Nonanes+	C9H20	0.747	0.824	128.26	105.746	1.425	0.000	0.009
Decanes+	C10H22	0.184	0.203	142.29	28.896	0.389	0.000	0.002
Undecanes+	C11H24	0.021	0.023	158.00	3.662	0.049	0.000	0.000
Hydrogen Sulfide	H2S							
Sulfur Dioxide	SO2							
Nitrogen Oxides (as NO2)	NO2							
Carbon Monoxide	CO							
Water	H2O							
Oxygen	O2							
	Total	100						
	Total VOCs	90.603			7419.378	100	0.013	

VOCs (tpy):	**0.0121**
VOCs (lbs./hr):	**0.5713**

HAPs (tpy):	**0.0007**
HAPs (lbs./hr):	**0.0167**

PETROLEUM LIQUID LOADING LOSS CALCULATION[1]

VERSION 2.01

Chevron

Facility Name: **Davidson-Matthews Compressor Station**

Product Loaded: **Condensate** True Vapor Pressure: **4.5274** psia MW: **69.57** lb/lb-mole

Loading Method: **Submerged Loading - Dedicated Tank Truck in Normal Service**

Bulk Loaded Liquid Temperature: **80** deg F

Vapor Recovery System Efficiency, if any: *(90 - 99+ % is typical)*

EMISSION CALCULATION

Loading Losses = (12.46*S*P*M/T)(1-eff/100)

where:

S=Saturation factor (Table 5.2-1)	=	**0.6**
P=True vapor pressure (psia)	=	**4.5274**
M=Molecular weight of vapors (lb/lb-mol)	=	**69.57**
T=Temperature (deg. R)	=	**540**
Calculated Loading Loss (lb/Mgal loaded)	=	**4.3606**
10^3 gallons loaded		**4,599**
Losses (lb/yr) = (Loading loss) * (10^3 gallons loaded / yr)	=	**20,054**
Losses (TPY)	=	**10.0272**

lb/hr = 20.05 tk

Total Loading Losses = 10.03 TPY

[1]Methodology used for calculations is AP-42, Chapter 5.2, June 2008.

[2]True Vapor Pressure obtained from AP-42, Table 7.1-2, November 2006.

Davidson-Matthews Compressor Station
Loading losses speciation and HAPs

EPN:	LOADD1
Condensate tanks loading losses	
Annual HC emissions (tpy):	10.0272

300 bbl/day = 4,099,000

Truck loading duration (min.):	30	
Capacity of truck (bbl):	170	
Condensate throughput (bcpd):	300	
Truck loads per year:	644	(=Daily throughput*365/capacity of truck)
lbs. HCs per truck load:	31.1404	(=2000*Annual VOC emissions/#Truck loads)
lbs. HCs per hour:	**62.2807**	

		mol % of breathing vapors	mol % of total VOCs	MW (lb/lb-mol)	MW, normalized	wt % of total VOCs	tpy	lbs/hr
Carbon Dioxide	CO2	0.480						
Nitrogen	N2	0.000						
Methane	CH4	3.127						
Ethane	C2H6	5.790						
Propane	C3H8	8.554	9.441	44.10	416.356	5.612	0.563	3.495
iso-Butane	C4H10	5.937	6.553	58.12	380.847	5.133	0.515	3.197
n-Butane	C4H10	15.890	17.538	58.12	1019.312	13.739	1.378	8.556
Cyclopentane	C5H10			70.13				
Neopentane (2,2, Dimethylpropane)	C5H10	0.025	0.028	72.15	1.991	0.027	0.003	0.017
iso-Pentane	C5H10	9.383	10.356	72.15	747.198	10.071	1.010	6.272
n-Pentane	C5H12	13.697	15.118	72.15	1090.735	14.701	1.474	9.156
Benzene	C6H6	4.225	4.663	78.11	364.243	4.909	0.492	3.058
Cyclohexane	C6H12	0.897	0.990	84.16	83.321	1.123	0.113	0.699
Methylcyclopentane	C6H12	0.393	0.434	84.16	36.505	0.492	0.049	0.306
Neohexane (2,2, Dimethylbutane)	C6H14	0.737	0.813	86.18	70.102	0.945	0.095	0.588

2,3 Dimethylbutane	C6H14	0.952	1.051	86.18	90.553	1.220	0.122	0.760
2 Methylpentane	C6H14	5.629	6.213	86.18	535.421	7.217	0.724	4.495
3 Methylpentane	C6H14	2.816	3.108	86.18	267.853	3.610	0.362	2.248
n-Hexane	C6H14	8.610	9.503	86.18	818.968	11.038	1.107	6.875
Hexanes +	C6H14			86.18				
Heptanes +	C7H16	4.339	4.789	100.20	479.860	6.468	0.649	4.028
Methylcyclohexane	C7H14	1.129	1.246	98.19	122.352	1.649	0.165	1.027
Toluene	C7H8	0.152	0.168	92.14	15.458	0.208	0.021	0.130
2-Methylhexane	C7H16	1.907	2.105	100.20	210.908	2.843	0.285	1.770
3-Methylhexane	C7H16	1.421	1.568	100.20	157.158	2.118	0.212	1.319
Xylenes	C8H10	0.096	0.106	106.17	11.249	0.152	0.015	0.094
Ethylbenzene	C8H10	0.017	0.019	106.17	1.992	0.027	0.003	0.017
Octanes +	C8H18	2.845	3.140	114.23	358.694	4.835	0.485	3.011
iso-Octane (2,2,4 Trimethylpentane)	C8H18			114.23				
Nonanes+	C9H20	0.747	0.824	128.26	105.746	1.425	0.143	0.888
Decanes+	C10H22	0.184	0.203	142.29	28.896	0.389	0.039	0.243
Undecanes+3	C11H24	0.021	0.023	158.00	3.662	0.049	0.005	0.031
Hydrogen Sulfide	H2S							
Sulfur Dioxide	SO2							
Nitrogen Oxides (as NO2)	NO2							
Carbon Monoxide	CO							
Water	H2O							
Oxygen	O2							
	Total	100						
	Total % VOCs	90.603			7419.378	100	10.027	

VOCs (tpy):	**9.0849**
VOCs (lbs./hr):	**56.4282**

HAPs (tpy):	**0.5311**
HAPs (lbs./hr):	**1.6492**

EPN:	LOADDW1
Water tank loading losses	
Annual HC emissions (tpy):	0.1003

300 bbl/day = 4599000 gal/yr

Truck loading duration (min.):	30	
Capacity of truck (bbl):	170	
Water throughput (bwpd):	300	
Truck loads per year:	644	(=Daily throughput*365/capacity of truck)
lbs. HCs per truck load:	0.3114	(=2000*Annual VOC emissions/#Truck loads)
lbs. HCs per hour:	**0.6228**	

		mol % of breathing vapors	mol % of total VOCs	MW (lb/lb-mol)	MW, normalized	wt % of total VOCs	tpy	lbs/hr
Carbon Dioxide	CO2	0.480						
Nitrogen	N2	0.000						
Methane	CH4	3.127						
Ethane	C2H6	5.790						
Propane	C3H8	8.554	9.441	44.10	416.356	5.612	0.006	0.035
iso-Butane	C4H10	5.937	6.553	58.12	380.847	5.133	0.005	0.032
n-Butane	C4H10	15.890	17.538	58.12	1019.312	13.739	0.014	0.086
Cyclopentane	C5H10			70.13				
Neopentane (2,2, Dimethylpropane)	C5H10	0.025	0.028	72.15	1.991	0.027	0.000	0.000
iso-Pentane	C5H10	9.383	10.356	72.15	747.198	10.071	0.010	0.063
n-Pentane	C5H12	13.697	15.118	72.15	1090.735	14.701	0.015	0.092
Benzene	C6H6	4.225	4.663	78.11	364.243	4.909	0.005	0.031
Cyclohexane	C6H12	0.897	0.990	84.16	83.321	1.123	0.001	0.007
Methylcyclopentane	C6H12	0.393	0.434	84.16	36.505	0.492	0.000	0.003
Neohexane (2,2, Dimethylbutane)	C6H14	0.737	0.813	86.18	70.102	0.945	0.001	0.006
2,3 Dimethylbutane	C6H14	0.952	1.051	86.18	90.553	1.220	0.001	0.008
2 Methylpentane	C6H14	5.629	6.213	86.18	535.421	7.217	0.007	0.045

3 Methylpentane	C6H14	2.816	3.108	86.18	267.853	3.610	0.004	0.022
n-Hexane	C6H14	8.610	9.503	86.18	818.968	11.038	0.011	0.069
Hexanes +	C6H14			86.18				
Heptanes +	C7H16	4.339	4.789	100.20	479.860	6.468	0.006	0.040
Methylcyclohexane	C7H14	1.129	1.246	98.19	122.352	1.649	0.002	0.010
Toluene	C7H8	0.152	0.168	92.14	15.458	0.208	0.000	0.001
2-Methylhexane	C7H16	1.907	2.105	100.20	210.908	2.843	0.003	0.018
3-Methylhexane	C7H16	1.421	1.568	100.20	157.158	2.118	0.002	0.013
Xylenes	C8H10	0.096	0.106	106.17	11.249	0.152	0.000	0.001
Ethylbenzene	C8H10	0.017	0.019	106.17	1.992	0.027	0.000	0.000
Octanes +	C8H18	2.845	3.140	114.23	358.694	4.835	0.005	0.030
iso-Octane (2,2,4 Trimethylpentane)	C8H18			114.23				
Nonanes+	C9H20	0.747	0.824	128.26	105.746	1.425	0.001	0.009
Decanes+	C10H22	0.184	0.203	142.29	28.896	0.389	0.000	0.002
Undecanes+	C11H24	0.021	0.023	158.00	3.662	0.049	0.000	0.000
Hydrogen Sulfide	H2S							
Sulfur Dioxide	SO2							
Nitrogen Oxides (as NO2)	NO2							
Carbon Monoxide	CO							
Water	H2O							
Oxygen	O2							
	Total	100						
	Total VOCs	90.603			7419.378	100	0.100	

VOCs (tpy):	**0.0908**
VOCs (lbs./hr):	**0.5643**

HAPs (tpy):	**0.0053**
HAPs (lbs./hr):	**0.0165**

PETROLEUM LIQUID LOADING LOSS CALCULATION[1]
VERSION 2.01

Chevron

Facility Name: **Davidson-Matthews Compressor Station**

Product Loaded: **Condensate** True Vapor Pressure: **4.5274** psia MW: **69.57** lb/lb-mole

Loading Method: **Submerged Loading - Dedicated Tank Truck in Normal Service**

Bulk Loaded Liquid Temperature: **80** deg F

Vapor Recovery System Efficiency, if any: *(90 - 99+ % is typical)*

EMISSION CALCULATION

Loading Losses = (12.46*S*P*M/T)(1-eff/100)

where:

S=Saturation factor (Table 5.2-1)	=	**0.6**
P=True vapor pressure (psia)	=	**4.5274**
M=Molecular weight of vapors (lb/lb-mol)	=	**69.57**
T=Temperature (deg. R)	=	**540**
Calculated Loading Loss (lb/Mgal loaded)	=	**4.3606**
10^3 gallons loaded		**46**
Losses (lb/yr) = (Loading loss) * (10^3 gallons loaded / yr)	=	**201**
Losses (TPY)	=	**0.1003**

24600 loading rate
0.20 lb/hr
0.10 tpy

Total Loading Losses = 0.10 TPY

[1]Methodology used for calculations is AP-42, Chapter 5.2, June 2008.
[2]True Vapor Pressure obtained from AP-42, Table 7.1-2, November 2006.

FUGITIVE EMISSIONS

Facility Name:	SE Matthews A1 Tank Battery

Separators	Total	Count	Connections WOG	Connections WO	Connections Oil	Connections Gas	Valves WOG	Valves WO	Valves Oil	Valves Gas
Number of Pressure Vessels	1	x 8 (wogc)	8							
1 separator		x 10 (woc)		10						
		x 10 (oc)			10					
		x 5 (gc)				5				
		x 2 (wogv)					2			
		x 4 (wov)						4		
		x 4 (ov)							4	
		x 2 (gv)								2

Tanks	Total	Count	WOG	WO	Oil	Gas	WOG	WO	Oil	Gas
Number of tanks/gunbarrels	1	x 8 (woc)		8						
1 condensate tank	1	x 8 (oc)			8					
	1	x 1 (gc)				1				
	1	x 5 (wov)						5		
	1	x 4 (ov)							4	

Manifold	Total	Count	WOG	WO	Oil	Gas	WOG	WO	Oil	Gas
Number of wells	1	x 10 (wogc)	10							
		x 4 (wocv)					4			

LACT units	Total	Count	WOG	WO	Oil	Gas	WOG	WO	Oil	Gas
Number of LACTs	0	x 21 (oc)			0					
		x 8 (ov)							0	

Heavy water/oil

Enclosed flare system	Total	Count	WOG	WO	Oil	Gas	WOG	WO	Oil	Gas
Number of flares	0	x 10 (gc)				0				
		x 4 (gv)								0

	WOG	WO	Oil	Gas	Valves WOG	Valves WO	Valves Oil	Valves Gas
Totals for connections and valves:	18	18	18	6	6	9	8	2
Compressor seals				0				
Pump seals		1	1					

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS

Version 3.3 10-7-2009

This spreadsheet calculates fugitive emissions from equipment in gas and light liquid service using EPA-approved methodology.

The emissions are calculated using the following equation.

Emission Rate	=	# of Sources	x	Non-C1/C2 Gas/Liquid Fraction	x	API Leak Factor[1]	x	Run Time

To use this spreadsheet, you will need to provide data in the blue cells.

Site Name: S.E. Matthews A1 Tank Battery

Source Name: Site-Wide Fugitives

Source ID: FUG1 (i.e., Facility Identification No. (FIN), Failure Point No., Source ID No., etc.)

Emission Point: FUG1 (i.e., Emission Point No. (EPN), Release Point No., Stack ID No., etc)

Operating Hours: 8760 (hr/yr)

Leak Detection Program?: None

What Streams Will Be Included in Fugitive Emission Calculations:

Select All That Apply:

Stream	Selected	Stream Name
Fuel Gas	☐	
Process Gas Stream 1	☑	Separator gas
Process Gas Stream 2	☐	
Liquid Hydrocarbon Stream 1	☑	Condensate
Liquid Hydrocarbon Stream 2	☐	
Water/Hydrocarbon Stream	☑	Water-condensate

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
Version 3.3 10-7-2009

Gas/Liquids Analyses (Volume Basis): *(enter data from laboratory analysis)*

Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)	Mole %	Separator gas		Condensate		Water-condensate	Comment
Carbon Dioxide	CO_2	44.01	0		1.2600		0.1050		0.1060	
Nitrogen	N_2	28.01	0		0.2100		0.0380		0.0380	
Methane	CH_4	16.04	909.4		86.4700		5.0720		5.0720	
Ethane	C_2H_6	30.07	1618.7		7.2100		1.9570		1.9570	
Propane	C_3H_8	44.10	2314.9		2.3600		1.8520		1.8520	
iso-Butane	C_4H_{10}	58.12	3000.4		0.6000		1.1510		1.1510	
n-Butane	C_4H_{10}	58.12	3010.8		0.7000		2.1630		2.1630	
Cyclopentane	C_5H_{10}	70.13	3513.2						0.0000	
Neopentane	C_5H_{12}	72.15	3682.9				0.0250		0.0250	also known as 2,2 Dimethylpropane
iso-Pentane	C_5H_{12}	72.15	3699		0.3500		1.1510		1.1510	
n-Pentane	C_5H_{12}	72.15	3706.9		0.2000		2.3310		2.3310	
Benzene	C_6H_6	78.11	3590.9				2.9490		2.9490	
Cyclohexane	C_6H_{12}	84.16	4179.7				0.6340		0.6340	
Methylcyclopentane	C_6H_{12}	84.16	4199				0.2190		0.2190	
Neohexane	C_6H_{14}	86.18	4384				0.1930		0.1930	also known as 2,2 Dimethylbutane
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7				0.2680		0.2680	
2 Methylpentane	C_6H_{14}	86.18	4395.2				1.2200		1.2200	
3 Methylpentane	C_6H_{14}	86.18	4398.1				0.7270		0.7270	
n-Hexane	C_6H_{14}	86.18	4403.8				2.3070		2.3070	
Hexanes +	C_6H_{14}	86.18	4403.8		0.3100				0.0000	
Heptanes +	C_7H_{16}	100.20	5100		0.3300		3.0940		3.0940	
Methylcyclohexane	C_7H_{14}	98.19	4863.6				0.9600		0.9600	
Toluene	C_7H_8	92.14	4273.6				0.7690		0.7690	
2-Methylhexane	C_7H_{16}	100.20	5092.2				0.9140		0.9140	
3-Methylhexane	C_7H_{16}	100.20	5096				0.9300		0.9300	
Xylenes	C_8H_{10}	106.17	4957				1.2370		1.2370	
Ethylbenzene	C_8H_{10}	106.17	4970.5				0.3420		0.3420	
Octanes +	C_8H_{18}	114.23	5796.1				6.9980		6.9980	
iso-Octane	C_8H_{18}	114.23	5778.8						0.0000	also known as 2,2,4 Trimethylpentane
Nonanes+	C_9H_{20}	128.26	6493.2				5.5810		5.5810	
Decanes+	$C_{10}H_{22}$	142.29	7189.6				5.9780		5.9780	
Undecanes+	$C_{11}H_{24}$	306.10	7825.9				48.8350		48.8350	Default MW is 156.31, use lab data if available.
H2S	H_2S	34.08	586.8							
Water	H_2O	18.02	0						98.0000	
Oxygen	O_2	32.00	0							
Totals (must equal 100)				0	100	0.00	100.00	0	100.00	
Non-Methane/Non-Ethane Fraction:				0.0000	0.0485	0.0000	0.9283	0.0000	0.0186	
Non-Methane Fraction:				0.0000	0.1206	0.0000	0.9479	0.0000	0.0190	
VOC Fraction:				0.0000	0.9853	0.0000	0.9986	0.0000	0.0200	

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS

Version 3.3 10-7-2009

Gas/Liquid Analyses (Net MW):

Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)	Net MW (lb-lb-mole): Separator gas (blank)	Separator gas	Condensate (blank)	Condensate	Water-condensate (blank)	Water-condensate
Carbon Dioxide	CO_2	44.01	0		0.5545		0.0462		0.0009
Nitrogen	N_2	28.01	0		0.0588		0.0106		0.0002
Methane	CH_4	16.04	909.4		13.8698		0.8135		0.0163
Ethane	C_2H_6	30.07	1618.7		2.1680		0.5885		0.0118
Propane	C_3H_8	44.1	2314.9		1.0408		0.8167		0.0163
Iso-Butane	C_4H_{10}	58.12	3000.4		0.3487		0.6690		0.0134
n-Butane	C_4H_{10}	58.12	3010.8		0.4068		1.2571		0.0251
Cyclopentane	C_5H_{10}	70.13	3513.2						
Neopentane	C_5H_{12}	72.15	3682.9				0.0180		0.0004
iso-Pentane	C_5H_{12}	72.15	3699		0.2525		0.8304		0.0166
n-Pentane	C_5H_{12}	72.15	3706.9		0.1443		1.6818		0.0336
Benzene	C_6H_6	78.11	3590.9				2.3035		0.0461
Cyclohexane	C_6H_{12}	84.16	4179.7				0.5336		0.0107
Methylcyclopentane	C_6H_{12}	84.16	4199				0.1843		0.0037
Neohexane	C_6H_{14}	86.18	4384				0.1663		0.0033
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7				0.2310		0.0046
2 Methylpentane	C_6H_{14}	86.18	4395.2				1.0514		0.0210
3 Methylpentane	C_6H_{14}	86.18	4398.1				0.6265		0.0125
n-Hexane	C_6H_{14}	86.18	4403.8				1.9882		0.0398
Hexanes +	C_6H_{14}	86.18	4403.8		0.2672				
Heptanes +	C_7H_{16}	100.20	5100		0.3307		3.1002		0.0620
Methylcyclohexane	C_7H_{14}	98.19	4863.6				0.9426		0.0189
Toluene	C_7H_8	92.14	4273.6				0.7086		0.0142
2-Methylhexane	C_7H_{16}	100.20	5092.2				0.9159		0.0183
3-Methylhexane	C_7H_{16}	100.20	5096				0.9319		0.0186
Xylenes	C_8H_{10}	106.17	4957				1.3133		0.0263
Ethylbenzene	C_8H_{10}	106.17	4970.5				0.3631		0.0073
Octanes +	C_8H_{18}	114.23	5796.1				7.9939		0.1599
iso-Octane	C_8H_{18}	114.23	5778.8						
Nonanes+	C_9H_{20}	128.26	6493.2				7.1581		0.1432
Decanes+	$C_{10}H_{22}$	142.29	7189.6				8.5058		0.1701
Undecanes+	$C_{11}H_{24}$	306.10	7825.9				149.4839		2.9897
H2S	H_2S	34.08	586.8						
Water	H_2O	18.02	0						17.6596
Oxygen	O_2	32	0						
			Total MW	0.00	19.44	0.00	195.23	0.00	21.56
			Non-Methane/Non-Ethane VOC Net MW:	0.00	2.79	0.00	193.78	0.00	3.88
			Non-Methane VOC Net MW:	0.00	4.96	0.00	194.36	0.00	3.89
			VOC Net MW:	0.00	18.83	0.00	195.18	0.00	3.90

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
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Gas/Liquid Analyses (Mass %):

				Mass %					
Component	**Formula**	**MW (lb-lb-mole)**	**LHV (btu/scf)**		**Separator gas**		**Condensate**		**Water-condensate**
Carbon Dioxide	CO_2	44.01	0		2.85		0.02		0.0043
Nitrogen	N_2	28.01	0		0.30		0.01		0.0010
Methane	CH_4	16.04	909.4		71.34		0.42		0.0755
Ethane	C_2H_6	30.07	1618.7		11.15		0.30		0.0546
Propane	C_3H_8	44.1	2314.9		5.35		0.42		0.0757
iso-Butane	C_4H_{10}	58.12	3000.4		1.79		0.34		0.0620
n-Butane	C_4H_{10}	58.12	3010.8		2.09		0.64		0.1166
Cyclopentane	C_5H_{10}	70.13	3513.2						
Neopentane	C_5H_{12}	72.15	3682.9				0.01		0.0017
iso-Pentane	C_5H_{12}	72.15	3699		1.30		0.43		0.0770
n-Pentane	C_5H_{12}	72.15	3706.9		0.74		0.86		0.1560
Benzene	C_6H_6	78.11	3590.9				1.18		0.2136
Cyclohexane	C_6H_{12}	84.16	4179.7				0.27		0.0495
Methylcyclopentane	C_6H_{12}	84.16	4199				0.09		0.0171
Neohexane	C_6H_{14}	86.18	4384				0.09		0.0154
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7				0.12		0.0214
2 Methylpentane	C_6H_{14}	86.18	4395.2				0.54		0.0975
3 Methylpentane	C_6H_{14}	86.18	4398.1				0.32		0.0581
n-Hexane	C_6H_{14}	86.18	4403.8				1.02		0.1844
Hexanes +	C_6H_{14}	86.18	4403.8		1.37				
Heptanes +	C_7H_{16}	100.20	5100		1.70		1.59		0.2875
Methylcyclohexane	C_7H_{14}	98.19	4863.6				0.48		0.0874
Toluene	C_7H_8	92.14	4273.6				0.36		0.0657
2-Methylhexane	C_7H_{16}	100.20	5092.2				0.47		0.0849
3-Methylhexane	C_7H_{16}	100.20	5096				0.48		0.0864
Xylenes	C_8H_{10}	106.17	4957				0.67		0.1218
Ethylbenzene	C_8H_{10}	106.17	4970.5				0.19		0.0337
Octanes +	C_8H_{18}	114.23	5796.1				4.09		0.7414
iso-Octane	C_8H_{18}	114.23	5778.8						
Nonanes+	C_9H_{20}	128.26	6493.2				3.67		0.6639
Decanes+	$C_{10}H_{22}$	142.29	7189.6				4.36		0.7889
Undecanes+	$C_{11}H_{24}$	306.10	7825.9				76.57		13.8640
H2S	H_2S	34.08	586.8						
Water	H_2O	18.02	0						81.8928
Oxygen	O_2	32	0						
			Totals (must equal 100)	0	100	0	100	0	100
			Non-Methane/Non-Ethane MW Fraction:	0.0000	0.1436	0.0000	0.9925	0.0000	0.1797
			Non-Methane MW Fraction:	0.0000	0.2551	0.0000	0.9955	0.0000	0.1803
			VOC MW Fraction:	0.0000	0.9685	0.0000	0.9997	0.0000	0.1810
			H2S MW Fraction:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
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Component Count:

