

PROPOSED

Issuance Date

CERTIFIED MAIL
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15-xxxE CAB
File No. 0088-24

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Mr. Jon Mauer
Refinery Manager
Chevron USA Products Company
Hawaii Refinery
91-480 Malakole Street
Kapolei, Hawaii 96707-1807

Dear Mr. Mauer:

**SUBJECT: Amendment of Covered Source Permit (CSP) No. 0088-01-C
Minor Modification Application No. 0088-24
FCCU NO_x Limits
Chevron USA Products Company
Petroleum Refinery
Located At: 91-480 Malakole Street, Kapolei, Oahu
Date of Expiration: June 27, 2011 (this date is to be revised upon issuance
of the renewal for CSP No. 0088-01-C)**

In accordance with Hawaii Administrative Rules, Chapter 11-60.1, and pursuant to your application for a Minor Modification dated January 15, 2015; the Department of Health (herein after referred to as Department), hereby amends Covered Source Permit (CSP) No. 0088-01-C issued to Chevron USA Products Company. The amendment incorporates NO_x limits in the existing covered source permit section for the fluid catalytic cracking unit (FCCU).

The enclosed amended Attachment II(I): Special Conditions for the Fluid Catalytic Cracking Unit (FCCU) supersedes the corresponding Attachment II(I) issued with CSP No. 0088-01-C dated February 22, 1999 and amended on January 22, 2002, April 16, 2002, March 3, 2003, June 28, 2006, April 24, 2007, August 13, 2007, November 8, 2007, July 22, 2008, September 11, 2009, November 4, 2009, April 22, 2013, September 30, 2014, and June 23, 2015. All other permit conditions issued with CSP No. 0088-01-C shall not be affected and shall remain valid.

If there are any questions regarding these matters, please contact Mr. Darin Lum of the Clean Air Branch at (808) 586-4200.

Sincerely,

STUART YAMADA, P.E., CHIEF
Environmental Management Division

DL:dh

c: CAB Monitoring Section

**ATTACHMENT II(I): SPECIAL CONDITIONS
COVERED SOURCE PERMIT NO. 0088-01-C
FLUID CATALYTIC CRACKING UNIT (FCCU)**

Amended Date:

Expiration Date: June 27, 2011³

In addition to the standard conditions of the Covered Source Permit, the following special conditions shall apply to the permitted facility.

Section A. Equipment Description.

1. This portion of the Covered Source Permit encompasses the following equipment and associated appurtenances:

- a. Catalyst transfer operations;
- b. One (1) - Fluid Catalytic Cracking Unit (FCCU) which includes the Regenerator and Reactor:

- i. Particulate Control Devices:

- (1) Cyclone; and
 - (2) Electrostatic Precipitator (ESP), Manufacturer: Hamon Research Cottrell, Inc., Model no. 8883.

- c. One (1) - 61 MMBtu/hr furnace identified as F-5300 equipped with Callidus Ultra Blue burners; and
 - d. One (1) - 52 MMBtu/hr FCC Startup Air Heater identified as F-5310, Manufacturer: John Zink, Model: Direct Fired Air Heater.

(Auth.: HAR §11-60.1-3)

2. The permittee shall permanently attach an identification tag or nameplate on each piece of equipment which identifies the model number, serial number or I.D. number, and manufacturer. The identification tag or nameplate shall be attached to the equipment in a conspicuous location.

(Auth.: HAR §11-60.1-5, §11-60.1-90)

Section B. Applicable Federal Regulations.

1. The FCCU is subject to the provisions of the following federal regulations:

- a. 40 CFR Part 60, New Source Performance Standards:

- i. Subpart A, General Provisions; and
 - ii. Subpart J, Standards of Performance for Petroleum Refineries.

- b. 40 CFR Part 63, National Emission Standards for Hazardous Air Pollutants for Source Categories:
 - i. Subpart A, General Provisions; and
 - ii. Subpart UUU, National Emission Standards for Hazardous Air Pollutants for Petroleum Refineries: Catalytic Cracking Units, Catalytic Reforming Units, and Sulfur Recovery Units.

The permittee shall comply with all applicable requirements of these standards, including all emission limits, notification, reporting, monitoring, testing, and recordkeeping requirements. The major requirements of these standards are detailed in the special conditions of this permit.

(Auth.: HAR §11-60.1-3, §11-60.1-90, 40 CFR §60.1, 40 CFR §60.100, 40 CFR §63.1561)¹

2. The FCC Startup Air Heater is subject to the provisions of the following federal regulations:
40 CFR Part 60, New Source Performance Standards:

- a. Subpart A, General Provisions;
- b. Subpart Ja, Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction or Modification Commenced After May 14, 2007.

The permittee shall comply with all applicable requirements of these standards, including all emission limits, notification, reporting, monitoring, testing and recordkeeping requirements. The major requirements of these standards are detailed in the special conditions of this permit.

(Auth.: HAR §11-60.1-3, §11-60.1-90, 40 CFR §60.1, 40 CFR §60.100a)¹

Section C. Operational and Emissions Limitations.

1. The F-5300 furnace shall be fired only on refinery fuel gas (RFG) with a hydrogen sulfide (H₂S) content not to exceed 230 mg/dscm (160 ppmv).

(Auth.: HAR §11-60.1-3, § 11-60.1-38, §11-60.1-90, 40 CFR §60.104)¹

2. The permittee shall take measures to control fugitive dust at all catalyst transfer operations. The Department at any time may require the permittee to further abate fugitive dust emissions if an inspection indicates poor or insufficient control.

(Auth.: HAR §11-60.1-3, §11-60.1-33, §11-60.1-90)

3. The permittee shall not cause the discharge of visible emissions of fugitive dust beyond the lot line of the property on which the emissions originate.

