**PERMIT TO OPERATE**
**(P/O, no P/C)**

**COMPANY NAME:** Chevron Products Company
El Segundo Refinery

**MAILING ADDRESS:** 324 W. El Segundo Blvd.
El Segundo, CA 90245

**EQUIPMENT LOCATION:** 324 W. El Segundo Blvd.
El Segundo, CA 90245

**CONTACT PERSON:** R. Mélida Escalante-Henricks
Permitting Engineer
Health, Environmental and Safety Department

## SECTION D: FACILITY DESCRIPTION AND EQUIPMENT SPECIFIC CONDITIONS

### EQUIPMENT DESCRIPTION:

Additions to the equipment description are noted in bold & underlines. Deletions are noted in strikeouts.

| Equipment | ID No. | Connected To | RECLAIM Source Type / Monitoring Unit | Emission* And Requirements | Conditions |
|---|---|---|---|---|---|
| **Process 15: OIL/WATER SEPARATION** | | | | | |
| **System 6: AIR POLLUTION CONTROL SYSTEMS FOR JUNCTION BOXES** | | | | | S13.7 |
| **CARBON ADSORBER, LPDU-1, 2 TOTAL, EACH 200 LBS, CONNECTED IN SERIES, SERVING JUNCTION BOX SOUTH OF #2 CRUDE UNIT AT MANHOLE 447 DIRECTING FLOW TO NO. 4 SEPARATOR A/N: 362223** | **Cxxx1** | | | | **D90.X, E128.1, E153.X, H23.4, K67.X** |
| **CARBON ADSORBER, CSA-1, 2 TOTAL, EACH 200 LBS, CONNECTED IN SERIES, SERVING JUNCTION BOX CSA-1 DIRECTING FLOW TO NO. 4 SEPARATOR A/N:362223** | **Cxxx2** | | | | **D90.X, E128.1, E153.X, H23.4, K67.X** |
| **CARBON ADSORBER, ISOMAX- 2, 2 TOTAL, EACH 2000 LBS, CONNECTED IN SERIES, SERVING JUNCTION BOX SP-410 DIRECTING FLOW TO NO. 4 SEPARATOR A/N:362223** | **Cxxx3** | | | | **D90.X, E128.1, E153.X, H23.4, K67.X** |

| Equipment | ID No. | Connected To | RECLAIM Source Type / Monitoring Unit | Emission* And Requirements | Conditions |
|---|---|---|---|---|---|
| **CARBON ADSORBER, ISOMAX- 3, 2 TOTAL, EACH 2000 LBS, CONNECTED IN SERIES, SERVING JUNCTION BOX SP-410 DIRECTING FLOW TO NO. 4 SEPARATOR A/N:362223** | **Cxxx4** | | | | **D90.X, E128.1, E153.X, H23.4, K67.X** |
| **CARBON ADSORBER, LPDU-3, 2 TOTAL, EACH 200 LBS, CONNECTED IN SERIES, SERVING JUNCTION BOX SP-101 DIRECTING FLOW TO NO. 2 SEPARATOR OR NO. 4 SEPARATOR A/N: 362227** | **Cxxx5** | | | | **D90.X, E128.1, E153.X, H23.4, K67.X** |
| **CARBON ADSORBER, LPDU-4, 2 TOTAL, EACH 200 LBS, CONNECTED IN SERIES, SERVING JUNCTION BOX SP-101 DIRECTING FLOW TO NO. 2 SEPARATOR OR NO. 4 SEPARATOR A/N:362227** | **Cxxx6** | | | | **D90.X, E128.1, E153.X, H23.4, K67.X** |
| **CARBON ADSORBER, LPDU-5, 2 TOTAL, EACH 200 LBS, CONNECTED IN SERIES, SERVING JUNCTION BOX SP-101 DIRECTING FLOW TO NO. 2 SEPARATOR OR NO. 4 SEPARATOR A/N:362227** | **Cxxx7** | | | | **D90.X, E128.1, E153.X, H23.4, K67.X** |
| **CARBON ADSORBER, ISOMAX-1, 2 TOTAL, EACH 200 LBS, CONNECTED IN SERIES, SERVING JUNCTION BOX SP-214 DIRECTING FLOW TO NO. 2 SEPARATOR OR NO. 4 SEPARATOR A/N:362227** | **Cxxx8** | | | | **D90.X, E128.1, E153.X, H23.4, K67.X** |
| **CARBON ADSORBER, LAB/ CLINIC, 2 TOTAL, EACH 2000 LBS, CONNECTED IN SERIES, SERVING JUNCTION BOX WEST OF LAB/CLINIC DIRECTING FLOW TO REFINERY FOREBAY A/N:362226** | **Cxxx9** | | | | **D90.X, E128.1, E153.X, H23.4, K67.X** |

