



1001 Louisiana Street, Suite 1000 Houston, Texas 77002

July 31, 2015

VIA FED EX

Environmental Protection Agency
Region 6, Air Permitting Division
1445 Ross Avenue (6 PD-R)
Dallas, Texas 75202
Fed Ex Tracking Number: 7741 4878 2784

RE: EPA-Issued PSD-TX-104949-GHG
Permit Rescission Request
Copano Processing, L.L.C.
Houston Central Gas Plant
Cryogenic 3 Process Unit
1650 County Road 255 South
Sheridan, Texas 77475

RECEIVED
15 AUG -5 PM 1:23
AIR PERMITS SECTION
6PD-R

To Whom It May Concern:

Copano Processing, L.L.C. (Copano) is submitting this request for rescission of Prevention of Significant Deterioration (PSD) Permit for Greenhouse Gas (GHG) Emissions Number: PSD-TX-104949-GHG (the GHG PSD permit) at the Houston Central Gas Plant (the Source) in accordance with the direct final rule Providing Option for Rescission of EPA-Issued Tailoring Rule Step 2 Prevention of Significant Deterioration Permits as published May 7, 2015 and effective July 6, 2015.

As outlined in the final rule, Copano is providing information to demonstrate that the Source did not, at the time the Source obtained its EPA-issued Step 2 PSD permit, emit or have the potential to emit any regulated pollutant other than GHG above the major source thresholds applicable to the Source. This information includes the following:

- a copy of the Texas Commission on Environmental Quality (TCEQ) issued minor New Source Review (NSR) permit #104949 for the non-GHG emissions,
- demonstrations of compliance with all applicable TCEQ minor source requirements,
- detailed potential emission methodologies and calculations demonstrating the TCEQ approved numerical potential to emit of each non-GHG pollutant associated with the issued GHG PSD permit, and
- demonstrations of NNSR and PSD inapplicability determinations for the non-GHG pollutant emissions.

The GHG PSD permit is not used, or planned to be used, for any other regulatory or compliance and enforcement purposes, and the information contained in this rescission request is factual and correct.

Copano would like to thank you in advance for your review and approval of this EPA-issued Step 2 PSD permit rescission. If you have any questions regarding this request or require additional information, please feel free to contact Shrishti Chhabra at 713-420-6318 or shrishti_chhabra@kindermorgan.com, or Rebecca Beatty at 469-365-1142 or rbeatty@apexcos.com.

Sincerely,
Copano Processing, L.L.C.



Michael Catt
VP-OPS

Attachments

cc: Apex TITAN, Inc., Mrs. Rebecca Beatty, rbeatty@apexcos.com
Kinder Morgan – EHS, Ms. Shrishti Chhabra, shrishti_chhabra@kindermorgan.com

Bryan W. Shaw, Ph.D., *Chairman*
Carlos Rubinstein, *Commissioner*
Toby Baker, *Commissioner*
Zak Covar, *Executive Director*



TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
Protecting Texas by Reducing and Preventing Pollution

August 20, 2012

MR REX J PROSSER
SR DIRECTOR EH&S CORPORATE
COPANO PROCESSING LP
1200 SMITH ST STE 2300
HOUSTON TX 77002-4507

Standard Permit Registration Number:	104949	Renewal Date:	August 20, 2022
Location:	1650 County Rd 255 South		
City/County:	Sheridan, Colorado County		
Project Description/Unit:	Houston Central Gas Plant		
Regulated Entity Number:	RN101271419		
Customer Reference Number:	CN601465255		
New or Existing Site:	Existing		
Affected Permit (if applicable):	56613		
Standard Permit Type:	Oil and Gas Production Facilities		

Copano Processing, L.P. has registered the emissions associated with the Houston Central Gas Plant under the standard permit listed above as authorized by the Commissioners pursuant to Title 30 Texas Administrative Code § 116.602 (30 TAC § 116.602). Emissions are listed on the attached table. For rule information see

www.tceq.texas.gov/permitting/air/nav/standard.html.

No planned MSS emissions have been represented or reviewed for this registration and none will be authorized.

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 applicability section for all Standard Permits, § 116.610(a)(2) states that "Construction or operation of the project must be commenced prior to the effective date of a revision to this subchapter."

Mr. Rex J Prosser
August 20, 2012
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Re: Standard Permit Registration Number 104949

If you have questions, please contact Mr. Guillermo Reyes, P.E. at (512) 239-5716. This action is taken under authority delegated by the Executive Director of the TCEQ.

Sincerely,

A handwritten signature in black ink, appearing to read "Anne M. Inman". The signature is fluid and cursive, with a large initial "A" and a long horizontal stroke.