(Auth.: HAR §11-60.1-3, §11-60.1-33, §11-60.1-90)

4. The permittee shall maintain and operate the cyclone and electrostatic precipitator in a manner consistent with good air pollution control practices for minimizing emissions.

(Auth.: HAR §11-60.1-3, §11-60.1-90)

5. The vacuum gas oil (VGO) processed by the FCCU shall not exceed the following feed rate and sulfur content limit:
 - a. A maximum VGO feed rate of 22,000 bbls/day*;
 - b. A maximum sulfur content of VGO of 0.30% by weight**.

* Based on a rolling 365-day average

**Based on a rolling seven-day (7-day) average, applicable at all times, including periods of startup, shutdown, and malfunctions

(Auth.: HAR §11-60.1-3, §11-60.1-90, 40 CFR §60.104, 40 CFR §60.108)¹

6. Emission Limits

The permittee shall not discharge or cause the discharge from the FCCU emissions in excess of the following:

- a. PM Emission Limit: 1.0 pounds of PM per 1000 pounds (1.0 kg/Mg or 2.0 lb/ton) of coke burn-off in the catalyst regenerator (3-hr average)**.
- b. CO Emission Limit: 500 ppmvd @ 0% O₂ (1-hr average)**.
- c. SO₂ Emission Limit: 25 ppmvd @ 0% O₂ (365-day rolling average)* and 50 ppmvd @ 0% O₂ (7-day rolling average)**.
- d. NO_x Emission Limit: 50 ppmvd @ 0% O₂ (365-day rolling average)* and 87.9 ppmvd @ 0% O₂ (7-day rolling average)**.

*Applicable at all times, including periods of startup, shutdown, and malfunctions

**Applicable at all times, excluding periods of startup, shutdown, and malfunctions

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90, 40 CFR §60.102, 40 CFR §60.103, 40 CFR §63.1564)¹

7. Visible Emissions (VE)

- a. For any six (6) minute averaging period, the FCCU shall not exhibit visible emissions of twenty (20) percent opacity or greater, except as follows: during start-up, shutdown, or equipment breakdown, the FCCU may exhibit visible emissions greater than twenty (20) percent opacity but not exceeding sixty (60) percent opacity for a period aggregating not more than six (6) minutes in any sixty (60) minutes.
- b. For any six (6) minute averaging period, the F-5300 furnace shall not exhibit visible emissions of forty (40) percent opacity or greater, except as follows: during start-up, shutdown, or equipment breakdown, the F-5300 furnace may exhibit visible emissions

greater than forty (40) percent opacity but not exceeding sixty (60) percent opacity for a period aggregating not more than six (6) minutes in any sixty (60) minutes.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-32, §11-60.1-90, SIP §11-60-24, 40 CFR §60.102, 40 CFR §63.1564)^{1,2}

8. Operation, Maintenance, and Monitoring Plan

The permittee must prepare and implement an operation, maintenance, and monitoring plan for the FCCU, air pollution control system and continuous monitoring system. The purpose of this plan is to detail the operation, maintenance, and monitoring procedures to follow.

- a. The plan shall be submitted to the Department for review and approval along with the notification of compliance status. Any changes to the plan must be submitted for review and approved by the Department.
- b. Each plan must include the following information:
 - i. Process and control device parameters to be monitored for the FCCU, along with established operating limits.
 - ii. Procedures for monitoring emissions and process and control device operating parameters for the FCCU.
 - iii. Procedures to determine the coke burn-rate and the volumetric flow rate (if you use process data rather than direct measurement).
 - iv. Procedures and analytical methods used to determine the equilibrium catalyst Ni concentration, the equilibrium catalyst Ni concentration monthly rolling average, and the hourly or hourly average Ni operating value.
 - v. Procedures to determine the gas flow rate for a catalytic cracking unit if you use the alternative procedure based on air flow rate and temperature.
 - vi. Monitoring schedule, including when you will monitor and when you will not monitor the FCCU (e.g., during the coke burn-off, regeneration process).
 - vii. Quality control plan for each continuous opacity monitoring system and continuous emission monitoring system used to meet an emission limit in 40 CFR Part 63, Subpart UUU. This plan must include procedures for calibrations, accuracy audits, and adjustments to the system needed to meet applicable requirements for the system.
 - viii. Maintenance schedule for each monitoring system and control device for the FCCU that is generally consistent with the manufacturer's instructions for routine and long-term maintenance.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, 40 CFR §63.1574)¹

9. Startup, Shutdown, and Malfunction Plan (SSMP)

- a. The permittee shall develop and implement a written startup, shutdown, and malfunction plan (SSMP) according to the provisions in 40 CFR §63.6(e)(3).
- b. During periods of startup, shutdown, and malfunction, the permittee must operate in accordance with the SSMP.
- c. The permittee must report each instance in which each emission limitation and each operating limitation was not met. This includes periods of startup, shutdown, and malfunction. The permittee shall also report each instance in which the work practice standards were not met. These instances are deviations from the emission limitations and work practices. These deviations must be reported according to the requirements in 40 CFR §63.1575.
- d. Consistent with 40 CFR §63.6(e) and 40 CFR §63.7(e)(1), deviations that occur during a period of startup, shutdown, or malfunction are not violations if you demonstrate to the Department's satisfaction that you were operating in accordance with 40 CFR §63.6(e)(1). The SSMP must also include elements designed to minimize the frequency of such periods (i.e., root cause analysis). The Department will determine whether deviations that occur during a period of startup, shutdown, or malfunction are violations, according to the provisions in 40 CFR §63.6(e).

(Auth.: HAR §11-60.1-3, §11-60.1-90, 40 CFR §63.1570)¹

10. FCC Startup Air Heater

- a. The startup air heater may be utilized for up to twenty-two (22) days per year at maximum duty and shall only combust an inherently low sulfur commercial-grade LPG gas with a sulfur content not to exceed thirty (30) ppmv.
- b. The startup air heater shall only combust gas that has a H₂S content that does not exceed 162 ppmv determined hourly on a three-hour (3-hour) rolling average basis and sixty (60) ppmv determined daily on a 365 successive calendar day rolling average basis.