Equipment Type		Separator gas		Condensate		Water-condensate
Valves		8		8		9
Connector						
Flanges		24		18		18
Open-Ended Lines						
Pumps				1		1
Other						

Fugitive Emission Sumary:

					Total VOCs (including Methane and Ethane)											
					Emission Rate (lb/hr)						Emission Rate (tpy)					
Equipment Type	EPA 453/R-95-017 Gas Factor (lb/hr/source)	EPA 453/R-95-017 Light Oil Factor (lb/hr/source)	EPA 453/R-95-017 Water/Oil Factor (lb/hr/source)	Leak Detection Factor		Separator gas		Condensate		Water-condensate		Separator gas		Condensate		Water-condensate
Valves	0.00992	0.0055	0.0002156	0		0.0794		0.0440		0.0019		0.3476		0.1927		0.0085
Connector	0.00044	0.000463	0.000242	0												
Flanges	0.00086	0.000243	0.00000638	0		0.0206		0.0044		0.0001		0.0904		0.0192		0.0005
Open-Ended Lines	0.00441	0.00309	0.00055	0												
Pumps	0.00529	0.02866	0.0000528	0				0.0287		0.0001				0.1255		0.0002
Other	0.0194	0.0165	0.0308	0												
				Totals	0.0000	0.1000	0.0000	0.0770	0.0000	0.0021	0.0000	0.4380	0.0000	0.3374	0.0000	0.0092

					H2S (Fugitive Gas Factor x Wt Fraction H2S x # of Components)											
					Emission Rate (lb/hr)						Emission Rate (tpy)					
Equipment Type	EPA 453/R-95-017 Gas Factor (lb/hr/source)	EPA 453/R-95-017 Light Oil Factor (lb/hr/source)	EPA 453/R-95-017 Water/Oil Factor (lb/hr/source)	Leak Detection Factor		Separator gas		Condensate		Water-condensate		Separator gas		Condensate		Water-condensate
Valves	0.00992	0.0055	0.0002156	0		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Connector	0.00044	0.000463	0.000242	0												
Flanges	0.00086	0.000243	0.00000638	0		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Open-Ended Lines	0.00441	0.00309	0.00055	0												
Pumps	0.00529	0.02866	0.0000528	0				0.0000		0.0000				0.0000		0.0000
Other	0.0194	0.0165	0.0308	0												
				Totals	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

SUMMARY

	lb/hr	tpy
VOC (C3+)	0.1791	0.7846
H2S	0.0000	0.0000

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
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SPECIATED EMISSIONS

				SPECIATED EMISSIONS (lb/hr)						SPECIATED EMISSIONS (tpy)					
Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)		Separator gas		Condensate		Water-condensate		Separator gas		Condensate		Water-condensate
Methane	CH_4	16.04	909.4		0.0737		0.0003		0.00001		0.3226		0.0014		0.00004
Ethane	C_2H_6	30.07	1618.7		0.0115		0.0002		0.00001		0.0504		0.0010		0.00003
Propane	C_3H_8	44.1	2314.9		0.0055		0.0003		0.00001		0.0242		0.0014		0.00004
iso-Butane	C_4H_{10}	58.12	3000.4		0.0019		0.0003		0.00001		0.0081		0.0012		0.00003
n-Butane	C_4H_{10}	58.12	3010.8		0.0022		0.0005		0.00001		0.0095		0.0022		0.00006
Cyclopentane	C_5H_{10}	70.13	3513.2												
Neopentane	C_5H_{12}	72.15	3682.9				0.0000		0.00000				0.0000		0.00000
iso-Pentane	C_5H_{12}	72.15	3699		0.0013		0.0003		0.00001		0.0059		0.0014		0.00004
n-Pentane	C_5H_{12}	72.15	3706.9		0.0008		0.0007		0.00002		0.0034		0.0029		0.00008
Benzene	C_6H_6	78.11	3590.9				0.0009		0.00002				0.0040		0.00011
Cyclohexane	C_6H_{12}	84.16	4179.7				0.0002		0.00001				0.0009		0.00003
Methylcyclopentane	C_6H_{12}	84.16	4199				0.0001		0.00000				0.0003		0.00001
Neohexane	C_6H_{14}	86.18	4384				0.0001		0.00000				0.0003		0.00001
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7				0.0001		0.00000				0.0004		0.00001
2 Methylpentane	C_6H_{14}	86.18	4395.2				0.0004		0.00001				0.0018		0.00005
3 Methylpentane	C_6H_{14}	86.18	4398.1				0.0002		0.00001				0.0011		0.00003
n-Hexane	C_6H_{14}	86.18	4403.8				0.0008		0.00002				0.0034		0.00009
Hexanes +	C_6H_{14}	86.18	4403.8		0.0014						0.0062				
Heptanes +	C_7H_{16}	100.20	5100		0.0018		0.0012		0.00003		0.0077		0.0054		0.00015
Methylcyclohexane	C_7H_{14}	98.19	4863.6				0.0004		0.00001				0.0016		0.00004
Toluene	C_7H_8	92.14	4273.6				0.0003		0.00001				0.0012		0.00003
2-Methylhexane	C_7H_{16}	100.20	5092.2				0.0004		0.00001				0.0016		0.00004
3-Methylhexane	C_7H_{16}	100.20	5096				0.0004		0.00001				0.0016		0.00004
Xylenes	C_8H_{10}	106.17	4957				0.0005		0.00001				0.0023		0.00006
Ethylbenzene	C_8H_{10}	106.17	4970.5				0.0001		0.00000				0.0006		0.00002
Octanes +	C_8H_{18}	114.23	5796.1				0.0032		0.00009				0.0138		0.00038
iso-Octane	C_8H_{18}	114.23	5778.8												
Nonanes+	C_9H_{20}	128.26	6493.2				0.0028		0.00008				0.0124		0.00034
Decanes+	$C_{10}H_{22}$	142.29	7189.6				0.0034		0.00009				0.0147		0.00040
Undecanes+	$C_{11}H_{24}$	306.10	7825.9				0.0590		0.00161				0.2584		0.00707
H2S	H_2S	34.08	586.8												
			Non-Methane/Non-Ethane VOC Total:	0.0000	0.0148	0.0000	0.0765	0.0000	0.0021	0.0000	0.0649	0.0000	0.3350	0.0000	0.0092
			Non-Methane VOC Total:	0.0000	0.0263	0.0000	0.0767	0.0000	0.0021	0.0000	0.1154	0.0000	0.3360	0.0000	0.0092
			VOC Total:	0.0000	0.1000	0.0000	0.0770	0.0000	0.0021	0.0000	0.4380	0.0000	0.3374	0.0000	0.0092
			HAP Total:	0.0000	0.0000	0.0000	0.0026	0.0000	0.0001	0.0000	0.0000	0.0000	0.0115	0.0000	0.0003

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
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SPECIATED EMISSIONS SUMMARY

Component	Formula	TOTALS (lb/hr)	(tpy)
Methane	CH_4	0.0740	0.3241
Ethane	C_2H_6	0.0118	0.0515
Propane	C_3H_8	0.0059	0.0257
iso-Butane	C_4H_{10}	0.0021	0.0093
n-Butane	C_4H_{10}	0.0027	0.0117
Cyclopentane	C_5H_{10}		
Neopentane	C_5H_{12}	0.0000	0.0000
iso-Pentane	C_5H_{12}	0.0017	0.0073
n-Pentane	C_5H_{12}	0.0014	0.0063
Benzene	C_6H_6	0.0009	0.0041
Cyclohexane	C_6H_{12}	0.0002	0.0009
Methylcyclopentane	C_6H_{12}	0.0001	0.0003
Neohexane	C_6H_{14}	0.0001	0.0003
2,3 Dimethylbutane	C_6H_{14}	0.0001	0.0004
2 Methylpentane	C_6H_{14}	0.0004	0.0019
3 Methylpentane	C_6H_{14}	0.0003	0.0011
n-Hexane	C_6H_{14}	0.0008	0.0035
Hexanes +	C_6H_{14}	0.0014	0.0062
Heptanes +	C_7H_{16}	0.0030	0.0132
Methylcyclohexane	C_7H_{14}	0.0004	0.0017
Toluene	C_7H_8	0.0003	0.0013
2-Methylhexane	C_7H_{16}	0.0004	0.0016
3-Methylhexane	C_7H_{16}	0.0004	0.0017
Xylenes	C_8H_{10}	0.0005	0.0023
Ethylbenzene	C_8H_{10}	0.0001	0.0006
Octanes +	C_8H_{18}	0.0032	0.0142
iso-Octane	C_8H_{18}		
Nonanes+	C_9H_{20}	0.0029	0.0127
Decanes+	$C_{10}H_{22}$	0.0034	0.0151
Undecanes+	$C_{11}H_{24}$	0.0606	0.2655
H2S	H_2S		
lon-Methane/Non-Ethane VOC Total:		0.0934	0.4091
Non-Methane VOC Total:		0.1051	0.4606
VOC Total:		0.1791	0.7846
HAP Total:		0.0027	0.0119

Facility Name: SE Matthews B Tank Battery

				Connections				Valves			
Separators		**Total**	**Count**	**WOG**	**WO**	**Oil**	**Gas**	**WOG**	**WO**	**Oil**	**Gas**
	Number of Pressure Vessels	1	x 8 (wogc)	8							
	1 separator		x 10 (woc)		10						
			x 10 (oc)			10					
			x 5 (gc)				5				
			x 2 (wogv)					2			
			x 4 (wov)						4		
			x 4 (ov)							4	
			x 2 (gv)								2
Tanks		**Total**	**Count**	**WOG**	**WO**	**Oil**	**Gas**	**WOG**	**WO**	**Oil**	**Gas**
	Number of tanks/gunbarrels	2	x 8 (woc)		16						
	1 condensate tank	1	x 8 (oc)			8					
	1 water tank	1	x 1 (gc)				1				
		2	x 5 (wov)						10		
		1	x 4 (ov)							4	
Manifold		**Total**	**Count**	**WOG**	**WO**	**Oil**	**Gas**	**WOG**	**WO**	**Oil**	**Gas**
	Number of wells	2	x 10 (wogc)	20							
			x 4 (wocv)					8			
LACT units		**Total**	**Count**	**WOG**	**WO**	**Oil**	**Gas**	**WOG**	**WO**	**Oil**	**Gas**
	Number of LACTs	0	x 21 (oc)			0					
			x 8 (ov)							0	
Enclosed flare system		**Total**	**Count**	**WOG**	**WO**	**Oil**	**Gas**	**WOG**	**WO**	**Oil**	**Gas**
	Number of flares	0	x 10 (gc)				0				
			x 4 (gv)								0
Totals for connections and valves:				28	26	18	6	10	14	8	2
Compressor seals							0				
Pump seals					1	1					

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
Version 3.3 10-7-2009

This spreadsheet calculates fugitive emissions from equipment in gas and light liquid service using EPA-approved methodology.

The emissions are calculated using the following equation.

Emission Rate	=	# of Sources	x	Non-C1/C2 Gas/Liquid Fraction	x	API Leak Factor[1]	x	Run Time

To use this spreadsheet, you will need to provide data in the blue cells.

Site Name: S.E. Matthews A1 Tank Battery

Source Name: Site-Wide Fugitives

Source ID: FUG1 (i.e., Facility Identification No. (FIN), Failure Point No., Source ID No., etc.)

Emission Point: FUG1 (i.e., Emission Point No. (EPN), Release Point No., Stack ID No., etc)

Operating Hours: 8760 (hr/yr)

Leak Detection Program?: None

What Streams Will Be Included In Fugitive Emission Calculations:

Select All That Apply:

- [ ] Fuel Gas
- [x] Process Gas Stream 1 — Stream Name: Separator gas
- [ ] Process Gas Stream 2 — Stream Name:
- [x] Liquid Hydrocarbon Stream 1 — Stream Name: Condensate
- [ ] Liquid Hydrocarbon Stream 2 — Stream Name:
- [x] Water/Hydrocarbon Stream — Stream Name: Water-condensate

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
Version 3.3 10-7-2009

Gas/Liquids Analyses (Volume Basis): *(enter data from laboratory analysis)*

Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)	Mole %	Separator gas		Condensate		Water-condensate	Comment
Carbon Dioxide	CO_2	44.01	0		1.2600		0.1050		0.1050	
Nitrogen	N_2	28.01	0		0.2100		0.0380		0.0380	
Methane	CH_4	16.04	909.4		86.4700		5.0720		5.0720	
Ethane	C_2H_6	30.07	1618.7		7.2100		1.9570		1.9570	
Propane	C_3H_8	44.10	2314.9		2.3600		1.8520		1.8520	
iso-Butane	C_4H_{10}	58.12	3000.4		0.6000		1.1510		1.1510	
n-Butane	C_4H_{10}	58.12	3010.8		0.7000		2.1630		2.1630	
Cyclopentane	C_5H_{10}	70.13	3513.2						0.0000	
Neopentane	C_5H_{12}	72.15	3682.9				0.0250		0.0250	also known as 2,2 Dimethylpropane
iso-Pentane	C_5H_{12}	72.15	3699		0.3500		1.1510		1.1510	
n-Pentane	C_5H_{12}	72.15	3706.9		0.2000		2.3310		2.3310	
Benzene	C_6H_6	78.11	3590.9				2.9490		2.9490	
Cyclohexane	C_6H_{12}	84.16	4179.7				0.6340		0.6340	
Methylcyclopentane	C_6H_{12}	84.16	4199				0.2190		0.2190	
Neohexane	C_6H_{14}	86.18	4384				0.1930		0.1930	also known as 2,2 Dimethylbutane
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7				0.2680		0.2680	
2 Methylpentane	C_6H_{14}	86.18	4395.2				1.2200		1.2200	
3 Methylpentane	C_6H_{14}	86.18	4398.1				0.7270		0.7270	
n-Hexane	C_6H_{14}	86.18	4403.8				2.3070		2.3070	
Hexanes +	C_6H_{14}	86.18	4403.8		0.3100				0.0000	
Heptanes +	C_7H_{16}	100.20	5100		0.3300		3.0940		3.0940	
Methylcyclohexane	C_7H_{14}	98.19	4863.6				0.9600		0.9600	
Toluene	C_7H_8	92.14	4273.6				0.7690		0.7690	
2-Methylhexane	C_7H_{16}	100.20	5092.2				0.9140		0.9140	
3-Methylhexane	C_7H_{16}	100.20	5096				0.9300		0.9300	
Xylenes	C_8H_{10}	106.17	4957				1.2370		1.2370	
Ethylbenzene	C_8H_{10}	106.17	4970.5				0.3420		0.3420	
Octanes +	C_8H_{18}	114.23	5796.1				6.9980		6.9980	
iso-Octane	C_8H_{18}	114.23	5778.8						0.0000	also known as 2,2,4 Trimethylpentane
Nonanes+	C_9H_{20}	128.26	6493.2				5.5810		5.5810	
Decanes+	$C_{10}H_{22}$	142.29	7189.6				5.9780		5.9780	
Undecanes+	$C_{11}H_{24}$	306.10	7825.9				48.8350		48.8350	Default MW is 156.31, use lab data if available.
H2S	H_2S	34.08	586.8							
Water	H_2O	18.02	0						98.0000	
Oxygen	O_2	32.00	0							
Totals (must equal 100)				0	100	0.00	100.00	0	100.00	
Non-Methane/Non-Ethane Fraction:				0.0000	0.0485	0.0000	0.9283	0.0000	0.0186	
Non-Methane Fraction:				0.0000	0.1206	0.0000	0.9479	0.0000	0.0190	
VOC Fraction:				0.0000	0.9853	0.0000	0.9986	0.0000	0.0200	

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
Version 3.3 10-7-2009

Gas/Liquid Analyses (Net MW):

				Net MW (lb-lb-mole)					
Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)		Separator gas		Condensate		Water-condensate
Carbon Dioxide	CO_2	44.01	0		0.5545		0.0462		0.0009
Nitrogen	N_2	28.01	0		0.0588		0.0106		0.0002
Methane	CH_4	16.04	909.4		13.8698		0.8135		0.0163
Ethane	C_2H_6	30.07	1618.7		2.1680		0.5885		0.0118
Propane	C_3H_8	44.1	2314.9		1.0408		0.8167		0.0163
iso-Butane	C_4H_{10}	58.12	3000.4		0.3487		0.6690		0.0134
n-Butane	C_4H_{10}	58.12	3010.8		0.4068		1.2571		0.0251
Cyclopentane	C_5H_{10}	70.13	3513.2						
Neopentane	C_5H_{12}	72.15	3682.9				0.0180		0.0004
iso-Pentane	C_5H_{12}	72.15	3699		0.2525		0.8304		0.0166
n-Pentane	C_5H_{12}	72.15	3706.9		0.1443		1.6818		0.0336
Benzene	C_6H_6	78.11	3590.9				2.3035		0.0461
Cyclohexane	C_6H_{12}	84.16	4179.7				0.5336		0.0107
Methylcyclopentane	C_6H_{12}	84.16	4199				0.1843		0.0037
Neohexane	C_6H_{14}	86.18	4384				0.1663		0.0033
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7				0.2310		0.0046
2 Methylpentane	C_6H_{14}	86.18	4395.2				1.0514		0.0210
3 Methylpentane	C_6H_{14}	86.18	4398.1				0.6265		0.0125
n-Hexane	C_6H_{14}	86.18	4403.8				1.9882		0.0398
Hexanes +	C_6H_{14}	86.18	4403.8		0.2672				
Heptanes +	C_7H_{16}	100.20	5100		0.3307		3.1002		0.0620
Methylcyclohexane	C_7H_{14}	98.19	4863.6				0.9426		0.0189
Toluene	C_7H_8	92.14	4273.6				0.7086		0.0142
2-Methylhexane	C_7H_{16}	100.20	5092.2				0.9159		0.0183
3-Methylhexane	C_7H_{16}	100.20	5096				0.9319		0.0186
Xylenes	C_8H_{10}	106.17	4957				1.3133		0.0263
Ethylbenzene	C_8H_{10}	106.17	4970.5				0.3631		0.0073
Octanes +	C_8H_{18}	114.23	5796.1				7.9939		0.1599
iso-Octane	C_8H_{18}	114.23	5778.8						
Nonanes+	C_9H_{20}	128.26	6493.2				7.1581		0.1432
Decanes+	$C_{10}H_{22}$	142.29	7189.6				8.5058		0.1701
Undecanes+	$C_{11}H_{24}$	306.10	7825.9				149.4839		2.9897
H2S	H_2S	34.08	586.8						
Water	H_2O	18.02	0						17.6596
Oxygen	O_2	32	0						
			Total MW	0.00	19.44	0.00	195.23	0.00	21.56
			Non-Methane/Non-Ethane VOC Net MW:	0.00	2.79	0.00	193.78	0.00	3.88
			Non-Methane VOC Net MW:	0.00	4.96	0.00	194.36	0.00	3.89
			VOC Net MW:	0.00	18.83	0.00	195.18	0.00	3.90

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS

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Gas/Liquid Analyses (Mass %):

				Mass %					
Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)		Separator gas		Condensate		Water-condensate
Carbon Dioxide	CO_2	44.01	0		2.85		0.02		0.0043
Nitrogen	N_2	28.01	0		0.30		0.01		0.0010
Methane	CH_4	16.04	909.4		71.34		0.42		0.0755
Ethane	C_2H_6	30.07	1618.7		11.15		0.30		0.0546
Propane	C_3H_8	44.1	2314.9		5.35		0.42		0.0757
iso-Butane	C_4H_{10}	58.12	3000.4		1.79		0.34		0.0620
n-Butane	C_4H_{10}	58.12	3010.8		2.09		0.64		0.1166
Cyclopentane	C_5H_{10}	70.13	3513.2						
Neopentane	C_5H_{12}	72.15	3682.9				0.01		0.0017
iso-Pentane	C_5H_{12}	72.15	3699		1.30		0.43		0.0770
n-Pentane	C_5H_{12}	72.15	3706.9		0.74		0.86		0.1560
Benzene	C_6H_6	78.11	3590.9				1.18		0.2136
Cyclohexane	C_6H_{12}	84.16	4179.7				0.27		0.0495
Methylcyclopentane	C_6H_{12}	84.16	4199				0.09		0.0171
Neohexane	C_6H_{14}	86.18	4384				0.09		0.0154
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7				0.12		0.0214
2 Methylpentane	C_6H_{14}	86.18	4395.2				0.54		0.0975
3 Methylpentane	C_6H_{14}	86.18	4398.1				0.32		0.0581
n-Hexane	C_6H_{14}	86.18	4403.8				1.02		0.1844
Hexanes +	C_6H_{14}	86.18	4403.8		1.37				
Heptanes +	C_7H_{16}	100.20	5100		1.70		1.59		0.2875
Methylcyclohexane	C_7H_{14}	98.19	4863.6				0.48		0.0874
Toluene	C_7H_8	92.14	4273.6				0.36		0.0657
2-Methylhexane	C_7H_{16}	100.20	5092.2				0.47		0.0849
3-Methylhexane	C_7H_{16}	100.20	5096				0.48		0.0864
Xylenes	C_8H_{10}	106.17	4957				0.67		0.1218
Ethylbenzene	C_8H_{10}	106.17	4970.5				0.19		0.0337
Octanes +	C_8H_{18}	114.23	5796.1				4.09		0.7414
iso-Octane	C_8H_{18}	114.23	5778.8						
Nonanes+	C_9H_{20}	128.26	6493.2				3.67		0.6639
Decanes+	$C_{10}H_{22}$	142.29	7189.6				4.36		0.7889
Undecanes+	$C_{11}H_{24}$	306.10	7825.9				76.57		13.8640
H2S	H_2S	34.08	586.8						
Water	H_2O	18.02	0						81.8928
Oxygen	O_2	32	0						
		Totals (must equal 100)		0	100	0	100	0	100
		Non-Methane/Non-Ethane MW Fraction:		0.0000	0.1436	0.0000	0.9925	0.0000	0.1797
		Non-Methane MW Fraction:		0.0000	0.2551	0.0000	0.9955	0.0000	0.1803
		VOC MW Fraction:		0.0000	0.9685	0.0000	0.9997	0.0000	0.1810
		H2S MW Fraction:		0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
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Component Count:

Equipment Type		Separator gas		Condensate		Water-condensate
Valves		12		8		14
Connector						
Flanges		34		18		26
Open-Ended Lines						
Pumps				1		1
Other						

Fugitive Emission Sumary:

					Total VOCs (Including Methane and Ethane)											
					Emission Rate (lb/hr)						Emission Rate (tpy)					
Equipment Type	EPA 453/R-95-017 Gas Factor (lb/hr/source)	EPA 453/R-95-017 Light Oil Factor (lb/hr/source)	EPA 453/R-95-017 Water/Oil Factor (lb/hr/source)	Leak Detection Factor		Separator gas		Condensate		Water-condensate		Separator gas		Condensate		Water-condensate
Valves	0.00992	0.0055	0.0002156	0		0.1190		0.0440		0.0030		0.5214		0.1927		0.0132
Connector	0.00044	0.000463	0.000242	0												
Flanges	0.00086	0.000243	0.00000638	0		0.0292		0.0044		0.0002		0.1281		0.0192		0.0007
Open-Ended Lines	0.00441	0.00309	0.00055	0												
Pumps	0.00529	0.02866	0.0000528	0				0.0287		0.0001				0.1255		0.0002
Other	0.0194	0.0165	0.0308	0												
				Totals	0.0000	0.1483	0.0000	0.0770	0.0000	0.0032	0.0000	0.6495	0.0000	0.3374	0.0000	0.0142