Anne M. Inman, P.E., Manager
Rule Registrations Section
Air Permits Division
Texas Commission on Environmental Quality

cc: Air Section Manager, Region 12 - Houston

Project Number: 178074

Standard Permit Maximum Emission Rates Table
Permit Number 104949

The facilities and emissions included in this table have been represented and reviewed as the maximum emissions authorized by this standard permit registration.

EPN / Emission Source	Specific VOC or Other Pollutants	VOC		NOx		CO		PM ₁₀		PM _{2.5}		SO ₂		Other	
		lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy	lbs/hr	tpy
TURB-5/Solar Mars 100 Turbine		0.80	3.50	4.13	18.07	6.98	30.57	0.76	3.31	0.76	3.31	0.39	1.71	0.08	0.36
TURB-6/Solar Mars 100 Turbine		0.80	3.50	4.13	18.07	6.98	30.57	0.76	3.31	0.76	3.31	0.39	1.71	0.08	0.36
HTR-3/Gas Heater		0.13	0.04	2.45	0.74	2.06	0.62	0.19	0.06	0.19	0.06	0.01	<0.01	<0.01	<0.01
HTR-4/Gas Heater		0.13	0.04	2.45	0.74	2.06	0.62	0.19	0.06	0.19	0.06	0.01	<0.01	<0.01	<0.01
RTO-3/RTO		0.53	2.28	0.32	0.73	1.27	3.74	0.02	0.04	0.02	0.04	0.02	0.09		
TANKS-3/Storage Tanks		0.01	0.01												
CRYO3 FUG/Process Fugitives		0.61	2.67												
TOTAL EMISSIONS (TPY):		3.01	12.04	13.48	38.35	19.35	66.12	1.91	6.78	1.91	6.78	0.83	3.51	0.17	0.71
MAXIMUM OPERATING SCHEDULE:		Hours/Day		Days/Week		Weeks/Year		Hours/Year		Hours/Year		Hours/Year		Hours/Year	
		7		24		7		52		52		52		8760	

- VOC - volatile organic compounds
- NO_x - total oxides of nitrogen
- CO - carbon monoxide
- PM₁₀ - particulate matter equal to or less than 10 microns in size
- PM_{2.5} - particulate matter equal to or less than 2.5 microns in size
- SO₂ - sulfur dioxide

**Fugitive emissions are an estimate only and should not be considered as a maximum allowable

Section 7

General Requirements

30 TAC §116.610 and 116.615 specify the general standard permit registration requirements. This section addresses those requirements.

7.1 Applicability - 30 TAC § 116.610

The project will comply with all applicable components of 30 TAC §116.610 as follows:

- § 116.610(a)(1) This project's emissions will comply with the emission limitations of §106.261/262. Refer to Appendix A, Table A-5 for this review.
- § 116.610(a)(2) The construction of the project will commence prior to the effective date of a revision to 30 TAC 116, Subchapter F.
- § 116.610(a)(3) The two natural gas turbines associated with this project comply with the provisions of the Federal Clean Air Act (FCAA), §111 (concerning New Source Performance Standards) as listed under 40 Code of Federal Regulations (CFR) Part 60, Subpart KKKK. Additionally, the new cryogenic process train and all associated equipment will comply with 40 CFR 60, Subpart KKK.
- § 116.610(a)(4) The provisions of FCAA, §112 (concerning Hazardous Air Pollutants) as listed under 40 CFR Part 61, promulgated by the EPA, are not applicable to this project.
- § 116.610(a)(5) The proposed turbines are not subject to the maximum achievable control technology standards as listed under 40 CFR Part 63 as the site is an area source for HAP emissions.
- § 116.610(a)(6) This facility is not located within the Houston-Galveston-Brazoria ozone nonattainment area, therefore Chapter 101, Subchapter H, Division 3 (relating to Mass Emissions Cap and Trade Program) does not apply.
- § 116.610(b) This project's emissions do not constitute a new major stationary source or major modification as defined in §116.12 of this title (relating to Nonattainment and Prevention of Significant Deterioration Review Definitions). Refer to Appendix B for this review.
- § 116.610(c) This project will not circumvent by artificial limitations the requirements of §116.110.
- § 116.610(d) This project does not involve an affected source; therefore, the requirements of Subchapter E do not apply.

7.2 General Conditions - 30 TAC § 116.615

The project will comply with all applicable general conditions of 30 TAC §116.615 to include compliance with all applicable rules and regulations of the commission adopted under Texas Health and Safety Code, Chapter 382, and with the intent of the Texas Clean Air Act (TCAA), including protection of health and property of the public; standard permit representations; construction progress; start-up notification; sampling requirements; equivalency of methods; recordkeeping; maintenance of emission controls; compliance with rules; and distance limitations, setbacks, and buffer zones.

