

US EPA ARCHIVE DOCUMENT

**DRAFT**

**PREVENTION OF SIGNIFICANT DETERIORATION PERMIT  
FOR GREENHOUSE GAS EMISSIONS  
ISSUED PURSUANT TO THE REQUIREMENTS AT 40 CFR § 52.21**

**U.S. ENVIRONMENTAL PROTECTION AGENCY, REGION 6**

**PSD PERMIT NUMBER:** PSD-TX-1392-GHG

**PERMITTEE:** Nuevo Midstream, LLC  
1221 Lamar, Suite 1100  
Houston, TX 77010

**FACILITY NAME:** Ramsey Gas Plant

**FACILITY LOCATION:** 231 CR 452  
Orla, Reeves County, TX 79770

Pursuant to the provisions of the Clean Air Act (CAA), Subchapter I, Part C (42 U.S.C. Section 7470, *et. Seq.*), and the Code of Federal Regulations (CFR) Title 40, Section 52.21, and the Federal Implementation Plan at 40 CFR § 52.2305 (effective May 1, 2011 and published at 76 FR 25178), the U.S. Environmental Protection Agency, Region 6 is issuing a *Prevention of Significant Deterioration* (PSD) permit to Nuevo Midstream LLC (Nuevo) for Greenhouse Gas (GHG) emissions. The Permit authorizes a major expansion at an existing permitted facility.

Nuevo is authorized to construct three additional cryogenic process trains (Ramsey IV, V, and VI Plants) and associated Amine Plants (Amine I and II Plants) at the existing Ramsey Gas Plant as described herein, in accordance with the permit application (and plans submitted with the permit application), the federal PSD regulations at 40 CFR § 52.21, and other terms and conditions set forth in this PSD permit in conjunction with the corresponding Texas Commission on Environmental Quality (TCEQ) permit No.1392. Failure to comply with any condition or term set forth in this PSD Permit may result in enforcement action pursuant to Section 113 of the Clean Air Act (CAA). This PSD Permit does not relieve Nuevo of the responsibility to comply with any other applicable provisions of the CAA (including applicable implementing regulations in 40 CFR Parts 51, 52, 60, 61, 72 through 75, and 98) or other federal and state requirements (including the state PSD program that remains under approval at 40 CFR § 52.2303).

In accordance with 40 CFR §124.15(b), this PSD Permit becomes effective 30 days after the service of notice of this final decision unless review is requested on the permit pursuant to 40 CFR §124.19.

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Wren Stenger, Director  
Multimedia Planning and Permitting Division

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Date

**Nuevo Midstream, LLC  
 Ramsey (IV, V, VI) Gas Plants (PSD-TX-1392-GHG)  
 Prevention of Significant Deterioration Permit  
 For Greenhouse Gas Emissions  
 Draft Permit Conditions**

**PROJECT DESCRIPTION**

Following the construction authorized by this permit, Nuevo will operate three new cryogenic plants - Ramsey (IV, V, and VI) Plants. The expansion project will include three-200 MMSCF/D cryogenic plants and associated two 1,000-gpm amine plants. The project will be a multiphase project, the 200 MMSCF/D Ramsey IV Plant and the associated 1,000-gpm amine plant (Amine Plant I) will be constructed in late 2015. The 200 MMSCF/D Ramsey V Plant will be constructed in late 2017, and another 200 MMSCF/D Ramsey VI Plant and associated the 1,000-gpm Amine Plant II will be constructed late 2019. The timing of the project phases will be dependent on actual market conditions.

The new project air emission sources consist of fifteen Gas Fired Internal Combustion Compressor Engines (COMP-15 through COMP-29) used for compression of residue gas, two Hot Oil Heaters (H-9 and H-11), three Regeneration Heaters (H-8, H-10, and H-12), two Amine Still Vents (A-4 and A-5), two Regenerative Thermal Oxidizers (RTO-4 and RTO-5), and the associated Fugitive Components (FUG4, FUG5, and FUG6).

**EQUIPMENT LIST**

The following devices are subject to this GHG PSD permit.

Emission Unit Identification Number	Description
<b>Ramsey IV Gas Plant</b>	
COMP-15, COMP-16, COMP-17, COMP-18, and COMP-19	Five (5) Gas Fired Internal Combustion Compressor Engines
H-8	36 MMBtu/hr Regeneration Heater
H-9	60 MMBtu/hr Hot Oil Heater
A-4	Amine Still Vent
RTO-4	Regenerative Thermal Oxidizer
FUG4	Fugitive Emissions from Ramsey IV Plant
<b>Ramsey V Gas Plant</b>	
COMP-20, COMP-21, COMP-23, COMP-24, and COMP-25	Five (5) Gas Fired Internal Combustion Compressor Engines
H-10	36 MMBtu/hr Regeneration Heater
FUG5	Fugitive Emissions from Ramsey V Plant

Emission Unit Identification Number	Description
<b>Ramsey VI Gas Plant</b>	
COMP-25, COMP-26, COMP-27, COMP-28, COMP-29	Five(5) Gas Fired Internal Combustion Compressor Engines
H-12	36 MMBtu/hr Regeneration Heater
H-11	60 MMBtu/hr Hot Oil Heater
A-5	Amine Still Vent
RTO-5	Regenerative Thermal Oxidizer
FUG6	Fugitive Emissions from Ramsey VI Plant

**I. GENERAL PERMIT CONDITIONS**

**A. PERMIT EXPIRATION**

As provided in 40 CFR §52.21(r), this PSD Permit shall become invalid if construction:

1. is not commenced (as defined in 40 CFR §52.21(b)(9)) within 18 months after the approval takes effect; or
2. is discontinued for a period of 18 months or more; or
3. is not completed within a reasonable time.

Pursuant to 40 CFR §52.21(r), EPA may extend the 18-month period upon a written satisfactory showing that an extension is justified.