					H2S (Fugitive Gas Factor x Wt Fraction H2S x # of Components)											
					Emission Rate (lb/hr)						Emission Rate (tpy)					
Equipment Type	EPA 453/R-95-017 Gas Factor (lb/hr/source)	EPA 453/R-95-017 Light Oil Factor (lb/hr/source)	EPA 453/R-95-017 Water/Oil Factor (lb/hr/source)	Leak Detection Factor		Separator gas		Condensate		Water-condensate		Separator gas		Condensate		Water-condensate
Valves	0.00992	0.0055	0.0002156	0		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Connector	0.00044	0.000463	0.000242	0												
Flanges	0.00086	0.000243	0.00000638	0		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
Open-Ended Lines	0.00441	0.00309	0.00055	0												
Pumps	0.00529	0.02866	0.0000528	0				0.0000		0.0000				0.0000		0.0000
Other	0.0194	0.0165	0.0308	0												
				Totals	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

SUMMARY

	lb/hr	tpy
VOC (C3+)	0.2286	1.0011
H2S	0.0000	0.0000

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
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SPECIATED EMISSIONS

Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)	SPECIATED EMISSIONS (lb/hr)						SPECIATED EMISSIONS (tpy)					
					Separator gas		Condensate		Water-condensate		Separator gas		Condensat e		Water-condensat e
Methane	CH_4	16.04	909.4		0.1092		0.0003		0.00001		0.4784		0.0014		0.00006
Ethane	C_2H_6	30.07	1618.7		0.0171		0.0002		0.00001		0.0748		0.0010		0.00004
Propane	C_3H_8	44.1	2314.9		0.0082		0.0003		0.00001		0.0359		0.0014		0.00006
iso-Butane	C_4H_{10}	58.12	3000.4		0.0027		0.0003		0.00001		0.0120		0.0012		0.00005
n-Butane	C_4H_{10}	58.12	3010.8		0.0032		0.0005		0.00002		0.0140		0.0022		0.00009
Cyclopentane	C_5H_{10}	70.13	3513.2												
Neopentane	C_5H_{12}	72.15	3682.9				0.0000		0.00000				0.0000		0.00000
iso-Pentane	C_5H_{12}	72.15	3699		0.0020		0.0003		0.00001		0.0087		0.0014		0.00006
n-Pentane	C_5H_{12}	72.15	3706.9		0.0011		0.0007		0.00003		0.0050		0.0029		0.00012
Benzene	C_6H_6	78.11	3590.9				0.0009		0.00004				0.0040		0.00017
Cyclohexane	C_6H_{12}	84.16	4179.7				0.0002		0.00001				0.0009		0.00004
Methylcyclopentane	C_6H_{12}	84.16	4199				0.0001		0.00000				0.0003		0.00001
Neohexane	C_6H_{14}	86.18	4384				0.0001		0.00000				0.0003		0.00001
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7				0.0001		0.00000				0.0004		0.00002
2 Methylpentane	C_6H_{14}	86.18	4395.2				0.0004		0.00002				0.0018		0.00008
3 Methylpentane	C_6H_{14}	86.18	4398.1				0.0002		0.00001				0.0011		0.00005
n-Hexane	C_6H_{14}	86.18	4403.8				0.0008		0.00003				0.0034		0.00014
Hexanes +	C_6H_{14}	86.18	4403.8		0.0021						0.0092				
Heptanes +	C_7H_{16}	100.20	5100		0.0026		0.0012		0.00005		0.0114		0.0054		0.00023
Methylcyclohexane	C_7H_{14}	98.19	4863.6				0.0004		0.00002				0.0016		0.00007
Toluene	C_7H_8	92.14	4273.6				0.0003		0.00001				0.0012		0.00005
2-Methylhexane	C_7H_{16}	100.20	5092.2				0.0004		0.00002				0.0016		0.00007
3-Methylhexane	C_7H_{16}	100.20	5096				0.0004		0.00002				0.0016		0.00007
Xylenes	C_8H_{10}	106.17	4957				0.0005		0.00002				0.0023		0.00010
Ethylbenzene	C_8H_{10}	106.17	4970.5				0.0001		0.00001				0.0006		0.00003
Octanes +	C_8H_{18}	114.23	5796.1				0.0032		0.00013				0.0138		0.00058
iso-Octane	C_8H_{18}	114.23	5778.8												
Nonanes+	C_9H_{20}	128.26	6493.2				0.0028		0.00012				0.0124		0.00052
Decanes+	$C_{10}H_{22}$	142.29	7189.6				0.0034		0.00014				0.0147		0.00062
Undecanes+	$C_{11}H_{24}$	306.10	7825.9				0.0590		0.00248				0.2584		0.01086
H2S	H_2S	34.08	586.8												
Non-Methane/Non-Ethane VOC Total:				0.0000	0.0220	0.0000	0.0765	0.0000	0.0032	0.0000	0.0963	0.0000	0.3350	0.0000	0.0141
Non-Methane VOC Total:				0.0000	0.0391	0.0000	0.0767	0.0000	0.0032	0.0000	0.1711	0.0000	0.3360	0.0000	0.0141
VOC Total:				0.0000	0.1483	0.0000	0.0770	0.0000	0.0032	0.0000	0.6495	0.0000	0.3374	0.0000	0.0142
HAP Total:				0.0000	0.0000	0.0000	0.0026	0.0000	0.0001	0.0000	0.0000	0.0000	0.0115	0.0000	0.0005

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
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SPECIATED EMISSIONS SUMMARY

Component	Formula	TOTALS (lb/hr)	(tpy)
Methane	CH_4	0.1096	0.4799
Ethane	C_2H_6	0.0173	0.0758
Propane	C_3H_8	0.0085	0.0374
iso-Butane	C_4H_{10}	0.0030	0.0132
n-Butane	C_4H_{10}	0.0037	0.0163
Cyclopentane	C_5H_{10}		
Neopentane	C_5H_{12}	0.0000	0.0000
iso-Pentane	C_5H_{12}	0.0023	0.0102
n-Pentane	C_5H_{12}	0.0018	0.0080
Benzene	C_6H_6	0.0009	0.0041
Cyclohexane	C_6H_{12}	0.0002	0.0010
Methylcyclopentane	C_6H_{12}	0.0001	0.0003
Neohexane	C_6H_{14}	0.0001	0.0003
2,3 Dimethylbutane	C_6H_{14}	0.0001	0.0004
2 Methylpentane	C_6H_{14}	0.0004	0.0019
3 Methylpentane	C_6H_{14}	0.0003	0.0011
n-Hexane	C_6H_{14}	0.0008	0.0036
Hexanes +	C_6H_{14}	0.0021	0.0092
Heptanes +	C_7H_{16}	0.0039	0.0170
Methylcyclohexane	C_7H_{14}	0.0004	0.0017
Toluene	C_7H_8	0.0003	0.0013
2-Methylhexane	C_7H_{16}	0.0004	0.0016
3-Methylhexane	C_7H_{16}	0.0004	0.0017
Xylenes	C_8H_{10}	0.0005	0.0024
Ethylbenzene	C_8H_{10}	0.0001	0.0007
Octanes +	C_8H_{18}	0.0033	0.0144
iso-Octane	C_8H_{18}		
Nonanes+	C_9H_{20}	0.0029	0.0129
Decanes+	$C_{10}H_{22}$	0.0035	0.0153
Undecanes+	$C_{11}H_{24}$	0.0615	0.2693
H2S	H_2S		
Ion-Methane/Non-Ethane VOC Total:		0.1017	0.4453
Non-Methane VOC Total:		0.1190	0.5212
VOC Total:		0.2286	1.0011
HAP Total:		0.0027	0.0120

Facility Name: Davidson-Matthews Compressor Station

	Total	Count	Connections WOG	Connections WO	Connections Oil	Connections Gas	Valves WOG	Valves WO	Valves Oil	Valves Gas
Separators										
Number of Pressure Vessels	3	x 8 (wogc)	24							
1 separator		x 10 (woc)		30						
2 scrubbers		x 10 (oc)			30					
		x 5 (gc)				15				
		x 2 (wogv)					6			
		x 4 (wov)						12		
		x 4 (ov)							12	
		x 2 (gv)								6
Tanks										
Number of tanks/gunbarrels	4	x 8 (woc)		32						
3 condensate tanks	3	x 8 (oc)			24					
1 water tank	4	x 1 (gc)				4				
	4	x 5 (wov)						20		
	3	x 4 (ov)							12	
Manifold										
Number of wells	2	x 10 (wogc)	20							
		x 4 (wocv)					8			
LACT units										
Number of LACTs	0	x 21 (oc)			0					
		x 8 (ov)							0	
Enclosed flare system										
Number of flares	1	x 10 (gc)				10				
		x 4 (gv)								4
Totals for connections and valves:			44	62	54	29	14	32	24	10
Compressor seals						2				
Pump seals				2	2					

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS

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This spreadsheet calculates fugitive emissions from equipment in gas and light liquid service using EPA-approved methodology.

The emissions are calculated using the following equation.

Emission Rate	=	# of Sources	x	Non-C1/C2 Gas/Liquid Fraction	x	API Leak Factor[1]	x	Run Time

To use this spreadsheet, you will need to provide data in the blue cells.

Site Name: Davidson-Matthews Compressor Station

Source Name: Site-Wide Fugitives

Source ID: FUG1 (i.e., Facility Identification No. (FIN), Failure Point No., Source ID No., etc.)

Emission Point: FUG1 (i.e., Emission Point No. (EPN), Release Point No., Stack ID No., etc)

Operating Hours: 8760 (hr/yr)

Leak Detection Program?: None

What Streams Will Be Included In Fugitive Emission Calculations:

Select All That Apply:

Stream	Selected	Stream Name
Fuel Gas	☐	
Process Gas Stream 1	☑	Separator gas
Process Gas Stream 2	☑	Flash vapors to flare
Liquid Hydrocarbon Stream 1	☑	Condensate
Liquid Hydrocarbon Stream 2	☐	
Water/Hydrocarbon Stream	☑	Water-condensate

CHEVRON USA, INC.

FUGITIVE EMISSION CALCULATIONS
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Gas/Liquids Analyses (Volume Basis): *(enter data from laboratory analysis)*

Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)	Mole %	Separator gas	Flash vapors to flare	Condensate		Water-condensate	Comment
Carbon Dioxide	CO_2	44.01	0		1.2600	0.4790	0.1050		0.1050	
Nitrogen	N_2	28.01	0		0.2100	0.9950	0.0380		0.0380	
Methane	CH_4	16.04	909.4		86.4700	44.5200	5.0720		5.0720	
Ethane	C_2H_6	30.07	1618.7		7.2100	25.3610	1.9570		1.9570	
Propane	C_3H_8	44.10	2314.9		2.3600	10.6350	1.8520		1.8520	
iso-Butane	C_4H_{10}	58.12	3000.4		0.6000	3.7540	1.1510		1.1510	
n-Butane	C_4H_{10}	58.12	3010.8		0.7000	4.7010	2.1630		2.1630	
Cyclopentane	C_5H_{10}	70.13	3513.2			0.0140			0.0000	
Neopentane	C_5H_{12}	72.15	3682.9			0.1690	0.0250		0.0250	also known as 2,2 Dimethylpropane
iso-Pentane	C_5H_{12}	72.15	3699		0.3500	1.9880	1.1510		1.1510	
n-Pentane	C_5H_{12}	72.15	3706.9		0.2000	2.4190	2.3310		2.3310	
Benzene	C_6H_6	78.11	3590.9			1.2830	2.9490		2.9490	
Cyclohexane	C_6H_{12}	84.16	4179.7			0.1290	0.6340		0.6340	
Methylcyclopentane	C_6H_{12}	84.16	4199			0.0660	0.2190		0.2190	
Neohexane	C_6H_{14}	86.18	4384			0.2510	0.1930		0.1930	also known as 2,2 Dimethylbutane
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7			0.1480	0.2680		0.2680	
2 Methylpentane	C_6H_{14}	86.18	4395.2			0.6700	1.2200		1.2200	
3 Methylpentane	C_6H_{14}	86.18	4398.1			0.3680	0.7270		0.7270	
n-Hexane	C_6H_{14}	86.18	4403.8			1.2600	2.3070		2.3070	
Hexanes +	C_6H_{14}	86.18	4403.8		0.3100				0.0000	
Heptanes +	C_7H_{16}	100.20	5100		0.3300	0.4160	3.0940		3.0940	
Methylcyclohexane	C_7H_{14}	98.19	4863.6			0.0460	0.9600		0.9600	
Toluene	C_7H_8	92.14	4273.6			0.0350	0.7690		0.7690	
2-Methylhexane	C_7H_{16}	100.20	5092.2			0.1710	0.9140		0.9140	
3-Methylhexane	C_7H_{16}	100.20	5096			0.0050	0.9300		0.9300	
Xylenes	C_8H_{10}	106.17	4957			0.0120	1.2370		1.2370	
Ethylbenzene	C_8H_{10}	106.17	4970.5			0.0030	0.3420		0.3420	
Octanes +	C_8H_{18}	114.23	5796.1			0.0800	6.9980		6.9980	
iso-Octane	C_8H_{18}	114.23	5778.8						0.0000	also known as 2,2,4 Trimethylpentane
Nonanes+	C_9H_{20}	128.26	6493.2			0.0200	5.5810		5.5810	
Decanes+	$C_{10}H_{22}$	142.29	7189.6			0.0060	5.9780		5.9780	
Undecanes+	$C_{11}H_{24}$	306.10	7825.9			0.0060	48.8350		48.8350	Default MW is 156.31, use lab data if available.
H2S	H_2S	34.08	586.8							
Water	H_2O	18.02	0						98.0000	
Oxygen	O_2	32.00	0							
		Totals (must equal 100)		0	100	100.00	100.00	0	100.00	
		Non-Methane/Non-Ethane Fraction:		0.0000	0.0485	0.2865	0.9283	0.0000	0.0186	
		Non-Methane Fraction:		0.0000	0.1206	0.5401	0.9479	0.0000	0.0190	
		VOC Fraction:		0.0000	0.9853	0.9853	0.9986	0.0000	0.0200	

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Gas/Liquid Analyses (Net MW):

Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)	Net MW (lb-lb-mole)	Separator gas	Flash vapors to flare	Condensate		Water-condensate
Carbon Dioxide	CO_2	44.01	0		0.5545	0.2108	0.0462		0.0009
Nitrogen	N_2	28.01	0		0.0588	0.2787	0.0106		0.0002
Methane	CH_4	16.04	909.4		13.8698	7.1410	0.8135		0.0163
Ethane	C_2H_6	30.07	1618.7		2.1680	7.6261	0.5885		0.0118
Propane	C_3H_8	44.1	2314.9		1.0408	4.6900	0.8167		0.0163
iso-Butane	C_4H_{10}	58.12	3000.4		0.3487	2.1818	0.6690		0.0134
n-Butane	C_4H_{10}	58.12	3010.8		0.4068	2.7322	1.2571		0.0251
Cyclopentane	C_5H_{10}	70.13	3513.2			0.0098			
Neopentane	C_5H_{12}	72.15	3682.9			0.1219	0.0180		0.0004
iso-Pentane	C_5H_{12}	72.15	3699		0.2525	1.4343	0.8304		0.0166
n-Pentane	C_5H_{12}	72.15	3706.9		0.1443	1.7453	1.6818		0.0336
Benzene	C_6H_6	78.11	3590.9			1.0022	2.3035		0.0461
Cyclohexane	C_6H_{12}	84.16	4179.7			0.1086	0.5336		0.0107
Methylcyclopentane	C_6H_{12}	84.16	4199			0.0555	0.1843		0.0037
Neohexane	C_6H_{14}	86.18	4384			0.2163	0.1663		0.0033
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7			0.1275	0.2310		0.0046
2 Methylpentane	C_6H_{14}	86.18	4395.2			0.5774	1.0514		0.0210
3 Methylpentane	C_6H_{14}	86.18	4398.1			0.3171	0.6265		0.0125
n-Hexane	C_6H_{14}	86.18	4403.8			1.0773	1.9882		0.0398
Hexanes +	C_6H_{14}	86.18	4403.8		0.2672				
Heptanes +	C_7H_{16}	100.20	5100		0.3307	0.4168	3.1002		0.0620
Methylcyclohexane	C_7H_{14}	98.19	4863.6			0.0452	0.9426		0.0189
Toluene	C_7H_8	92.14	4273.6			0.0322	0.7086		0.0142
2-Methylhexane	C_7H_{16}	100.20	5092.2			0.1713	0.9159		0.0183
3-Methylhexane	C_7H_{16}	100.20	5096			0.0050	0.9319		0.0186
Xylenes	C_8H_{10}	106.17	4957			0.0127	1.3133		0.0263
Ethylbenzene	C_8H_{10}	106.17	4970.5			0.0032	0.3631		0.0073
Octanes +	C_8H_{18}	114.23	5796.1			0.0914	7.9939		0.1599
iso-Octane	C_8H_{18}	114.23	5778.8						
Nonanes+	C_9H_{20}	128.26	6493.2			0.0257	7.1581		0.1432
Decanes+	$C_{10}H_{22}$	142.29	7189.6			0.0085	8.5058		0.1701
Undecanes+	$C_{11}H_{24}$	306.10	7825.9			0.0184	149.4839		2.9897
H2S	H_2S	34.08	586.8						
Water	H_2O	18.02	0						17.6596
Oxygen	O_2	32	0						
			Total MW	0.00	19.44	32.48	195.23	0.00	21.56
Non-Methane/Non-Ethane VOC Net MW:				0.00	2.79	17.23	193.78	0.00	3.88
Non-Methane VOC Net MW:				0.00	4.96	24.85	194.36	0.00	3.89
VOC Net MW:				0.00	18.83	31.99	195.18	0.00	3.90

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Gas/Liquid Analyses (Mass %):

Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)	Mass %	Separator gas	Flash vapors to flare	Condensate		Water-condensate
Carbon Dioxide	CO_2	44.01	0		2.85	0.65	0.02		0.0043
Nitrogen	N_2	28.01	0		0.30	0.86	0.01		0.0010
Methane	CH_4	16.04	909.4		71.34	21.98	0.42		0.0755
Ethane	C_2H_6	30.07	1618.7		11.15	23.48	0.30		0.0546
Propane	C_3H_8	44.1	2314.9		5.35	14.44	0.42		0.0757
iso-Butane	C_4H_{10}	58.12	3000.4		1.79	6.72	0.34		0.0620
n-Butane	C_4H_{10}	58.12	3010.8		2.09	8.41	0.64		0.1166
Cyclopentane	C_5H_{10}	70.13	3513.2			0.03			
Neopentane	C_5H_{12}	72.15	3682.9			0.38	0.01		0.0017
iso-Pentane	C_5H_{12}	72.15	3699		1.30	4.42	0.43		0.0770
n-Pentane	C_5H_{12}	72.15	3706.9		0.74	5.37	0.86		0.1560
Benzene	C_6H_6	78.11	3590.9			3.09	1.18		0.2136
Cyclohexane	C_6H_{12}	84.16	4179.7			0.33	0.27		0.0495
Methylcyclopentane	C_6H_{12}	84.16	4199			0.17	0.09		0.0171
Neohexane	C_6H_{14}	86.18	4384			0.67	0.09		0.0154
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7			0.39	0.12		0.0214
2 Methylpentane	C_6H_{14}	86.18	4395.2			1.78	0.54		0.0975
3 Methylpentane	C_6H_{14}	86.18	4398.1			0.98	0.32		0.0581
n-Hexane	C_6H_{14}	86.18	4403.8			3.32	1.02		0.1844
Hexanes +	C_6H_{14}	86.18	4403.8		1.37				
Heptanes +	C_7H_{16}	100.20	5100		1.70	1.28	1.59		0.2875
Methylcyclohexane	C_7H_{14}	98.19	4863.6			0.14	0.48		0.0874
Toluene	C_7H_8	92.14	4273.6			0.10	0.36		0.0657
2-Methylhexane	C_7H_{16}	100.20	5092.2			0.53	0.47		0.0849
3-Methylhexane	C_7H_{16}	100.20	5096			0.02	0.48		0.0864
Xylenes	C_8H_{10}	106.17	4957			0.04	0.67		0.1218
Ethylbenzene	C_8H_{10}	106.17	4970.5			0.01	0.19		0.0337
Octanes +	C_8H_{18}	114.23	5796.1			0.28	4.09		0.7414
iso-Octane	C_8H_{18}	114.23	5778.8						
Nonanes+	C_9H_{20}	128.26	6493.2			0.08	3.67		0.6639
Decanes+	$C_{10}H_{22}$	142.29	7189.6			0.03	4.36		0.7889
Undecanes+	$C_{11}H_{24}$	306.10	7825.9			0.06	76.57		13.8640
H2S	H_2S	34.08	586.8						
Water	H_2O	18.02	0						81.8928
Oxygen	O_2	32	0						
			Totals (must equal 100)	0	100	100	100	0	100
			Non-Methane/Non-Ethane MW Fraction:	0.0000	0.1436	0.5303	0.9925	0.0000	0.1797
			Non-Methane MW Fraction:	0.0000	0.2551	0.7651	0.9955	0.0000	0.1803
			VOC MW Fraction:	0.0000	0.9685	0.9849	0.9997	0.0000	0.1810
			H2S MW Fraction:	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

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Component Count:

Equipment Type		Separator gas	Flash vapors to flare	Condensate		Water-condensate
Valves		20	4	24		32
Connector						
Flanges		63	10	54		62
Open-Ended Lines						
Pumps				2		2
Other		2				

Fugitive Emission Sumary:

					Total VOCs (Including Methane and Ethane)											
					Emission Rate (lb/hr)						Emission Rate (tpy)					
Equipment Type	EPA 453/R-95-017 Gas Factor (lb/hr/source)	EPA 453/R-95-017 Light Oil Factor (lb/hr/source)	EPA 453/R-95-017 Water/Oil Factor (lb/hr/source)	Leak Detection Factor		Separator gas	Flash vapors to flare	Condensate		Water-condensate		Separator gas	Flash vapors to flare	Condensate		Water-condensate
Valves	0.00992	0.0055	0.0002156	0		0.1984	0.0397	0.1320		0.0069		0.8690	0.1738	0.5782		0.0302
Connector	0.00044	0.000463	0.000242	0												
Flanges	0.00086	0.000243	0.00000638	0		0.0542	0.0086	0.0131		0.0004		0.2373	0.0377	0.0575		0.0017
Open-Ended Lines	0.00441	0.00309	0.00055	0												
Pumps	0.00529	0.02866	0.0000528	0				0.0573		0.0001				0.2511		0.0005
Other	0.0194	0.0165	0.0308	0		0.0388						0.1699				
				Totals	0.0000	0.2914	0.0483	0.2024	0.0000	0.0074	0.0000	1.2762	0.2115	0.8867	0.0000	0.0324

					H2S (Fugitive Gas Factor x Wt Fraction H2S x # of Components)											
					Emission Rate (lb/hr)						Emission Rate (tpy)					
Equipment Type	EPA 453/R-95-017 Gas Factor (lb/hr/source)	EPA 453/R-95-017 Light Oil Factor (lb/hr/source)	EPA 453/R-95-017 Water/Oil Factor (lb/hr/source)	Leak Detection Factor		Separator gas	Flash vapors to flare	Condensate		Water-condensate		Separator gas	Flash vapors to flare	Condensate		Water-condensate
Valves	0.00992	0.0055	0.0002156	0		0.0000	0.0000	0.0000		0.0000		0.0000	0.0000	0.0000		0.0000
Connector	0.00044	0.000463	0.000242	0												
Flanges	0.00086	0.000243	0.00000638	0		0.0000	0.0000	0.0000		0.0000		0.0000	0.0000	0.0000		0.0000
Open-Ended Lines	0.00441	0.00309	0.00055	0												
Pumps	0.00529	0.02866	0.0000528	0				0.0000		0.0000				0.0000		0.0000
Other	0.0194	0.0165	0.0308	0		0.0000						0.0000				
				Totals	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