Section 8

Specific Requirements

30 TAC §116.620 specifies the standard permit registration requirements for installation and/or modification of oil and gas facilities. This section addresses those requirements.

8.1 Installation and/or Modification of Oil and Gas Facilities - 30 TAC §116. 620

- §116.620(a)(1)-(3) This facility processes sweet gas and emits sulfur compounds at rates and in a manner that complies with §116.620(a)(1)-(3).
- §116.620(a)(4) See Section 8.2 for details satisfying §116.620(a)(4) in regards to §106.512 requirements.
- §116.620(a)(5) This project does not include a glycol dehydration unit; therefore, this requirement does not apply.
- §116.620(a)(6) The combustion turbines in this project shall emit NO_x at rates and in a manner that complies with §116.620(a)(6) as noted from the calculations representations in Appendix A.
- §116.620(a)(7)-(11) This facility is located more than 500 feet from the nearest off-plant receptor. Uncontrolled fugitives from this project do not exceed 25 tpy.
- §116.620(a)(12) Copano's elevated flare (EPN FLARE) will be designed and operated in accordance with 40 CFR 60.18, including minimum flare stream heating value and maximum flare stream exit velocity requirements.
- §116.620(a)(13) The facility is located in Colorado County which is not a designated nonattainment area; therefore, nonattainment permitting requirements are not applicable. This project is not considered a major modification for the federal Prevention of Significant Deterioration (PSD) program, and the facility is located in an area that is classified as attainment /unclassified for all criteria pollutants. Refer to Appendix B for PSD modification review.
- §116.620(a)(14) The combustion turbines are subject to 40 CFR 60 Subpart KKKK requirements. Additionally, the new cryogenic process train and all associated equipment will comply with 40 CFR 60, Subpart KKK.
- §116.620(a)(15) There are no applicable 40 CFR 61 requirements associated with this project.
- §116.620(a)(16) There are no applicable 40 CFR 63 requirements associated with this project.
- §116.620(a)(17) The increased emissions from this project will not cause or contribute to a violation of any National Ambient Air Quality Standard or regulation

property line standards as specified in Chapters 111, 112, or 113 as shown in the NAAQS table in Appendix C.

- §116.620(a)(18) Fuel used at the site will not contain more than 10 grains total sulfur per 100 dscf of natural gas.
- §116.620(b)(1) This requirement does not apply as there are no storage tanks on site which exceed 25,000 gallons or have uncontrolled VOC emissions greater than 10 tons per year associated with this project.
- §116.620(b)(2) This requirement does not apply as there is no glycol dehydration system associated with this project.
- 116.620(c)(1)-(3) The facility is located more than 500 feet from the nearest off-plant receptor, and uncontrolled fugitive emissions are less than 25 tpy; therefore, these requirements do not apply.
- §116.620(d)(1) This requirement does not apply as this project is not subject to a fugitive emissions control program.
- §116.620(d)(2) This requirement does not apply since the facility does not use fuel with more than 1.5 grains of H₂S or 30 grains total sulfur per 100 dry standard cubic feet.
- §116.620(d)(3) The requirement does not apply as this project does not include the use of a condenser as a control device.
- §116.620(e) The facility will comply with the applicable requirements of this section.

8.2 Stationary Engines and Turbines - 30 TAC §106.512

- §106.512(1) This registration application includes Table 31 forms in Section 2.
- §106.512(2) This registration does not include any engines; therefore, this section does not apply.
- §106.512(3) The two gas turbines are rated at greater than 500 hp, will operate at less than 3 gm/hp hr of NO_x and will be in compliance with NSPS Subpart KKKK.
- §106.512(4) This registration does not include any engines or turbines rated less than 500 hp or used for temporary replacement purposes; therefore, this section does not apply.
- §106.512(5) The combustion turbines at HCP fire natural gas containing no more than 10 grains total sulfur per 100 dry standard cubic feet.
- §106.512(6) There will be no violations of any National Ambient Air Quality Standard (NAAQS) in the area of the proposed facility. Compliance is demonstrated using ambient sampling or dispersion modeling

accomplished pursuant to guidance obtained from the executive director or another method allowed under item §106.512(6). Refer to Appendix C for a copy of the SCREEN3 model output report.

The model was run in the rural mode using the hourly NO₂ emission rates of 1.65 lb/hr for the proposed compressor turbines, 1.96 lb/hr for the proposed supplemental heaters, and 0.26 lb/hr for the proposed RTO. Concentrations were calculated for distances between thirty meters and five thousand meters for the sources. See Table C-1 for more details.