(Auth.: HAR §11-60.1-3, §11-60.1-38, §11-60.1-90, 40 CFR §60.102a(g)(1)(ii), §60.107a(a)(3)(ii))¹

Section D. Monitoring and Recordkeeping Requirements.

1. All records, including support information, shall be maintained at the facility for at least five (5) years from the date of the monitoring samples, measurements, tests, reports, or application. Support information includes all calibration and maintenance records and copies of all reports required by the permit. These records shall be in a permanent form suitable for inspection and made available to the Department or their representatives upon request.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90)

2. Vacuum Gas Oil (VGO)

- a. The permittee shall monitor the feed rates (in barrels per day) of the VGO processed by the FCCU. Records shall be kept on a **rolling 365-day average basis**.
- b. Compliance with the maximum sulfur content limit for the fresh feed (VGO) is determined daily on a **rolling seven-day (7-day) average basis** using the following analytical methods and calculation procedures outlined below:
 - i. One fresh feed sample shall be collected once per eight-hour (8-hour) period.
 - ii. Fresh feed samples shall be analyzed separately by using any one of the following applicable analytical test methods:

ASTM D129-64, 78, or 95, ASTM D1552-83 or 95, ASTM D2622-87, 94 or 98, or ASTM D1266-87, 91, or 98. (These methods are incorporated by reference: see 40 CFR §60.17). The applicable range of some of these ASTM methods is not adequate to measure the levels of sulfur in some fresh feed samples. Dilution of samples prior to analysis with verification of the dilution ratio is acceptable upon prior approval of the Department.

- iii. If a fresh feed sample cannot be collected at a single location, then the fresh feed sulfur content shall be determined as follows:
 - (1) Individual samples shall be collected once per eight-hour (8-hour) period for each separate fresh feed stream charged directly into the riser or reactor of the fluid catalytic cracking unit. For each sample location the fresh feed volumetric flow rate at the time of collecting the fresh feed sample shall be measured and recorded. The same method for measuring volumetric flow rate shall be used at all locations.
 - (2) Each fresh feed sample shall be analyzed separately using the methods specified in Special Condition No. D.2.b.ii of this Attachment.
 - (3) Fresh feed sulfur content shall be calculated for each 8-hour period using the following equation:

$$S_f = \sum_{i=1}^n S_i Q_i / Q_f$$

where:

S_f = fresh feed sulfur content expressed in percent by weight of fresh feed.

n = number of separate fresh feed streams charged directly to the riser or reactor of the fluid catalytic cracking unit.

Q_f = total volumetric flow rate of fresh feed charged to the fluid catalytic cracking unit.

S_i = fresh feed sulfur content expressed in percent by weight of fresh feed for the "ith" sampling location.

Q_i = volumetric flow rate of fresh feed stream for the "ith" sampling location.

- iv. Calculate a seven-day (7-day) average (arithmetic mean) sulfur content of the fresh feed using all of the fresh feed sulfur content values obtained during seven (7) successive twenty-four-hour (24-hour) periods.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, 40 CFR §60.106)¹

3. Visible Emissions (VE)

- a. Except in those months where VE observations are conducted by a certified reader for the annual observations of the F-5300 furnace, the permittee shall conduct monthly (*calendar month*) VE observations for the F-5300 furnace in accordance with 40 CFR Part 60, Appendix A, Method 9 or by use of a Ringelmann Chart as provided. For each month, two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals for the F-5300 furnace. Records shall be completed and maintained in accordance with the **Visible Emissions Form Requirements**.
- b. The permittee shall conduct annually (*calendar year*) VE observations for the F-5300 furnace by a certified reader in accordance with 40 CFR Part 60, Appendix A, Method 9. For the annual observations, two (2) consecutive six (6) minute observations shall be taken at fifteen (15) second intervals for the F-5300 furnace. Records shall be completed and maintained in accordance with the **Visible Emissions Form Requirements**.
- c. Upon written request and justification, the Department may waive the requirements for the annual VE observations. The waiver request is to be submitted prior to the required annual VE observations and must include documentation justifying such action. Documentation should include, but is not limited to, the results of the prior VE observations indicating compliance by a wide margin, documentation of continuing compliance, and further that operations of the source have not changed since the previous annual VE observations. The annual VE observations shall not be waived for more than two (2) consecutive years.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-32, §11-60.1-90; SIP §11-60-15, SIP §11-60-24)²

4. Continuous Emissions Monitoring System (CEMS) for CO

- a. The permittee shall install, operate and maintain a continuous emissions monitoring system (CEMS) for continuously monitoring and recording the concentration by volume (dry basis) of CO emissions from the FCCU.
- b. The CEMS shall meet the following requirements:
 - i. The span value for the CEMS is 1,000 ppm CO.
 - ii. Performance evaluations for the CO CEMS shall be in accordance with 40 CFR §60.13 and §63.8. The CO CEMS shall meet 40 CFR Part 60, Appendix B, Performance Specification 4, Specifications and Test Procedures for Carbon Monoxide Continuous Emission Monitoring Systems in Stationary Sources; and Appendix F, Quality Assurance Procedures. 40 CFR Part 60, Appendix A, Method 10 shall be used in conducting any relative accuracy test audit (RATA).
 - iii. Cylinder Gas Audits (CGA) shall be conducted on a quarterly basis in accordance with 40 CFR Part 60, Appendix F, Section 5.1.2.

