

US EPA ARCHIVE DOCUMENT

**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-748-GHG

PERMITTEE: Chevron Phillips Chemical Company, LP
363 S. Sam Houston Parkway East
Houston, TX 77060

FACILITY NAME: Chevron Phillips Chemical Company, LP
Cedar Bayou Plant, Unit 1594

FACILITY LOCATION: 9500 Interstate 10 East
Baytown, TX 77521

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 Chevron Phillips Chemical Company, LP for Greenhouse Gas (GHG) emissions. The Permit applies to the addition of a new ethylene production unit (Unit 1594) consisting of eight furnaces and supporting equipment at their Cedar Bayou facility located in Baytown, Texas.

Chevron Phillips is authorized to construct Unit 1594 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) PSD permit No. PSD-TX-748M1. 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 Chevron Phillips 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.

Carl E. Edlund, Director
Multimedia Planning and Permitting Division

Date

Draft for November 14, 2012 public notice.

**Chevron Phillips Chemical Company LP (PSD-TX-748-GHG)
Prevention of Significant Deterioration Permit
For Greenhouse Gas Emissions
Final Permit Conditions**

PROJECT DESCRIPTION

The proposed modification will add a new ethylene production unit (Unit 1594) consisting of eight cracking furnaces and associated equipment to the existing Cedar Bayou Plant in Baytown, Texas. Unit 1594 will increase the production capacity of the plant by approximately 1.5 million metric tons per year of polymer grade ethylene. Other products produced by Unit 1594 include fuel gas, mixed C₃ and C₄ hydrocarbon streams, and other lower-output hydrocarbon streams.

EQUIPMENT LIST

The following devices are subject to this GHG PSD permit.

FIN	EPN	Description
H-10100 H-10200 H-10300 H-10400 H-10500 H-10600 H-10700 H-10800	H-10100 H-10200 H-10300 H-10400 H-10500 H-10600 H-10700 H-10800	Eight Ethylene Cracking Furnaces (Combustion Units). Each furnace has a maximum design heat input rate of 500 MMBtu/hr, and will be equipped with a Selective Catalytic Reduction (SCR) system.
B-83010	B-83010	Very High Pressure (VHP) Boiler (Combustion Unit). The VHP Boiler has a maximum design heat input rate of 500 MMBtu/hr, and is equipped with Selective Catalytic Reduction (SCR) controls.
PK-90060	PK-90060	Vapor Destruction Unit (VDU) (Combustion Unit). The VDU has a maximum design heat input rate of 28.8 MMBtu/hr.
PK-90050	PK-90050	Low Profile Flare (Combustion Unit).
PK-87010A PK-87010B PK-87010C PK-87010D PK-87010E PK-87010F	PK-87010A PK-87010B PK-87010C PK-87010D PK-87010E PK-87010F	Emergency Generator Engines (Combustion Units). Up to six generators are allowed however, the total power output will not exceed 4.0 MW for all generators combined.
F-1594	F-1594	Unit 1594 Fugitives

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 maintenance, Permittee shall, to the extent practicable, 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, or other means identified by EPA, within 48 hours 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 and III of this permit.

2. Within 10 days of the discovery of any GHG emissions above the allowable emission limits resulting from malfunctions as described in I.D.1., Permittee shall provide a written supplement to the initial notification that includes 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 III, 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 this project in compliance with this PSD Permit, the application on which this permit is based, the TCEQ PSD Permit PSD-TX-748M1 (when issued) 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.

Draft for November 14, 2012 public notice.

I. ACRONYMS AND ABBREVIATIONS

AVO	Auditory, Visual, and Olfactory
BACT	Best Available Control Technology
C ₃ ⁺	Hydrocarbon with Three or More Carbon Atoms
CAA	Clean Air Act
CC	Carbon Content
CCS	Carbon Capture and Sequestration
CEMS	Continuous Emissions Monitoring System
CFR	Code of Federal Regulations
CH ₄	Methane
CO ₂	Carbon Dioxide
CO ₂ e	Carbon Dioxide Equivalent
dscf	Dry Standard Cubic Foot
EF	Emission Factor
EPN	Emission Point Number
FIN	Facility Identification Number
FR	Federal Register
GCV	Gross Calorific Value
GHG	Greenhouse Gas
gr	Grains
GWP	Global Warming Potential
HHV	High Heating Value
hr	Hour
HRSG	Heat Recovery Steam Generating
LAER	Lowest Achievable Emission Rate
lb	Pound
LDAR	Leak Detection and Repair
MMBtu	Million British Thermal Units
MSS	Maintenance, Start-up and Shutdown
N ₂ O	Nitrous Oxides
NSPS	New Source Performance Standards
PSD	Prevention of Significant Deterioration
QA/QC	Quality Assurance and/or Quality Control
SCFH	Standard Cubic Feet per Hour
SCR	Selective Catalytic Reduction
TAC	Texas Administrative Code
TCEQ	Texas Commission on Environmental Quality
TOC	Total Organic Carbon
TPY	Tons per Year
USC	United States Code
VDU	Vapor Destruction Unit
VHP	Very High Pressure
VOC	Volatile Organic Compound