SUMMARY

	lb/hr	tpy
VOC (C3+)	0.5495	2.4068
H2S	0.0000	0.0000

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SPECIATED EMISSIONS

Component	Formula	MW (lb-lb-mole)	LHV (btu/scf)	SPECIATED EMISSIONS (lb/hr)						SPECIATED EMISSIONS (tpy)					
					Separator gas	Flash vapors to flare	Condensate		Water-condensate		Separator gas	Flash vapors to flare	Condensate		Water-condensate
Methane	CH_4	16.04	909.4		0.2146	0.0108	0.0008		0.00003		0.9401	0.0472	0.0037		0.0001
Ethane	C_2H_6	30.07	1618.7		0.0336	0.0115	0.0006		0.00002		0.1470	0.0504	0.0027		0.0001
Propane	C_3H_8	44.1	2314.9		0.0161	0.0071	0.0008		0.00003		0.0706	0.0310	0.0037		0.0001
iso-Butane	C_4H_{10}	58.12	3000.4		0.0054	0.0033	0.0007		0.00003		0.0236	0.0144	0.0030		0.0001
n-Butane	C_4H_{10}	58.12	3010.8		0.0063	0.0041	0.0013		0.00005		0.0276	0.0181	0.0057		0.0002
Cyclopentane	C_5H_{10}	70.13	3513.2			0.0000						0.0001			
Neopentane	C_5H_{12}	72.15	3682.9			0.0002	0.0000		0.00000			0.0008	0.0001		0.0000
iso-Pentane	C_5H_{12}	72.15	3699		0.0039	0.0022	0.0009		0.00003		0.0171	0.0095	0.0038		0.0001
n-Pentane	C_5H_{12}	72.15	3706.9		0.0022	0.0026	0.0017		0.00006		0.0098	0.0115	0.0076		0.0003
Benzene	C_6H_6	78.11	3590.9			0.0015	0.0024		0.00009			0.0066	0.0105		0.0004
Cyclohexane	C_6H_{12}	84.16	4179.7			0.0002	0.0006		0.00002			0.0007	0.0024		0.0001
Methylcyclopentane	C_6H_{12}	84.16	4199			0.0001	0.0002		0.00001			0.0004	0.0008		0.0000
Neohexane	C_6H_{14}	86.18	4384			0.0003	0.0002		0.00001			0.0014	0.0008		0.0000
2,3 Dimethylbutane	C_6H_{14}	86.18	4392.7			0.0002	0.0002		0.00001			0.0008	0.0010		0.0000
2 Methylpentane	C_6H_{14}	86.18	4395.2			0.0009	0.0011		0.00004			0.0038	0.0048		0.0002
3 Methylpentane	C_6H_{14}	86.18	4398.1			0.0005	0.0006		0.00002			0.0021	0.0028		0.0001
n-Hexane	C_6H_{14}	86.18	4403.8			0.0016	0.0021		0.00008			0.0071	0.0090		0.0003
Hexanes +	C_6H_{14}	86.18	4403.8		0.0041						0.0181				
Heptanes +	C_7H_{16}	100.20	5100		0.0051	0.0006	0.0032		0.00012		0.0224	0.0028	0.0141		0.0005
Methylcyclohexane	C_7H_{14}	98.19	4863.6			0.0001	0.0010		0.00004			0.0003	0.0043		0.0002
Toluene	C_7H_8	92.14	4273.6			0.0000	0.0007		0.00003			0.0002	0.0032		0.0001
2-Methylhexane	C_7H_{16}	100.20	5092.2			0.0003	0.0009		0.00003			0.0011	0.0042		0.0002
3-Methylhexane	C_7H_{16}	100.20	5096			0.0000	0.0010		0.00004			0.0000	0.0042		0.0002
Xylenes	C_8H_{10}	106.17	4957			0.0000	0.0014		0.00005			0.0001	0.0060		0.0002
Ethylbenzene	C_8H_{10}	106.17	4970.5			0.0000	0.0004		0.00001			0.0000	0.0016		0.0001
Octanes +	C_8H_{18}	114.23	5796.1			0.0001	0.0083		0.00030			0.0006	0.0363		0.0013
iso-Octane	C_8H_{18}	114.23	5778.8												
Nonanes+	C_9H_{20}	128.26	6493.2			0.0000	0.0074		0.00027			0.0002	0.0325		0.0012
Decanes+	$C_{10}H_{22}$	142.29	7189.6			0.0000	0.0088		0.00032			0.0001	0.0386		0.0014
Undecanes+	$C_{11}H_{24}$	306.10	7825.9			0.0000	0.1550		0.00567			0.0001	0.6791		0.0248
H2S	H_2S	34.08	586.8												
			Non-Methane/Non-Ethane VOC Total:	0.0000	0.0432	0.0260	0.2010	0.0000	0.0073	0.0000	0.1892	0.1139	0.8803	0.0000	0.0322
			Non-Methane VOC Total:	0.0000	0.0767	0.0375	0.2016	0.0000	0.0074	0.0000	0.3361	0.1643	0.8830	0.0000	0.0323
			VOC Total:	0.0000	0.2914	0.0483	0.2024	0.0000	0.0074	0.0000	1.2762	0.2115	0.8867	0.0000	0.0324
			HAP Total:	0.0000	0.0000	0.0032	0.0069	0.0000	0.0003	0.0000	0.0000	0.0141	0.0303	0.0000	0.0011

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SPECIATED EMISSIONS SUMMARY

Component	Formula	TOTALS (lb/hr)	(tpy)
Methane	CH_4	0.2263	0.9911
Ethane	C_2H_6	0.0457	0.2001
Propane	C_3H_8	0.0241	0.1054
iso-Butane	C_4H_{10}	0.0094	0.0412
n-Butane	C_4H_{10}	0.0118	0.0516
Cyclopentane	C_5H_{10}	0.0000	0.0001
Neopentane	C_5H_{12}	0.0002	0.0009
iso-Pentane	C_5H_{12}	0.0070	0.0305
n-Pentane	C_5H_{12}	0.0067	0.0292
Benzene	C_6H_6	0.0040	0.0175
Cyclohexane	C_6H_{12}	0.0007	0.0032
Methylcyclopentane	C_6H_{12}	0.0003	0.0012
Neohexane	C_6H_{14}	0.0005	0.0022
2,3 Dimethylbutane	C_6H_{14}	0.0004	0.0019
2 Methylpentane	C_6H_{14}	0.0020	0.0088
3 Methylpentane	C_6H_{14}	0.0012	0.0050
n-Hexane	C_6H_{14}	0.0038	0.0165
Hexanes +	C_6H_{14}	0.0041	0.0181
Heptanes +	C_7H_{16}	0.0091	0.0398
Methylcyclohexane	C_7H_{14}	0.0011	0.0047
Toluene	C_7H_8	0.0008	0.0035
2-Methylhexane	C_7H_{16}	0.0012	0.0054
3-Methylhexane	C_7H_{16}	0.0010	0.0044
Xylenes	C_8H_{10}	0.0014	0.0063
Ethylbenzene	C_8H_{10}	0.0004	0.0017
Octanes +	C_8H_{18}	0.0087	0.0382
iso-Octane	C_8H_{18}		
Nonanes+	C_9H_{20}	0.0077	0.0339
Decanes+	$C_{10}H_{22}$	0.0092	0.0401
Undecanes+	$C_{11}H_{24}$	0.1607	0.7041
H2S	H_2S		
lon-Methane/Non-Ethane VOC Total:		0.2775	1.2155
Non-Methane VOC Total:		0.3232	1.4157
VOC Total:		0.5495	2.4068
HAP Total:		0.0104	0.0455

Exemption §106.492 Checklist
(Previously Standard Exemption 80)

Smokeless Gas Flares

YOU MUST SUBMIT A PI-7 WITH REQUIRED ATTACHMENTS BEFORE CONSTRUCTION OR OPERATION IF THE GAS BURNED IN THE FLARE HAS A SULFUR OR CHLORINE CONCENTRATION GREATER THAN 24 PPMV.

The following checklist is designed to help you confirm that you meet Exemption §106.492, previously standard exemption 80, requirements. **Any "no" answers indicate that the claim of exemption may not meet all requirements for the use of Exemption §106.492, previously standard exemption 80.** If you do not meet all the requirements, you may alter the project design/operation in such a way that all the requirements of the exemption are met, or obtain a construction permit.

YES	NO	NA	DESCRIPTION
✓	_	_	Have you included a description of how this exemption claim meets the general rule for the use of exemptions (§106.4 checklist is available)?
✓	_	_	Is the flare equipped with a tip designed to provide good mixing with air, flame stability and a tip velocity less than 60 ft/sec for gases having a lower heating value less than 1,000 BTU/ft^3, or less than 400 ft/sec for gases with a LHV greater than 1,000 BTU/ft^3? Attach a description including BTU content and tip velocity (Table 8 is available).
✓	_	_	Is the flare equipped with a continuously burning pilot or other automatic ignition system that assures gas ignition whenever vents are directed to the flare? Attach a description of the system.
_	_	✓	If the flare emits more than 4 #/hr of reduced sulfur compounds, excluding sulfur oxides, is it equipped with an alarm system that immediately notifies appropriate personnel when the ignition system ceases functioning? Attach a description of the system.
_	_	✓	If the flare emits less than 4 #/hr of reduced sulfur compounds and is not equipped with an alarm system, does the stack height meet the requirements of condition (d) of §106.352, previously standard exemption STDX 66? Required height:___. Actual height ___.
_	_	✓	If the flare burns gases containing more than 24 ppmv of sulfur, chlorine or compounds containing either element, is it located at least 1/4 mile from any recreational area, residence, or other structure not occupied or used solely by the owner or operator of the flare or owner of the property where the flare is located? Attach a scaled map.
_	_	✓	If the flare emits HCl, does the heat release (BTU/hr based on lower heating value) equal or exceed 2.73 x 10E5 x HCl emission rate(lb/hr)? Attach calculations.
_	_	✓	If the flare emits SO2, does the heat release (BTU/hr based on lower heating value) equal or exceed 0.53 x 10E5 x SO2 emission rate (lb/hr)? Attach calculations.
✓	_	_	Will you limit the flare to burning only combustible mixtures of gases containing only carbon, hydrogen, nitrogen, oxygen, sulfur, chlorine, or compounds derived from these elements?
✓	_	_	Will the gas mixture always have a net or lower heating value of at least 200 BTU/ft3 prior to addition of air?
✓	_	_	Do you understand and will you ensure that liquids shall never be burned in the flare?

(1) design requirements.

(A) The flare shall be equipped with a flare tip designed to provide good mixing with air, flame stability, and a tip velocity less than 60 feet per second (ft/sec) for gases having a lower heating value less than 1,000 British thermal units per cubic foot (Btu/ft3) or a tip velocity less than 400 ft/sec for gases having a lower heating value greater than 1,000 Btu/ft3 .

The enclosed flare consists of	210 holes.		
Each hole is	0.04 inches in diameter.		
Cross-sectional area of each hole:	0.001257	$inch^2$	
Cross-sectional area of all holes:	0.263894	$inch^2$	
Maximum heating rate:	2.1	MMBtu/hr	
	583.3333	Btu/s	
Heat content of flare stream:	1835	Btu/scf	
Flow rate at max heating rate:	0.317893	ft^3/s	
Flare tip velocity at max flow rate:	173.4659	ft/s	which is less than 400 ft/s

(B) The flare shall be equipped with a continuously burning pilot or other automatic ignition system that assures gas ignition and provides immediate notification of appropriate personnel when the ignition system ceases to function. A gas flare which emits no more than 4.0 pounds per hour (lb/hr) of reduced sulfur compounds, excluding sulfur oxides, is exempted from the immediate notification requirement, provided the emission point height meets the requirements of §106.352(4) of this title (relating to Oil and Gas Production Facilities).

The enclosed flare is a skid-mounted package which contains a pilot system and automatic ignition system.

(C) A flare which burns gases containing more than 24 parts per million by volume (ppmv) of sulfur, chlorine, or compounds containing either element shall be located at least 1/4 mile from any recreational area or residence or other structure not occupied or used solely by the owner or operator of the flare or the owner of the property upon which the flare is located.

The gases that will be burned will contain less than 1 ppm sulfur and chlorine. Not applicable.

(D) The heat release of a flare which emits sulfur dioxide (SO^2) or hydrogen chloride (HCl) shall be greater than or equal to the following values:

The gases that will be burned will contain less than 1 ppm sulfur and chlorine. Not applicable.

(2) operational conditions.

(A) The flare shall burn a combustible mixture of gases containing only carbon, hydrogen, nitrogen, oxygen, sulfur, chlorine, or compounds derived from these elements. When the gas stream to be burned has a net or lower heating value of more than 200 Btu/ft3 prior to the addition of air, it may be considered combustible.

The gas streams to be burned contain no gases other than the ones listed above. No gas streams are expected to have a heating value less than 200 Btu/ft3.

(B) A flare which burns gases containing more than 24 ppmv of sulfur, chlorine, or compounds containing either element shall be registered with the commission's Office of Permitting, Remediation, and Registration in Austin using Form PI-7 prior to construction of a new flare or prior to the use of an existing flare for the new service.

The gases that will be burned will contain less than 1 ppm sulfur and chlorine. Not applicable.

(C) Under no circumstances shall liquids be burned in the flare.

The enclosed flare is a skid-mounted package which contains a small vessel for capturing any liquids. The facility will follow the manufacturer's instructions - slope the vent pipes from the tanks downwards towards this vessel to prevent any carryover of liquids.

FLARING EMISSIONS

FLARE EMISSION CALCULATIONS

Site: Davidson-Matthews Compressor Station

Acct. No.:

Flare ID: FLR1

Emiss Pt.: FLR1

WASTE GAS STREAM: Process Emissions

Conversions:
1 lb = 453.51 gm
1 tn = 2,000 lb
1 yr = 8,760 hr

What is the Molar Volume to be used for calculations? 380 scf/lb-mole (Default is 379.5 scf/lb-mole)

What is flare VOC destruction efficiency?: 98 % DRE *Note: Default for propane stream-only is 99%, VOC is 98%)*

FLARE CALCULATION METHODOLOGY:

NOx, CO and VOC1 Calculation

V	x	LHV	x	EF	=	lb				

VOC Calculation

V	x	mole frac	x	MWVOC	x	1/C	x	1-DRE/100	=	lb

H2S Calculation2

V	x	mole frac	x	MWH2S	x	1/C	x	1-CE	=	lb

SO2 Calculation2

V	x	mole frac	x	MWSO2	x	1/C	x	CE	=	lb

Where:

V = Flared Volume (scf)
LHV = Lower or Net Heating Value (btu/scf)
EF = Emission Factor (lb/mmbtu)
MW = Molecular Weight (lb/lb-mole)
C = Molar Volume (scf/lb-mol)
DRE = Destruction Efficiency (%)
CE = H2S Conversion to SO2 (decimal)

Notes: 1If using AP-42 emission factor, which represents total hydrocarbon, factor is adjusted for weight percent of C3+.
2Unless otherwise specified, H2S Conversion to SO2 is 98 percent.

FLARE EMISSION CALCULATIONS - PILOT FUEL

Pilot Gas Fuel Rate: 50 scf/hr
Hours Operated: 8760 hr *(Note: Enter 8,760 for Continuous Pilot Operation)*

FUEL GAS COMPOSITION						
Component	LHV (BTU/scf)	Mole %	MW	Net MW	Net LHV (BTU/scf)	Wt %
Carbon Dioxide	0	1.2600	44.01	0.55	0	2.85
Nitrogen	0	0.2100	28.01	0.06	0	0.30
Methane	909	86.4700	16.04	13.87	786	71.34
Ethane	1619	7.2100	30.07	2.17	117	11.15
Propane	2315	2.3600	44.10	1.04	55	5.35
I-Butane	3000	0.6000	58.12	0.35	18	1.79
N-Butane	3011	0.7000	58.12	0.41	21	2.09
I-Pentane	3699	0.3500	72.15	0.25	13	1.30
N-Pentane	3707	0.2000	72.15	0.14	7	0.74
Hexanes+	4404	0.3100	86.18	0.27	14	1.37
Heptanes+	5100	0.3300	100.20	0.33	17	1.70
Octanes+	5796		114.20	0.00	0	0.00
H2S	587		34.08	0.00	0	0.00
Water	0		18.02	0.00	0	0.00
Oxygen	0		32.00	0.00	0	0.00
Totals		100.00		19.44	1048	100
C3+		4.85		2.79		14.35

FLARE EMISSION CALCULATIONS - WASTE GAS STREAM 1

Waste Gas Stream: Flash gas from condensate
Waste Gas/Acid Gas Rate: 87.5 scf/hr
Hours Operated: 8760 hr

WASTE GAS/ACID GAS COMPOSITION						
Component	LHV (btu/scf)	Mole %	MW	Net MW	Net LHV (btu/scf)	Wt %
Carbon Dioxide	0	0.4790	44.01	0.21	0	0.65

Nitrogen	0	0.9950	28.01	0.28	0	0.86
Methane	909.4	44.5200	16.04	7.14	405	21.99
Ethane	1618.7	25.3610	30.07	7.63	411	23.48
Propane	2314.9	10.6350	44.1	4.69	246	14.44
iso-Butane	3000.4	3.7540	58.12	2.18	113	6.72
n-Butane	3010.8	4.7010	58.12	2.73	142	8.41
Cyclopentane	3513.2	0.0140	70.13	0.01	0	0.03
2,2, Dimethylpropane	3682.9	0.1690	72.15	0.12	6	0.38
iso-Pentane	3699	1.9880	72.15	1.43	74	4.42
n-Pentane	3706.9	2.4190	72.15	1.75	90	5.37
Benzene	3590.9	1.2830	78.11	1.00	46	3.09
Cyclohexane	4179.7	0.1290	84.16	0.11	5	0.33
Methylcyclopentane	4199	0.0660	84.16	0.06	3	0.17
2,2, Dimethylbutane	4384	0.2510	86.18	0.22	11	0.67
2,3 Dimethylbutane	4392.7	0.1480	86.18	0.13	7	0.39
2 Methylpentane	4395.2	0.6700	86.18	0.58	29	1.78
3 Methylpentane	4398.1	0.3680	86.18	0.32	16	0.98
n-Hexane	4403.8	1.2500	86.18	1.08	55	3.32
Hexanes +	4403.8		86.18	0.00	0	0.00
Heptanes +	5100	0.4160	100.2	0.42	21	1.28
Methylcyclohexane	4863.6	0.0460	98.188	0.05	2	0.14
Toluene	4273.6	0.0350	92.14	0.03	1	0.10
2-Methylhexane	5092.2	0.1710	100.204	0.17	9	0.53
3-Methylhexane	5096	0.0050	100.204	0.01	0	0.02
Xylenes	4957	0.0120	106.17	0.01	1	0.04
Ethylbenzene	4970.5	0.0030	106.17	0.00	0	0.01
Octanes +	5796.1	0.0800	114.231	0.09	5	0.28
2,2,4 Trimethylpentane	5778.8		114.231	0.00	0	0.00
Nonanes+	6493.2	0.0200	128.258	0.03	1	0.08
Decanes+	7189.6	0.0060	142.285	0.01	0	0.03
Undecanes+	7825.9	0.0060	156.31	0.01	0	0.03
Hydrogen Sulfide	586.8	0.0000	34.08	0.00	0	0.00
Sulfur Dioxide	0		64.065	0.00	0	0.00
Nitrogen Oxides (as NO2)	0		46.05	0.00	0	0.00
Carbon Monoxide	320.5		28.01	0.00	0	0.00
Water	0		18.02	0.00	0	0.00
Oxygen	0		32	0.00	0	0.00
Totals		100.00		32.48	1699.58	100.00
C3+		28.65		17.22		53.02

FLARE EMISSION CALCULATIONS - WASTE GAS STREAM 2

Waste Gas Stream:	Working and Breathing losses	
Waste Gas/Acid Gas Rate:	10.7755	scf/hr
Hours Operated:	8760	hr

WASTE GAS/ACID GAS COMPOSITION						
Component	LHV (btu/scf)	Mole %	MW	Net MW	Net LHV (btu/scf)	Wt %
Carbon Dioxide	0	0.4800	44.01	0.21	0	0.30
Nitrogen	0	0.0000	28.01	0.00	0	0.00
Methane	909	3.1270	16.04	0.50	28	0.72
Ethane	1619	5.7900	30.07	1.74	94	2.50
Propane	2315	8.5540	44.1	3.77	198	5.41
iso-Butane	3000	5.9370	58.12	3.45	178	4.95
n-Butane	3011	15.8900	58.12	9.24	478	13.25
Cyclopentane	3513		70.13	0.00	0	0.00
2,2, Dimethylpropane	3683	0.0250	72.15	0.02	1	0.03
iso-Pentane	3699	9.3830	72.15	6.77	347	9.72
n-Pentane	3707	13.6970	72.15	9.88	508	14.18
Benzene	3591	4.2250	78.11	3.30	152	4.74
Cyclohexane	4180	0.8970	84.16	0.75	37	1.08
Methylcyclopentane	4199	0.3930	84.16	0.33	17	0.47
2,2, Dimethylbutane	4384	0.7370	86.18	0.64	32	0.91
2,3 Dimethylbutane	4393	0.9520	86.18	0.82	42	1.18
2 Methylpentane	4395	5.6290	86.18	4.85	247	6.96
3 Methylpentane	4398	2.8160	86.18	2.43	124	3.48
n-Hexane	4404	8.6100	86.18	7.42	379	10.65
Hexanes +	4404		86.18	0.00	0	0.00
Heptanes +	5100	4.3390	100.2	4.35	221	6.24
Methylcyclohexane	4864	1.1290	98.188	1.11	55	1.59
Toluene	4274	0.1520	92.14	0.14	6	0.20
2-Methylhexane	5092	1.9070	100.204	1.91	97	2.74
3-Methylhexane	5096	1.4210	100.204	1.42	72	2.04
Xylenes	4957	0.0960	106.17	0.10	5	0.15
Ethylbenzene	4971	0.0170	106.17	0.02	1	0.03

Octanes +	5796	2.8450	114.231	3.25	165	4.66
2,2,4 Trimethylpentane	5779		114.231	0.00	0	0.00
Nonanes+	6493	0.7470	128.258	0.96	49	1.38
Decanes+	7190	0.1840	142.285	0.26	13	0.38
Undecanes+	7826	0.0210	156.31	0.03	2	0.05
Hydrogen Sulfide	587		34.08	0.00	0	0.00
Sulfur Dioxide	0		64.065	0.00	0	0.00
Nitrogen Oxides (as NO2)	0		46.05	0.00	0	0.00
Carbon Monoxide	321		28.01	0.00	0	0.00
Water	0		18.02	0.00	0	0.00
Oxygen	0		32	0.00	0	0.00
Totals		100.00		69.68	3548.82	100.00
C3+		90.60		67.22		96.48

FLARE EMISSION CALCULATIONS SUMMARY

Gas Stream	Flow Rate (scf/hr)	Net Heat Value (btu/scf)	Total Hours (hr/yr)	VOC (wt %)	VOC (lb-mole)	Total Flow (mscf/yr)
Pilot Gas Fuel Rate	50	1,048	8,760	14.35	279.09	438
Flash gas from condensate Rate	88	1,700	8,760	53.02	1,721.89	767
Working and Breathing losses Rate	11	3,549	8,760	96.48	6,722.14	94
Total Flow:	148					

Combined Stream	Calculated NHV (btu/scf)
Combined Pilot Fuel, Waste Gas Streams	1,614.12
Pilot Fuel Gas Only	1,047.62

Waste Gas 1	1,699.58
Waste Gas 2	3,548.82

Preferred Calculation: Combined Pilot Fuel, Purge/Assist and Waste Gas

Preferred Emission Factors:

NOx EF:	AP-42 January 1995	0.068	lb/mmbtu
CO EF:	AP-42 January 1995	0.37	lb/mmbtu

FLARE EMISSION SUMMARY

	NOx		CO		VOC		H2S		SO2	
Gas stream	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Pilot Gas Fuel	0.0036	0.0156	0.0194	0.0849	0.0073	0.0322	0.00	0.00	0.00	0.00
Flash gas from condensate	0.0101	0.0443	0.0550	0.2410	0.0793	0.3473	0.00	0.00	0.00	0.00
Working and breathing gas	0.0026	0.0114	0.0141	0.0620	0.0381	0.1670	0.00	0.00	0.00	0.00
TOTALS	0.0163	0.0713	0.0886	0.3879	0.1248	0.5465	0.0000	0.0000	0.0000	0.0000

SPECIATED FLARE EMISSIONS SUMMARY

	Pilot Gas Fuel			Flash gas from condensate			Working and breathing gas		
Component	wt %	lb/hr	tpy	wt %	lb/hr	tpy	wt %	lb/hr	tpy
Propane	5.3520	0.0027	0.0006	14.4418	0.0216	0.0946	5.4141	0.0021	0.0094
iso-Butane	1.7935	0.0009	0.0002	6.7184	0.0100	0.0440	4.9524	0.0020	0.0086
n-Butane	2.0924	0.0011	0.0002	8.4132	0.0126	0.0551	13.2547	0.0052	0.0229
Cyclopentane				0.0302	0.0000	0.0002	0.0000	0.0000	0.0000
2,2, Dimethylpropane				0.3755	0.0006	0.0025	0.0259	0.0000	0.0000
iso-Pentane	1.2987	0.0007	0.0002	4.4167	0.0066	0.0289	9.7163	0.0038	0.0168
n-Pentane	0.7421	0.0004	0.0001	5.3742	0.0080	0.0352	14.1835	0.0056	0.0245
Benzene				3.0859	0.0046	0.0202	4.7365	0.0019	0.0082
Cyclohexane				0.3343	0.0005	0.0022	1.0835	0.0004	0.0019
Methylcyclopentane				0.1710	0.0003	0.0011	0.4747	0.0002	0.0008
2,2, Dimethylbutane				0.6661	0.0010	0.0044	0.9116	0.0004	0.0016
2,3 Dimethylbutane				0.3927	0.0006	0.0026	1.1775	0.0005	0.0020
2 Methylpentane				1.7780	0.0027	0.0116	6.9624	0.0028	0.0121
3 Methylpentane				0.9766	0.0015	0.0064	3.4831	0.0014	0.0060
n-Hexane				3.3171	0.0050	0.0217	10.6495	0.0042	0.0184
Hexanes +	1.3739	0.0007	0.0002	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Heptanes +	1.7006	0.0009	0.0002	1.2835	0.0019	0.0084	6.2399	0.0025	0.0108
Methylcyclohexane				0.1391	0.0002	0.0009	1.5910	0.0006	0.0028
Toluene				0.0993	0.0001	0.0007	0.2010	0.0001	0.0003
2-Methylhexane				0.5276	0.0008	0.0035	2.7426	0.0011	0.0047
3-Methylhexane				0.0154	0.0000	0.0001	2.0436	0.0008	0.0035
Xylenes				0.0392	0.0001	0.0003	0.1463	0.0001	0.0003
Ethylbenzene				0.0098	0.0000	0.0001	0.0259	0.0000	0.0000
Octanes +				0.2814	0.0004	0.0018	4.6643	0.0018	0.0081
2,2,4 Trimethylpentane				0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Nonanes+				0.0790	0.0001	0.0005	1.3751	0.0005	0.0024
Decanes+				0.0263	0.0000	0.0002	0.3757	0.0001	0.0007
Undecanes+				0.0289	0.0000	0.0002	0.0471	0.0000	0.0001
HAPs per stream:					0.0098	0.0429		0.0062	0.0273

	lb./hr	tpy
TOTAL HAPs:	0.0160	0.0702

FLARE EQUIPMENT SPECS

SFI
Superior Fabrication, Inc.