- iv. Calibration Drift (CD) assessments shall be performed on a daily basis pursuant to 40 CFR Part 60, Appendix F, Section 4.1.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, 40 CFR §60.105, 40 CFR §63.1572)¹

5. Continuous Emissions Monitoring System (CEMS) for H₂S

- a. The permittee shall operate and maintain a continuous emissions monitoring system (CEMS) for continuously monitoring and recording the concentration (dry basis) of H₂S in the RFG before being burned.
- b. The CEMS shall meet the following requirements:
 - i. The span value for the CEMS is 425 mg/dscm (300 ppmv) H₂S.
 - ii. All fuel gas combustion devices having a common source of fuel gas may be monitored at one (1) location, if monitoring at this location accurately represents the concentration of H₂S in the RFG being burned.
 - iii. Performance evaluations for the H₂S CEMS shall be in accordance with 40 CFR §60.13. The H₂S CEMS shall meet 40 CFR Part 60, Appendix B, Performance Specification 7, Specifications and Test Procedures for Hydrogen Sulfide Continuous Emissions Monitoring Systems in Stationary Sources; and Appendix F, Quality Assurance Procedures. 40 CFR Part 60, Appendix A, Method 11, 15, 15A, or 16, shall be used in conducting any relative accuracy test audit (RATA).
 - iv. Cylinder Gas Audits (CGA) shall be conducted in accordance with 40 CFR Part 60, Appendix F, Section 5.1.2.
 - v. Calibration Drift (CD) assessments shall be performed on a daily basis pursuant to 40 CFR Part 60, Appendix F, Section 4.1.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, 40 CFR §60.105)¹

6. Continuous Emissions Monitoring System (CEMS) for O₂

- a. The permittee shall install, operate and maintain a continuous emissions monitoring system (CEMS) for continuously monitoring and recording the concentration by volume (dry basis) of O₂ emissions from the FCCU.
- b. The CEMS shall meet the following requirements:
 - i. The span value for the CEMS is ten percent (10%) O₂.
 - ii. Performance evaluations for the O₂ CEMS shall be in accordance with 40 CFR §60.13 and §63.8. The O₂ CEMS shall meet 40 CFR Part 60, Appendix B, Performance Specification 3, Specifications and Test Procedures for O₂ and CO₂ Continuous Emission Monitoring Systems in Stationary Sources; and Appendix F, Quality Assurance Procedures. 40 CFR Part 60, Appendix A, Method 3A or 3B shall be used in conducting any relative accuracy test audit (RATA).

- iii. Cylinder Gas Audits (CGA) shall be conducted in accordance with 40 CFR Part 60, Appendix F, Section 5.1.2. In lieu of the audit points specified in 40 CFR Part 60, Appendix F, Section 5.1.2, the permittee may audit the O₂ CEMS at twenty to thirty percent (20-30%) and fifty to sixty percent (50-60%) of the actual O₂ CEMS span value.
- iv. Calibration Drift (CD) assessments shall be performed on a daily basis pursuant to 40 CFR Part 60, Appendix F, Section 4.1.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, 40 CFR §60.105, 40 CFR §63.1572)¹

7. Continuous Emissions Monitoring System (CEMS) for SO₂

- a. The permittee shall install, operate and maintain a continuous emissions monitoring system (CEMS) for continuously monitoring and recording the concentration by volume (dry basis) of SO₂ emissions from the FCCU.
- b. The CEMS shall meet the following requirements:
 - i. The span value for the CEMS is 100 ppm SO₂.
 - ii. Performance evaluations for the SO₂ CEMS shall be in accordance with 40 CFR §60.13. The SO₂ CEMS shall meet 40 CFR Part 60, Appendix B, Performance Specification 2, Specifications and Test Procedures for SO₂ and NO_x Continuous Emission Monitoring Systems in Stationary Sources; and Appendix F, Quality Assurance Procedures. 40 CFR Part 60, Appendix A, Method 6, 6A or 6B shall be used in conducting any relative accuracy test audit (RATA). In lieu of the requirements of 40 CFR Part 60, Appendix F, Sections 5.1.1, 5.1.3, and 5.1.4, the permittee must conduct either a Relative Accuracy Audit (RAA) or a Relative Accuracy Test Audit (RATA) at least once every three (3) years. The permittee shall conduct a Cylinder Gas Audit (CGA) each calendar quarter during which a RAA or a RATA is not performed.
 - iii. Cylinder Gas Audits (CGA) shall be conducted in accordance with 40 CFR Part 60, Appendix F, Section 5.1.2.
 - iv. Calibration Drift (CD) assessments shall be performed on a daily basis pursuant to 40 CFR Part 60, Appendix F, Section 4.1.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-11, §11-60.1-90)

8. Continuous Emissions Monitoring System (CEMS) for NO_x

- a. The permittee shall install, operate and maintain a continuous emissions monitoring system (CEMS) for continuously monitoring and recording the concentration by volume (dry basis) of NO_x emissions from the FCCU.
- b. The CEMS shall meet the following requirements:

- i. Performance evaluations for the NO_x CEMS shall be in accordance with 40 CFR §60.13. The NO_x CEMS shall meet 40 CFR Part 60, Appendix B, Performance Specification 2, Specifications and Test Procedures for SO₂ and NO_x Continuous Emission Monitoring Systems in Stationary Sources; and Appendix F, Quality Assurance Procedures. 40 CFR Part 60, Appendix A, Method 7, 7A, 7B, 7C, 7D, or 7E shall be used in conducting any relative accuracy test audit (RATA). In lieu of the requirements of 40 CFR Part 60, Appendix F, Sections 5.1.1, 5.1.3, and 5.1.4, the permittee must conduct either a Relative Accuracy Audit (RAA) or a Relative Accuracy Test Audit (RATA) at least once every three (3) years. The permittee shall conduct a Cylinder Gas Audit (CGA) each calendar quarter during which a RAA or a RATA is not performed.
- ii. CGA shall be conducted in accordance with 40 CFR Part 60, Appendix F, Section 5.1.2.
- iii. Calibration Drift (CD) assessments shall be performed on a daily basis pursuant to 40 CFR Part 60, Appendix F, Section 4.1.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-11, §11-60.1-90)