**B. PERMIT NOTIFICATION REQUIREMENTS**

Permittee shall notify EPA Region 6 in writing or by electronic mail of the:

1. date construction is commenced, postmarked within 30 days of such date;
2. actual date of initial startup, as defined in 40 CFR §60.2, postmarked within 15 days of such date; and
3. date upon which initial performance tests will commence, in accordance with the provisions of Section V, postmarked not less than 30 days prior to such date. Notification may be provided with the submittal of the performance test protocol required pursuant to Condition V.B.

**C. FACILITY OPERATION**

At all times, including periods of startup, shutdown, and malfunction, Permittee shall maintain and operate the facility including associated air pollution control equipment in a manner

consistent with good air pollution control practice for minimizing emissions. Determination of whether acceptable operating and maintenance procedures are being used will be based on information available to the EPA, which may include, but is not limited to, monitoring results, review of operating maintenance procedures and inspection of the facility.

#### **D. MALFUNCTION REPORTING**

1. Permittee shall notify EPA by mail within two working days following the discovery of any failure of air pollution control equipment, process equipment, or of a process to operate in a normal manner, which results in an increase in GHG emissions above the allowable emission limits stated in Section II of this permit.
2. In addition, Permittee shall notify EPA in writing within 15 days of any such failure described under Section III. This notification shall include a description of the malfunctioning equipment or abnormal operation, the date of the initial malfunction, the period of time over which emissions were increased due to the failure, the cause of the failure, the estimated resultant emissions in excess of those allowed in Section II, and the methods utilized to mitigate emissions and restore normal operations.
3. Compliance with this malfunction notification provision shall not excuse or otherwise constitute a defense to any violation of this permit or any law or regulation such malfunction may cause.

#### **E. RIGHT OF ENTRY**

EPA authorized representatives, upon the presentation of credentials, shall be permitted:

1. to enter the premises where the facility is located or where any records are required to be kept under the terms and conditions of this PSD Permit;
2. during normal business hours, to have access to and to copy any records required to be kept under the terms and conditions of this PSD Permit;
3. to inspect any equipment, operation, or method subject to requirements in this PSD Permit; and,
4. to sample materials and emissions from the source(s).

#### **F. TRANSFER OF OWNERSHIP**

In the event of any changes in control or ownership of the facilities to be constructed, this PSD Permit shall be binding on all subsequent owners and operators. Permittee shall notify the succeeding owner and operator of the existence of the PSD Permit and its conditions by letter; a copy of the letter shall be forwarded to EPA Region 6 within thirty days of the letter signature.

**G. SEVERABILITY**

The provisions of this PSD Permit are severable, and, if any provision of the PSD Permit is held invalid, the remainder of this PSD Permit shall not be affected.

**H. ADHERENCE TO APPLICATION AND COMPLIANCE WITH OTHER ENVIRONMENTAL LAWS**

Permittee shall construct and operate this project in compliance with this PSD Permit, the application on which this permit is based, and all other applicable federal, state, and local air quality regulations. This PSD permit does not release the Permittee from any liability for compliance with other applicable federal, state and local environmental laws and regulations, including the Clean Air Act.

## I. ACRONYMS AND ABBREVIATIONS

BACT	Best Available Control Technology
Btu	British thermal unit
CAA	Clean Air Act
CCS	Carbon Capture and Sequestration
CEMS	Continuous Emissions Monitoring System
CFR	Code of Federal Regulations
CGA	Cylinder Gas Audit
CH <sub>4</sub>	Methane
CO <sub>2</sub>	Carbon Dioxide
CO <sub>2</sub> e	Carbon Dioxide Equivalent
DRE	Destruction and Removal Efficiency
dscf	Dry Standard Cubic Foot
EPA	Environmental Protection Agency
EOR	Enhanced Oil Recovery
EPN	Emission Point Number
ETC	Energy Transfer Company
FR	Federal Register
GCV	Gross Calorific Value
GHG	Greenhouse Gas
gr	Grains
HHV	Higher Heating Value
hp	Horsepower
Hr	Hour
IFR	Internal Floating Roof
LDAR	Leak Detection and Repair
LHV	Lower Heating Value
Lb	Pound
MMBtu	Million British Thermal Units
MMSCF/D	Million Standard Cubic Feet per Day
MSS	Maintenance, Start-up and Shutdown
NGL	Natural Gas Liquids
N <sub>2</sub> O	Nitrous Oxides
NSPS	New Source Performance Standards
OC	Oxidation Catalyst
O <sub>2</sub>	Oxygen
PSD	Prevention of Significant Deterioration
QA/QC	Quality Assurance and/or Quality Control
RATA	Relative Accuracy Test Audit
SCFH	Standard Cubic Feet per Hour
SCR	Selective Catalytic Reduction
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TEG	Triethylene Glycol
TPY	Tons per Year
VRU	Vapor Recovery Unit
USC	United States Code

## II. ANNUAL FACILITY EMISSION LIMITS

Annual emissions, in tons per year (TPY) shall not exceed the following:

**Table 1. Facility Emission Limits<sup>1</sup>**

EPN	Description	GHG Mass Basis		TPY CO <sub>2</sub> e <sup>2,5</sup>	BACT Requirements
			TPY <sup>2</sup>		
COMP-15, COMP-16, COMP-17, COMP-18, and COMP-19	<u>Ramsey IV</u> Gas Fired Internal Combustion Compressors Engines	CO <sub>2</sub>	75,242.5 <sup>4</sup>	78,490 <sup>3</sup> (15,698/engine)	412.3 lbs CO <sub>2</sub> /MMSCF each engine See permit condition III.A.1.o
		CH <sub>4</sub>	128.55 <sup>4</sup>		
		N <sub>2</sub> O	0.115 <sup>4</sup>		
COMP-20, COMP-21, COMP-22, COMP-23, and COMP-24	<u>Ramsey V</u> Gas Fired Internal Combustion Compressors Engines	CO <sub>2</sub>	75,242.5 <sup>4</sup>	78,490 <sup>3</sup> (15,698/engine)	412.3 lbs CO <sub>2</sub> /MMSCF each engine. See permit condition III.A.1.p
		CH <sub>4</sub>	128.55 <sup>4</sup>		
		N <sub>2</sub> O	0.115 <sup>4</sup>		
COMP-25, COMP-26, COMP-27, COMP-28, and COMP-29	<u>Ramsey VI</u> Gas Fired Internal Combustion Compressors Engines	CO <sub>2</sub>	75,242.5 <sup>4</sup>	78,490 <sup>3</sup> (15,698/engine)	412.3 lbs CO <sub>2</sub> /MMSCF each engine. See permit condition III.A.1.q
		CH <sub>4</sub>	128.55 <sup>4</sup>		
		N <sub>2</sub> O	0.115 <sup>4</sup>		
H-9	<u>Ramsey IV</u> Hot Oil Heater	CO <sub>2</sub>	30,718	30,750	280.5 lbs CO <sub>2</sub> /MMSCF See permit condition III.A.2.p
		CH <sub>4</sub>	0.58		
		N <sub>2</sub> O	0.058		
H-11	<u>Ramsey VI</u> Hot Oil Heater	CO <sub>2</sub>	30,718	30,750	280.5 lbs CO <sub>2</sub> /MMSCF See permit condition III.A.2.p
		CH <sub>4</sub>	0.58		
		N <sub>2</sub> O	0.058		
H-8	<u>Ramsey IV</u> <u>Regeneration</u> <u>Heater</u>	CO <sub>2</sub>	18,431	18,450	168.3 lbs CO <sub>2</sub> /MMSCF See permit condition III.A.2.q
		CH <sub>4</sub>	0.35		
		N <sub>2</sub> O	0.035		
H-10	<u>Ramsey V</u> Regeneration Heater	CO <sub>2</sub>	18,431	18,450	168.3 lbs CO <sub>2</sub> /MMSCF See permit condition III.A.2.q
		CH <sub>4</sub>	0.35		
		N <sub>2</sub> O	0.035		
H-12	<u>Ramsey VI</u> Regeneration Heater	CO <sub>2</sub>	18,431	18,450	168.3 lbs CO <sub>2</sub> /MMSCF See permit condition III.A.2.q
		CH <sub>4</sub>	0.35		
		N <sub>2</sub> O	0.035		



EPN	Description	GHG Mass Basis		TPY CO <sub>2</sub> e <sup>2,5</sup>	BACT Requirements
			TPY <sup>2</sup>		
RTO-4	Ramsey IV Regenerative Thermal Oxidizer	CO <sub>2</sub>	107,578	215,192 <sup>9</sup>	Minimum combustion temperature of 1,550 °F for each RTO on a 365-day rolling average. Good combustion practices and annual compliance testing. See permit conditions III.A.3
		CH <sub>4</sub>	0.73		
		N <sub>2</sub> O	No Emission Limit Established <sup>6</sup>		
RTO-5	Ramsey VI Regenerative Thermal Oxidizer	CO <sub>2</sub>	107,578	215,192 <sup>9</sup>	Assumes use of CCS to capture 35% of the CO <sub>2</sub> emissions from the Amine Still Vent before routing to the RTO, See Permit conditions III.A.3.c, III.A.3.d, and III.A.3.f.
		CH <sub>4</sub>	0.73		
		N <sub>2</sub> O	No Emission Limit Established <sup>6</sup>		
Ramsey IV- FUG4 Ramsey V – FUG5 Ramsey VI – FUG6	Process Fugitives	CO <sub>2</sub>	1.1/plant	185 /plant <sup>7</sup>	Implementation of LDAR Program. See Permit conditions III.B.1
		CH <sub>4</sub>	8.76/plant		
		N <sub>2</sub> O	No Emission Limit Established <sup>6</sup>		
Totals <sup>8</sup>		CO <sub>2</sub>	557,614	568,067	
		CH <sub>4</sub>	416		
		N <sub>2</sub> O	1.0		

- Compliance with the annual emission limits (tons per year) is based on a 12-month rolling average, except for the RTOs, emissions which will be based on a calendar year (12-consecutive months) basis.
- The TPY emission limits specified in this table are not to be exceeded for this facility and include emissions from the facility during all operations and include MSS activities.
- Miscellaneous emissions from engines blow down per plant (for all five (5) engines in each plant) are estimated to be 0.202 TPY CO<sub>2</sub>, 33 TPY CH<sub>4</sub>, and 827.8 TPY CO<sub>2</sub>e. In lieu of an emission limit, the blow down emissions will be limited by implementing a design/work practice standard as specified in the permit.
- The GHG Mass Basis TPY limit and the CO<sub>2</sub>e TPY limit for the internal combustion compressor engines is for all five compressors combined for each plant. The emissions for each compressor engine shall not exceed 15,048.5 TPY CO<sub>2</sub>, 25.6 TPY CH<sub>4</sub>, and 0.023 TPY N<sub>2</sub>O.
- Global Warming Potentials (GWP): CO<sub>2</sub>= 1, CH<sub>4</sub> = 25, N<sub>2</sub>O = 298
- These values indicated as “No Emission Limit Established” are less than 0.01 TPY with appropriate rounding. The emission limit will be a design/work practice standard as specified in the permit.
- Fugitive process emissions from EPN FUG4 are estimated to be 8.76 TPY of CH<sub>4</sub>, 1.1 TPY CO<sub>2</sub>, and 185 TPY CO<sub>2</sub>e. Fugitive process emissions from EPN FUG5 are estimated to be 8.76 TPY of CH<sub>4</sub>, 1.1 TPY CO<sub>2</sub>, and 185 TPY CO<sub>2</sub>e. Fugitive process emissions from EPN FUG6 are estimated to be 8.76 TPY of CH<sub>4</sub>, 1.1 TPY CO<sub>2</sub>, and 185 TPY CO<sub>2</sub>e. The emission limit will be a design/work practice standard as specified in the permit.
- The total emissions for CH<sub>4</sub> and CO<sub>2</sub>e include the PTE for process fugitive emissions of CH<sub>4</sub>. These totals are given for informational purposes only and do not constitute emission limits.
- Annual CO<sub>2</sub>e emission limit for each RTO during long term period listed in permit condition (III.A.3.g) in which all of the amine still vent emissions are routed to the RTO for control shall not exceed 165,550 TPY. The CO<sub>2</sub>e emission from RTO-4 during the short term period listed in permit condition (III.A.3.e) shall not exceed 37,793 lbs/hr.