2.3 ITEM III – 2.1MM BTU/hr VOC Enclosed Flare

Superior Fabrication, Inc. 48" x 8'-0", 2.1MM BTU/hr VOC Enclosed Flare, complete with the following:

Vessel Features

Plate 3/16" SA-36 – shell, misc.
Plate 10 gauge SA-36 – hood
(1) 10 ¾" x 5'-0" Knockout Pot
(1) 6" x 24" x 125# WP ASME Fuel Gas Scrubber

Connections

(1) Phoenix #108 Flange 2" NPT
(1) ¼" 3000# Full Coupling
(1) ½" 3000# Full Coupling
(1) 1" 3000# Full Coupling
(2) 2" 3000# Full Coupling

Accessories

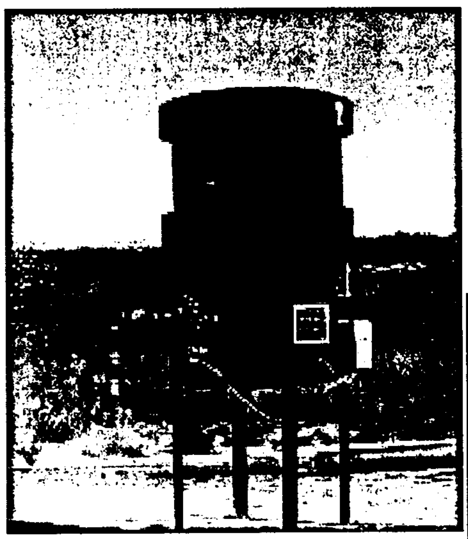
(1) Hammer Union 2" Fig 100
(1) Union sight glass assembly, low press. 2" NPT
(1) Farley Burner, F210
(1) Flame Cell, 47.5" dia. x 4" thk.
(1) Standard Pilot assembly, mixer, tip & nipples
(1) Fisher (or equal) 67CFR-224 regulator
(1) 0-5psi Gauge ¼" CBM
(1) SVC Igniter
(1) Solenoid
(1) Solar Panel & bracket
Conduit & wiring
(1) 2" NPT In-Line Flame Arrestor, steel housing

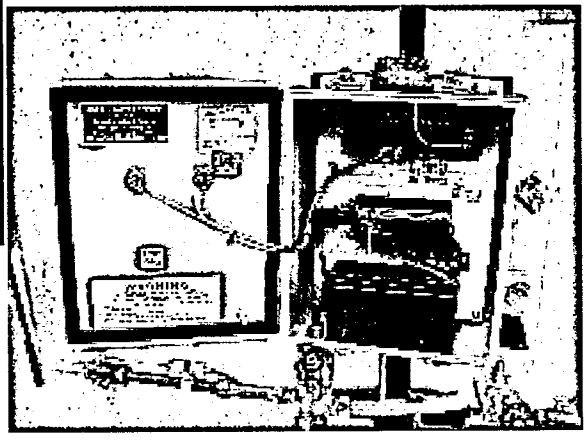
Finish: Painted

SFI

Superior Fabrication, Inc.

VOC Enclosed Flare Installation Guide





VOC Enclosed Flare
MEETS Requirements of CFR title 40

Superior Fabrication's VOC Flares are designed for burning waste / vent gas from storage tanks, exhaust from instruments such as level controls and pressure pilots and any other low pressure gas source. The flares are sized based on the following criteria for a minimum of 98% destruction efficiency. The VOC Flare is an Enclosed Flare, also referred to as a ground flare, as in the case of API publication 931 chapter 15. It is simply a flare that has been surrounded by barrier. Since the flare is at ground level, maintenance is much easier and safer. The enclosure also limits the affects of wind and downdrafts.

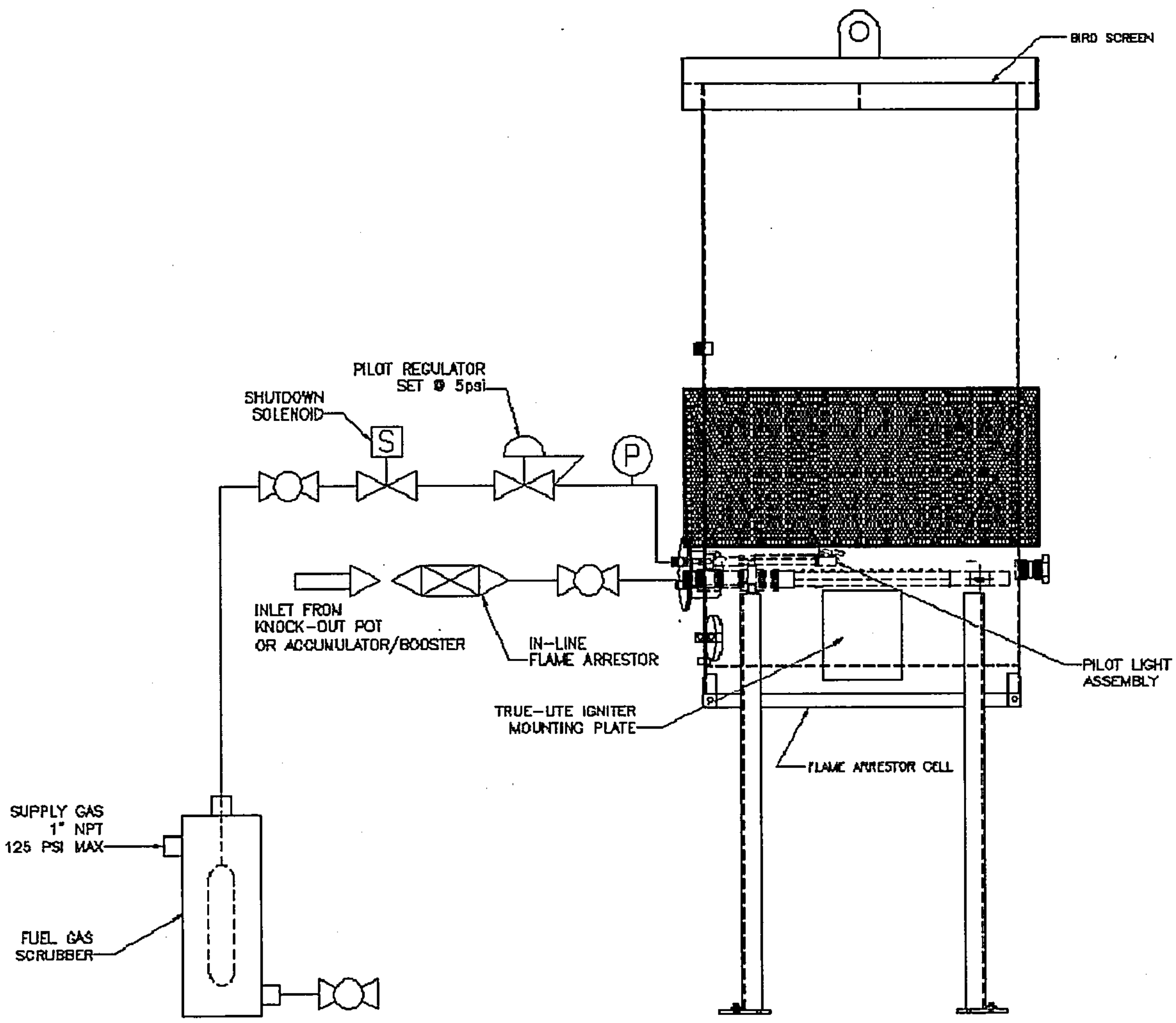
The enclosed flare meets the requirements of CFR title 40 §63.771(d)(1)(iii) as a "Flare" per §63.11 (b).
§63.11(b)(1) Operator shall monitor and operate the control device.
§63.11(b)(2) The SFI flare is a non-assisted, natural draft type.
§63.11(b)(3) The flare is operated continuously.
§63.11(b)(4) The flare is designed to have no visible emissions, except for a maximum total of 5 minutes in any 2 hour period. Test Method 22 in appendix A of part 60 is to be used in determining visible emissions.
§63.11(b)(5) The flare is equipped with a constant pilot flame monitored by a thermocouple. The thermocouple causes instant re-light should there be a pilot outage.
§63.11(b)(6) Refer to §63.11(b)(7)(i) The SFI flares are sized for 10 ft/sec based on anticipated flow rates.

There are two different configurations for dumping the liquid from the vent gas before it is burned in the Enclosed Flare. The configuration of the unit should be specified when ordering.

1.) The first configuration uses a Knock-Out Pot where the liquid has to be manually dumped.

2.) The second configuration uses an Accumulator/Booster. In this system the liquid is automatically dumped back into the tanks. This is the preferred system for daily operations.

This guide has both configuration types incorporated into it.



WARNING: To reduce the risk of explosion, it is imperative to have the *In-Line Flame Arrestor* installed before the system is started.

Figure 1

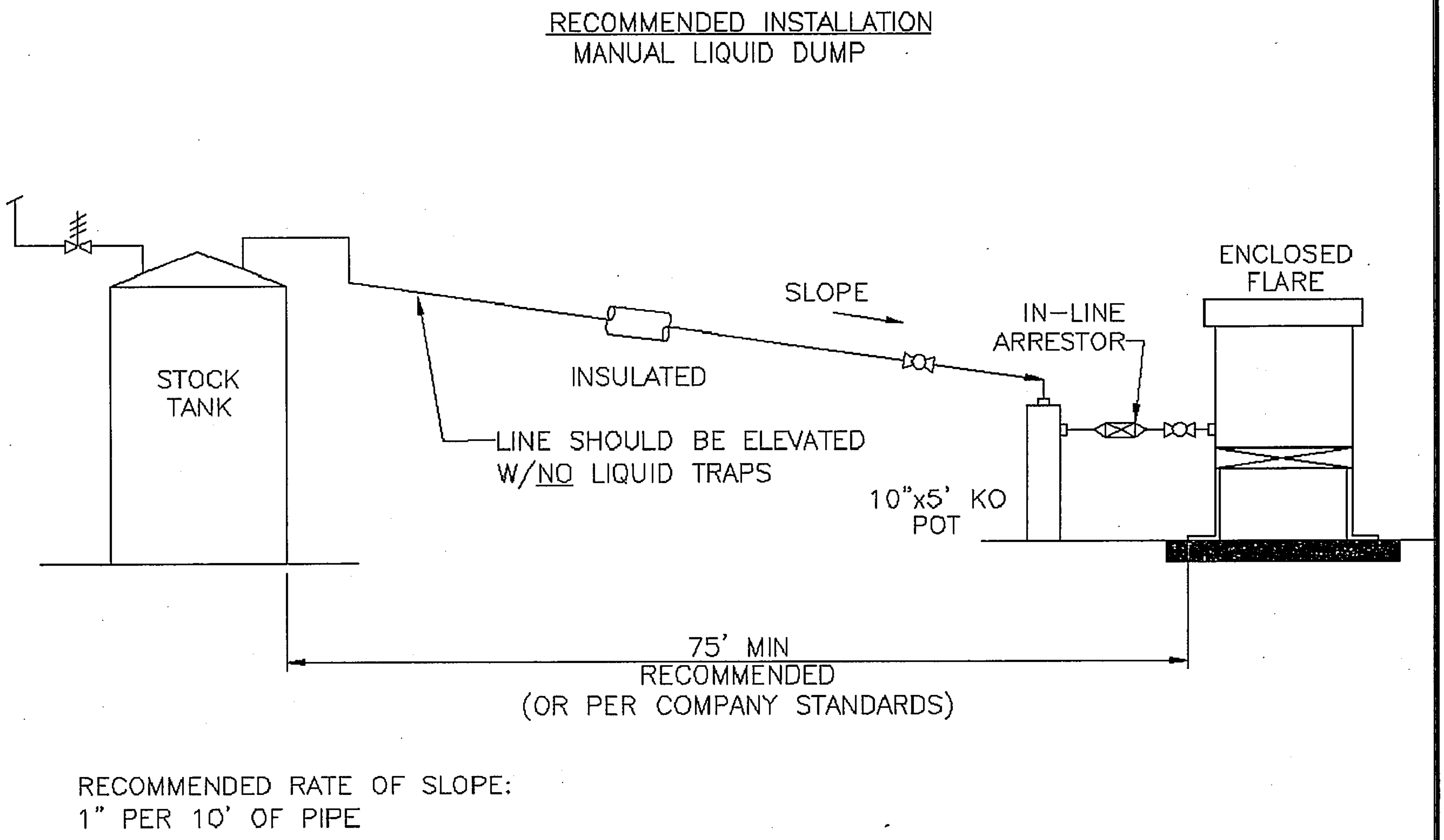

RECOMMENDED INSTALLATION
MANUAL LIQUID DUMP
STOCK TANK
INSULATED
SLOPE
IN-LINE ARRESTOR
ENCLOSED FLARE
LINE SHOULD BE ELEVATED W/NO LIQUID TRAPS
10"x5' KO POT
75' MIN RECOMMENDED (OR PER COMPANY STANDARDS)
RECOMMENDED RATE OF SLOPE:
1" PER 10' OF PIPE

Figure 2.1

Stationary Engines and Turbines
Air Permits by Rule (PBR) Checklist
Title 30 Texas Administrative Code § 106.512
Chevron USA, Inc. – Davidson-Matthews Compressor Station
Ajax DPC60 Engine

Check the most appropriate answer and include any additional information in the spaces provided. If additional space is needed, please include an extra page and reference the question number. The PBR forms, tables, checklists, and guidance documents are available from the TCEQ, Air Permits Division Web site at: www.tceq.state.tx.us/permitting/air/nav/air_pbr.html.

This PBR (§ 106.512) requires registration with the commission's Office of Permitting, Remediation, and Registration in Austin before construction if the horsepower (hp) of the facility is greater than 240 hp. Registration of the facility can be performed by completing a Form PI-7, "Registration for Permits by Rule," or Form PI-7-CERT, "Certification and Registration for Permits by Rule." This checklist should accompany the registration form.

Definitions:

The following words and terms, when used in this section, shall have the following meanings, unless the context clearly indicates otherwise.

A. Rich-burn Engine: A rich-burn engine is a gas-fired, spark-ignited engine that is operated with an exhaust oxygen content less than four percent by volume.

B. Lean-burn Engine: A lean-burn engine is a gas-fired, spark-ignited engine that is operated with an exhaust oxygen content of four percent by volume, or greater.

C. Rated Engine Horsepower: Engine rated horsepower shall be based on the engine manufacturer's maximum continuous load rating at the lesser of the engine or driven equipment's maximum published continuous speed.

D. Turbine Horsepower: Turbine rated horsepower shall be based on turbine base load, fuel power heating value, and International Standards Organization Standard Day Conditions of 59 degrees Fahrenheit, 1.0 atmosphere pressure, and 60 percent relative humidity.

CHECK THE MOST APPROPRIATE ANSWERS AND FILL IN THE BLANKS

Rule	Questions/Description	Information	Response
	Will the engine or turbine be used as a replacement at an oil and gas site and does it meet all the requirements of the policy memo entitled, "Replacement of All Engine and Turbine Components for Oil and Gas Production?" *If "YES," registration is not required for like-kind replacements of engine or turbine components.* *If "NO," please continue.*		☐ YES ☒ NO
(1)	Is the engine or turbine rated less than 240 hp? *If "YES," then registration is not required, but the facility must comply with conditions (5) and (6) of this rule.* *If "NO," then registration is required and the facility must be registered by submitting a completed Form PI-7 and Table 29 or Table 31, as applicable, within 10 days after construction begins.*		☒ YES ☐ NO
(1)	Indicate the type of equipment (pick one): *If an engine, go to Question (2).* *If a turbine, go to Question (3)*	☒ Engine ☐ Turbine	☒ YES ☐ NO

Stationary Engines and Turbines
Air Permits by Rule (PBR) Checklist
Title 30 Texas Administrative Code § 106.512

CHECK THE MOST APPROPRIATE ANSWERS AND FILL IN THE BLANKS			
Rule	**Questions/Description**	**Information**	**Response**
(2)	Is the engine rated at 500 hp or greater? *If "NO," the engine is between 240 hp and 500 hp. The engine must be registered by submitting a completed <u>Form PI-7</u> and a <u>Table 29</u> within 10 days after construction begins and must comply with conditions (5) and (6) of this rule.* *If "YES," in addition to registration, the engine must operate in compliance with the following nitrogen (NO_x) emission limit(s). Check the limit(s) applicable to this engine by answering the following:*		☐ YES ☒ NO
(2)(A)(i)	The engine is a gas-fired, rich-burn engine and will not exceed 2.0 grams per horsepower hour (g/hp-hr) under all operating conditions.	____________ g/hp-hr NO_x	☐ YES ☐ NO **Not applicable**
(2)(A)(ii)	The engine is a spark-ignited, gas-fired, lean-burn engine or any compression-ignited, dual fuel-fired engine manufactured new after June 18, 1992, and will not exceed 2.0 g/hp-hr NO_x at manufacturer's rated full load and speed at all times; except, the engine will not exceed 5.0 g/hp-hr NO_x under reduced speed and 80% and 100% of full torque conditions.	____________ g/hp-hr NO_x	☐ YES ☐ NO **Not applicable**
(2)(A)(iii)	The engine is any spark-ignited, lean-burn two-cycle or four-cycle engine or any compression-ignited, dual fuel-fired engine rated 825 hp or greater and manufactured between September 23, 1982 and June 18, 1992, and will not exceed 5.0 g/hp-hr NO_x under all operating conditions.	____________ g/hp-hr NO_x	☐ YES ☐ NO **Not applicable**
(2)(A)(iv)	The engine is any spark-ignited, gas-fired, lean-burn, four-cycle engine or compression-ignited, dual-fuel-fired engine that was manufactured before June 18, 1992, and is rated less than 825 hp, or was manufactured before September 23, 1982, and will not exceed 5.0 g/hp-hr NO_x at manufacturer's rated full load and speed at all times; except, the engine will not exceed 8.0 g/hp-hr NO_x under reduced speed and 80% and 100% of full torque conditions.	____________ g/hp-hr NO_x	☐ YES ☐ NO **Not applicable**
(2)(A)(v)	The engine is any spark-ignited, gas-fired, two-cycle, lean-burn engine that was manufactured before June 18, 1992, and is rated less than 825 hp, or was manufactured before September 23, 1982, and will not exceed 8.0 g/hp-hr NO_x under all operating conditions.	____________ g/hp-hr NO_x	☐ YES ☐ NO **Not applicable**
(2)(A)(vi)	The engine is any compression-ignited, liquid-fired engine and will not exceed 11.0 g/hp-hr NO_x under all operating conditions.	____________ g/hp-hr NO_x	☐ YES ☐ NO **Not applicable**
(2)(B)	Does the engine require an automatic air-fuel ratio controller to meet the NO_x limit(s) above?		☐ YES ☐ NO **Not applicable**
(2)(B)	For spark-ignited gas-fired or compression-ignited dual fuel-fired engines, is the engine required to have an automatic air-fuel ratio controller under condition (2)(B) of the PBR?		☐ YES ☐ NO **Not applicable**

TCEQ

Stationary Engines and Turbines
Air Permits by Rule (PBR) Checklist
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CHECK THE MOST APPROPRIATE ANSWERS AND FILL IN THE BLANKS			
Rule	**Questions/Description**	**Information**	**Response**
(2)(C)	Are you aware of and accept responsibility for the record and testing requirements as specified in (2)(C) of the PBR?		☐ YES ☐ NO **Not applicable**
(3)	Is the turbine rated 500 hp or more? *If "NO," the turbine is between 240 hp and 500 hp. The engine only needs to be registered by submitting a completed Form PI-7 and a Table 31 within 10 days after construction begins.* *If "YES," in addition to registration, the turbine must operate in compliance with the following emission limit(s).*		☐ YES ☐ NO **Not applicable**
(3)(A)	Will the emissions of NO_x exceed 3.0 g/hp-hr for gas-firing?		☐ YES ☐ NO **Not applicable**
(3)(B)	Will the turbine meet all applicable NO_x and sulfur dioxide (or fuel sulfur) emission limitations, monitoring requirements, and reporting requirements of 40 CFR Part 60, NSPS Subpart GG?		☐ YES ☐ NO **Not applicable**
(4)	Is the engine or turbine rated less than 500 hp or used for temporary replacement purposes? *If "NO," go to Question (5).* *If "YES," the equipment does not have to meet the emission limits of (2) and (3). However, the temporary replacement equipment can only remain in service for a maximum of 90 days.*		☒ YES ☐ NO
(5)	What type of fuel will be used and will the fuel meet the requirements of the PBR? *Indicate the fuel(s) used.*	☐ Natural gas ☐ Liquid petroleum gas ☒ Field gas ☐ Liquid fuel	☒ YES ☐ NO
(6)	Does the installation comply with the National Ambient Air Quality Standards (NAAQS)? *Note: Indicate which method is used and attach the modeling report and/or calculations and diagrams to support the selected method.*	☐ Modeling ☐ Stack height ☒ Facility emissions and property line distance	☒ YES ☐ NO
(6)	Have you included a modeling report and/or calculations and diagrams to support the selected NAAQS compliance determination method?		☒ YES ☐ NO
	For the following questions, please refer to the Electric Generators under Permit by Rule policy memo from October 2006.		
(7)	Is the engine or turbine used to generate electricity? *If "NO," the following do not apply.*		☐ YES ☒ NO