To demonstrate compliance with the 1-hour NO₂ NAAQS standard, a SCREEN Impact maximum one-hour concentration for the sources was determined by the model. The one-hour concentration was converted to NO₂ using an NO₂/NO_x ratio of 0.40 (for the compressor turbine) and 0.8 for the heaters and RTO, per the applicable equation in paragraph 6(A) of PBR 106.512. The resulting final NO₂ concentration is 37.98 ug/m³. A background concentration of 70 ug/m³ ("Interim Screening Background Concentrations, July 22, 2010" under TCEQ Region 12) was added to the modeled concentration to obtain a total concentration of 107.98 ug/m³. This concentration is less than the 1-hour NO₂ NAAQS of 188 ug/m³; therefore, these emission source operations do not cause a violation of the NAAQS.

To demonstrate compliance with the annual NO₂ NAAQS standard, a SCREEN Impact maximum one-hour concentration for the sources was determined by the model. EPA's Screen3 model was also run for the existing Boiler 3N (the boiler installation was not included in September 4, 1998 annual background concentration). The one-hour concentration was converted to an annual average using a factor of 0.08 and then to NO₂ using an NO₂/NO_x ratio of 0.40, for the compressor turbines, 0.80 for the heaters and RTO per the applicable equation in paragraph 6(A) of PBR 106.512. The resulting final NO₂ concentration is 3.26 ug/m³. A background concentration of 20 ug/m³ ("Screening Background Concentrations, September 4, 2998 under TCEQ Region 12) was added to the modeled concentration to obtain a total concentration of 23.26 ug/m³. This concentration is less than the annual NO₂ NAAQS of 100 ug/m³; therefore, operations of these sources do not cause a violation of the NAAQS.

§106.512(7) This is not a standard permit registration for an electric generating unit; therefore, this section does not apply

Section 9

NNSR and PSD Applicability

Non-attainment New Source Review (NNSR) permitting is required for each non-attainment pollutant for which a modification of an existing major source will result in a significant net emissions increase. Prevention of Significant Deterioration (PSD) permitting is required for a modification of an existing major source for each attainment pollutant and other regulated pollutants (such as H₂S) for which the modification will result in a significant net emissions increase. Colorado County is designated attainment for all criteria pollutants; therefore, NNSR is not applicable for this project.

As shown in Appendix B, Table B-1, NNSR and PSD Applicability Determination, project emissions will result in permitted emissions increases that are less than the PSD netting thresholds of 40 tpy of NO_x, 100 tpy CO, 40 tpy of VOC, 25 tpy of PM, 15 tpy of PM₁₀, 10 tpy of PM_{2.5} and 40 tpy of SO₂. Therefore, PSD is not applicable to these pollutants.

Table 1-1
New Cryogenic Plant Emissions Summary
Copano Processing, LP, Houston Central Gas Plant

EPN	Emissions Source	VOC		NO _x		CO		SO ₂		PM/PM ₁₀ /PM _{2.5}		Formaldehyde	
		lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
TURB-5	Solar Mars 100	0.80	3.50	4.13	18.07	6.98	30.57	0.39	1.71	0.76	3.31	0.08	0.36
TURB-6	Solar Mars 100	0.80	3.50	4.13	18.07	6.98	30.57	0.39	1.71	0.76	3.31	0.08	0.36
HTR-3	Gas Heater	0.13	0.04	2.45	0.74	2.06	0.62	0.01	<0.01	0.19	0.06	<0.01	<0.01
HTR-4	Gas Heater	0.13	0.04	2.45	0.74	2.06	0.62	0.01	<0.01	0.19	0.06	<0.01	<0.01
RTO-3	RTO	0.53	2.28	0.32	0.73	1.27	3.74	0.02	0.09	0.02	0.04		
TANK-3	Amine Tanks	0.01	0.01										
FLARE	Elevated Flare	0.61	2.66	0.19	0.84	0.38	1.68						
CRYO3 FUG	Fugitives	0.61	2.67										
Total		3.62	14.70	13.66	39.18	19.72	67.79	0.83	3.51	1.91	6.78	0.17	0.71

Section 5

Emissions Summary

Emission factors and calculation methods are addressed in this section along with a TCEQ Table 1(a) – Emission Point Summary. Appendix A contains the emission factors and operations data used to calculate the hourly and annual emissions from the newly proposed emission sources at the Houston Central Plant.

5.1 Compressor Turbines

Compressor turbines TURB-5 and TURB-6 are Solar Mars 100 gas combustion turbines that will be fueled with natural gas and have a rated capacity of 15,000 HP each. All emissions are based on firing 100% natural gas. Emission factors for nitrogen oxides (NO_x), volatile organic compounds (VOC) and carbon monoxide (CO) are from manufacturer's specifications. The formaldehyde (CH₂O), particulate (PM₁₀ and PM_{2.5}) and sulfur dioxide (SO₂) emission factors used in the calculations are based on the AP-42 factors from Table 3.1.2 *Uncontrolled Emission Factors for Criteria Pollutants from Stationary Natural Gas Turbines* (5th edition, July 2000). Hourly emissions are based on the emission factors and the turbine operating at maximum capacity. Annual emissions are based on 8,760 hours/yr of operation. See Appendix A, Table A-1 for additional emission calculation details.