II. Annual Emission Limits

Annual emissions, in tons per year (TPY) on a 12-month total, rolling monthly, shall not exceed the following:

Table 1. Annual Emission Limits

FIN	EPN	Description	GHG Mass Basis		TPY CO ₂ e ^{1,2}	BACT Requirements
				TPY ¹		
H-10100 H-10200 H-10300 H-10400 H-10500 H-10600 H-10700 H-10800	H-10100 H-10200 H-10300 H-10400 H-10500 H-10600 H-10700 H-10800	Steam Cracking Furnaces	CO ₂	206,000 ³	1,579,000 ⁴	Furnace Gas Exhaust Temperature ≤ 350 °F. See permit condition III.A.1.j.
CH ₄	11.9 ³					
N ₂ O	2.4 ³					
B-83010	B-83010	VHP Boiler	CO ₂	127,000		Minimum Thermal Efficiency of 77%. See permit condition III.A.1.i.
			CH ₄	6.5		
			N ₂ O	1.1		
PK-90060	PK-90060	VDU	CO ₂	2,400	2,400	Use of Low Carbon Fuel and Good Combustion Practices. See permit condition III.A.2.c. - i.
			CH ₄	0.046		
			N ₂ O	0.0046		
PK-90050	PK-90050	Low Profile Flare	CO ₂	27,000	27,000	Use of Low Carbon Fuel and Good Combustion Practices. See permit condition III.A.3.c. and f.
			CH ₄	2.1		
			N ₂ O	0.42		
PK-87010A PK-87010B PK-87010C PK-87010D PK-87010E PK-87010F	PK-87010A PK-87010B PK-87010C PK-87010D PK-87010E PK-87010F	Emergency Generator Engines ⁵	CO ₂	274	275	Use of Good Combustion Practices. See permit condition III.A.4.c.
CH ₄	0.011					
N ₂ O	0.002					
F-1594	F-1594	Fugitive Process Emissions	CH ₄	Not Applicable	Not Applicable	Implementation of LDAR/AVO program. See permit condition III.A.5.
Totals⁶			CO ₂	1,600,000	CO₂e 1,615,000	
			CH ₄	416		
			N ₂ O	18		

1. 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.
2. Global Warming Potentials (GWP): CH₄ = 21, N₂O = 310
3. The GHG Mass Basis TPY limit for the steam cracking furnaces applies to each unit and cannot be exceeded for any individual unit.
4. The compliance emission cap applies to the eight steam cracking furnaces, includes decoking activities, and the VHP Boiler.
5. Up to 6 generators are allowed however, total power output will not exceed 4.0MW for all generators combined.
6. Total emissions include the PTE for fugitive emissions. Totals are given for informational purposes only and do not constitute emission limits.

Draft for November 14, 2012 public notice.

III. SPECIAL PERMIT CONDITIONS

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

1. Steam Cracking Furnaces (H-10100, H-10200, H-10300, H-10400, H-10500, H-10600, H-10700, and H-10800) and VHP Boiler (B-83010)