Stationary Engines and Turbines
Air Permits by Rule (PBR) Checklist
Title 30 Texas Administrative Code § 106.512

CHECK THE MOST APPROPRIATE ANSWERS AND FILL IN THE BLANKS			
Rule	**Questions/Description**	**Information**	**Response**
(7)	Will the engine or turbine be used to generate electricity to operate facilities authorized by a New Source Review Permit? *If "YES," the engine or turbine does not qualify for this PBR and authorization must be obtained through a permit amendment.*		☐ YES ☐ NO **Not applicable**
(7)	If the engine or turbine is used to generate electricity, will it be exclusively for on-site use at locations which cannot be connected to an electric grid? *If "YES," describe why access to the electric grid is not available.* *If "NO," the engine or turbine does not qualify for this PBR.*		☐ YES ☐ NO **Not applicable**
(7)	Has an Electric Generating Unit Standard Permit been issued for one of the following activities for which the engine or turbine will only be used to generate electricity? ☐ Engines or turbines used to provide power for the operation of facilities registered under the Air Quality Standard Permit for Concrete Batch Plants. ☐ Engines or turbines satisfying the conditions for facilities permitted by rule under 30 TAC 106, Subchapter E (relating to Aggregate and Pavement). ☐ Engines or turbines used exclusively to provide power to electric pumps used for irrigating crops. *If "NO," the engine or turbine does not qualify for this PBR.*		☐ YES ☐ NO **Not applicable**
Rule	**Other Applicable Rules and Regulations**	**Why or Why Not?**	**Response**
	If the engine or turbine is located in the Houston/Galveston nonattainment area, is the site subject to the Mass Emission Cap and Trade Program?	Engine is not located in the HGB nonattainment area.	☐ YES ☒ NO
	Is the facility subject to 30 TAC Chapter 115?	This regulation imposes no requirements on the engine.	☐ YES ☒ NO
	Is the facility subject to 30 TAC Chapter §§ 117.201-223?	This regulation imposes no requirements on the engine.	☐ YES ☒ NO

Stationary Engines and Turbines
Air Permits by Rule (PBR) Checklist
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TCEQ

CHECK THE MOST APPROPRIATE ANSWERS AND FILL IN THE BLANKS			
		Why or Why Not?	Response
	Is the facility subject to 40 CFR Part 60, NSPS Subpart D?	The source is an engine.	☐ YES ☒ NO
	Is the facility subject to 40 CFR Part 60, NSPS Subpart Da?	The source is an engine.	☐ YES ☒ NO
	Is the facility subject to 40 CFR Part 60, NSPS Subpart Db?	The source is an engine.	☐ YES ☒ NO
	Is the facility subject to 40 CFR Part 60, NSPS Subpart Dc?	The source is an engine.	☐ YES ☒ NO
	Is the facility subject to 40 CFR Part 60, NSPS Subpart GG?	The source is an engine.	☐ YES ☒ NO
	Is the facility subject to 40 CFR Part 63, MACT Subpart YYYY?	The source is an engine.	☐ YES ☒ NO
	Is the facility subject to 40 CFR Part 63, MACT Subpart ZZZZ	The engine is located at an area source and the design rating power is less than 500 hp. It was originally manufactured before July 1, 2008 and not modified or reconstructed after June 12, 2006. Therefore, it is not subject to Subpart ZZZZ Area Source requirements.	☐ YES ☒ NO
	Is the facility subject to 40 CFR Part 63, MACT Subpart PPPPP?	The source is not an engine test cell.	☐ YES ☒ NO

Record Keeping: In order to demonstrate compliance with the general and specific requirements of this PBR, sufficient records must be maintained to demonstrate that all requirements are met at all times. If the engine or turbine is rated greater than 500 horsepower, all records must be maintained as required by 30 TAC § 106.512(2)(C). The registrant should also become familiar with the additional record keeping requirements in 30 TAC § 106.8. The records must be made available immediately upon request to the commission or any air pollution control program having jurisdiction. If you have any questions about the type of records that should be maintained or testing requirements, contact the Air Program in the TCEQ Regional Office for the region in which the site is located.

Recommended Calculation Method: In order to demonstrate compliance with this PBR, emission factors for each air contaminant from the EPA Compilation of Air Pollutant Emission Factors (AP-42), Fifth Edition, Volume 1, Section 3.1: Stationary Gas Turbines for Electricity Generation at: www.epa.gov/ttn/chief/ap42/index.html should be used, including, the specific air contaminant's emission limit listed on the table below.

Stationary Engines and Turbines
Air Permits by Rule (PBR) Checklist
Title 30 Texas Administrative Code § 106.512

TCEQ Exemption 30 TAC §106.512 General Guidelines										
NOx g/hp-hr Emission Limits										
Date Original Manufacture		NA	NA	Before 9/23/82		9/23/82 to 6/18/92			After 6/18/92	
Mfg. Rated Horsepower		<240	>240 <500	>500*		500-824*		>825	>500*	
Operating Speed Operating Torque		NA NA	NA NA	Full NA	Reduced 80-100%	Full NA	Reduced 80-100%	NA NA	Full NA	Reduced 80-100%
Ignition Type	*Engine Combustion Design*									
Spark	Rich Burn †† Lean Burn** 2-Cycle	NA NA NA	NA NA NA	2.0 5.0 8.0	2.0 8.0 8.0	2.0 5.0 8.0	2.0 8.0 8.0	2.0 5.0 5.0	2.0 2.0 2.0	2.0 5.0 5.0
Compression	Dual Fuel Liquid Fuel	NA NA	NA NA	5.0 11.0	8.0 11.0	5.0 11.0	8.0 11.0	5.0 11.0	2.0 11.0	5.0 11.0
	Turbines†	NA	NA	3.0	3.0	3.0	3.0	3.0	3.0	3.0
PI-7 Registration Emission Testing		No No	Yes No	Yes Biennial	Yes Biennial	Yes Biennial	Yes Biennial	Yes Biennial	Yes Biennial	Yes Biennial

Notes:

* Lower emission rates apply to lean-burn engine operating: Full Speed & Any Torque or Any Speed & <80% or >100% Torque

† Turbine emissions are also regulated by EPA NSPS Standards for NO_X and SO_2

** Lean Burn > 4% exhaust 0_2

†† Rich Burn = ≤ 4% exhaust 0_2

"(6) There will be no violations of any National Ambient Air Quality Standard (NAAQS) in the area of the proposed facility. Compliance with this condition shall be demonstrated by one of the following three methods:

...

(C) the total emissions of NO_x (nitrogen oxide plus NO_2) from all existing and proposed facilities on the property do not exceed the most restrictive of the following:

(i) 250 tpy;

(ii) the value (0.3125 D) tpy, where D equals the shortest distance in feet from any existing or proposed stack to the nearest property line. "

Total emissions of NO_X for the facility (including from the enclosed flare) are 2.6210 tpy. This is less than 250 tpy, so this meets condition (6)(C)(i) of 106.512.

The western edge of the lease is the closest property line to the Davidson-Matthews Compressor Station. The nearest NO_X-emitting piece of equipment is the enclosed flare (EPN: FLR1); the distance to the property line from this piece of equipment is over 1495 feet. The distance from the stack of the compressor (EPN: ENG1) is approximately 1570 feet.

(0.3125*(1495)) tpy = 467.1875 tpy. 2.6120 tons/year << 467.1875 tons/year, so this meets condition (6)(C)(ii) of 106.512.

In addition, the nearest habitable building is approximately ½ mile away, to the South-Southwest.

Though NO_X emissions might vary above the normal hourly emission rate due to increases of gas throughput to the flare, it is not expected to be significant. The total throughput capacity of the flare is less than 9 times of the throughput used to calculate emissions for this registration. At the maximum rate throughput for the flare, total NO_X emissions would only be 3.1912 tpy (9*0.0713 + 2.5497), which is well below the allowable NO_X levels.

Turbine/Engine Emission Calculation

Site: Davidson-Matthews Compressor Station

Acct. No.:

Conversions:
1 lb = 453.51 gm
1 tn = 2,000 lb
1 yr = 8,760 hr

Compressor Engine Emissions:

FIN: ENG1
EPN: ENG1
CIN:

Common ID:
Stroke:

Horsepower: 60 hp
Run Time: 8,760 hr/yr
Fuel Consumption: 9,000 btu/hp-hr
Emission Factors:

		Units	Source	Test Date
NOx:	4.400	g/hp-hr	Manufacturer	
CO:	1.700	g/hp-hr	Manufacturer	
SO2:	0.000	lb/mmbtu	Eng. Estimate	
VOC:	0.500	g/hp-hr	Manufacturer	
PM:	0.010	lb/mmbtu	AP-42	
CH2O:	0.300	g/hp-hr	Manufacturer	

Calculation Using "**g/hp-hr**" emission factor:

hp x g/hp-hr x 1 lb/453.54 g = lb/hr

Calculation Using "**lb/mmbtu**" emission factor:

hp x lb/mmbtu x btu/hp-hr x 1 mmbtu/1,000,000 btu = lb/hr

NOx Emission Rate:

hp		emiss factor g/hp-hr		grams to lb		
60	x	4.4	x	0.0022	=	0.5821 lb/hr
					=	2.5497 tn/yr

CO Emission Rate:

hp		emiss factor g/hp-hr		grams to lb		
60	x	1.7	x	0.0022	=	0.2249 lb/hr
					=	0.9851 tn/yr

SO2 Emission Rate[1]:

hp		emiss factor lb/mmbtu		btu/hp-hr		
60	x	0.00	x	9000	=	0.0000 lb/hr
					=	0.0000 tn/yr

VOC Emission Rate[1]:

hp		emiss factor g/hp-hr		grams to lb		
60	x	0.50	x	0.0022	=	0.0662 lb/hr
					=	0.2897 tn/yr

PM Emission Rate[1]:

hp		emiss factor lb/mmbtu		btu/hp-hr		
60	x	0.01	x	9000	=	0.0054 lb/hr
					=	0.0234 tn/yr

CH2O Emission Rate[1]:

hp		emiss factor g/hp-hr		grams to lb		
60	x	0.30	x	0.0022	=	0.0397 lb/hr
					=	0.1738 tn/yr

Calculated Aggregate Heat Input: 4,730 mmbtu

CAMERON

AJAX

Estimated Exhaust Emissions Based On PLQNG, 1500 FASL Elevation and an average Ambient Temperature of 65 Degrees F

For Emissions Permits, please contact Ajax for emissions data based on specific site conditions

Ajax Engine Model	Emissions (Gm / Bhph)					BSFC	RPM	BHP	BMEP	Exhaust Stack						No. Of Cyl's	Bore	Stroke
	NOx	CO	NMHC	VOC	H2CO					Dia. (in.)	Height (in.)	Temp (Deg.F)	Flow (acfm)	Flow (lb/m)	Velocity (ft/m)			
EA-15	4.4	3.3	0.7	0.5	0.3	9900	900	14	49.6	4	31	500	140	5	1604	1	5	6.5
EA-22	4.4	3.3	0.7	0.5	0.3	9900	650	21	48.5	5	64	500	200	8	1467	1	6.5	8
EA-30	4.4	3.3	0.7	0.5	0.3	9900	650	29	53.1	5	80	500	250	10	1833	1	7.25	8
C-30	4.4	3.3	0.7	0.5	0.3	9400	525	29	49.2	5	101	450	260	11	1907	1	7.5	10
C-42	4.4	3.3	0.7	0.5	0.3	9900	525	40	53.6	6	137	565	380	14	1935	1	8.5	10
E-42	4.4	3.3	0.7	0.5	0.3	9900	525	40	53.6	6	137	565	380	14	1935	1	8.5	10
DP-60	4.4	1.7	0.6	0.5	0.3	9000	475	58	56.5	8	150	540	500	18	1432	1	9.5	12
DP-80	4.4	2.8	0.7	0.5	0.3	8900	400	77	57.1	10	164	470	610	24	1118	1	11.0	14
DP-81	6.6	1.1	0.5	0.5	0.3	8500	475	78	62.4	10	164	545	610	22	1118	1	10.5	12
DP-115	4.4	2.4	0.9	0.6	0.3	9000	360	110	55.0	12	190	440	880	36	1120	1	13.25	16
DP-125	5.0	2.7	0.8	0.6	0.3	8500	380	120	56.7	12	190	470	960	38	1222	1	13.25	16
DP-160	4.4	2.8	0.7	0.5	0.3	8900	400	154	57.1	10	164	470	1220	48	2237	2	11	14
DP-165	6.0	3.0	0.8	0.6	0.3	8500	380	158	58.4	13.25	260	450	1210	49	1264	1	15	16
DP-230	4.4	2.4	0.9	0.6	0.3	9000	360	221	55.0	12	190	440	1770	72	2254	2	13.25	16
DP-250	5.5	3.0	0.8	0.6	0.3	8500	380	240	56.7	12	190	460	1910	76	2432	2	13.25	16
DP-325	5.5	1.7	0.8	0.6	0.3	8400	380	312	57.5	13.25	260	450	2420	98	2527	2	15	16
DPC-60	4.4	1.7	0.6	0.5	0.3	9000	475	58	56.5	8	150	540	500	18	1432	1	9.5	12
DPC-80	4.4	2.8	0.7	0.5	0.3	8900	400	77	57.1	10	164	470	610	24	1118	1	11	14
DPC-81	6.6	1.1	0.5	0.5	0.3	8500	475	78	62.4	10	164	545	610	22	1118	1	10.5	12
DPC-105	4.4	2.8	0.6	0.5	0.3	8800	425	101	59.3	12	193	480	780	31	993	1	12	14
DPC-115	4.4	2.4	0.9	0.6	0.3	8700	360	110	55.0	12	190	440	870	36	1108	1	13.25	16
DPC-115 LE	2.0	2.2	0.7	0.5	0.3	8100	360	110	55.0	12	190	400	830	36	1057	1	13.25	16
DPC-120	5.5	1.7	0.6	0.5	0.3	9000	475	115	56.5	8	150	540	1000	37	2865	2	9.5	12
DPC-140	10.5	1.3	0.6	0.5	0.3	8200	400	134	60.3	12	190	490	1040	40	1324	1	13.25	16
DPC-140 LE	2.0	1.4	0.6	0.5	0.3	7800	400	134	60.3	12	190	450	1010	41	1286	1	13.25	16
DPC-160	4.4	2.7	0.7	0.5	0.3	8900	400	154	57.1	10	164	470	1220	48	2237	2	11	14
DPC-162	6.6	1.1	0.5	0.5	0.3	8500	475	156	62.4	10	164	545	1230	45	2255	2	10.5	12
DPC-180	6.3	1.4	0.9	0.6	0.3	8400	400	173	60.5	13.25	256	460	1290	52	1347	1	15	16
DPC-180 LE	2.0	1.1	0.6	0.5	0.3	7900	400	173	60.5	13.25	256	555	1450	53	1514	1	15	16

Site Altitude = 0 - 1500 FASL Date: March 2011

Site Fuel Composition = Pipeline Quality Natural Gas (PLQNG)

Ambient Temp For Defining Maximum Load = 100 Deg F

Ambient Temp For Defining Exhaust Emissions = 65 Deg F

NOx = Nitrogen Oxide

CO = Carbon Monoxide

H2CO = Formaldehyde

NMHC= Non-Methane Hydrocarbons reported as Propane

VOC = Non-Methane, Non-Ethane & Non-Formaldehyde reported as Propane

BSFC = Brake Specific Fuel Consumptior (Btu / Bhp-hr)

FASL = Feet Above Sea Level

ACFM = Actual Cubic Feet Per Minute

BMEP = Brake Mean Effective Pressure (Psi)

Gm / Bhph = Gram / Brake Horse Power-Hour

The above emissions and performance data is contingent on:

1.) Engine must be maintained in good working order.

2.) Engine modifications or upgrades from the original factory configuration must meet Ajax specifications and installation guidelines.

3.) Engine operating parameters must be consistent with those specified in the Ajax manual.

Fuel Composition (PLQNG):

Compound	Formula	% Volume
Nitrogen	N2	0.72
Carbon Dioxide	CO2	1.14
Methane	CH4	92.84
Ethane	C2H6	4.10
Propane	C3H8	1.20
	Total Volume % =	100.00

For additional information, please contact Application Engineering at (405) 670-4121
Cameron Compression Systems, 2101 SE 18th Street Oklahoma City, OK USA

Estimated Exhaust Emissions Based On PLQNG, 1500 FASL Elevation and an average Ambient Temperature of 65 Degrees F

For Emissions Permits, please contact Ajax for emissions data based on specific site conditions

Ajax Engine Model	Emissions (Gm / Bhph)					BSFC	RPM	BHP	BMEP	Exhaust Stack						No. Of Cyl's	Bore	Stroke
	NOx	CO	NMHC	VOC	H2CO					Dia. (in.)	Height (in.)	Temp (Deg.F)	Flow (acfm)	Flow (lb/m)	Velocity (ft/m)			
DPC-230	4.4	2.4	0.9	0.6	0.3	8700	360	221	55.0	12	190	440	1730	71	2203	2	13.25	16
DPC-230 LE	2.0	2.2	0.7	0.5	0.3	8100	360	221	55.0	12	190	400	1670	72	2126	2	13.25	16
DPC-280	11.4	1.3	0.6	0.5	0.3	8200	400	269	60.3	12	190	470	2030	80	2585	2	13.25	16
DPC-280 LE	2.0	1.4	0.6	0.5	0.3	7800	400	269	60.3	12	190	450	1990	81	2534	2	13.25	16
DPC-300	4.1	1.9	1.0	0.6	0.3	8700	360	288	56.0	13.25	260	435	2210	91	2308	2	15	16
DPC-300 LE	2.0	1.6	0.7	0.5	0.3	8200	360	288	56.0	13.25	260	435	2230	92	2329	2	15	16
DPC-360	6.3	1.4	0.9	0.6	0.3	8400	400	346	60.5	13.25	260	480	2630	103	2747	2	15	16
DPC-360 LE	2.0	1.1	0.6	0.5	0.3	7900	400	346	60.5	13.25	260	480	2690	105	2809	2	15	16
DPC-450 LE	2.7	1.2	0.6	0.5	0.3	7800	400	432	64.6	17.25	190	500	3220	124	1984	3	13.25	16
DPC-540	8.6	1.3	0.8	0.6	0.3	8300	400	540	63.0	17.25	303	465	3890	155	2397	3	15	16
DPC-540 LE	2.0	1.0	0.6	0.5	0.3	7800	400	540	63.0	17.25	303	465	3970	158	2446	3	15	16
DPC-600	13.0	1.2	0.7	0.5	0.3	8200	400	576	67.2	17.25	303	515	4110	155	2532	3	15	16
DPC-600 LE	6.5	0.9	0.6	0.5	0.3	7800	400	576	67.2	17.25	303	515	4190	158	2582	3	15	16
DPC-720	9.5	1.3	0.7	0.5	0.3	8300	400	720	63.0	17.25	241	465	5190	207	3198	4	15	16
DPC-720 LE	2.0	1.0	0.6	0.5	0.3	7800	400	720	63.0	17.25	241	465	5300	211	3266	4	15	16
DPC-800	13.0	1.2	0.7	0.5	0.3	8200	400	768	67.2	17.25	241	515	5480	207	3377	4	15	16
DPC-800 LE	6.5	1.0	0.6	0.5	0.3	7800	400	768	67.2	17.25	241	515	5590	211	3444	4	15	16
DPC-2201	10.0	1.3	0.6	0.5	0.3	8000	440	148	60.4	12	190	490	1160	45	1477	1	13.25	16
DPC-2201 LE	2.0	1.4	0.6	0.5	0.3	7800	440	148	60.4	12	190	490	1200	47	1528	1	13.25	16
DPC-2202	10.0	1.3	0.6	0.5	0.3	8000	440	296	60.4	12	190	470	2280	90	2903	2	13.25	16
DPC-2202 LE	2.0	1.4	0.6	0.5	0.3	7800	440	296	60.4	12	190	470	2350	93	2992	2	13.25	16
DPC-2801	5.5	1.4	0.8	0.5	0.3	8200	440	192	61.1	13.25	256	460	1450	58	1514	1	15	16
DPC-2801 LE	2.0	1.2	0.6	0.5	0.3	7800	440	192	61.1	13.25	256	460	1490	60	1556	1	15	16
DPC-2802	5.5	1.3	0.8	0.5	0.3	8200	440	422	67.2	13.25	260	465	2910	116	3039	2	15	16
DPC-2802 LE	2.0	1.2	0.6	0.5	0.3	7800	440	384	61.1	13.25	260	465	3000	119	3133	2	15	16
DPC-2802 LE*	2.0	1.2	0.6	0.5	0.3	7800	440	384	61.1	14.13	260	465	3000	119	2757	2	15	16
DPC-2803	12.0	1.2	0.8	0.5	0.3	8000	440	634	67.3	17.25	303	465	4380	174	2699	3	15	16
DPC-2803 LE	2.0	1.2	0.6	0.5	0.3	7800	440	600	63.7	17.25	241	515	4740	179	2921	3	15	16
DPC-2804	12.0	1.2	0.8	0.5	0.3	8000	440	845	67.2	17.25	241	465	5840	233	3598	4	15	16
DPC-2804 LE	2.0	1.2	0.6	0.5	0.3	7800	440	800	63.7	17.25	241	515	6320	239	3894	4	15	16
DPC-3401 LE	2.0	1.1	0.6	0.5	0.3	7800	440	232	61.0	13.25	256	460	1800	72	1880	1	16.5	16
DPC-3402 LE	2.0	1.1	0.6	0.5	0.3	7800	440	465	61.2	13.25	260	465	3630	145	3791	2	16.5	16
DPC-3403 LE	2.0	1.1	0.6	0.5	0.3	7800	440	726	63.7	17.25	241	515	5740	217	3537	3	16.5	16
DPC-3404 LE	2.0	1.1	0.6	0.5	0.3	7800	440	970	63.8	17.25	241	515	7650	289	4714	4	16.5	16

Date: March 2011, Site Altitude = 0 - 1500 FASL, Site Fuel Composition = Pipeline Quality Natural Gas (PLQNG)
Ambient Temp For Defining Maximum Load = 100 Deg F, Ambient Temp For Defining Exhaust Emissions = 65 Deg F
The above emissions and performance data is contingent on: 1.) Engine must be maintained in good working order. 2.) Engine modifications or upgrades from the original factory configuration must meet Ajax specifications and installation guidelines. 3.) Engine operating parameters must be consistent with those specified in the Ajax manual. NOx = Nitrogen Oxide, CO = Carbon Monoxide, NMHC = Non-Methane Hydrocarbons reported as Propane
VOC = non-methane, non-ethane and non-Formaldehyde reported as propane, H2CO = Formaldehyde
FASL=Feet Above Sea Level, ACFM=Actual Cubic Feet Per Minute, BMEP=Brake Mean Effective Pressure, BSFC=Brake Specific Fuel Consumption (Btu/Bhp-Hr)
Pipe Line Quality Natural Gas (PLQNG): Nitrogen = 0.72%, Carbon Dioxide = 1.14%, Methane = 92.84%, Ethane = 4.1%, Propane = 1.2%
* = DPC-2802LE Tilt Muffler Package
For additional info, please contact Applications Engineering at (405) 670-4121, Cameron Compression Systems, 2101 SE 18th Street, Oklahoma City, OK 73129

Controlled emissions:

	VOC (lb/hr)	VOC (tpy)	HAP (lb/hr)	HAP (tpy)	H_2S (lb/hr)	H_2S (tpy)	SO_2 (lb/hr)	SO_2 (tpy)	NO_X (lb/hr)	NO_X (tpy)	CO (lb/hr)	CO (tpy)	PM (lb/hr)	PM (tpy)
ENG1[a]	0.0662	0.2897	0.0397	0.1738	0.0	0.0	0.0	0.0	0.5821	2.5497	0.2249	0.9851	0.0054	0.0234
TANKA1	0.3161	1.3843	0.0490	0.2146	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKB1	0.3517	1.5404	0.0511	0.2240	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKBW1	0.0027	0.0120	0.0004	0.0020	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKD1	0.0332	0.5012	0.0045	0.0682	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKD2	0.0420	0.6346	0.0057	0.0866	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKD3	0.0420	0.6346	0.0057	0.0866	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKDW1	0.0001	0.0018	0.0000	0.0003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKDW2	0.0002	0.0024	0.0000	0.0004	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADA1[b,c]	61.7912	0.1545	1.8060	0.0090	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADB1[b,c]	58.1454	0.3634	1.6994	0.0212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADBW1[c]	0.5713	0.0121	0.0167	0.0007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADD1[c]	56.4282	9.0849	1.6492	0.5311	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADDW1[c]	0.5643	0.0908	0.0165	0.0053	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLR1	0.1248	0.5465	0.0160	0.0702	0.0	0.0	0.0	0.0	0.0163	0.0713	0.0886	0.3879	0.0	0.0
FUGA1	0.1791	0.7846	0.0027	0.0119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FUGB1	0.2286	1.0011	0.0027	0.0120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FUGD1	0.5495	2.4068	0.0104	0.0455	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total[a,b]	***179.4365***	**19.4456**	***5.3759***	**1.5635**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.5984**	**2.6210**	**0.3135**	**1.3730**	**0.0054**	**0.0234**

a: HAP emissions calculated for engines are CH_2O (formaldehyde).

b: lbs/hr for VOCs and HAPs includes all 5 trucks loading at once, which is not likely to happen in the life of the facility

c: Hourly emissions for VOCs and HAPs are peak hourly emissions during loading.

c: These hourly emissions for VOCs and HAPs do not represent annual averages.