5.2 Supplemental Gas Heaters

Supplemental Gas Heater HTR-3 and HTR-4 emissions are based on firing 100% natural gas. Emission factors for nitrogen oxides (NO_x), carbon monoxide (CO), volatile organic compounds (VOC), formaldehyde, particulate matter (PM/PM₁₀/PM_{2.5}) and sulfur dioxide (SO₂) are used from AP-42 Tables 1.4-1, 1.4-2 and 1.4-3 from *Emission Factors for Natural Gas Combustion* (July 1998). Hourly emissions are based on the emission factors and the heaters operating at a maximum capacity of 25 MMBtu/hr. Annual emissions are based on a maximum of 600 hours/yr of operation for each heater. See Appendix A, Table A-2 for additional emission calculation details.

5.3 Amine Unit

The Amine Unit will produce an acid gas stream that will be controlled by a Regenerative Thermal Oxidizer (EPN RTO-3). EPN RTO-3 emissions are based on maximum acid gas VOC flows from the new amine treating system and required pilot/assist gas. Emissions from EPN RTO-3 are estimated using methods outlined in the TCEQ's *Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000*. The calculations employ a 99% VOC destruction efficiency. Emissions of NO_x and CO are quantified based on the emission factors for low BTU streams (less than 1,000 BTU/scf). Emissions for PM/PM₁₀/PM_{2.5} were calculated based on the emission factors for small boilers/heaters. See Appendix A, Table A-3 for additional emission calculation details.

Copano's Amine Unit will also produce a flash gas vent stream that will be routed to a previously authorized elevated flare (EPN FLARE). Amine Unit flash gas emissions are calculated based on maximum flash gas flows and methods outlined in the TCEQ's *Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers, October 2000*. Emissions of NO_x and CO were calculated based on the emission factors for low BTU streams. The calculations employ a 99% VOC destruction efficiency for material with three carbon atoms or less and a 98% VOC destruction efficiency for hydrocarbons with more than three carbon atoms. See Appendix A, Table A-5 for additional emission calculation details.

5.4 Fugitive Components

Process fugitive (equipment leak) emissions consist of VOC from the new piping components. The VOC emissions (EPN CRYO3 FUG) are estimated utilizing the TCEQ fugitive emission factors for the Oil and Gas Production Operations found in the TCEQ's *Equipment Leak Fugitives Technical Guidance Document, October 2000* and by applying the control efficiencies from the 28M program as the site and new process train is subject to NSPS KKK. The annual fugitive emissions are based on 8,760 hours of service. See Appendix A, Table A-4 for emission calculations.

Appendix A

Emissions Calculations

Table A-1

Turbine Emissions (EPN: TURB-5 & TURB-6)
Copano Processing, L.P., Houston Central Gas Plant
Colorado County, Texas

Turbine Model: Solar Mars 100

UNIT MAX DESIGN HP

15,000

LHV, BTU/SCF

916

FUEL CONSUMPTION, BTU/BHP-HR

7639.3

BTU/hp-hr

Emissions = factor x MMBTU (fuel gas)

EMISSION FACTORS, G/HP-HR

PERMIT HOURS

8,760

HP-HOURS

131,400,000

Horse Power Rating, hp
15,000

NOx LB/HR	CO LB/HR	NM VOC LB/HR	PM10 LB/HR	SO2 LB/HR	Formaldehyde LB/HR
TONS/YR	TONS/YR	TONS/YR	TONS/YR	TONS/YR	TONS/YR
4.13	6.98	0.80	0.76	0.3896	0.08
18.07	30.57	3.50	3.31	1.71	0.36

STACK VELOCITY DATA

HP-HOURS

131,400,000

SCFH FUEL

125,098

TEMP. °F

400

ACFH EXHAUST

6,354,897

DIAM. IN

58.7

VELOCITY FPS

94.0

HEIGHT Ft

50.00

(1) Emission Factors for NOx, CO and VOC are from manufacturer's specifications. PM10, VOC, SO2 and Formaldehyde factors from AP-42 Table 3.1-2 and 3.1-3.