9. Continuous Opacity Monitoring System (COMS) for Opacity

The permittee shall install, operate and maintain a continuous opacity monitoring system (COMS) for continuously measuring and recording the opacity levels of stack emissions from the FCCU. The system shall meet U.S. EPA monitoring performance standards (40 CFR §60.13, 40 CFR §63.8 and 40 CFR Part 60, Appendix B, Performance Specification 1, Specifications and test procedures for opacity continuous emission monitoring systems in stationary sources). The instrument shall be spanned at sixty (60), seventy (70), or eighty (80) percent opacity. As specified in 40 CFR §63.8(c)(4)(i), each continuous opacity monitoring system must complete a minimum of one (1) cycle of sampling and analyzing for each successive ten-second (10-second) period and one (1) cycle of data recording for each successive Six-minute (6-minute) period.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, 40 CFR §60.105, 40 CFR §63.1572)¹

10. The following records must be kept:

- a. A copy of each notification and report that was submitted to comply with 40 CFR Part 63, Subpart UUU, including all documentation supporting any initial notification or Notification of Compliance Status that was submitted, according to the requirements in 40 CFR §63.10(b)(2)(xiv).
- b. The records in 40 CFR §63.6(e)(3)(iii) through (v) related to startup, shutdown, and malfunction.
- c. Records of performance tests, performance evaluations, and opacity and visible emission observations as required in 40 CFR §63.10(b)(2)(viii).
- d. For each continuous emission monitoring system and continuous opacity monitoring system:

- i. Records described in 40 CFR §63.10(b)(2)(vi) through (xi).
 - ii. Monitoring data for continuous opacity monitoring systems during a performance evaluation as required in 40 CFR §63.6(h)(7)(i) and (ii).
 - iii. Previous (i.e., superceded) versions of the performance evaluation plan as required in 40 CFR §63.8(d)(3).
 - iv. Requests for alternatives to the relative accuracy test for continuous emission monitoring systems as required in 40 CFR §63.8(f)(6)(i).
 - v. Records of the date and time that each deviation started and stopped, and whether the deviation occurred during a period of startup, shutdown, or malfunction or during another period.
- e. Records in 40 CFR §63.6(h) for visible emission observations.
 - f. A current copy of the operation, maintenance, and monitoring plan onsite and available for inspection. Also records to show continuous compliance with the procedures in the operation, maintenance, and monitoring plan.
 - g. Records of any changes that affect emission control system performance.
 - h. The average coke burn-off rate (Mg (tons) per hour) and hours of operation shall be recorded daily for any fluid catalytic cracking unit catalyst regenerator subject to 40 CFR §60.102, 40 CFR §60.103, or 40 CFR §60.104(b)(2).
 - i. Data obtained from the daily feed sulfur tests.
 - j. Each rolling seven-day (7-day) average compliance determination for sulfur content of the feed.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, 40 CFR §60.105, 40 CFR §60.107, 40 CFR §63.1576)¹

11. FCC Startup Air Heater

- a. The permittee shall maintain records of the fuel gas exemption that applies to the combustion of commercial-grade LPG gas that is inherently low in sulfur content.
- b. The permittee shall maintain a record of the number of days of operation of the unit.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-11, §11-60.1-90, 40 CFR §60.108a(c)(5))¹

Section E. Notification and Reporting Requirements.

1. Annual Emissions

As required by Attachment IV and in conjunction with the requirements of Attachment III, Annual Fee Requirements, the permittee shall submit **on an annual basis** the total tons per year emitted of each regulated air pollutant, including hazardous air pollutants. The reporting of annual emissions is due within **sixty (60) days following the end of each calendar year**. The enclosed **Annual Emissions Report Form: Refinery Equipment - Process Rate** and **Annual Emissions Report Form: Fuel Consumption** or equivalent forms, shall be used in reporting the FCCU feed rate and the fuel consumption of Furnace F-5300, respectively.

Upon written request of the permittee, the deadline for reporting annual emissions may be extended if the Department determines that reasonable justification exists for the extension.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-90, §11-60.1-114)

2. Additional notification and reporting requirements shall be conducted in accordance with the standard conditions found in Attachment I, Standard Conditions 16, 17 and 25, respectively. These notifications shall include, but not be limited to:
 - a. Intent to shutdown air pollution control equipment for necessary scheduled maintenance;
 - b. Emissions of air pollutants in violation of HAR, Chapter 11-60.1 or this permit (excluding technology-based emission exceedances due to emergencies); and
 - c. Permanent discontinuance of construction, modification, relocation or operation of the facility covered by this permit.

(Auth.: HAR §11-60.1-8, §11-60.1-15, §11-60.1-16, §11-60.1-90)

3. The permittee shall report **within five (5) working days** any *deviations from permit requirements*, including those attributable to upset conditions, the probable cause of such deviations and any corrective actions or preventative measures taken. Corrective actions may include a requirement for more frequent monitoring, or could trigger implementation of a corrective action plan.

(Auth.: HAR §11-60.1-3, §11-60.1-15, §11-60.1-16, §11-60.1-90)

4. Compliance Certification

During the permit term, the permittee shall submit at least **annually** to the Department and U.S. EPA, Region 9, the attached **Compliance Certification Form**, pursuant to HAR §11-60.1-86. The permittee shall indicate whether or not compliance is being met with each term or condition of this permit. The compliance certification shall be submitted **within ninety (90) days after the end of each calendar year**, and shall be signed and dated by a responsible official. The compliance certification shall include at a minimum the following information:

- a. The identification of each term or condition of the permit that is the basis of the certification;
- b. The compliance status;
- c. Whether compliance was continuous or intermittent;
- d. The methods used for determining the compliance status of the source currently and over the reporting period;
- e. Any additional information indicating the source's compliance status with any applicable enhanced monitoring and compliance certification including the

- requirements of Section 114(a)(3) of the Clean Air Act or any applicable monitoring and analysis provisions of Section 504(b) of the Clean Air Act; and
- f. Any additional information as required by the Department including information to determine compliance.