- a. The steam cracking furnaces and the VHP boiler shall combust plant tail gas (fuel gas) or pipeline quality natural gas. Ethane may be used as an emergency backup fuel.
- b. 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. A computer that collects, sums, and stores electronic data from continuous fuel flow meters is an acceptable totalizer.
 - ii. Record the total fuel combusted for each fuel monthly.
 - iii. The fuel gross calorific value (GCV) [high heat value (HHV)], carbon content and, if applicable, molecular weight, shall be determined, at a minimum, monthly by the procedures contained in 40 CFR Part 98.34(b)(3). Records of the fuel GCV shall be maintained for a minimum period of five years. Upon request, Permittee shall provide a sample and/or analysis of the fuel that is fired in any unit covered by this permit at the time of the request, or shall allow a sample to be taken by EPA for analysis.
 - iv. The fuel flow of the fuel fired in the ethylene cracking furnaces and the VHP boiler shall be continuously monitored and recorded.
- c. Permittee shall calibrate and perform preventative maintenance check of the fuel gas flow meters and document annually.
- d. Permittee shall install, operate, and maintain an O₂ analyzer on the furnaces (H-10100, H-10200, H-10300, H-10400, H-10500, H-10600, H-10700, and H-10800). Oxygen concentration shall be a maximum of 10 mole % (dry) during normal operations, not including startup, shutdown, decoke, and hot steam standby.
- e. Oxygen analyzers shall continuously monitor and record oxygen concentration in the furnaces (H-10100, H-10200, H-10300, H-10400, H-10500, H-10600, H-10700, and H-10800). It shall reduce the oxygen readings to an averaging period of 15 minutes or less and record it hourly.
- f. The oxygen analyzers shall be quality-assured at least quarterly using cylinder gas audits (CGAs) in accordance with 40 CFR Part 60, Appendix F, Procedure 1, § 5.1.2, with the following exception: a relative accuracy test audit is not required once every four quarters (i.e., two successive semiannual CGAs may be conducted).
- g. The VHP boiler shall not exceed the one-hour maximum firing rate of 500 MMBtu/hr.
- h. The steam cracking furnaces shall not exceed the one hour firing rate of 500 MMBtu per hour per furnace.
- i. The one-hour maximum firing rates shall be determined monthly to demonstrate compliance with the firing rate conditions in III.A.1.g. and III.A.1.h.

- j. Permittee shall continuously monitor and record the furnace gas exhaust temperature hourly and limit the temperature to less than or equal to 350 °F on a 12-month rolling average basis. This stack temperature is for normal operations and does not include commissioning, startup, shutdown, hot steam standby, and decoking operations.
- k. No more than 96 decokes per year for all eight furnaces combined after the first year of operation. A maximum of 160 decokes will be allowed in the first year of operation for all eight furnaces combined.
- l. The Permittee shall maintain a minimum overall thermal efficiency of 77% on a 12-month rolling average basis, calculated monthly, for emission unit (B-83010).
- m. Thermal efficiency of the VHP boiler shall be calculated using the following equation:

$$\text{Boiler Efficiency} = \frac{(\text{steam flow rate} \times \text{steam enthalpy}) - (\text{feedwater flowrate} \times \text{feedwater enthalpy})}{\text{Fuel firing rate} \times \text{GCV}} * 100$$

- n. The Permittee has requested and shall comply with an emissions cap for the eight steam cracking furnaces and the VHP boiler. This cap is based on the continuous operation of seven furnaces and decoking with the annual emissions from the boiler.
- o. Compliance with the Annual Emission Limit shall be demonstrated on a 12-month total, rolling monthly, calculated in accordance with 40 CFR Part 98 Subpart C §98.33(a)(3)(iii).

2. Vapor Destruction Unit (PK-90060)

- a. The Vapor Destruction Unit (VDU) shall serve as a backup control device for process vent streams while maintenance or inspections are performed on the VHP boiler.
- b. The VDU can remain in hot standby with only the pilots combusting fuel when not used as a backup control device.
- c. The VDU pilots shall only combust pipeline natural gas when in hot standby mode. Ethane can be used as an emergency backup fuel.
- d. Natural gas will be used as supplemental fuel, if needed, to maintain combustion temperature when controlling gaseous vent streams. Ethane can be used as an emergency backup fuel.
- e. Permittee shall calibrate and perform preventative maintenance check of the fuel gas flow meters and document annually.
- f. Permittee shall perform burner tune-ups at a minimum of annually.
- g. The VDU will have a destruction and removal efficiency of 98% and will be equipped with a volatile organic carbon (VOC) or total organic carbon (TOC) continuous emissions monitoring system (CEMS).
- h. The maximum firing rate for the VDU shall not exceed 28.8 MMBtu/hr .
- i. A rolling 12 month average and the one-hour maximum firing rates shall be calculated monthly to demonstrate compliance with the firing rates in III.A.2.h.
- j. Compliance with the Annual Emission Limit shall be demonstrated on a 12-month total, rolling monthly, calculated in accordance with 40 CFR Part 98 Subpart C §98.33(a)(3)(iii).