(2) SCFH Fuel = (Engine BHP x 7,639.3 BTU/BHP)/Fuel LHV

(3) ACFH, TEMP, & DIAM=Actual Data

(4) FPS=[6354897.46771759 ACFH/ 3600 sec/hr] / [(58.67 in / 12 in/ft)² * PI/4] = 94.0

Table A-2

**Regen Gas Heater (EPN: HTR-3/HTR-4), Uncontrolled
 Copano Processing, LP, Houston Central Gas Plant**

25 MMBtu/hr Supplemental Gas Heater

EPN:	HTR-3/HTR-4		
Heater Description:	Regen Gas Heater		
Heater/Boiler Type:	Small Boiler (<100 MMBtu) Uncontrolled		
Annual Heater/Boiler Operating Hours (hrs/yr):	600		
Natural Gas Heating Value (Btu/scf):	1020		
Rated Duty/Heat Input (MMBtu/hr):	25		
Annual Fuel Usage (MMscf/yr):	14.71		
Rated Fuel Usage (scf/hr):	24510		
Control Efficiency (%):	0		
Pollutant	Emission Factor, Small Boiler (<100 MMBtu) Uncontrolled (lb/MMSCF) ¹	Emissions	
		(lb/hr)	(tons/yr)
NO _x	100.00	2.45	0.74
CO	84.00	2.06	0.62
NMNE VOC	505.00 5.5	42.38 0.13	3.74 0.04
PM10	7.60	0.19	0.06
SO ₂	0.60	0.01	0.004
Formaldehyde	0.075	0.002	0.001

¹Based on AP-42, 5th ed. (July 1998) Tables 1.4-1, 1.4-2 & 1.4-3, "Natural Gas Combustion".

Sample Calculations:

Short-Term Emissions (lb/hr) = (Emission Factor lb/MMscf) * (Rated Duty, MMBtu/hr) / (Heating Value Btu/scf)

Long-Term Emissions (tpy) = (Emission Rate lb/hr) * (Annual Operating Hours hrs/yr) / (2000 lb/ton)

Table A-4
Equipment Leak Fugitives (EPN: CRYO3 FUG)
Copano Gas Processing, LP, Houston Central Gas Plant
Colorado County, Texas

Monitored Component Type	Service	Oil & Gas Production Operations Fugitive Emission Factors	Total Component Count	28M Control Efficiencies (%)	Uncontrolled HC Emissions (lb/hr)	Uncontrolled HC Emissions (TPY)	Controlled HC Emissions (lb/hr)	Controlled HC Emissions (TPY)
Valves	Gas/Vapor	0.00992	1600	75%	15.87	68.52	3.97	17.38
	Light Liquid	0.0055	120	75%	0.66	2.89	0.17	0.72
	Heavy Liquid	0.0000185		0%				
Pumps	Gas Vapor	0.00529						
	Light Liquid	0.02866	14	75%	0.40	1.76	0.10	0.44
	Heavy Liquid	0.00113		0%				
Flanges	Gas/Vapor	0.00086	1400	30%	1.20	5.27	0.84	3.69
	Light Liquid	0.000243	140	30%	0.03	0.15	0.02	0.10
	Heavy Liquid	0.0000086		30%				
Compressors	Gas/Vapor	0.0194	8	75%	0.16	0.68	0.04	0.17
	Gas/Vapor	0.0194	24	75%	0.47	2.04	0.12	0.51
Relief Valves	Gas/Vapor	0.0194	3306		18.79	82.31	5.26	23.02

1) Emission factors are from TCEQ Air Permit Technical Guidance for Chemical Sources: Equipment Leak Fugitives October 2000 which refers to Oil and Gas Production Operations extracted from Table 2-4 of EPA-453/R-95-017

2) For Oil and Gas Production Operations, "Other" includes diaphragms, dump arms, hatches, instruments, meters, polished rods, and vents.

Sample Calculations:

Non-Monitored Component Emissions (lb/hr)=Emission Factor (lb/hr) * Non-Monitored Component Count

Inlet Gas Analysis	Compound	Dry Basis Mole %	MW	lb/mol	Component Emissions	
					VOC lb/hr	VOC TPY
	Methane	87.40	16.043	1402.21	3.88	16.99
	Ethane	6.40	30.070	192.39	0.53	2.33
	Propane	2.54	44.097	111.79	0.31	1.35
	i-butane	0.497	58.124	28.89	0.08	0.35
	n-butane	0.66	58.124	38.25	0.11	0.46
	i-pentane	0.22	72.151	15.51	0.04	0.19
	n-pentane	0.15	72.151	10.82	0.03	0.13
	C6*	0.17	86.117	14.64	0.04	0.18
	CO2	1.84	44.010	80.85		
	N2	0.14	28.013	3.84		
	H2S	0.00	34.076	0.00	0.00	0.00
	Total:	100.00		1899.17	0.61	2.67
				VOC Total:	11.58%	

*Use of inlet gas analysis is conservative as the compressors will be compressing residue gas.