Upon written request of the permittee, the deadline for submitting the compliance certification may be extended, if the Department determines that reasonable justification exists for the extension.

(Auth.: HAR §11-60.1-4, §11-60.1-86, §11-60.1-90)

5. The permittee shall submit **semi-annually** written reports to the Department for monitoring purposes. The permittee shall submit a signed statement certifying the accuracy and completeness of the information contained in the report. The reports for Special Conditions Nos. E.5.a, E.5.b and E.5.c. shall be submitted **within sixty (60) days after the end of each semi-annual calendar period (January 1 to June 30 and July 1 to December 31)** and the reports for Special Conditions Nos. E.5.d thru E.5.h shall be submitted **within thirty (30) days after the end of each semi-annual calendar period (January 1 to June 30 and July 1 to December 31)** and shall include the following:
 - a. The Vacuum Gas Oil (VGO) data consisting of the following:
 - i. The maximum VGO feed rate (bbls/day) processed by the FCCU on a rolling 365-day average basis;
 - ii. The maximum sulfur content (% by weight) of the VGO on a rolling seven-day (7-day) average basis; and
 - iii. Any VGO exceedances as determined by the required VGO monitoring. Each exceedance reported shall include the date the exceedance occurred and the possible reason for the exceedance.

The enclosed **Monitoring Report Form: Vacuum Gas Oil (VGO)** or an equivalent form, shall be used for reporting.

- b. Any opacity exceedances as determined by the required VE monitoring for the F-5300 furnace. Each exceedance reported shall include the date, six (6) minute average opacity reading, possible reason for exceedance, duration of exceedance, and corrective actions taken. If there were no exceedances, the permittee shall submit in writing a statement indicating that there were no exceedances for that semi-annual period.

The enclosed **Monitoring Report Form: Visible Emissions**, shall be used.

- c. Any deviations from permit requirements shall be clearly identified.
- d. Any seven-day (7-day) period during which the average sulfur content of the fresh feed exceeds 0.30 percent by weight. The fresh feed sulfur content, a rolling

seven-day (7-day) average, shall be determined using the procedures specified in Special Condition No. D.2.b of this Attachment.

- e. For each seven-day (7-day) period during which an exceedance has occurred as defined in Special Condition No. E.5.d of this Attachment:
 - i. The date that the exceedance occurred;
 - ii. An explanation of the exceedance;
 - iii. Whether the exceedance was concurrent with a startup, shutdown, or malfunction of the fluid catalytic cracking unit or control system; and
 - iv. A description of the corrective action taken, if any.
- f. For each eight-hour (8-hour) period in which a feed sulfur measurement required by Special Condition No. D.2.b of this Attachment was not obtained, the date for which and brief explanation as to why a feed sulfur measurement was not obtained, for approval by the Department.
- g. Compliance Report

The compliance report must contain the following information:

- i. Company name and address.
- ii. Statement by a responsible official, with that official's name, title, and signature, certifying the accuracy of the content of the report.
- iii. Date of report and beginning and ending dates of the reporting period.
- iv. If there are no deviations from any emission limitations that applies and there are no deviations from the requirements for work practice standards, a statement that there were no deviations from the emission limitations or work practice standards during the reporting period and that no continuous emission monitoring system or continuous opacity monitoring system was inoperative, inactive, malfunctioning, out-of-control, repaired, or adjusted.
- v. For each deviation from an emission limitation occurring at the FCCU where you are using a continuous opacity monitoring system or a continuous emission monitoring system to comply with the emission limitation, you must include the following information:
 - (1) The total operating time of the FCCU during the reporting period.
 - (2) Information on the number, duration, and cause of deviations (including unknown cause, if applicable) as applicable, and the corrective action taken.
 - (3) Information on the number, duration, and cause for monitor downtime incidents (including unknown cause, if applicable, other than downtime associated with zero (0) and span and other daily calibration checks).
 - (4) The date and time that each malfunction started and stopped.
 - (5) The date and time that each continuous opacity monitoring system or continuous emission monitoring system was inoperative, except for zero (low-level) and high level checks.

- (6) The date and time that each continuous opacity monitoring system or continuous emission monitoring system was out-of-control, including the information in 40 CFR §63.8(c)(8).
- (7) The date and time that each deviation started and stopped, and whether each deviation occurred during a period of startup, shutdown, or malfunction or during another period.
- (8) A summary of the total duration of the deviation during the reporting period (recorded in minutes for opacity and hours for gases and in the averaging period specified in the regulation for other types of emission limitations), and the total duration as a percent of the total source operating time during the reporting period.
- (9) A breakdown of the total duration of the deviations during the reporting period and into those that are due to startup, shutdown, control equipment problems, process problems, other known causes, and other unknown causes.
- (10) A summary of the total duration of downtime for the continuous opacity monitoring system or continuous emission monitoring system during the reporting period (recorded in minutes for opacity and hours for gases and in the averaging time specified in the regulation for other types of standards), and the total duration of downtime for the continuous opacity monitoring system or continuous emission monitoring system as a percent of the total source operating time during that reporting period.
- (11) A breakdown of the total duration of downtime for the continuous opacity monitoring system or continuous emission monitoring system during the reporting period into periods that are due to monitoring equipment malfunctions, non-monitoring equipment malfunctions, quality assurance/quality control calibrations, other known causes, and other unknown causes.
- (12) An identification of each HAP that was monitored at the FCCU.
- (13) A brief description of the process units.
- (14) The monitoring equipment manufacturer(s) and model number(s).
- (15) The date of the latest certification or audit for the continuous opacity monitoring system or continuous emission monitoring system.
- (16) A description of any change in the continuous emission monitoring system or continuous opacity monitoring system, processes, or controls since the last reporting period.
- (17) A copy of any performance test done during the reporting period on the FCCU. The report may be included in the next semiannual report. The copy must include a complete report for each test method used for a particular kind of emission point tested. For additional tests performed for a similar emission point using the same method, the permittee must submit the results and any other information required, but a complete test report is not required. A complete test report contains a brief process description; a simplified flow diagram showing affected processes, control equipment, and sampling point locations; sampling site data; description of sampling and analysis procedures and any modifications to standard procedures; quality assurance procedures; record of operating conditions during the test; record of preparation of