3. Low Profile Flare (PK-90050)

- a. The flare shall have a minimum destruction and removal efficiency (DRE) of 98% based on flowrate and gas composition measurements as specified in 40 CFR Part 98 Subpart W § 98.233(n).
- b. The flare is designed for control of routine venting, during maintenance, startup, and shutdown (MSS) activities, and upset conditions.
- c. The flare shall only combust pipeline natural gas in the pilots during normal operations. Ethane can be used as an emergency backup fuel.
- d. Permittee must record the time, date, fuel heat input (LHV) in MMBtu/hr and duration of each MSS event. The records must include hourly CH₄ emission levels as measured by the in-line gas analyzer (Gas chromatograph or equivalent with volumetric flare gas flowrate) and the calculations based on the actual heat input for the CO₂, N₂O, and CH₄ emissions during each MSS event. These records must be kept for five years following the date of each event. Process knowledge and engineering calculations are acceptable if the in-line gas analyzer is not operational during the MSS event.
- e. CO₂ emissions are calculated using equation Y-1 found in 40 CFR Part 98 Subpart Y, §98.253(b)(1)(ii)(A). CH₄ and N₂O emissions are calculated using equations Y-4 and Y-5 as found in 40 CFR Part 98 Subpart Y.
- f. The flare shall be designed and operated in accordance with 40 CFR 60.18 including specifications of minimum heating value of the waste gas, maximum tip velocity, and pilot flame monitoring or an approved alternate. An infrared monitor is considered equivalent to a thermocouple for flame monitoring purposes.
- g. The in-line analyzer shall have an on-stream time of 95% on a semi-annual basis.

4. Emergency Generator Engines (PK-87010A, PK-87010B, PK-87010C, PK-87010D, PK-87010E, and PK-87010F)

- a. Each emergency generator shall be diesel fired.
- b. Up to six emergency generators are allowed.
- c. The emergency generators shall have an aggregate power output not to exceed 4.0 MW, regardless of the number installed.
- d. The emission limit in Table 1 is based on each emergency generator engine operating 52 hours a year for maintenance and testing, excluding initial stack testing and testing required by Special Condition V.J.
- e. Compliance with the Annual Emission Limit shall be demonstrated on a 12-month total, rolling monthly, calculated in accordance with 40 CFR Part 98 Subpart C §98.33(a)(3)(ii).

5. Piping Fugitives (F-1594)

- a. The Permittee shall implement the TCEQ 28LAER leak detection and repair (LDAR) program for fugitive emissions of methane for process lines in VOC service.
- b. The Permittee shall implement an as-observed auditory, visual, and olfactory (AVO) method for detecting leaking in fuel gas and natural gas piping components.
- c. AVO monitoring shall be performed weekly.

B. Continuous Emissions Monitoring Systems (CEMS)

1. As an alternative to Special Conditions III.A.1. 1. through III.A.1.o. Permittee may install a CO₂ CEMS and volumetric stack gas flow monitoring system with an automated data acquisition and handling system for measuring and recording CO₂ emissions discharged to the atmosphere, and use these values to show compliance with the annual emission limit in Table 1.
2. Permittee shall ensure that all required CO₂ monitoring system/equipment are installed and all certification tests are completed on or before the earlier of 90 unit operating days or 180 calendar days after the date the unit commences operation or after CO₂ CEMS are installed.
3. Permittee shall ensure compliance with the specifications and test procedures for CO₂ emission monitoring system at stationary sources, 40 CFR Part 75, or 40 CFR Part 60, Appendix B, Performance Specification numbers 1 through 9, as applicable.