**TABLE A-5
COPANO PROCESSING, LP
HOUSTON CENTRAL GAS PLANT
ELEVATED FLARE
Flash Gas Emissions
May 2012**

Flare EPN: FLARE
Description of Unit: Elevated Flare
Flare Type: Air or Unassisted >1000 Btu/scf
Operating Hours (hr/yr): 8760
Sweep Gas Flow (scf/hr): 829.63 (Basis: Process flow data)

Component	Sweep Gas Stream										VOC EMISSIONS				Net Heat Release				Emission Factors				NOX AND CO EMISSIONS			
	MW	MI %	Mol%	Vol%	lb/hr	scf/hr	mol/hr	Efficiency %	lb/hr	tpy	BTU/scf	BTU/hr	MMBTU/yr	NOX	CO	lb/hr	tpy	lb/hr	tpy	CO						
Methane	16.04	25.06%	49.37%	49.37%	16.98	409.59	1.06	99.0%	0.1698	0.7439	892	440	365,351	0.138	0.2755	0.0604	0.2208	0.1007	0.4409							
Ethane	30.07	14.49%	15.23%	15.23%	9.82	126.35	0.33	99.0%	0.0982	0.4301	2,254	343	284,787	0.138	0.2755	0.0393	0.1721	0.0785	0.3437							
Propane	44.10	19.71%	14.13%	14.13%	13.36	117.23	0.30	99.0%	0.1336	0.5853	2,371	335	277,943	0.138	0.2755	0.0384	0.1680	0.0766	0.3354							
Isobutane	58.12	0.00%	0.00%	0.00%	-	-	0.00	98.0%	0.0000	0.0000	2,923	-	-	0.138	0.2755	0.0000	0.0000	0.0000	0.0000							
n-Butane	58.12	14.92%	8.12%	8.12%	10.11	67.33	0.17	98.0%	0.2023	0.8861	2,930	237.78	197,272	0.138	0.2755	0.0272	0.1192	0.0543	0.2380							
Isopentane	72.15	0.00%	0.00%	0.00%	-	-	0.00	98.0%	0.0000	0.0000	3,602	-	-	0.138	0.2755	0.0000	0.0000	0.0000	0.0000							
n-Pentane	72.15	8.33%	3.68%	3.65%	5.65	30.28	0.08	98.0%	0.1129	0.4947	3,609	132	109,291	0.138	0.2755	0.0151	0.0661	0.0301	0.1319							
Carbon Dioxide	44.01	4.77%	3.43%	3.43%	3.23	28.41	0.07	0%	0.0000	0.0000	-	-	-	0.138	0.2755	0.0000	0.0000	0.0000	0.0000							
Nitrogen	28.01	0.00%	0.00%	0.00%	-	-	0.00	0%	0.0000	0.0000	-	-	-	0.138	0.2755	0.0000	0.0000	0.0000	0.0000							
H2S	34.08	0.00%	0.00%	0.00%	-	-	0.0000	98.0%	0.0000	0.0000	596	-	-	0.138	0.2755	0.0000	0.0000	0.0000	0.0000							
Water	18.02	1.02%	1.78%	1.78%	0.69	14.79	0.04	0%	0.6886	3.0163	-	-	-	0.138	0.2755	0.0000	0.0000	0.0000	0.0000							
n-Hexane	86.18	11.70%	4.29%	4.29%	7.93	35.61	0.09	98.0%	0.1587	0.6949	4,376	188	155,844	0.138	0.2755	0.0215	0.0842	0.0429	0.1881							
Ucarcol AP-814	61.08	0.00%	0.00%	0.00%	0.00	0.00	0.00	98.0%	0.0000	0.0000	1,677	0	1	0	0.138	0.2755	0.0000	0.0000	0.0000							
TOTAL		100.00%	100.00%	100.00%	87.78	829.59	2.14		0.6075	2.6810		1,676	1,390,497			0.1919	0.8405	0.3631	1.6779							

TOTAL EMISSIONS		
Component	lb/hr	tpy
VOC	1.22	2.66
NOX	0.38	0.84
CO	0.77	1.68

* Calculations based on October 2000, RG-109 Air Permit Technical Guidance for Chemical Sources: Flares and Vapor Oxidizers

Table A-5
§106.261 and §106.262 Compliance Demonstration
Copano Processing, LP, Houston Central Gas Plant
Colorado County, Texas