standards; record of calibrations; raw data sheets for field sampling; raw data sheets for field and laboratory analyses; documentation of calculations; and any other information required by the test method.

- (18) Any requested change in the applicability of an emission standard in the periodic report. The permittee must include all information and data necessary to demonstrate compliance with the new emission standard selected and any other associated requirements.
- (19) When actions taken to respond are consistent with the startup, shutdown and malfunction plan, the permittee is not required to report these events in the semiannual compliance report and the reporting requirement in 40 CFR §63.6(e)(3)(iii) and 40 CFR §63.10(d)(5) do not apply.
- (20) When actions taken to respond are not consistent with the startup, shutdown and malfunction plan, the permittee must report these events and the response taken in the semiannual compliance report. In this case, the reporting requirements in 40 CFR §63.6(e)(3)(iv) and 40 CFR §63.10(d)(5) do not apply.

h. Excess Emissions Report

- i. The permittee shall submit an excess emissions and monitoring systems performance report pursuant to 40 CFR §60.7(c) to the Department and the U.S. EPA for every **semi-annual calendar period**. The report shall include the following information:
 - (1) The magnitude of excess emissions computed in accordance with 40 CFR §60.13(h), any conversion factor(s) used, and the date and time of commencement and completion of each time period of excess emissions. The process operating time during the reporting period;
 - (2) Specific identification of each period of excess emissions that occurs during startups, shutdowns, and malfunctions of the FCCU and F-5300 furnace. The nature and cause of any malfunction (if known), and the corrective action taken or preventative measures adopted;
 - (3) The date and time identifying each period during which the continuous emissions monitoring system was inoperative except for zero (0) and span checks. The nature of each system repair or adjustment shall be described; and
 - (4) The report shall so state if no excess emissions have occurred. Also, the report shall so state if the continuous emissions monitoring system operated properly during the period and was not subject to any repairs or adjustments except for zero (0) and span checks.
- ii. All reports shall be postmarked by the thirtieth (30th) day following the end of each **semi-annual calendar period**. The enclosed **Excess Emissions and Monitoring System Performance Summary Report** form shall also be submitted in addition to the excess emissions and monitoring systems performance report.

- iii. For purposes of reports under 40 CFR §60.7(c), periods of excess emissions for the FCCU and F-5300 furnace that shall be determined and reported are defined as follows:
- (1) Opacity. All one-hour (1-hour) periods that contain two or more 6-minute periods during which the average opacity, as measured by the continuous opacity monitoring system, exceeds twenty (20) percent.
 - (2) Carbon Monoxide. All one-hour (1-hour) periods during which the average CO concentration, as measured by the CO continuous monitoring system under 40 CFR §60.105(a)(2), exceeds 500 ppmvd @ 0% O₂.
 - (3) H₂S. All rolling 3-hour periods during which the average concentration of H₂S in RFG, as measured by the H₂S continuous emissions monitoring system, exceeds 230 mg/dscm (160 ppmv).
 - (4) Sulfur Dioxide. All rolling 365-day periods during which the average SO₂ concentration, as measured by the SO₂ continuous emissions monitoring system, exceeds twenty-five (25) ppmvd @ 0% O₂ and all rolling seven-day (7-day) periods during which the average SO₂ concentration, as measured by the SO₂ continuous emissions monitoring system, exceeds 50 ppmvd @ 0% O₂.
 - (5) Nitrogen Oxides. All rolling 365-day periods during which the average NO_x concentration, as measured by the NO_x continuous emissions monitoring system, exceeds fifty (50) ppmvd @ 0% O₂ and all rolling seven-day (7-day) periods during which the average NO_x concentration, as measured by the NO_x continuous emissions monitoring system, exceeds 87.9 ppmvd @ 0% O₂.
- iv. Excess emissions indicated by the continuous emissions monitoring systems shall be considered violations of the applicable emission and concentration limits for the purposes of this permit.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-32, §11-60.1-90, SIP §11-60-24, 40 CFR §60.105, 40 CFR §60.107, 40 CFR §63.1575)¹

6. At least **thirty (30) days** prior to the following events, the permittee shall notify the Department in writing of:
- a. Conducting a performance specification test on any of the CEMS (CO, SO₂, NO_x, O₂, or H₂S) or COMS (opacity).
 - b. Conducting a source performance test as required by this Attachment, Section F, Testing Requirements.

(Auth.: HAR §11-60.1-3, §11-60.1-90, 40 CFR §60.105, 40 CFR §60.106)¹

Section F. Testing Requirements.