## – CONDITIONS –

Additions are noted in bold & underlines. New are noted in bold and deletions in strikeouts.

**PROCESS CONDITIONS:**

none

**SYSTEM CONDITIONS:**

S13.7 All devices under this system are subject to the applicable requirements of the following rules or regulations:

| Contaminant | Rule | Rule/Subpart |
|---|---|---|
| Benzene | 40CFR61, SUBPART | FF |

[**40CFR 61 Subpart FF, 12-4-2003**]
[Systems subject to this condition : Process 15, System 1 , 2 , 3 , 4 , 5**, 6**]

**DEVICE CONDITIONS:**

**D. Monitoring/Testing Requirements**

D90.**X** The operator shall periodically monitor the VOC concentration at the outlet of the primary and secondary carbon canisters according to the following specifications:

The operator shall monitor once every month at the time when the junction boxes are receiving wastes. If the junction boxes do not receive waste during a month, the VOC monitor may be conducted at anytime.

The operator shall utilize EPA Method 21 with a District approved hydrocarbon detection instrument calibrated in ppmv methane. Alternately, the operator may use the District Grab Sample Method, as specified by Rule 1176.

The operator shall maintain records in a manner approved by the District, to demonstrate compliance with this condition.

[**RULE 1176, 9-13-1996; 40CFR 61 Subpart FF, 12-4-2003**]
[Devices subject to this condition : C**xxx1, Cxxx2, Cxxx3, Cxxx4, Cxxx5, Cxxx6, Cxxx7, Cxxx8, Cxxx9]**

**E. Equipment Operation/Construction Requirements**

E128.1 The operator shall keep all spent carbon in a tightly covered container which shall remain closed except when it is being transferred into or out of the container.

[**RULE 1303(a)(1)-BACT, 5-10-1996;** RULE 1303(a)(1)-BACT, 12-6-2002]

[Devices subject to this condition : …C**xxx1, Cxxx2, Cxxx3, Cxxx4, Cxxx5, Cxxx6, Cxxx7, Cxxx8, Cxxx9**]

**E153.X The operator shall change over the carbon in the adsorber whenever breakthrough occurs.**

**If a concentration limit is exceeded at the outlet of the secondary carbon adsorber, then both carbon adsorbers must be replaced with fresh ones since it is assumed that both are spent.**

**If a concentration limit is exceeded at the outlet of the primary carbon adsorber but not the outlet of the secondary, the primary can be removed, replaced with the secondary; and a fresh bed installed in the secondary position. As an option, both beds can also be replaced.**

**For the purpose of this condition, breakthrough occurs when the VOC concentration measured in accordance to Condition D90.X exceeds 500 ppmv.**

**[RULE 1176, 9-13-1996; 40CFR 61 Subpart FF, 12-4-2003]**
**[Devices subject to this condition : Cxxx1, Cxxx2, Cxxx3, Cxxx4, Cxxx5, Cxxx6, Cxxx7, Cxxx8, Cxxx9]**