Regenerative Thermal Oxidizer (EPN: RTO-3)		ft	K value
Distance to nearest off property receptor		>600	65
COMPOUND	Emissions (lb/hr)		PBR Section §106
	(tons/yr)		Meets PBR?
n-Butane	0.09	0.39	261(a)(2)
n-Pentane	0.17	0.72	262
Propane	0.05	0.27	261(a)(2)
CS+	0.20	0.87	261(a)(2)
Fugitive Emissions (EPN: CRYO3 FUG)		ft	K value
Distance to nearest off property receptor		>600	65
COMPOUND	Uncontrolled Emissions (lb/hr)		PBR Section §106
	(tons/yr)		Meets PBR?
Propane	0.31	1.35	261(a)(2)
i-butane	0.08	0.35	261(a)(2)
n-butane	0.11	0.48	261(a)(2)
i-pentane	0.04	0.19	262
n-pentane	0.03	0.13	262
CS+	0.04	0.18	261(a)(2)
Turbine Emissions (EPN: TURB-STURB-6)		ft	K value
Distance to nearest off property receptor		>600	65
COMPOUND	Uncontrolled Emissions (lb/hr)		PBR Section §106
	(tons/yr)		Meets PBR?
Formaldehyde	0.08	0.35	261(a)(3)
Flash Gas Emissions (EPN: FLARE)		ft	K value
Distance to nearest off property receptor		>600	65
COMPOUND	Emissions (lb/hr)		PBR Section §106
	(tons/yr)		Meets PBR?
Propane	0.13	0.59	261(a)(2)
n-Butane	0.20	0.89	261(a)(2)
n-Pentane	0.11	0.49	262
CS+	0.16	0.69	261(a)(2)
PROJECT TOTALS		ft	K value
Distance to nearest off property receptor		>600	65
COMPOUND	Uncontrolled Emissions (lb/hr)		PBR Section §106
	(tons/yr)		Meets PBR?
Propane	0.51	2.21	261(a)(2)
i-butane	0.08	0.35	261(a)(2)
n-butane	0.31	1.35	261(a)(2)
i-pentane	0.04	0.19	262
n-pentane	0.31	1.35	262
CS+	0.40	1.74	261(a)(2)
formaldehyde	0.08	0.38	261(a)(3)

Appendix B

NNSR and PSD Applicability Determination

Table B-1

New 400 MMSCFD Cryogenic Plant PSD Analysis
 Copano Processing, LP, Houston Central Gas Plant
 Colorado County, Sheridan, Texas

Emission Point Description	Project VOC Emissions (tpy)			Project NOx Emissions (tpy)			Project CO Emissions (tpy)			Project SO _x Emissions (tpy)			Project Total PM Emissions (tpy)			Project PM ₁₀ Emissions (tpy)			Project PM _{2.5} Emissions (tpy)		
	Baseline	Proposed	Increase	Baseline	Proposed	Increase	Baseline	Proposed	Increase	Baseline	Proposed	Increase	Baseline	Proposed	Increase	Baseline	Proposed	Increase	Baseline	Proposed	Increase
TURB-5 Solar Turbine Mers 100	-	3.50	3.50	-	18.07	18.07	-	30.57	30.57	-	1.71	1.71	-	3.31	3.31	-	3.31	3.31	-	3.31	3.31
TURB-6 Solar Turbine Mers 100	-	3.50	3.50	-	18.07	18.07	-	30.57	30.57	-	1.71	1.71	-	3.31	3.31	-	3.31	3.31	-	3.31	3.31
HTR-3 Regeneration Gas Header No. 3	-	0.04	0.04	-	0.74	0.74	-	0.62	0.62	-	0.004	0.004	-	0.06	0.06	-	0.06	0.06	-	0.06	0.06
HTR-4 Regeneration Gas Header No. 4	-	0.04	0.04	-	0.74	0.74	-	0.62	0.62	-	0.004	0.004	-	0.06	0.06	-	0.06	0.06	-	0.06	0.06
RTO-3 Regenerative Thermal Oxidizer No.	-	2.28	2.28	-	0.73	0.73	-	3.74	3.74	-	0.09	0.09	-	0.04	0.04	-	0.04	0.04	-	0.04	0.04
TANK-3 Amino Tank	-	0.01	0.01	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
FLARE Elevated Flare	-	2.86	2.86	-	0.84	0.84	-	1.68	1.68	-	0.00	0.00	-	-	-	-	-	-	-	-	-
CRNOS Fugitives Fugitives	-	2.67	2.67	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Project Increase (tons)	-	14.70	14.70	-	38.18	38.18	-	87.79	87.79	-	3.51	3.51	-	6.78	6.78	-	6.78	6.78	-	6.78	6.78
Netting Threshold (tons)	-	40	40	-	40	40	-	100	100	-	40	40	-	25	25	-	15	15	-	10	10
Netting Required (Yes/No)	-	No	No	-	No	No	-	No	No	-	No	No	-	No	No	-	No	No	-	No	No
Significant Modification Threshold (tons)	-	40	40	-	40	40	-	100	100	-	40	40	-	25	25	-	15	15	-	10	10
Federal Review Required (Yes/No)	-	No	No	-	No	No	-	No	No	-	No	No	-	No	No	-	No	No	-	No	No