Davidson-Matthews facilities (Davidson-Matthews Compressor Station, SE Matthews Tank Batteries A1, B):

Uncontrolled emissions:

	VOC (lb/hr)	VOC (tpy)	HAP (lb/hr)	HAP (tpy)	H_2S (lb/hr)	H_2S (tpy)	SO_2 (lb/hr)	SO_2 (tpy)	NO_X (lb/hr)	NO_X (tpy)	CO (lb/hr)	CO (tpy)	PM (lb/hr)	PM (tpy)
ENG1[a]	0.0662	0.2897	0.0397	0.1738	0.0	0.0	0.0	0.0	0.5821	2.5497	0.2249	0.9851	0.0054	0.0234
TANKA1	0.3161	1.3843	0.0490	0.2146	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKB1	0.3517	1.5404	0.0511	0.2240	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKBW1	0.0027	0.0120	0.0004	0.0020	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKD1	1.6582	7.2633	0.2258	0.9890	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKD2	2.0995	9.1960	0.2866	1.2553	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKD3	2.0995	9.1960	0.2866	1.2553	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKDW1	0.0059	0.0259	0.0010	0.0042	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TANKDW2	0.0078	0.0341	0.0013	0.0056	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADA1[b,c]	61.7912	0.1545	1.8060	0.0090	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADB1[b,c]	58.1454	0.3634	1.6994	0.0212	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADBW1[c]	0.5713	0.0121	0.0167	0.0007	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADD1[c]	56.4282	9.0849	1.6492	0.5311	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LOADDW1[c]	0.5643	0.0908	0.0165	0.0053	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FLR1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FUGA1	0.1791	0.7846	0.0027	0.0119	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FUGB1	0.2286	1.0011	0.0027	0.0120	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FUGD1	0.5495	2.4068	0.0104	0.0455	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total[a,b]	***185.0653***	**42.8399**	***6.1452***	**4.7606**	**0.0000**	**0.0000**	**0.0000**	**0.0000**	**0.5821**	**2.5497**	**0.2249**	**0.9851**	**0.0054**	**0.0234**

a: HAP emissions calculated for engines are CH_2O (formaldehyde).

b: lbs/hr for VOCs and HAPs includes all 5 trucks loading at once, which is not likely to happen in the life of the facility

c: Hourly emissions for VOCs and HAPs are peak hourly emissions during loading.

c: These hourly emissions for VOCs and HAPs do not represent annual averages.

Voucher Detail

Voucher 137709

The voucher status has been updated.

Transaction Information

Voucher Number: 137709
Trace Number: 582EA000106663
Date: 10/05/2011 09:58 AM
Payment Method: CC - Authorization 0000045642
Amount: $450.00
Fee Code: PBR
Fee Type: PERMIT BY RULE - NOT SMALL BUSINESS, CITY OR ISD
ePay Actor: ERIK PITONIAK
Actor Email: EPIT@CHEVRON.COM
IP: 146.23.68.43

Payment Contact Information

Name: TANYA JONES
Company: CHEVRON USA INC
Address: 1400 SMITH STREET, HOUSTON, TX 77002
Phone: 713-372-2166

Site Information

Site Name: DAVIDSON-MATTHEWS COMPRESSOR STATION
Site Location: INTX OF FM959 124 GO E ON FM124 2.6 MI TURN N ON PRV ROAD BTY ON L IN 6 MI

Customer Information

CN: CN600132484
Customer Name: CHEVRON USA INC
Customer Address: 1400 SMITH STREET, HOUSTON, TX 77002

USAS Status

USAS Status:
USAS Date:

Voucher Status

Status	Staff	Comment	Start	End
APPLIED	JBEATTY	170546 - 98929	10/11/2011	

Change Status | Cancel

From: "Pitoniak, Erik R." <EPitoniak@chevron.com>
To: Jennifer Beatty <Jennifer.Beatty@tceq.texas.gov>
Date: 10/11/2011 10:30 AM
Subject: RE: PI-7 for Davidson Matthews Compressor Station

Jennifer,

Thank you for your emails.

Beckville is a small town of about 1000 people. Carthage is only about 6000. If Beckville qualifies as a "city" for TCEQ's purposes, then the nearest city would be Beckville, with a zip code of 75631.

Regards,

Erik Pitoniak
Green/Blue
Air Specialist
Chevron North America Exploration and Production Company
Midcontinent/Alaska Business Unit
Office: (713)-372-0456
Cell: (504)-452-0282
1400 Smith Street
Office 44028
Houston, TX 77002

-----Original Message-----
From: Jennifer Beatty [mailto:Jennifer.Beatty@tceq.texas.gov]
Sent: Tuesday, October 11, 2011 10:12 AM
To: Pitoniak, Erik R.
Subject: PI-7 for Davidson Matthews Compressor Station

Additionally, please confirm the zip code. 75633 or 75631

Texas Commission on Environmental Quality
Registration for Permits by Rule (PBR)
Form PI-7 Submission Form

TCEQ

AIR PERMITS DIVISION

OCT 10 2011

RECEIVED

I. REGISTRANT INFORMATION			
A. TCEQ Customer Reference Number:	CN- 600132484	TCEQ Regulated Entity Number:	RN-
New Core Data Form Information: If there is no CN or RN number, a Core Data Form must be completed and submitted with an original signature.			
B. Company or Other Legal Customer Name: Chevron USA, Inc.			
Company Official Contact Name: Erik Pitoniak		Title: Air Specialist	
Mailing Address: 1400 Smith Street			
City: Houston		State: TX	Zip Code: 77002
Phone No.: 713-372-0456	Fax No.: 713-372-2900	E-mail Address: epit@chevron.com	
C. Technical Contact Name: Erik Pitoniak		Title: Air Specialist	
Company: Chevron USA, Inc.			
Mailing Address: 1400 Smith Street			
City: Houston		State: TX	Zip Code: 77002
Phone No. : 713-372-0456	Fax No.: 713-372-2900	E-mail Address: epit@chevron.com	
D. Facility Location Information - Street Address:			
If "NO," street address, provide written driving directions to the site: (attach description if additional space is needed)			
In Beckville, from intx of FM 959/124, go E on FM 124 2.6 miles; turn left (N) on private road. Battery on left in 0.6 mi.			
City: ~~Carthage~~ BECKVILLE per e-mail TB	County: Panola		Zip Code: 75633
II. FACILITY AND SITE INFORMATION			
A. Name and Type of Facility: Davidson-Matthews Compressor Station			☑ Permanent ☐ Portable
B. PBR claimed under **30 TAC § 106** *(List all that apply in hard copy, or choose all that apply from the drop down menus in electronic version):*			
§ 106. 352 **Oil and Gas Production Facilities**	§ 106.		
§ 106. 492 **Flares**	§ 106.		
§ 106. 512 **Stationary Engines and Turbines**	§ 106.		
Are you claiming a **historical standard exemption or PBR?**			☐ YES ☑ NO
If "YES," enter effective date and Rule Number:			

170546/98929

APIRT
OCT 10 2011

Texas Commission on Environmental Quality
Registration for Permits by Rule (PBR)
Form PI-7 Submission Form

II. FACILITY AND SITE INFORMATION			
C. Is there a previous Standard Exemption or PBR for the facility in this registration? (Attach details regarding changes)			☐ YES ☑ NO
If "YES," enter Registration Number and Rule Number:			
D. Are there any **other facilities** at this **site** which are **authorized by an Air Standard Exemption or PBR**?			☐ YES ☑ NO
If "YES," enter Registration Number and Rule Number:			
E. Are there any **other air preconstruction permits** at this site?			☐ YES ☑ NO
If "YES," enter Permit Numbers:			
Are there any other air preconstruction permits at this site that would be directly associated with this project?			☐ YES ☑ NO
If "YES," enter Permit Numbers:			
F. Is this facility located at a site which is required to obtain a federal operating permit pursuant to 30 TAC Chapter 122?			☐ YES ☑ NO ☐ To be Determined
If the site currently has an existing federal operating permit, enter the permit number:			
Identify the requirements of 30 TAC Chapter 122 that will be triggered if this claim is accepted: (*check all that apply*) ☐ Initial Application for an FOP ☐ Significant Revision for SOP ☐ Minor Revision for SOP ☐ Operational Flexibility/Off Permit Notification for an SOP ☐ Revision for GOP ☐ To be Determined ☑ None			
Identify the type(s) issued and/or FOP application(s) submitted/pending for the site: (*check all that apply*) ☐ SOP ☐ GOP ☐ GOP application/revision application: (*submitted or under APD review*) ☐ SOP application/revision application: (*submitted or under APD review*) ☑ N/A			
G. TCEQ Account Identification Number: (*if known*)			
III. FEE INFORMATION			
See Section VI. for an address to send fee or go to www.2.tceq.state.tx.us/epay to pay online.			
A. Is this registration an update to a previously registered facility and accompanied by a Form APD-CERT solely to establish a federally enforceable emission limit and will not authorize new facilities? (*If "YES," a fee is not required. If "NO," then go to Section III.B.)*			☑ *YES* ☐ *NO*
B. *If "YES," to any of the following three questions, a $100 fee is required. Otherwise, a $450 fee is required.*			
Does this business have less than 100 employees or have less than 6 million dollars in annual gross receipts?			☐ YES ☑ NO
Is this registration submitted by a governmental entity with a population of less than 10,000?			☐ YES ☑ NO

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Texas Commission on Environmental Quality
Registration for Permits by Rule (PBR)
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TCEQ

III. FEE INFORMATION (continued)			
C. Check/Money Order or Transaction Number *(Payable to TCEQ)*:		*Was fee Paid online?*	☑ YES ☐ NO
Company name of check: Chevron USA, Inc.		Fee amount:	$ $450.00
IV. SELECTED FACILITY REVIEWS <u>ONLY</u>–TECHNICAL INFORMATION *Note: If claiming one of the following PBRs, complete this section, then skip to Section VI., "Submitting your registration" below:* ***Animal Feeding Operations § 106.161, Livestock Auction Facilities § 106.162, Saw Mills § 106.223, Grain Handling, Storage and Drying § 106.283, Auto Body Refinishing Facilities § 106.436, Air Curtain Incinerator § 106.496***			
A. Is the applicable PBR checklist attached which shows the facility meets all general and specific requirements of the PBR(s) being claimed?			☐ YES ☐ NO
B. Distance from this facility's emission release point to the nearest property line:			feet
Distance from this facility's emission release point to the nearest off-property structure:			feet
V. TECHNICAL INFORMATION INCLUDING STATE AND FEDERAL REGULATORY REQUIREMENTS ***Registrants must be in compliance with all applicable state and federal regulations and standards to claim a PBR.***			
A. Is Confidential information submitted and properly marked "CONFIDENTIAL" with this registration?			☐ YES ☑ NO
B. Is a process flow diagram or a process description attached?			☑ YES ☐ NO
C. Are emissions data and calculations for this claim attached?			☑ YES ☐ NO
D. Is information attached showing how the **general** requirements (**30 TAC § 106.4**) of the PBR is met for this Registration? (**PBR checklists** may be used, but are optional)			☑ YES ☐ NO
*Note: Please be reminded that if the facilities listed in this registration are subject to the Mass Emissions Cap & Trade program under **30 TAC Chapter 101, Subchapter H, Division 3**, the owner/operator of these facilities must possess NO_x allowances equivalent to the actual NO_x, emissions from these facilities.*			
E. Is information attached showing how the **specific PBR** requirements are met for this registration? (***PBR checklist*** *may be used, but are optional*)			☑ YES ☐ NO
F. Distance from this facility's emission release point to the nearest property line:			1200 feet
Distance from this facility's emission release point to the nearest off-property structure:			>1650 feet
Note: In limited cases, a map or drawing of the site and surrounding land use may be requested during the technical review or at the request of the TCEQ Regional Office or local air pollution control program during an investigation.			

Texas Commission on Environmental Quality
Registration for Permits by Rule (PBR)
Form PI-7 Submission Form

VI. SUBMITTING YOUR REGISTRATION		
A. FEES – Pick one of the two options below for payment:		
Who	***Where***	***What***
1. Fee Paid Online	**Go to Website** www6.tceq.state.tx.us/epay	No Additional Action Needed
2. Fee Mailed to Revenue Section, TCEQ	Regular, Certified, Priority Mail MC 214, P.O. Box 13088 Austin, Texas 78711-3088 Hand Delivery, Overnight Mail MC 214, 12100 Park 35 Circle, Building A, Third Floor, Austin, Texas 78753	Original Money Order or Check Copy of Form PI-7 and Core Data Form
B. COPIES OF THE REGISTRATION – Copies must be sent as listed below: Processing delays may occur if copies are not sent as noted.		
1. Hard Copy Only Air Permits Initial Review Team (APIRT)	Regular, Certified, Priority Mail MC161, P.O. Box 13087 Austin, Texas 78711-3087 Hand Delivery, Overnight Mail MC 161, 12100 Park 35 Circle, Building C, Third Floor, Austin, Texas 78753 Fax No.: (512) 239-2123 *(do not follow fax with paper copies)*	Originals Form PI-7, Core Data Form, and all attachments
2. Appropriate local and TCEQ Regional Office Programs	To Find your local or Regional Air Pollution Control Programs go to the TCEQ, APD Website at www.tceq.state.tx.us/nav/permits/air_permits.html or call (512) 239-1250	Copy of Form PI-7, Core Data Form, and all attachments to each office.
3. Print [/]	(Blank for Print Button)	Prints a Hard Copy of the Form PI-7

APIRT
OCT 10 2011

TCEQ

TCEQ Use Only

TCEQ Core Data Form

For detailed instructions regarding completion of this form, please read the Core Data Form Instructions or call 512-239-5175.

SECTION I: General Information

1. Reason for Submission *(If other is checked please describe in space provided)*

☒ New Permit, Registration or Authorization *(Core Data Form should be submitted with the program application)*

☐ Renewal *(Core Data Form should be submitted with the renewal form)* ☐ Other

2. Attachments ☒Yes ☐No

Describe Any Attachments: *(ex. Title V Application, Waste Transporter Application, etc.)*
New PBR Registration for Davidson-Matthews Compressor Station

3. Customer Reference Number *(if issued)*: CN 600132484

Follow this link to search for CN or RN numbers in Central Registry**

4. Regulated Entity Reference Number *(if issued)*: RN

SECTION II: Customer Information

5. Effective Date for Customer Information Updates (mm/dd/yyyy)

6. Customer Role (Proposed or Actual) – *as it relates to the Regulated Entity listed on this form. Please check only one of the following:*

☐Owner ☐ Operator ☒ Owner & Operator
☐Occupational Licensee ☐ Responsible Party ☐ Voluntary Cleanup Applicant ☐Other: ____

7. General Customer Information

☐ New Customer ☒ Update to Customer Information ☐ Change in Regulated Entity Ownership
☐Change in Legal Name (Verifiable with the Texas Secretary of State) ☐ No Change**

*****If "No Change" and Section I is complete, skip to Section III – Regulated Entity Information.***

8. Type of Customer:	☒ Corporation	☐ Individual	☐ Sole Proprietorship- D.B.A
☐ City Government	☐ County Government	☐ Federal Government	☐ State Government
☐ Other Government	☐ General Partnership	☐ Limited Partnership	☐ Other:

9. Customer Legal Name *(If an individual, print last name first: ex: Doe, John)*	*If new Customer, enter previous Customer below*	*End Date:*
Chevron USA, Inc.		

10. Mailing Address:
1400 Smith Street

City	Houston	State	TX	ZIP	77002	ZIP + 4	

11. Country Mailing Information *(if outside USA)*

12. E-Mail Address *(if applicable)*: epit@chevron.com

13. Telephone Number	14. Extension or Code	15. Fax Number *(if applicable)*
(713) 372-0456		(713) 372-2900

16. Federal Tax ID *(9 digits)*	17. TX State Franchise Tax ID *(11 digits)*	18. DUNS Number *(if applicable)*	19. TX SOS Filing Number *(if applicable)*

20. Number of Employees
☐ 0-20 ☐ 21-100 ☐ 101-250 ☐ 251-500 ☒ 501 and higher

21. Independently Owned and Operated?
☐ Yes ☒ No

SECTION III: Regulated Entity Information

22. General Regulated Entity Information *(If 'New Regulated Entity" is selected below this form should be accompanied by a permit application)*

☒ New Regulated Entity ☐ Update to Regulated Entity Name ☐ Update to Regulated Entity Information ☐ No Change** *(See below)*

****If "NO CHANGE" is checked and Section I is complete, skip to Section IV, Preparer Information.**

23. Regulated Entity Name *(name of the site where the regulated action is taking place)*

Davidson-Matthews Compressor Station

APIRT
OCT 10 2011

24. Street Address of the Regulated Entity: (No P.O. Boxes)								
	City		State		ZIP		ZIP + 4	
25. Mailing Address:	1400 Smith Street							
	City	Houston	State	TX	ZIP	77002	ZIP + 4	
26. E-Mail Address:	epit@chevron.com							

27. Telephone Number	28. Extension or Code	29. Fax Number (if applicable)
(713) 372-0456		(713) 372-2900

30. Primary SIC Code (4 digits)	31. Secondary SIC Code (4 digits)	32. Primary NAICS Code (5 or 6 digits)	33. Secondary NAICS Code (5 or 6 digits)
1311		211111	

34. What is the Primary Business of this entity? (Please do not repeat the SIC or NAICS description.)

Questions 34 – 37 address geographic location. Please refer to the instructions for applicability.

35. Description to Physical Location:	In Beckville, from intx of FM 959/124, go E on FM 124 2.6 miles; turn left (N) on private road. Battery on left in 0.6 mi.

36. Nearest City	County	State	Nearest ZIP Code
Beckville	Panola	TX	75631

37. Latitude (N) In Decimal:	32.2516		38. Longitude (W) In Decimal:	-94.4082	
Degrees	Minutes	Seconds	Degrees	Minutes	Seconds

39. TCEQ Programs and ID Numbers Check all Programs and write in the permits/registration numbers that will be affected by the updates submitted on this form or the updates may not be made. If your Program is not listed, check other and write it in. See the Core Data Form instructions for additional guidance.

☐ Dam Safety	☐ Districts	☐ Edwards Aquifer	☐ Industrial Hazardous Waste	☐ Municipal Solid Waste
☒ New Source Review – Air	☐ OSSF	☐ Petroleum Storage Tank	☐ PWS	☐ Sludge
☐ Stormwater	☐ Title V – Air	☐ Tires	☐ Used Oil	☐ Utilities
☐ Voluntary Cleanup	☐ Waste Water	☐ Wastewater Agriculture	☐ Water Rights	☐ Other:

SECTION IV: Preparer Information

40. Name:	Erik Pitoniak	41. Title:	Air Specialist

42. Telephone Number	43. Ext./Code	44. Fax Number	45. E-Mail Address
(713) 372-0456		(713) 372-2900	epit@chevron.com

SECTION V: Authorized Signature

46. By my signature below, I certify, to the best of my knowledge, that the information provided in this form is true and complete, and that I have signature authority to submit this form on behalf of the entity specified in Section II, Field 9 and/or as required for the updates to the ID numbers identified in field 39.

(See the Core Data Form instructions for more information on who should sign this form.)

Company:	Chevron USA, Inc.	Job Title:	Air Specialist
Name (In Print):	Erik Pitoniak	Phone:	(713) 372-0456
Signature:	[signature]	Date:	10/1/2011

APIRT
OCT 10 2011

ePAY
TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

>> Questions or Comments

Shopping Cart | Select Fee | Search Transactions | Sign Out

Your transaction is complete. Note: It may take up to 3 working days for this electronic payment to be processed and be reflected in the TCEQ ePay system. Print this receipt and the vouchers for your records. An email receipt has also been sent.

Transaction Information

Trace Number:	582EA000106663
Date:	10/05/2011 09:58 AM
Payment Method:	CC - Authorization 0000045642
Amount:	$450.00
ePay Actor:	Erik Pitoniak
Actor Email:	epit@chevron.com
IP:	146.23.68.43

Payment Contact Information

Name:	Tanya Jones
Company:	Chevron Usa Inc
Address:	1400 Smith Street, Houston, TX 77002
Phone:	713-372-2166

Cart Items

Click on the voucher number to see the voucher details.

Voucher	Fee Description	AR Number	Amount
137709	PERMIT BY RULE - NOT SMALL BUSINESS, CITY OR ISD		$450.00
	Total fees for transaction:	**$450.00**	

ePay Again | Exit ePay

Note: It may take up to 3 working days for this electronic payment to be processed and be reflected in the TCEQ ePay system. Print this receipt for your records.

Chevron

Erik Pitoniak
Air Specialist

Mid Continent/Alaska SBU
HES Department
Chevron USA, Inc
1400 Smith Street
Houston, TX 77002
Tel (713) 372-0456
Fax (713) 372-2900
epit@chevron.com

October 5, 2011

CERTIFIED MAIL
RETURN RECEIPT No. 7003 3110 0003 1204 9998

AIR PERMITS DIVISION
APIRT OCT 10 2011
OCT 10 2011 RECEIVED

Texas Commission on Environmental Quality
Air Permits Initial Review Team, MC 161
P.O. Box 13087
Austin, Texas 78711-3087

Subject: *Permit-By-Rule Registration, Davidson-Matthews Compressor Station*
Panola County, Texas
Chevron USA, Inc., CN 600132484

Enclosed is a Permit-By-Rule (PBR) registration application for the Davidson-Matthews Compressor Station. The Davidson-Matthews Compressor Station is an existing facility which will add three new tanks and an enclosed flare control device as part of a drilling program.

In addition, there are two facilities with ¼ mile of the Davidson-Matthews Compressor Station. These facilities are called the S.E. Matthews A1 Tank Battery and the S.E. Matthews B Tank Battery, and they both send gas to the compressor station, and are operationally dependent. Therefore, both of these facilities have been included in the registration for Davidson-Matthews Compressor Station. These facilities will operate in compliance with 30 TAC §106.352 and 30 TAC §106.492. The Davidson-Matthews facility is currently shut in during construction activities, but is expected to begin operation on October 15, 2011 with added condensate production. The table below summarizes emissions for the project:

Pollutant	Post-Project Emissions (tpy)
VOCs	19.6
NO_X	2.7
CO	1.4
PM	0.1
HAPs	1.7

In support of this registration representation, the following documents are included:

- Core Data Form
- 106.4 Checklist
- 106.352 Checklist
- 106.492 Checklist
- 106.512 Checklist
- PI-7 Form
- Table 1(a)
- Process Description
- Process Flow Diagram
- Emission Calculation Methodology
- Emission Calculations
- Gas and Crude Oil Analyses
- Copy of PBR Permit Fee ePay Payment

Please contact me at (713)-372-0456 if you have any questions or require additional information.