**H. Applicable Rules**

H23.4 This equipment is subject to the applicable requirements of the following rules or regulations:

| Contaminant | Rule | Rule/Subpart |
|---|---|---|
| VOC | District Rule | 1176 |

[**RULE 1176, 9-13-1996**]
[Devices subject to this condition : …… C**xxx1, Cxxx2, Cxxx3, Cxxx4, Cxxx5, Cxxx6, Cxxx7, Cxxx8, Cxxx9**]

**K. Record Keeping/Reporting**

**K67.X The operator shall keep records, in a manner approved by the District, for the following parameter(s) or item(s):**

**Description of the carbon adsorbers**
**Monitoring date and time**
**VOC concentration at the outlet of the primary and secondary carbon adsorbers**
**Date of carbon canister replacement or recharge**

**[RULE 1176, 9-13-1996; 40CFR 61 Subpart FF, 12-4-2003]**
**[Devices subject to this condition:** Cxxx1, Cxxx2, Cxxx3, Cxxx4, Cxxx5, Cxxx6, Cxxx7, Cxxx8, Cxxx9**]**

**COMPLIANCE RECORD REVIEW:**
The AQMD's compliance database shows that Chevron El Segundo Refinery has been cited with 8 Notices of Violation and one Notice to Comply within the last two years. Appendix A includes a list of the citations. All of the NOVs and NC have been resolved to the satisfaction of the Executive Officer. No NOV or NC was issued to the junction boxes in the Oil/Water Separation Process.

**BACKGROUND:**
Chevron Products Co. submitted a total of nine applications for the carbon adsorbers serving the junctions boxes at various locations in the refinery. Four applications (AN 362223, 362225 to 362227) were filed on October 29, 1999 in response to a Notice to Comply (A-21753, also see **Appendix A** for copy) issued to Chevron on September 30, 1999. Five applications (Nos. 495444 to 495448) were submitted on January 28, 2009 to cover additional junction boxes serving separate permit units. The actual installation dates of the subject carbon adsorbers are not known, but eight of them (LPDU-1, 3, 4, 5; ISO-1, 2, 3; and CSA-1) were put in operation as early as February of 1992. Therefore, all the permit applications cover carbon adsorbers that are already in use (P/O, no P/C) and 50% penalty fees were paid for them. These applications are summarized in **Appendix B** and described in Table 1 below:

**Table 1. Nine applications previously submitted for carbon canisters serving junction boxes at various locations in the refinery**

| Permit Appl # | ID # | Number | Size each (lbs.) | Location | Division | Sec/Plt | Status of Use |
|---|---|---|---|---|---|---|---|
| 362223 | LPDU-1 | 2 | 200 | South of #2 Crude Unit at manhole 447 | LPD/Utilities | #2 CU | Continuous |
| 495446 | LPDU-3 | 2 | 200 | SP-101 | LPD/Utilities | #2 CU | Continuous |
| 495447 | LPDU-4 | 2 | 200 | SP-101 | LPD/Utilities | #2 CU | Continuous |
| 495445 | LPDU-5 | 2 | 200 | SP-101 | LPD/Utilities | #2 CU | Continuous |
| 362225 | CSA-1 | 2 | 200 | SW corner of plant | Coker/SA | Diesel Furnace Hydrofiner | Continuous |
| 362226 | Lab / Clinic | 2 | 2,000 | West of Lab / Clinic | EF & S | ETP | Continuous |
| 362227 | Isomax-1 | 2 | 200 | SP-214 | Isomax | East of Flare | Continuous |
| 495448 | Isomax-2 | 2 | 2,000 | SP-410 | Isomax | East of Flare | Continuous |
| 495444 | Isomax-3 | 2 | 2,000 | SP-410 | Isomax | East of Flare | Continuous |

These carbon adsorbers have been connected to the junction boxes located in fixed locations, and they serve to mainly control emissions and attendant odors from sections of the refinery's drain system. They are not used as portable units or used to treat vacuum truck exhausts as incorrectly stated in the permit applications. The location of each is indicated in Table 1 and also in **Appendix C**.