1. The permittee shall conduct or cause to be conducted annual performance tests for the FCCU, except for the opacity testing specified in Attachment II(I), Special Condition No. F.3.d, which is only required to be conducted initially. Performance tests shall be conducted for carbon monoxide (CO) and particulate matter (PM). All performance tests shall be conducted at the maximum production rate of the FCCU and at the maximum VGO feed rate, or at other production rates as may be specified by the Department.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-11, §11-60.1-90, 40 CFR §60.106)¹

2. Performance tests for the emissions of CO and PM shall be conducted in accordance with the test methods set forth in 40 CFR Part 60, Appendix A. Only the test methods specified below or U.S. EPA-approved equivalent methods with prior written approval from the Department shall be used.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, 40 CFR §60.106)¹

3. The permittee shall determine compliance with the particulate matter (PM) standards in 40 CFR §60.102(a) as follows:

- a. The emission rate (E) of PM shall be computed for each run using the following equation:

$$E = C_s Q_{sd} / K R_c$$

Where:

E = Emission rate of PM, kg/Mg (lb/ton) of coke burn-off.

C_s = Concentration of PM, gr/dscm (gr/dscf).

Q_{sd} = Volumetric flow rate of effluent gas, dscm/hr (dscf/hr).

R_c = Coke burn-off rate, Mg/hr (ton/hr) coke.

K = Conversion factor, 1000 g/kg (7000 gr/lb).

- b. Method 5B or 5F is to be used to determine the particulate matter emissions and associated moisture content from affected facilities without wet FGD systems. The sampling time for each run shall be at least sixty (60) minutes and the sampling rate shall be at least 0.015 dscm/min (0.53 dscf/min), except that shorter sampling times may be approved by the Department when process variables or other factors preclude sampling for at least sixty (60) minutes.

- c. The coke burn-off rate (R_c) shall be computed for each run using the following equation:

$$R_c = K_1 Q_r (\%CO_2 + \%CO) - (K_2 Q_a - K_3 Q_r) ((\%CO/2) + (\%CO_2 + \%O_2))$$

Where:

R_c = Coke burn-off rate, Mg/hr (ton/hr)

Q_r = Volumetric flow rate of exhaust gas from catalyst regenerator before entering the emission control system, dscm/min (dscf/min).

Q_a = Volumetric flow rate of air to FCCU regenerator, as determined from the fluid catalytic cracking unit control room instrumentation, dscm/min (dscf/min).

%CO₂ = carbon dioxide concentration, percent by volume (dry basis).

%CO = carbon monoxide concentration, percent by volume (dry basis).

%O₂ = Oxygen concentration, percent by volume (dry basis).

K_1 = Material balance and conversion factor, 2.982×10^{-4} (Mg-min)/(hr-dscm -%)
[9.31×10^{-6} (ton-min)/(hr-dscf-%)].

K_2 = Material balance and conversion factor, 2.088×10^{-3} (Mg-min)/(hr-dscm -%)
[6.52×10^{-5} (ton-min)/(hr-dscf-%)].

K_3 = Material balance and conversion factor, 9.94×10^{-5} (Mg-min)/(hr-dscm -%)
[3.1×10^{-6} (ton-min)/(hr-dscf-%)].

- i. Method 2 shall be used to determine the volumetric flow rate (Q_r).
- ii. The emission correction factor, integrated sampling and analysis procedure of Method 3B shall be used to determine CO₂, CO and O₂ concentrations.

d. Method 9 and the procedures of 40 CFR §60.11 shall be used to determine opacity.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, 40 CFR §60.106)¹

4. The permittee shall determine compliance with the CO standard in 40 CFR §60.103(a) by using the integrated sampling or continuous sampling technique of Method 10 to determine the CO concentration (dry basis). The sampling time for each run shall be sixty (60) minutes.

(Auth.: HAR §11-60.1-3, §11-60.1-5, §11-60.1-11, §11-60.1-90, 40 CFR §60.106)¹

5. Each source performance test shall consist of three (3) separate runs using the applicable test method. For the purpose of determining compliance with an applicable regulation, the arithmetic mean of the results from the three (3) runs shall apply.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, §11-60.1-161, §11-60.1-174, 40 CFR §60.8; 40 CFR §63.7)¹

6. The permittee shall provide sampling and testing facilities at its own expense. The tests shall be conducted at the operating capacities identified in Special Condition No. F.1 of this Attachment. The Department may monitor any of the required source performance tests.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90)

7. Any deviations from these conditions, test methods, or procedures may be cause for rejection of the test results unless such deviations are approved by the Department before the tests.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90)

8. **At least thirty (30) days** prior to performing a test, the permittee shall submit a written source performance test plan to the Department and U.S. EPA that describes the test date(s), test duration, test locations, test method, source operation, fuel consumption, and other parameters that may affect test results. Such a plan shall conform to U.S. EPA guidelines including quality assurance procedures. A source performance test plan or quality assurance plan that does not have the approval of the Department may be grounds to invalidate any test and require a retest.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, §11-60.1-161, §11-60.1-174, 40 CFR §60.8; 40 CFR §63.7)¹

9. **Within sixty (60) days** after completion of the source performance test, the permittee shall submit to the Department and U.S. EPA, the test report which shall include the operating conditions of the FCCU at the time of the test, the analysis of the VGO, the summarized test results, comparative results with the permit emission limits, and other pertinent field and laboratory data.

(Auth.: HAR §11-60.1-3, §11-60.1-11, §11-60.1-90, §11-60.1-161, §11-60.1-174, 40 CFR §60.8; 40 CFR §63.7)¹

Section G. Agency Notifications.

Any document (including reports) required to be submitted by this Covered Source permit shall be in accordance with Attachment I, Standard Condition No. 29.

(Auth.: HAR §11-60.1-4, §11-60.1-90)

¹The citations to the Code of Federal Regulations (CFR) identified under a particular condition, indicate that the permit condition complies with the specified provision(s) of the CFR. Due to the integration of the preconstruction and operating permit requirements, permit conditions may incorporate more stringent requirements than those set forth in the CFR.

²The citations to the State Implementation Plan (SIP) identified under a particular condition, indicate that the permit condition complies with the specified provision(s) of the SIP.

³This date is to be revised upon issuance of the renewal for CSP No. 0088-01-C.