### III. SPECIAL PERMIT CONDITIONS

#### A. Emission Unit Work Practice Standards, Operational Requirements, and Monitoring

##### 1. Gas-Fired Internal Combustion Compression Engines (EPN: COMP-15 through COMP-29)

- a. Gas-fired internal combustion compression engines (COMP-15, COMP-16, COMP-17, COMP-18, COMP-19, COMP-20, COMP-21, COMP-22, COMP-23, COMP-24, COMP-25, COMP-26, COMP-27, COMP-28, and COMP-29) will be designed to combust low carbon intensity residue gas.
- b. All engines (COMP-15, COMP-16, COMP-17, COMP-18, COMP-19, COMP-20, COMP-21, COMP-22, COMP-23, COMP-24, COMP-25, COMP-26, COMP-27, COMP-28, and COMP-29) will be Caterpillar G3612 or equivalent low emission engines and will be operated using good combustion practices, such as maintaining a written site specific operating procedure, maintaining equipment, and other practices that result in improved operation of the equipment.
- c. All engines (COMP-15, COMP-16, COMP-17, COMP-18, COMP-19, COMP-20, COMP-21, COMP-22, COMP-23, COMP-24, COMP-25, COMP-26, COMP-27, COMP-28, and COMP-29) will be tuned once per year, following vendor recommendations, for optimal thermal efficiency.
- d. Permittee shall calculate, on a monthly basis, the amount of CO<sub>2</sub> emitted from combustion in tons/yr using equation C-2a in 40 CFR Part 98, Subpart C, converted to short tons. Compliance shall be based on a 12-month rolling basis to be updated by the last day of the following month.
- e. Permittee shall calculate the CH<sub>4</sub> and N<sub>2</sub>O emissions on a 12-month rolling basis to be updated by the last day of the following month. Permittee shall determine compliance with the CH<sub>4</sub> and N<sub>2</sub>O emissions limits contained in this section using the default CH<sub>4</sub> and N<sub>2</sub>O emission factors contained in Table C-2 and equation C-9a of 40 CFR Part 98 and the measured actual heat input (HHV), converted to short tons.
- f. Permittee shall calculate the CO<sub>2</sub>e emissions on a 12-month rolling basis, based on the procedures and Global Warming Potentials (GWP) contained in Greenhouse Gas Regulations, 40 CFR Part 98, Subpart A, Table A-1, as published on November 29, 2013 (78 FR 71904).
- g. The internal combustion compression engines shall combust residue gas or equivalent with a fuel sulfur content of up to 5 grains of sulfur per 100 dry standard cubic feet (gr S/100 dscf).
- h. All fuel combustion units identified in this permit shall have fuel metering for each fuel, and Permittee shall:

- i. Measure and record the fuel flow rate using an operational non-resettable elapsed flow meter or by recording the flow rate data in an electronic format with individual flow measurements being taken no less frequently than once every 15 minutes. Electronic data may be reduced to hourly averages for recordkeeping purposes.
- ii. Record the total fuel combusted for each engine monthly.
- iii. The fuel gross calorific value (GCV) [higher heat value (HHV)] of the fuel shall be determined, at a minimum, monthly by the procedures contained in 40 CFR 98.34(a)(6) and records shall be maintained of the fuel GCV for a period of five years. Upon request, Permittee shall provide a sample and/or analysis of the fuel that is fired in the heaters or shall allow a sample to be taken by EPA for analysis.
- iv. The fuel flow of the fuel fired in the engines (COMP-15, COMP-16, COMP-17, COMP-18, COMP-19, COMP-20, COMP-21, COMP-22, COMP-23, COMP-24, COMP-25, COMP-26, COMP-27, COMP-28, and COMP-29) shall be continuously monitored and recorded.
  - i. Permittee shall calibrate and perform preventative maintenance check of the fuel gas flow meters and document annually.
  - j. The engines shall be equipped with a control package that monitors the air/fuel ratio in the combustion primary zone.
  - k. Permittee shall record the volume of residue compressed on a daily basis, and totaled monthly in MMSCF.
  - l. Permittee shall minimize emissions during start-up and shutdown activities by operating and maintaining the facility and associated air pollution control equipment in accordance with good air pollution control practices, safe operating practices, and protection of the facility.
  - m. Engine startups are limited to 15 minutes, four times per month, and 360 times per year for all compression engines.
  - n. Each internal combustion compressor engine is equipped with a blowdown vent. Engines blow downs are limited to 15 minutes, four times per month, and 720 times per year for all fifteen (15) engines. See condition IV.A.f.
  - o. On or after the date of initial startup, Permittee shall not discharge or cause the discharge of emissions from each engine (COMP-15, COMP-16, COMP-17, COMP-18, and COMP-19) at the Ramsey IV Plant in excess of 412.3 lbs CO<sub>2</sub>/MMSCF on a 12-month rolling basis. To determine this BACT emission limit, Permittee shall calculate the limit based on the measured input mass rate of CO<sub>2</sub> from the natural gas GCV analysis required in Special Condition III.A.1.h. and divide by the measured daily natural gas output from Ramsey IV Plant (MMSCF/D).
  - p. On or after the date of initial startup, Permittee shall not discharge or cause the discharge of emissions from each engine (COMP-20, COMP-21, COMP-22, COMP-