Chevron originally submitted nine applications for the carbon adsorbers as shown Table 1 above. However, the nine junction boxes served by the carbon adsorbers are actually parts of only three separate permit units: Nos. 2 and 4 Separators and Effluent Treatment Plant. Depending on to which system the streams are directed from these junction boxes, the carbon adsorbers will be permitted under only three applications and all of the cardbon adsorbers will be listed under the new Process 15, System 6—"Air Pollution Control Systems for Junction Boxes". The streams from the junction boxes/carbon adsorbers LPDU-1, CAS-1, Isomax-2 and Isomax-3 go to System 3, No. 4 Seperator and APC. Therefore, the carbon adsorbers LPDU-1, CAS-1, Isomax-2 and Isomax-3 are covered under AN 362223. The streams

from the junction boxes/carbon adsorbers LPDU-3, LPDU-4, LPDU-5 and Isomax-1 normally go to System 1, No. 2 Seperator and APC. But they can be alternatively routed to System 3, No. 4 Seperator and APC. Therefore, the carbon adsorbers LPDU-3, LPDU-4, LPDU-5 and Isomax-1 are covered under AN 362227. The stream from the junction boxes/carbon adsorbers Lab/Clinc goes to the Refinery Forbay in System 4, Effluent Treating Plant. Therefore, the carbon adsorbers Lab/Clinic are covered under AN 362226. Since only three applications are needed to permit the nine carbon adsorber systems, the other six applications have been cancelled. The junction boxes won't be described in the Facility Permit.

**Table 2. Permit applications for carbon adsorbers in Process 15 System 6**

| | **Junction Box /Carbon Adsorber** | **Process 15** | | |
|---|---|---|---|---|
| | | **No. 2 Separator** | **No. 4 Separator** | **Refinery Forbay** |
| **AN 362223** | LPDU-1 | | Yes | |
| | CSA-1 | | Yes | |
| | Isomax-2 | | Yes | |
| | Isomax-3 | | Yes | |
| **AN 362227** | LPDU-3 | Yes | Yes (alternate routing) | |
| | LPDU-4 | Yes | Yes (alternate routing) | |
| | LPDU-5 | Yes | Yes (alternate routing) | |
| | Isomax-1 | Yes | Yes (alternate routing) | |
| **AN 362226** | Lab / Clinic | | | Yes |

**PROCESS DESCRIPTION:**
The junction boxes combine multiple waste water streams into one and then direct these streams to treatment and/or storage systems. The carbon adsorbers are connected to the junction boxes to control emissions from the refinery's drain system. Each installation consists of two carbon adsorbers in series so that the first bed operates as the main adsorber and the second as a polisher. A simple Process Flow Diagram showing the typical setup for the junction boxes and their APC system and the destinations of the streams flowing from the junction boxes is included in **Appendix D. Appendix E** shows manufacturer's brochure for the carbon adsorbers. Currently, Chevron replaces carbon depending on where breakthrough occurs in the system:

1. If a concentration limit is exceeded at the outlet of the secondary bed, then both beds must be replaced with fresh ones since it is assumed that both are spent.

2. If a concentration limit is exceeded at the outlet of the primary bed but not the outlet of the secondary, the primary can be removed, replaced with the secondary; and a fresh bed installed in the secondary position. This is the preferred process since this most effectively uses the carbon. As an option, both beds can also be replaced.

This carbon changeout procedure is imposed in the Condition E153.X.