Sincerely,

Erik Pitoniak
Air Specialist

cc: HES/DR/file copy
Alicia Pollock – Houston (via e-file)
Matt Dangel – Houston (via e-file)
Shelby Tucker – Carthage (via e-file)
Mike Milliorn – Carthage (via e-file)

Air Program Manager
TCEQ – Region 5
2916 Teague Drive
Tyler, TX 75701-3734

Enclosures

CORE DATA FORM

FORM PI-7

106.4 CHECKLIST

Texas Commission on Environmental Quality
Permit by Rule Applicability Checklist
Title 30 Texas Administrative Code § 106.4

The following checklist was developed by the Texas Commission on Environmental Quality (TCEQ), Air Permits Division, to assist applicants in determining whether or not a facility meets all of the applicable requirements. Before claiming a specific Permit by Rule (PBR), a facility must first meet all of the requirements of Title 30 Texas Administrative Code § 106.4 (30 TAC § 106.4), "Requirements for Permitting by Rule." Only then can the applicant proceed with addressing requirements of the specific Permit by Rule being claimed.

The use of this checklist is not mandatory; however, it is the responsibility of each applicant to show how a facility being claimed under a PBR meets the general requirements of 30 TAC § 106.4 and also the specific requirements of the PBR being claimed. If all PBR requirements cannot be met, a facility will not be allowed to operate under the PBR and an application for a construction permit may be required under 30 TAC § 116.110(a).

Registration of a facility under a PBR can be performed by completing Form PI-7 (Registration for Permits by Rule) or Form PI-7-CERT (Certification and Registration for Permits by Rule). The appropriate checklist should accompany the registration form. Check the most appropriate answer and include any additional information in the spaces provided. If additional space is needed, please include an extra page and reference the question number. The PBR forms, tables, checklists and guidance documents are available from the TCEQ, Air Permits Division Web site at: www.tceq.state.tx.us/permitting/air/nav/air_pbr.html.

1. 30 TAC § 106.4(a)(1) & (4): Emission limits	
List emissions in tpy for **each** facility (add additional pages or table if needed): SO_2 = ____ PM_{10} = 0.1 VOC = 14.3 NO_x = 2.7 CO = 1.4 Other HAP = 0.9 SO_2 = ____ PM_{10} = ____ VOC = 2.3 NO_x = ____ CO = ____ Other HAP = 0.3 SO_2 = ____ PM_{10} = ____ VOC = 3.0 NO_x = ____ CO = ____ Other HAP = 0.3 **Total** ____ 0.1 19.6 2.7 1.4 1.7	
• Are the SO_2, PM_{10}, VOC, or other air contaminant emissions claimed for **each** facility in this PBR submittal less than 25 tpy? • Are the NO_x and CO emissions claimed for each facility in this PBR submittal less than 250 tpy? *If the answer to both is "Yes," continue to the question below. If the answer to either question is "No," a* ***PBR cannot be*** *claimed.*	☑ YES ☐ NO ☑ YES ☐ NO
Has any facility at the property had public notice and opportunity for comment under 30 TAC Section 116 for a regular permit or permit renewal? (This does not include public notice for voluntary emission reduction permits, grandfathered existing facility permits, or federal operating permits.) *If "Yes," skip to Section 2. If "No," continue to the questions below.*	☐ YES ☑ NO
If the site has had no public notice, please answer the following: • Are the SO_2, PM_{10}, VOC, or other emissions claimed for **all** facilities in this PBR submittal less than 25 tpy? • Are the NO_x and CO emissions claimed for all facilities in this PBR submittal less than 250 tpy? *If the answer to both questions is "Yes," continue to Section 2.* *If the answer to either question is "No,"* ***a PBR cannot be claimed.*** *A permit will be required under Chapter 116.*	☑ YES ☐ NO ☑ YES ☐ NO
2. 30 TAC § 106.4(a)(2): Nonattainment check	
Are the facilities to be claimed under this PBR located in a designated ozone nonattainment county? *If "Yes," please indicate which county by checking the appropriate box to the right.* (Marginal) - Hardin, Jefferson, and Orange counties *(BPA)* (Moderate) - Brazoria, Chambers, Fort Bend, Galveston, Harris, Liberty, Montgomery, and Waller counties *(HGA)* (Moderate) - Collin, Dallas, Denton, Ellis, Johnson, Kaufman, Parker, Rockwall, and Tarrant counties *(DFW)* *If "Yes," to any of the above, continue to the next question. If "No," continue to Section 3.*	☐ YES ☑ NO ☐ BPA ☐ HGA ☐ DFW

Does this project trigger a nonattainment review? To determine the answer, review the information below: • Is the project's potential to emit (PTE) for emissions of VOC or NO_x increasing by 100 tpy or more? *PTE is the maximum capacity of a stationary source to emit any air pollutant under its worst-case physical and operational design unless limited by a permit, rule, or made federally enforceable by a certification.* • Is the site an existing major nonattainment site and are the emissions of VOC or NO_x increasing by 40 tpy or more? If needed, attach contemporaneous netting calculations per nonattainment guidance. Additional information can be found at: www.tceq.state.tx.us/permitting/air/forms/newsourcereview/tables/nsr_table8.html and www.tceq.state.tx.us/permitting/air/nav/air_docs_newsource.html *If "Yes," to any of the above, the project is a major source or a major modification and **a PBR may not be used.** A Nonattainment Permit review must be completed to authorize this project. If "No," continue to Section 3.*	☐YES ☐NO ☐YES ☐NO
3. 30 TAC § 106.4(a)(3): Prevention of Significant Deterioration (PSD) check	
Does this project trigger a review under PSD rules? To determine the answer, review the information below: • Are emissions of any regulated criteria pollutant increasing by 100 tpy of any criteria pollutant at a named source? • Are emissions of any criteria pollutant increasing by 250 tpy of any criteria pollutant at an unnamed source? • Are emissions increasing above significance levels at an existing major site? PSD information can be found at: www.tceq.state.tx.us/permitting/air/forms/newsourcereview/tables/nsr_table9.html and www.tceq.state.tx.us/permitting/air/nav/air_docs_newsource.html *If "Yes," to any of the above, **a PBR may not be used.** A PSD Permit review must be completed to authorize the project. If "No," continue to Section 4.*	☐YES ☑NO ☐YES ☑NO ☐YES ☑NO
4. 30 TAC § 106.4(a)(6): Federal Requirements	
• Will all facilities under this PBR meet applicable requirements of Title 40 Code of Federal Regulations (40 CFR) Part 60, New Source Performance Standards (NSPS)? If "Yes," which Subparts are applicable?: ______________________________	☐YES ☐NO ☑N/A
• Will all facilities under this PBR meet applicable requirements of 40 CFR Part 63, Hazardous Air Pollutants Maximum Achievable Control Technology (MACT) standards? If "Yes," which Subparts are applicable?: ______________________________	☐YES ☐NO ☑N/A
• Will all facilities under this PBR meet applicable requirements of 40 CFR Part 61, National Emissions Standards for Hazardous Air Pollutants (NESHAPs)? If "Yes," which Subparts are applicable?: ______________________________ *If "Yes" to any of the above, please attach a discussion of how the facilities will meet any applicable standards.*	☐YES ☐NO ☑N/A
5. 30 TAC § 106.4(a)(7): PBR prohibition check	
Are there any air permits at the site containing conditions which prohibit or restrict the use of PBRs? *If "Yes," PBRs may not be used or their use must meet the restrictions of the permit. A new permit or permit amendment may be required. **List permit number(s):**____________________* *If "No," continue to Section 6.*	☐YES ☑NO

6. 30 TAC § 106.4(a)(8): NO_x Cap and Trade	
• Is the facility located in Harris, Brazoria, Chambers, Fort Bend, Galveston, Liberty, Montgomery, or Waller County? *If "Yes," answer the question below. If "No," continue to Section 7.*	☐YES ☑NO
• Will the proposed facility or group of facilities obtain required allowances for NO_x if they are subject to 30 TAC Chapter 101, Subchapter H, Division 3 (relating to the Mass Emissions Cap and Trade Program)?	☐YES ☐NO
7. Highly Reactive Volatile Organic Compounds (HRVOC) check	
• Is the facility located in Harris County? *If "Yes," answer the next question. If "No," skip to the box below.* • Will the project be constructed after June 1, 2006? *If "Yes," answer the next question. If "No," skip to the box below.* • Will one or more of the following HRVOC be emitted as a part of this project? *If "Yes," complete the information below:* lb/hr ____ tpy ____ ▸ 1,3-butadiene ____ ____ ▸ all isomers of butene (e.g., isobutene [2-methylpropene or isobutylene]) ____ ____ ▸ alpha-butylene (ethylethylene) ____ ____ ▸ beta-butylene (dimethylethylene, including both cis- and trans-isomers) ____ ____ ▸ ethylene ____ ____ ▸ propylene ____ ____	☐YES ☑NO ☐YES ☐NO ☐YES ☐NO
• Is the facility located in Brazoria, Chambers, Fort Bend, Galveston, Liberty, Montgomery, or Waller County? *If "Yes," answer the next question. If "No," the checklist is complete.* • Will the project be constructed after June 1, 2006? *If "Yes," answer the next question. If "No," the checklist is complete.* • Will one or more of the following HRVOC be emitted as a part of this project? *If "Yes," complete the information below:* lb/hr tpy ▸ ethylene ____ ____ ▸ propylene ____ ____	☐YES ☑NO ☐YES ☐NO ☐YES ☐NO

PRINT

106.352 CHECKLIST

106.492 CHECKLIST

106.512 CHECKLIST

Table 1(a)

Texas Commission on Environmental Quality
Table 1(a)
Emission Point Summary
Instructions

1. Emission Point Number and Name:

   A. Identify each emission point with a unique number for this plant site. The emission point numbers (EPN) must be consistent with the emission point identification used on the plot plan, any previous permits, and "Emissions Inventory Questionnaire."

   B. Associate the EPN to the appropriate facility with a facility identification number (FIN). These numbers can be alphanumeric and maximum of 10 characters.

   C. Examples of emission point names are; "heater," "vent," 'boiler," "tank," "reactor," "separator," "baghouse," or "fugitive." Examples of EPN and/or FIN numbers are, "BOILER1," "100B1," "BH1." If appropriate, a FIN can be the same as the EPN. Abbreviations are acceptable.

2. Component or Air Contaminant Name: List each component or air contaminant name. Examples of component names are; "air," "H_2O," "nitrogen," "oxygen," "CO_2," "CO," "NO_x," "SO_2," "hexane," or "particulate matter (PM)." Abbreviations are acceptable.

3. Air Contaminant Emission Rate:

   A. Pounds per hour is the maximum short-term emission rate expected to occur in any one-hour period.

   B. Tons per year (tpy) is the annual (any rolling 12 month period) total maximum emissions expected by the facility, taking the process operating schedule into account.

4. Universal Transverse Mercator (UTM) Coordinates of Emission Points: The applicant must furnish a facility plot plan drawn to scale showing a plant benchmark. Latitude and longitude must be correct and to the nearest second for the benchmark, and the dimension of all emission points with respect to the benchmark as required by the Form PI-1 (General Application for Air Preconstruction Permits and Amendments). This information is essential for the calculation of emission point UTM coordinates. Please show emission point UTM coordinates if known. Use the southwest corner as the emission point coordinate for each area source.

5. Building Height: Enter the height of the building.

6. Height Above Ground: Enter the height of the stacks above the ground.

7. Stack Exit Data:

   A. Enter the length, width and equivalent diameter for rectangular stacks. Also indicate horizontal discharge or covered stacks (raincap).

   B. Enter the velocity of emissions in actual feet per second.

   C. Enter the actual temperature if the exit temperature is "room" or "climate controlled." Enter "ambient" to represent exit temperatures that are the same as the outdoor environment. Flare exit temperatures are not required.

8. Fugitives:

   A. For area fugitive sources, enter the dimensions of a rectangle, which will "enclose" all fugitive sources included in this EPN. Length to width ratio should be 10:1 or less. Subdivide larger areas to meet this requirement.

   B. Enter the width of the fugitive source area.

   C. Enter the number of degrees the long axis of the fugitive area is offset from north south.

NOTE: The TCEQ standard conditions are 68° F and 14.7 PSIA (Title 30 Texas Administrative Code § 101.1)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 10/1/2011	Permit No.:	Regulated Entity No.:
Area Name: Davidson-Matthews Compressor Station		Customer Reference No.: CN600132484

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS							
						Source							
1. Emission Point			4. UTM Coordinates of Emission Point			5. Building Height (Ft.)	6. Height Above Ground (Ft.)	7. Stack Exit Data			8. Fugitives		
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)			(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	(A) Length (Ft.)	(B) Width (Ft.)	(C) Axis Degrees

EPN = Emission Point Number
FIN = Facility Identification Number

TCEQ

Texas Commission on Environmental Quality
Table 1(a)
Emission Point Summary
Instructions

1. Emission Point Number and Name:

   A. Identify each emission point with a unique number for this plant site. The emission point numbers (EPN) must be consistent with the emission point identification used on the plot plan, any previous permits, and "Emissions Inventory Questionnaire."

   B. Associate the EPN to the appropriate facility with a facility identification number (FIN). These numbers can be alphanumeric and maximum of 10 characters.

   C. Examples of emission point names are; "heater," "vent," 'boiler," "tank," "reactor," "separator," "baghouse," or "fugitive." Examples of EPN and/or FIN numbers are, "BOILER1," "100B1," "BH1." If appropriate, a FIN can be the same as the EPN. Abbreviations are acceptable.

2. Component or Air Contaminant Name: List each component or air contaminant name. Examples of component names are; "air," "H_2O," "nitrogen," "oxygen," "CO_2," "CO," "NO_x," "SO_2," "hexane," or "particulate matter (PM)." Abbreviations are acceptable.

3. Air Contaminant Emission Rate:

   A. Pounds per hour is the maximum short-term emission rate expected to occur in any one-hour period.

   B. Tons per year (tpy) is the annual (any rolling 12 month period) total maximum emissions expected by the facility, taking the process operating schedule into account.

4. Universal Transverse Mercator (UTM) Coordinates of Emission Points: The applicant must furnish a facility plot plan drawn to scale showing a plant benchmark. Latitude and longitude must be correct and to the nearest second for the benchmark, and the dimension of all emission points with respect to the benchmark as required by the Form PI-1 (General Application for Air Preconstruction Permits and Amendments). This information is essential for the calculation of emission point UTM coordinates. Please show emission point UTM coordinates if known. Use the southwest corner as the emission point coordinate for each area source.

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8. Fugitives:

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   B. Enter the width of the fugitive source area.

   C. Enter the number of degrees the long axis of the fugitive area is offset from north south.

NOTE: The TCEQ standard conditions are 68° F and 14.7 PSIA (Title 30 Texas Administrative Code § 101.1)

TCEQ

Texas Commission on Environmental Quality
Table 1(a)
Emission Point Summary
Instructions

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   C. Examples of emission point names are; "heater," "vent," 'boiler," "tank," "reactor," "separator," "baghouse," or "fugitive." Examples of EPN and/or FIN numbers are, "BOILER1," "100B1," "BH1." If appropriate, a FIN can be the same as the EPN. Abbreviations are acceptable.

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   C. Enter the number of degrees the long axis of the fugitive area is offset from north south.

NOTE: The TCEQ standard conditions are 68° F and 14.7 PSIA (Title 30 Texas Administrative Code § 101.1)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 10/1/2011	Permit No.:	Regulated Entity No.:
Area Name: Davidson-Matthews Compressor Station		Customer Reference No.: CN600132484

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS							
						Source							
1. Emission Point			4. UTM Coordinates of Emission Point			5. Building Height (Ft.)	6. Height Above Ground (Ft.)	7. Stack Exit Data			8. Fugitives		
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)			(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	(A) Length (Ft.)	(B) Width (Ft.)	(C) Axis Degrees

EPN = Emission Point Number
FIN = Facility Identification Number

Texas Commission on Environmental Quality
Table 1(a)
Emission Point Summary
Instructions

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   A. Identify each emission point with a unique number for this plant site. The emission point numbers (EPN) must be consistent with the emission point identification used on the plot plan, any previous permits, and "Emissions Inventory Questionnaire."

   B. Associate the EPN to the appropriate facility with a facility identification number (FIN). These numbers can be alphanumeric and maximum of 10 characters.

   C. Examples of emission point names are; "heater," "vent," 'boiler," "tank," "reactor," "separator," "baghouse," or "fugitive." Examples of EPN and/or FIN numbers are, "BOILER1," "100B1," "BH1." If appropriate, a FIN can be the same as the EPN. Abbreviations are acceptable.

2. Component or Air Contaminant Name: List each component or air contaminant name. Examples of component names are; "air," "H_2O," "nitrogen," "oxygen," "CO_2," "CO," "NO_x," "SO_2," "hexane," or "particulate matter (PM)." Abbreviations are acceptable.

3. Air Contaminant Emission Rate:

   A. Pounds per hour is the maximum short-term emission rate expected to occur in any one-hour period.

   B. Tons per year (tpy) is the annual (any rolling 12 month period) total maximum emissions expected by the facility, taking the process operating schedule into account.

4. Universal Transverse Mercator (UTM) Coordinates of Emission Points: The applicant must furnish a facility plot plan drawn to scale showing a plant benchmark. Latitude and longitude must be correct and to the nearest second for the benchmark, and the dimension of all emission points with respect to the benchmark as required by the Form PI-1 (General Application for Air Preconstruction Permits and Amendments). This information is essential for the calculation of emission point UTM coordinates. Please show emission point UTM coordinates if known. Use the southwest corner as the emission point coordinate for each area source.

5. Building Height: Enter the height of the building.

6. Height Above Ground: Enter the height of the stacks above the ground.

7. Stack Exit Data:

   A. Enter the length, width and equivalent diameter for rectangular stacks. Also indicate horizontal discharge or covered stacks (raincap).

   B. Enter the velocity of emissions in actual feet per second.

   C. Enter the actual temperature if the exit temperature is "room" or "climate controlled." Enter "ambient" to represent exit temperatures that are the same as the outdoor environment. Flare exit temperatures are not required.

8. Fugitives:

   A. For area fugitive sources, enter the dimensions of a rectangle, which will "enclose" all fugitive sources included in this EPN. Length to width ratio should be 10:1 or less. Subdivide larger areas to meet this requirement.

   B. Enter the width of the fugitive source area.

   C. Enter the number of degrees the long axis of the fugitive area is offset from north south.

NOTE: The TCEQ standard conditions are 68° F and 14.7 PSIA (Title 30 Texas Administrative Code § 101.1)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 10/1/2011	Permit No.:	Regulated Entity No.:
Area Name: Davidson-Matthews Compressor Station		Customer Reference No.: CN600132484

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS							
1. Emission Point			4. UTM Coordinates of Emission Point			Source							
						5. Building Height (Ft.)	6. Height Above Ground (Ft.)	7. Stack Exit Data			8. Fugitives		
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)			(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	(A) Length (Ft.)	(B) Width (Ft.)	(C) Axis Degrees
ENG1	ENG1	Ajax Engine				NA	12	0.83	23.86	540			
TANKA1	TANKA1	S.E.M. A Cond				NA	22	0.25	0.017	80			
TANKB1	TANKB1	S.E.M. B Cond				NA	17	0.25	0.025	80			
TANKBW1	TANKBW1	S.E.M. B Wtr				NA	17	0.25	0.00008	80			
TANKD1	TANKD1	DMCS Cond 1				NA	18	0.25	0.16	80			
TANKD2	TANKD2	DMCS Cond 2				NA	18	0.25	0.20	80			
TANKD3	TANKD3	DMCS Cond 3				NA	18	0.25	0.20	80			
TANKDW1	TANKDW1	DMCS Wtr 1				NA	22	0.25	0.0002	80			
TANKDW2	TANKDW2	DMCS Wtr 2				NA	18	0.25	0.0002	80			
LOADA1	LOADA1	SEM A C Load				NA	10	0.33	6.6	80			
LOADB1	LOADB1	SEM B C Load				NA	10	0.33	6.6	80			
LOADBW1	LOADBW1	SEM B W Load				NA	10	0.33	6.6	80			

EPN = Emission Point Number
FIN = Facility Identification Number

Texas Commission on Environmental Quality
Table 1(a)
Emission Point Summary
Instructions

1. Emission Point Number and Name:

   A. Identify each emission point with a unique number for this plant site. The emission point numbers (EPN) must be consistent with the emission point identification used on the plot plan, any previous permits, and "Emissions Inventory Questionnaire."

   B. Associate the EPN to the appropriate facility with a facility identification number (FIN). These numbers can be alphanumeric and maximum of 10 characters.

   C. Examples of emission point names are; "heater," "vent," 'boiler," "tank," "reactor," "separator," "baghouse," or "fugitive." Examples of EPN and/or FIN numbers are, "BOILER1," "100B1," "BH1." If appropriate, a FIN can be the same as the EPN. Abbreviations are acceptable.

2. Component or Air Contaminant Name: List each component or air contaminant name. Examples of component names are; "air," "H_2O," "nitrogen," "oxygen," "CO_2," "CO," "NO_x," "SO_2," "hexane," or "particulate matter (PM)." Abbreviations are acceptable.

3. Air Contaminant Emission Rate:

   A. Pounds per hour is the maximum short-term emission rate expected to occur in any one-hour period.

   B. Tons per year (tpy) is the annual (any rolling 12 month period) total maximum emissions expected by the facility, taking the process operating schedule into account.

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   C. Enter the actual temperature if the exit temperature is "room" or "climate controlled." Enter "ambient" to represent exit temperatures that are the same as the outdoor environment. Flare exit temperatures are not required.

8. Fugitives:

   A. For area fugitive sources, enter the dimensions of a rectangle, which will "enclose" all fugitive sources included in this EPN. Length to width ratio should be 10:1 or less. Subdivide larger areas to meet this requirement.

   B. Enter the width of the fugitive source area.

   C. Enter the number of degrees the long axis of the fugitive area is offset from north south.

NOTE: The TCEQ standard conditions are 68° F and 14.7 PSIA (Title 30 Texas Administrative Code § 101.1)

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY

Table 1(a) Emission Point Summary

Date: 10/1/2011	Permit No.:	Regulated Entity No.:
Area Name: Davidson-Matthews Compressor Station		Customer Reference No.: CN600132484

Review of applications and issuance of permits will be expedited by supplying all necessary information requested on this Table.

AIR CONTAMINANT DATA						EMISSION POINT DISCHARGE PARAMETERS								
1. Emission Point			4. UTM Coordinates of Emission Point			Source								
						5. Building Height (Ft.)	6. Height Above Ground (Ft.)	7. Stack Exit Data			8. Fugitives		
(A) EPN	(B) FIN	(C) NAME	Zone	East (Meters)	North (Meters)			(A) Diameter (Ft.)	(B) Velocity (FPS)	(C) Temperature (°F)	(A) Length (Ft.)	(B) Width (Ft.)	(C) Axis Degrees
LOADD1	LOADD1	DMCS C Load				NA	10	0.33	6.6	80			
LOADDW1	LOADDW1	DMCS W Load				NA	10	0.33	6.6	80			
FLR1	FLR1	Enclosed Flare				NA	12	0.05	20				
FUGA1	FUGA1	SEM A Fugit.				NA	4				50	15	90
FUGB1	FUGB1	SEM B Fugit.				NA	4				50	20	0
FUGD1	FUGD1	DMCS Fugitive				NA	5				100	60	-70

EPN = Emission Point Number
FIN = Facility Identification Number

PROCESS DESCRIPTION

PROCESS FLOW DIAGRAM

EMISSION CALCULATIONS

ENGINE EMISSIONS

GAS AND CRUDE OIL ANALYSES

ENGINE EMISSION SPECS

COPY OF PBR REGISTRATION FEE PAYMENT