- 23, and COMP-24) at the Ramsey V Plant in excess of 412.3 lbs CO<sub>2</sub>/MMSCF on a 12-month rolling basis. To determine this BACT emission limit, Permittee shall calculate the limit based on the measured input mass rate of CO<sub>2</sub> from the natural gas GCV analysis required in Special Condition III.A.1.h. and divide by the measured daily natural gas output from Ramsey V Plant (MMSCF/D).
- q. On or after the date of initial startup, Permittee shall not discharge or cause the discharge of emissions from each engine (COMP-25, COMP-26, COMP-27, COMP-28, and COMP-29) at the Ramsey VI Plant in excess of 412.3 lbs CO<sub>2</sub>/MMSCF on a 12-month rolling. To determine this BACT emission limit, Permittee shall calculate the limit based on the measured input mass rate of CO<sub>2</sub> from the natural gas GCV analysis required in Special Condition III.A.1.h. and divide by the measured daily natural gas output from Ramsey VI Plant (MMSCF/D).
- 2. Hot Oil Heaters (EPNs: H-9, and H-11) and Regeneration Heaters (EPNs: H-8, H-10, and H-12)**
- a. Each of the Ramsey IV and Ramsey VI plants will be equipped with one hot oil heater (H-9 and H-11) respectively, each will be rated at 60 million British thermal units per hour (MMBtu/hr), or equivalent. The total firing rate for both hot oil heaters combined shall not exceed 120 MMBtu/hr.
- b. Each of the Ramsey IV, Ramsey V, and Ramsey VI Plants will be equipped with one Regeneration Heater (H-8, H-10, and H-12), respectively, and each regeneration heater will be rated at 36 MMBtu/hr, or equivalent. The total firing rate for all three regeneration heaters combined shall not exceed 108 MMBtu/hr.
- c. Permittee shall calculate, on a monthly basis, the amount of CO<sub>2</sub> emitted from combustion in tons/yr using equation C-2a in 40 CFR Part 98, Subpart C. Compliance shall be based on a 12-month rolling basis.
- d. Permittee shall calculate the CH<sub>4</sub> and N<sub>2</sub>O emissions on a 12-month rolling basis. Permittee shall determine compliance with the CH<sub>4</sub> and N<sub>2</sub>O emissions limits contained in this section using the default CH<sub>4</sub> and N<sub>2</sub>O emission factors contained in Table C-2 and equation C-9a of 40 CFR Part 98 and the measured actual heat input (HHV).
- e. Permittee shall calculate the CO<sub>2</sub>e emissions on a 12-month rolling basis, based on the procedures and Global Warming Potentials (GWP) contained in Greenhouse Gas Regulations, 40 CFR Part 98, Subpart A, Table A-1, as published on November 29, 2013 (78 FR 71904).
- f. All fuel combustion units identified in this permit shall have fuel metering for each fuel, and Permittee shall:
- i. Continuously, measure and record the fuel flow rate using an operational non-resettable elapsed flow meter or by recording the flow rate data in an electronic

format with individual flow measurements being taken no less frequently than once every 15 minutes. Electronic data may be reduced to hourly averages for recordkeeping purposes.

- ii. Record the total fuel combusted for each heater monthly.
- iii. The fuel gross calorific value (GCV) [high heat value (HHV)] of the fuel shall be determined, at a minimum, monthly by the procedures contained in 40 CFR 98.34(a)(6) and records shall be maintained of the fuel GCV for a period of five years. Upon request, Permittee shall provide a sample and/or analysis of the fuel that is fired in the heaters or shall allow a sample to be taken by EPA for analysis.
- g. Permittee shall calibrate and perform a preventative maintenance check of the fuel gas flow meters and document annually.
- h. The heaters shall be tuned for thermal efficiency on an annual basis.
- i. The heaters are not expected to have GHG emissions in excess of the allowed emission rates during periods of startup, shutdown, or maintenance. The fuel firing rates will be below the maximum rate and startups will be limited to 15 minutes.
- j. Permittee shall monitor the hot oil heaters (H-9, and H-11) and each of the regeneration heaters (H-8, H-10, and H-12) exhaust oxygen content using portable stack gas analyzers. Exhaust oxygen content will be limited to a maximum of 15% O<sub>2</sub> on semiannual monitoring.
- k. The exhaust oxygen content of each hot oil heater (H-9, and H-11) and each regeneration heater (H-8, H-10, and H-12) shall be monitored semi-annually for a period of 15 minutes and recorded at the beginning and end of the 15 minute period. If monitoring indicates an exhaust oxygen content of greater than 15% O<sub>2</sub>, then the air /fuel mixture will be manually adjusted and the exhaust monitored again after adjustment to verify the oxygen content does not exceed 15% O<sub>2</sub>.
- l. Permittee shall clean the burner tips of each heater during an annual shutdown if occurring. If a planned outage is not performed, cleaning may be delayed until the next planned outage, not to exceed 5 years from the previous cleaning.
- m. Permittee shall install, operate, and maintain an automated air/fuel control system.
- n. Permittee shall calibrate and perform preventative maintenance on the air/fuel control analyzers once per quarter, at a minimum.
- o. Permittee shall utilize insulation materials (e.g. ceramic fiber blankets and Kaolite™) where feasible to reduce heat loss.
- p. On or after the date of initial startup, the Permittee shall not discharge or cause the discharge of emissions from each hot oil heater (H-9 in the Ramsey IV-Plant) and (H-11 in the Ramsey VI Plant) in excess of 280.5 lbs CO<sub>2</sub>/MMSCF of natural gas processed on a 12-month rolling basis. To determine achievement of this BACT emission limit, the Permittee shall divide the value of the measured input mass rate of CO<sub>2</sub> from the natural gas GCV analysis required in Special Condition III.A.2.f. by

the measured daily natural gas processed from each of the Ramsey Gas Plants (IV and VI) required in Special Condition IV.B.