Measured Flowrate of Streams Handled by the Carbon Adsorbers:
The feed streams to the carbon adsorbers consist of gas and vapor pushed from the drain system by liquid level changes or changes in the water temperature. Since the junction boxes are underground, the increases in the vapor space temperature caused by daily ambient temperature changes are negligible. The gas flows are quite low and well within the flow range to be handled by these carbon adsorbers. During 1992 and 1993, the refinery reportedly had a consultant measure flows from seven of the nine adsorbers (LPDU-1, 3, 4, 5 and ISO-1, 2, 3), and the flowrates ranged from 0.02 to 0.2 cfm. This is well below the design flowrate rating of 100 cfm for the smaller 200 lb carbon adsorbers. Due to the low flowrates, the pressure drop across the carbon adsorbers is minimal, most likely less than a couple of inches of water column. Each system consists of two carbon canisters in series. The 200 pound canisters are connected by 2" PVC pipe, while the 2,000 pounders are connected by 4". The maximum measured flowrate through one of the systems at one time was 0.2 cfm. According to vendor supplied pressure drop curve, this flow rate will produce minimal pressure drop in the carbon canisters. The pressure drop through the 2" and 4" pipe connecting these units is expected to be negligible at this low flowrate.

APCS Monitoring:
Each of these carbon adsorbers consists of two adsorbers in series. Currently, refinery personnel and contractors periodically monitor the outlet of the second adsorber (the outlet to atmosphere) to demonstrate compliance with the requirements of SCAQMD Rule 1176 and the Benzene Waste Operations NESHAP (BWON). For 1176, the refinery monitors the outlet VOC concentration of the adsorbers using a portable analyzer according to Method 21. For BWON, the refinery uses a portable gas chromatograph (GC) to measure the outlet benzene concentration. The refinery currently conducts the 1176 and BWON monitoring monthly.

Rule 1176 requires monitoring of the outlet of the second carbon adsorber by one of two methods. Rule section (h)(1) specifies Method 21 VOC monitoring, while (h)(2) specifies collection and analysis of a sample by the "District Grab Sample Method." With either method, the VOC concentration can not exceed 500 ppmv above background. Although all of the reported VOC monitoring were determined using Method 21, Chevron would like to retain the option of taking Grab Samples since the specified analysis methods, EPA Method 25 or District Test Method 25.1, discount the contribution of methane that can occur naturally in wastewater systems.

Refinery personnel and contractors don't regularly monitor the carbon beds for $H_2S$ since the systems are in place for controlling VOC and benzene emissions.

**Appendix F** contains the two years (6/2006 – 6/2008) of monitoring results for the carbon systems: LPDU-1, 3, 4, & 5; ISO-1, 2, & 3; Lab / Clinic; and CSA-1. Along with monitoring results, Table 3 below summaries the number of carbon replacements, the maximum VOC concentration at the outlet of the second adsorber and benzene concentration at the inlet of the second adsober during such period.

The inlet concentrations of benzene measured in December, 2006 were included in the monitoring results in **Appendix F**. They are lower than 10 ppm for seven of these nine systems, except for LPDU-5 and Isomax-3. The exit concentration of benzene from the second carbon canister of each of the carbon adsorption systems is said to be nil (0 ppmv). The carbon bed breakthrough has been the result of the excess of VOC 500 ppmv limit. Five systems, including LPDU-1, Isomax-1, Isomax-2, Lab/Clinic and

CSA-1, the carbon bed breakthrough did not occur during the period of two years. However, for LPDU-3, LPDU-4, LPDU-5 and Isomax-3, multiple numbers of replacements of carbon bed took place and the above table showed the maximum VOC concentration right before the carbon bed changeout. The outlet VOC concentration reached to 34396 ppm when the carbon bed breakthrough was detected in one case. The monitoring results after replacement are typically well below the 500 ppmv VOC limit.