IV. Recordkeeping and Reporting

A. Records

1. In order to demonstrate compliance with the GHG emission limits in Table 1, 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. Records of the fuel consumed by each source
 - c. The 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) A computer that collects, sums, and stores electronic data from continuous fuel flow meters is an acceptable totalizer;
 - d. Semi-annual fuel sampling for natural gas, daily fuel sampling of plant tail gas, or other frequencies as allowed by 40 CFR Part 98 Subpart C §98.34(b)(3);
2. Permittee shall maintain records of the following for GHG emissions from the Equipment List (excluding fugitives): all records or reports pertaining to significant maintenance performed; duration of startup, shutdown; the initial startup period for the emission units; malfunctions; all records relating to performance tests, calibrations, checks, and monitoring of combustion equipment; duration of an inoperative monitoring device and emission units with the required corresponding emission data; and all other information required by this permit recorded in a permanent form suitable for inspection. These records may be maintained in electronic databases. The records must be retained for not less than five years following the date of such measurements, maintenance, reports, and/or records.
3. Permittee shall maintain records of all GHG emission units and CO₂ emission certification tests and monitoring and compliance information required by this permit.
4. 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. The report is due on the 30th day following the end of each semi-annual period and shall include the following:

- a. Time intervals, data and magnitude of the excess emissions, the nature and cause (if known), corrective actions taken and preventive measures adopted;
 - b. Applicable time and date of each period during which the monitoring equipment was inoperative (monitoring down-time);
 - c. 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;
 - d. Any failure to conduct any required source testing, monitoring, or other compliance activities; and
 - e. Any violation of limitations on operation, including but not limited to restrictions on hours of operation of the emergency generator or fire pump.
5. Excess emissions shall be defined as any period in which the facility emissions exceed a maximum emission limit set forth in this permit, a malfunction occurs of an emission unit listed in the Equipment List that results in excess GHG emissions, or any other unauthorized GHG emissions occur.
 6. 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.
 7. Instruments and monitoring systems required by this PSD permit shall have a 95% on-stream time on an annual basis.
 8. All records required by this PSD Permit shall be retained for not less than 5 years following the date of such measurements, maintenance, and reporting.

V. Initial Performance Testing Requirements:

- A. The Permittee shall perform stack sampling and other testing to establish the actual pattern and quantities of air contaminants being emitted into the atmosphere from at least four of the stacks of the Steam Cracking Furnaces (H-10100, H-10200, H-10300, H-10400, H-10500, H-10600, H-10700, and H-10800), VHP Boiler (B-83010), and the Emergency Generator Engines (PK-87010A, PK-87010B, PK-87010C, PK-87010D, PK-87010E, and PK-87010F) and to determine the initial compliance with the CO₂ 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 CO₂.
 1. For the Steam Cracking Furnaces and VHP boiler calculate the CO₂ hourly average emission rate determined under maximum operating test conditions, convert to lbs of CO₂/MMBtu. Use the following equation to calculate the annual emissions.

$$CO_2 \text{ TPY} = 7 * 412 \frac{MMBtu}{hr} * 8,760 \frac{hr}{year} * lb \frac{CO_2}{MMBtu} + 150 \frac{MMBtu}{hr} * 8,760 \frac{hr}{year} * lb \frac{CO_2}{MMBtu}$$

Where:

412 MMBtu/hr = is the design annual average furnace firing rate upon which the emissions in Table 1 were based on.

150 MMBtu/hr = is the design annual average VHP firing rate upon which the emissions in Table 1 were based on.

lb CO₂/MMBtu = calculated from V.A.1.

2. For the Emergency Generator Engines, multiply the CO₂ hourly average emission rate determined under maximum operating test conditions by 52 hours.
 3. If the above calculated CO₂ emission total does not exceed the tons per year (TPY) specified on Table 1, no compliance strategy needs to be developed.
 4. If the above calculated CO₂ emission total exceeds the tons per year (TPY) specified in Table 1, the facility shall;
 - a. Document the potential to exceed in the test report; and
 - b. Explain within the report how the facility will assure compliance with the CO₂ 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.** The steam cracking furnaces (H-10100, H-10200, H-10300, H-10400, H-10500, H-10600, H-10700, and H-10800), VHP Boiler (B-83010), and shall operate at representative production rates during stack emission testing.
- E.** Emergency Generator Engines (PK-87010A, PK-87010B, PK-87010C, PK-87010D, PK-87010E, and PK-87010F) should be tested as required in NSPS III.
- F.** 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.
- G.** The owner or operator must provide the EPA at least 30 days' prior notice of any performance 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 unless EPA approves an earlier rescheduled date due to unforeseen events, such as delays that are caused by weather.
- H.** The owner or operator shall provide, or cause to be provided, performance testing facilities as follows:
1. 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.

- I. 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.
- J. Emissions testing for the emergency engines, as outlined above, shall be performed every 8,760 hours or three years whichever comes first 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:

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

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

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