- q. On or after the date of initial startup, the Permittee shall not discharge or cause the discharge of emissions from each regenerator heaters (H-8 Ramsey IV Plant), (H-10 in Ramsey V Plant), and (H-12 in Ramsey VI Plant) in excess of 168.3 lbs CO<sub>2</sub>/MMSCF of natural gas processed on a 12-month rolling basis. To determine achievement of this BACT emission limit, the Permittee shall divide the value of the measured input mass rate of CO<sub>2</sub> from the natural gas GCV analysis required in Special Condition III.A.2.f. by the measured daily natural gas processed from the each of the regeneration heaters (H-8, H-10, and H-12) in the Ramsey Gas Plants (IV, V, and VI), respectively, as required in Special Condition IV.B.

**3. Regenerative Thermal Oxidizer Emission Sources (EPNs:RTO-4 and RTO-5), and Amine Still Vents (EPNs:A-4 and A-5)**

- a. The Ramsey Plant expansion will be equipped with two (2) regenerative thermal oxidizers (RTO-4 located in Ramsey IV Plant, and RTO-5 located in Ramsey VI Plant).
- b. Each regenerative thermal oxidizer (RTO-4 and RTO-5) will be designed to combust low carbon intensity plant residue gas (equivalent to pipeline quality natural gas), and has a fuel rating of 8.0 MMBtu/hr.
- c. By no later than January 15, 2016, Permittee shall begin to route an apportionment of no less than 35% of the CO<sub>2</sub> on an annual basis generated from the amine still vents A-4 and A-5 to a nearby CO<sub>2</sub> pipeline that will capture, treat, and transport CO<sub>2</sub> for an enhanced oil recovery (EOR) project. The remainder apportionment of the acid gas generated from the two amine units shall be sent to RTO-4 and RTO-5 for control.
- d. Permittee may increase the apportionment of captured CO<sub>2</sub> routed to a nearby pipeline from the amine still vents (A-4 and A-5) at any time (based upon the CO<sub>2</sub> pipeline contractual agreement) without EPA prior approval. Compliance with emission limits will be based on no less than 35% of the CO<sub>2</sub> routed to the pipeline on a calendar year (twelve (12) consecutive months) basis.
- e. During the period between the starting of operation in the Ramsey IV and the routing of an apportionment of captured CO<sub>2</sub> to a nearby pipeline in accordance with permit condition III. A.3.c above, Permittee may route the CO<sub>2</sub> stream generated from the amine still vent (A-4) to the regenerative thermal oxidizer (RTO-4) for control. The CO<sub>2</sub>e emission from RTO-4 during this period shall not exceed 37,793 lbs/hr.
- f. After Permittee has begun routing of a portion of CO<sub>2</sub> from the amine still vents (A-4 and A-5) to a nearby pipeline in accordance with permit condition III. A.3.c above, Permittee may route the CO<sub>2</sub> streams generated from the amine still vents (A-4 and A-5) to the regenerative thermal oxidizers (RTO-4 and RTO-5) for control when

conditions exist that prevent the capture or transportation of the CO<sub>2</sub> to the pipelines, as long as the Permittee can demonstrate compliance with 35% capture at the end of each calendar year. The annual CO<sub>2</sub>e emissions shall not exceed 215,192 TPY from RTO-4 and RTO-5 combined at the end of each calendar year.

- g. In case of any contractual agreement issues or termination that will affect the capture and transportation of the CO<sub>2</sub> to the pipelines on a long term basis, the permittee shall send the CO<sub>2</sub> generated from the amine vents (A-4 and A-5) to the RTOs (RTO-4 and RTO-5) for control and follow permit condition III. A.3.i below. The annual CO<sub>2</sub>e emission limit from each RTO during this period shall not exceed 165,550 TPY.
- h. Permittee shall submit a written notification to EPA within 60 days of any termination, or any contractual issues that will affect or prevent the capture and transportation of the CO<sub>2</sub> to the pipeline and will result in routing all of the CO<sub>2</sub> generated from the amine vents to the RTOs instead of apportionment of it, as specified in permittee's normal operating conditions. The written notification shall include the following:
  - 1. A detailed description describing why CO<sub>2</sub> capture is no longer feasible for the source,
  - 2. The date on which the change is proposed to occur,
  - 3. Any change in emission limits from the RTOs,
  - 4. Any permit term or condition that the permittee believes would no longer be applicable as a result of the change, and
  - 5. Permittee shall submit to EPA a permit amendment for review and approval within 60 days of the written notification above.
- i. The flow rate of the CO<sub>2</sub> streams generated from the amine still vents in the Ramsey (IV, VI) Plants and routed to the CO<sub>2</sub> pipeline for Carbon Capture and Sequestration (CCS) shall be measured and recorded separately from the streams generated from existing amine vents in the existing Ramsey (I, II, III) Plants.
- j. Permittee shall prepare and submit a demonstration plan for EPA approval no later than ninety (90) days after issuance of this permit or 180 days before commence operation (initial start-up), whichever is later. This plan will detail how the CO<sub>2</sub> apportionment from the amine still vents routed to the nearby facility will be determined on a calendar year basis, monitored, recorded, and include a strategy to demonstrate compliance with the permit.
- k. Each RTO shall have an initial stack test, and annual compliance testing, to verify destruction and removal efficiency (DRE) of at least 99.0%. If current acid gas flow rate to the RTO exceeds the flow rate during the stack testing by 10% or greater, additional sampling may be required by TCEQ or EPA. The initial stack test shall be conducted within 60 days of achieving the maximum production rate at which the RTO will be operated, but no later than 180 days after startup.