**Table 3. Summary of monitoring results during June 2006 through June 2008**

| Carbon Adsorber ID # | Max Outlet VOC Concentration (ppm) | Max Inlet Benzene Concentration (ppm) | Number of Replacements |
|---|---|---|---|
| LPDU-1 | 235 | 0.01 | None |
| LPDU-3 | 2911 | 0.04 | 7 |
| LPDU-4 | 34396 | 0.02 | 8 |
| LPDU-5 | 5412 | 0.04 | 14 |
| Isomax-1 | 96 | Not detectable | None |
| Isomax-2 | 15 | Not detectable | None |
| Isomax-3 | 1149 | Not detectable | 3 |
| Lab / Clinic | 126 | Not detectable | None |
| CSA-1 | 67 | 1.84 | None |

**Appendix F** also includes the monitoring results of VOC and Benzene concentration from 1/2008 to 12/2012. The summary of the monitoring results was shown in Table 4. The records show that Chevron have changed out the carbon in 5 systems in the last 5 years due to breakthroughs. Three of these breakthroughs were for benzene concentrations measured between the primary and secondary canisters and two were for VOC concentrations at the outlet of the secondary canister exceeded the 500 ppmv rule limit. The exit concentration of benzene from the second carbon canister of each of the carbon adsorption systems has always been 0 ppmv. Chevron believes that the current monthly monitoring program more than adequately maintains these systems below this limit and that an increase in monitoring frequency would provide little or no benefit.

**Table 4. Summary of monitoring results during January 2008 through January 2012**

| Carbon Adsorber ID # | Max Outlet VOC Concentration (ppm) | Max Inlet Benzene Concentration (ppm) | Number of Replacements | Note |
|---|---|---|---|---|
| LPDU-1 | 81 | Not detectable | 0 | |
| LPDU-3 | 323 | Not detectable | 0 | |
| LPDU-4 | 1470 | Not detectable | 1 | Carbon changed due to VOC reading |
| LPDU-5 | 523 | Not detectable | 1 | Carbon changed due to VOC reading |
| Isomax-1 | 362 | Not detectable | 0 | |
| Isomax-2 | 213 | 16.7 | 1 | Carbon changed due to Benzene reading |
| Isomax-3 | 412 | 22.16 | 1 | Carbon changed due to Benzene reading |
| Lab / Clinic | 276 | 0.24 | 0 | |
| CSA-1 | 126 | 5.2 | 1 | Carbon changed due to Benzene reading |

It is noticed that the VOC concentration in the monitoring records goes up to, for example, over 300 ppm in one month and goes down below 100 ppm in the next month without any indication of carbon change out. However, the fluctuations in carbon outlet concentrations are normal for systems like these passive carbon adsorbers on drain system vents. The fluctuation in outlet readings most likely occurs because the inlet VOC concentration, flowrate, moisture content, and temperature vary over time. As a result, the outlet concentrations also vary. By contrast, carbon systems hooked to industrial processes with more uniform inlet conditions exhibit a more predictable or expected outlet concentration – no or low outlet VOC until the bed is near saturation followed by a relatively quick increase to the breakthrough concentration.

Comparing two sets of monitoring data provided, it is observed that the performance of the carbon systems have greatly improved over the last 5 years. Chevron was not able to find causal links between the drain system management and carbon system performance because of the complexity of the drain system. However, Chevron believes this improvement is almost certainly due to improvements in the management of their drain system.

Field Visit

A field visit to Chevron was taken on January 31, 2013 to inspect the nine sets of carbon adsorbers. The field visit report is included in **Appendix G**. Chevron was questioned why they changed out the LPDU-3, 4 and 5 carbon adsorbers at that time which made these carbon adsorbers unavailable to be inspected by the District's inspector. Chevron explained that they changed these carbon beds because they looked a little old and rusty – particularly the canister lids. It was not due to a breakthrough. Chevron explained further that this is what they run into when the carbon adsorbers operate several years without a breakthrough.