- l. For burner combustion, gas fuel usage (scf) shall be recorded using an operational non-resettable elapsed flow meter at each RTO.
- m. The flow rate of the waste gas combusted shall be measured and recorded using an operational non-resettable elapsed flow meter at each RTO.
- n. Waste gas will be sampled and analyzed on a quarterly basis for composition following one of the fuel sampling and analysis methods listed at 40 CFR §98.34(a)(6). The sampled data will be used to calculate GHG emissions to show compliance with the limits specified in Table 1.
- o. Permittee shall calculate GHG emissions, on a monthly basis, using equations W-20 (un-combusted CO<sub>2</sub>), W-21 (combusted CO<sub>2</sub>), and W-19 (un-combusted CH<sub>4</sub>) consistent with 40 CFR 98.233(n)(4) and converted from volumetric emissions to mass emissions using equation W-36.
- p. Periodic maintenance will help maintain the efficiency of the RTOs and shall be performed at a minimum annually or as recommended by the manufacturer specifications.
- q. The Permittee shall maintain the combustion temperature at a minimum of 1,550 °F on 365 days rolling average at all times when processing waste gases from the amine unit in the RTO. Temperature monitoring of the RTO will ensure proper operation. The Permittee shall install and maintain a temperature recording device with an accuracy of the greater of ±0.75 percent of the temperature being measured expressed in degrees Celsius or ±2.5°C.
- r. The RTO exhaust temperature shall be continuously monitored and recorded when waste gas is directed to the RTO. The temperature measurement devices shall reduce the temperature readings to an averaging period of 6 minutes or less and record it at that frequency.
- s. The exhaust oxygen content of regenerative thermal oxidizer shall be monitored semi-annually for a period of 15 minutes and recorded at the beginning and end of the 15 minute period. If monitoring indicates an exhaust oxygen content of greater than 15% O<sub>2</sub>, then the air/fuel mixture will be manually adjusted and the exhaust monitored again after adjustment to verify the oxygen content does not exceed 15% O<sub>2</sub>.

**B. Fugitive Emission Sources (EPNs: FUG4, FUG5, and FUG6)**

**1. Fugitive Emission Sources Work Practice and Operational Requirements**

- a. The Permittee shall use rod packing for reciprocating compressors and will conduct annual inspections of the packing materials.
- b. The Permittee shall use low-bleed gas-driven pneumatic controllers which emit less gas or compressed air-driven pneumatic controllers which do not emit GHGs.



- c. Permittee shall implement and comply with 40 CFR Part 60, Subpart OOOO Leak Detection and Repair (LDAR) Program requirements.

#### IV. Recordkeeping Requirements

- A. In order to demonstrate compliance with the GHG emission rates, the Permittee will monitor the following parameters and summarize the data on a calendar month basis.
  - a. Operating hours for all air emission sources;
  - b. The natural gas fuel usage for all combustion sources, using continuous fuel flow monitors (a group of equipment can utilize a common fuel flow meter, as long as actual fuel usage is allocated to the individual equipment based upon actual operating hours and maximum firing rate);
  - c. Annual fuel sampling for natural gas, and quarterly fuel sampling of waste gas;
  - d. The daily natural gas processing rate for each plant;
  - e. Record the number and duration of start-ups for each engine;
  - f. Record the number and duration of blow downs for each engine; and
  - g. Record the volume of CO<sub>2</sub> from the amine vents that is sent to the CO<sub>2</sub> pipeline and the RTO in order to demonstrate compliance with the 35% CO<sub>2</sub> capture on a calendar year basis.
- B. Permittee shall maintain the daily production volumes of residue natural gas for each plant in million standard cubic feet per day (MMSCF/D). Records shall be maintained for a period of five years.
- C. Permittee will implement a 40 CFR Part 60, Subpart OOOO leak detection and repair (LDAR) program and keep records of the monitoring results, as well as the repair and maintenance records.
- D. At least once per year, the Permittee will obtain an updated analysis of the inlet gas to document the CO<sub>2</sub> and methane content of the gas streams.
- E. At least once per quarter, the Permittee will obtain an updated analysis of the waste gas from each amine unit. This analysis will be considered to be representative of the gas streams for the quarter during which it was taken and will be used to estimate the amine unit waste gas vent emissions, Higher Heating Value (HHV), and Lower Heating Value (LHV).
- F. Permittee will calculate the 12-month rolling GHG emission rates for comparison to the Maximum Allowable Emission Rates Table (MAERT).
- G. The Permittee will also maintain site-specific procedures for best/optimum maintenance practices and vendor-recommended operating procedures and O&M manuals. These manuals must be maintained with the permit and located on-site.
- H. Permittee shall maintain a file of all records, data, measurements, reports, and documents related to the operation of the facility, including, but not limited to, the following: all records or reports pertaining to significant maintenance performed on

any system or device at the facility; annual tuning of engines and heaters; all records relating to performance tests and monitoring of combustion equipment; and all other information required by this permit recorded in a permanent form suitable for inspection. The file must be retained for not less than five years following the date of such measurements, maintenance, reports, and/or records. The records may be maintained electronically.

- I. Permittee shall maintain records that include the following: the occurrence and duration of any startup, shutdown, or malfunction, performance testing, calibrations, checks, duration of any periods during which a monitoring device is inoperative, and corresponding emission measurements. The records may be maintained electronically.
- J. Permittee shall maintain records for 5 years from the event that includes the duration of startup, shutdown, the initial startup period for the emission units, pollution control units, malfunctions, performance testing, calibrations, checks, maintenance, and duration of an inoperative monitoring device and emission units with the required corresponding emission data. The records may be maintained electronically.
- K. Permittee shall maintain records and submit a written report of all excess emissions to EPA semi-annually, except when: more frequent reporting is specifically required by an applicable subpart; or the Administrator or authorized representative, on a case-by-case basis, determines that more frequent reporting is necessary to accurately assess the compliance status of the source. See general permit condition I.D. The report is due on the 30<sup>th</sup> day following the end of each semi-annual period and shall include the following:
  1. Time intervals, data and magnitude of the excess emissions, the nature and cause (if known), corrective actions taken and preventive measures adopted;
  2. Applicable time and date of each period during which the monitoring equipment was inoperative (monitoring down-time);
  3. A statement in the report of a negative declaration; that is; a statement when no excess emissions occurred or when the monitoring equipment has not been inoperative, repaired or adjusted; and
  4. Any failure to conduct any required source testing, monitoring, or other compliance activities.
- L. Excess emissions shall be defined as any period in which the facility emission exceeds a maximum emission limit set forth in this permit.
- M. Excess emissions indicated by GHG emission source certification testing or compliance monitoring shall be considered violations of the applicable emission limit for the purpose of this permit.
- N. All records required by this PSD Permit shall be retained for not less than 5 years following the date of such measurements, maintenance, and reports. The records may be maintained electronically.

**V. Performance Testing Requirements:**

- A. The holder of this permit shall perform an initial stack test to establish the actual quantities of air contaminants being emitted into the atmosphere from Gas Fired Internal Combustion Compressor Engines (EPNs: COMP-15, COMP-16, COMP-17, COMP-18, COMP-19, COMP-20, COMP-21, COMP-22, COMP-23, COMP-24, COMP-25, COMP-26, COMP-27, COMP-28, and COMP-29), Hot Oil Heaters (EPNS: H-9 and H-11), and Regeneration Heaters (EPNs: H-8, H-10, and H-12) to determine the initial compliance with the CO<sub>2</sub> emission limits established in this permit. Sampling shall be conducted in accordance with 40 CFR § 60.8 and EPA Method 3a or 3b for the concentration of CO<sub>2</sub> for the engines and heaters.
1. Multiply the CO<sub>2</sub> hourly average emission rate determined under maximum operating test conditions by 8,760 hours.
  2. If the above calculated CO<sub>2</sub> emission total does not exceed the tons per year (TPY) specified on Table 1, no compliance strategy needs to be developed.
  3. If the above calculated CO<sub>2</sub> emission total exceeds the tons per year (TPY) specified in Table 1, the facility shall;
    - a. Document the exceedance in the test report; and
    - b. Explain within the report how the facility will assure compliance with the CO<sub>2</sub> emission limit listed in Table 1.
- B. Within 60 days after achieving the maximum production rate at which the affected facility will be operated, but not later than 180 days after initial startup of the facility, performance tests(s) must be conducted and a written report of the performance testing results furnished to the EPA. Additional sampling may be required by TCEQ or EPA.
- C. Permittee shall submit a performance test protocol to EPA no later than 30 days prior to the test to allow review of the test plan and to arrange for an observer to be present at the test. The performance test shall be conducted in accordance with the submitted protocol, and any changes required by EPA.
- D. Fuel sampling for emission units RTO-4, RTO-5, shall be conducted in accordance with 40 CFR Part 98.
- E. The holder of this permit shall perform initial performance demonstration testing of regenerative thermal oxidizers at the site. The thermal oxidizers shall operate at the maximum production rate during stack emissions testing. The Permittee shall measure CH<sub>4</sub> concentrations in the regenerative thermal oxidizer inlet and exhaust streams to demonstrate a minimum destruction efficiency of 99.0 % by weight at a minimum combustion chamber temperature of 1,400 °F.
- F. The Permittee shall record the combustion chamber temperature and combustion chamber set-point temperature during the performance test. These and any additional operational parameters shall be identified in the test protocol and recorded during testing. Following the performance test, the RTO shall be operated at or above the

combustion chamber set-point temperature used to demonstrate compliance, and at all times equal to or greater than 1,400 °F.

- G. For regenerative thermal oxidizers the sampling sites and velocity traverse points shall be selected in accordance with EPA Test Method 1 or 1A. The gas volumetric flow rate shall be measured in accordance with EPA Test Method 2, 2A, 2C, 2D, 2F, 2G, or 19. The dry molecular weight shall be determined in accordance with EPA Test Method 3, 3A or 3B. The stack gas moisture shall be determined in accordance with EPA Test Method 4. These methods must be performed, as applicable, during each test run.
- H. Each compressor engine shall be tested at maximum capacity. Each tested engine load shall be identified in the sampling report. The permit holder shall present at the pretest meeting the manner in which stack sampling will be executed in order to demonstrate compliance with the emissions limits contained in Section II.
- I. The Permittee shall conduct evaluations of engine performance on a quarterly basis, based on the calendar year, by measuring the CO<sub>2</sub> content of the exhaust. After four consecutive acceptable quarterly tests, the engine testing schedule may be changed to semiannually, with at least four months between tests.
- J. Performance tests must be conducted under such conditions to ensure representative performance of the affected facility. The owner or operator must make available to the EPA such records as may be necessary to determine the conditions of the performance tests.
- K. The owner or operator must provide the EPA at least 30 days prior notice of any performance stack test, except as specified under other subparts, to afford the EPA the opportunity to have an observer present and/or to attend a pre-test meeting. If there is a delay in the original test date, the facility must provide at least 7 days prior notice of the rescheduled date of the performance test.
  - 1. The owner or operator shall provide, or cause to be provided, performance testing as follows: Sampling ports adequate for test methods applicable to this facility,
  - 2. Safe sampling platform(s),
  - 3. Safe access to sampling platform(s), and
  - 4. Utilities for sampling and testing equipment.
- L. Unless otherwise specified, each performance test shall consist of three separate runs using the applicable test method. Each run shall be conducted for the time and under the conditions specified in the applicable standard. For purposes of determining compliance with an applicable standard, the arithmetic mean of the results of the three runs shall apply.
- M. Emissions testing as outline above, shall be performed every five (5) years, or more frequently if identified above, to verify continued performance at permitted emission limits.

## **VI. Agency Notifications**

Permittee shall submit GHG permit applications, permit amendments, and other applicable permit information to:

Multimedia Planning and Permitting Division  
EPA Region 6  
1445 Ross Avenue (6 PD-R)  
Dallas, TX 75202  
Email: [Group R6AirPermits@EPA.gov](mailto:Group R6AirPermits@EPA.gov)

Permittee shall submit a copy of all compliance and enforcement correspondence as required by this Approval to Construct to:

Compliance Assurance and Enforcement Division  
EPA Region 6  
1445 Ross Avenue (6EN-A)  
Dallas, TX 75202