**EMISSION CALCULATION:**

The maximum exhaust flowrate of the contaminated gases vented to the carbon adsorbers connected to the junction boxes, based on actual field measurements, is reported to be well below 1.0 cfm (0.02 to 0.2 cfm). Based on the monitoring data submitted, the exit concentration of benzene from the second carbon canister of each of the carbon adsorption systems is said to be nil (0 ppmv). The carbon canisters are also said to be replaced when the final exhaust concentration of VOC exceeds 500 ppmv. Under this scenario, and for purposes of rough estimation, the following parameters would be used for the emission calculation: Operating Schedual – 24 hrs/day, 365 days/yr and outlect contions – 20 ˚C (527.67 ˚R) and 14.7 pisa.

For each carbon adsorption system:

| **Pollutant** | **MW** | **Expected Max Outlet Conc. *x*, ppmv** | **Exhaust Flowrate, cfm** | **Max Emissions pounds/hour** | **Max Emissions pounds/day** | **Max Emissions pounds/year** |
|---|---|---|---|---|---|---|
| VOC | **16** | 500 | 1 | 0.00125 | 0.0299 | 10.92 |
| Benzene | **78** | 1 | 1 | 0.0000122 | 0.000292 | 0.106 |

$$Emission\left(\frac{lb}{hr}\right)=1\cdot\left(\frac{ft^3}{\min}\right)\times\frac{x}{1000000}\times\frac{60\min}{hr}\times\frac{14.7\,psia}{10.73\frac{psia\cdot ft^3}{^\circ R\cdot lbmol}\times 527.67^\circ R}\times MW\frac{lb}{lbmol}$$

Based on the calculated maximum emissions of benzene on an hourly and annual basis, these emissions are below their respective 100 meter Tier I screening levels as found in Table 1A of PERMIT APPLICATION PACKAGE "L" For Use in Conjunction with the RISK ASSESSMENT PROCEDURES for Rules 1401 and 212 Version 7.0 (see table below)

| | **Benzene Max Emissions** | **Benzene Table 1A 100 meter Screening Emission Level** |
|---|---|---|
| lb/hr | 0.0000122 | 3.96 |
| lb/yr | 0.106 | 8.92 |

Since the maximum expected emissions would be less than its corresponding screening value, no further health risk analysis or Tier II Screening Level Assessment is required.

**EVALUATION:**

The carbon adsorption systems are mainly used for the control of VOC and benzene emissions from the wastewater systems, specifically from junction boxes, to comply with Rule 1176 and 40 CFR 61 Subpart FF (National Emission Standard for Benzene Waste Operations) control requirements. Since these APC systems serve existing sources and they do not contribute to the emissions from the source, no emission increases would be reported for NSR purposes.

Both Rule 1176 and 40CFR 61 Subpart FF require the owner of the refineries to operate the individual drain system including junction boxes with a closed-vent system that routes all organic vapor to a control device. Chevron chose the control device to be carbon adsorption system. The compliance with the rule and regulation can be met by either limiting the VOC emission to be less than 500 ppmv above background or keeping the control efficiency of at least 95% for VOC or 98% for benzene. However, for practical purposes, the limit imposed in the permit condition is only the VOC emission limit of less than 500 ppmv above background.

For the carbon adsorber systems installed on the wastewater junction boxes, the outlet VOC emissions are usually not monitored continuously. So the adequate recording keeping and periodic monitoring for breakthrough becomes crucial to keep the system in compliance and minimize the air pollution. Rule 1176 requires the frequency of monitoring shall be at least monthly. This is what Chevron currently has been doing for periodic monitoring. Based on the carbon replacement records for 2008 through 2012, 5 systems had one breakthrough over the five-year period. Per Subpart FF § 61.354 (d), the device shall be monitored on a daily basis or at intervals no greater than 20 percent of the design carbon replacement interval, whichever is greater. Comparing the monitoring requirements between Rule 1176 and Subpart FF, the monthly monitoring in Rule 1176 is more stringent and conservative. Therefore, it is recommended the subject carbon adsorbers be kept on their monthly monitoring schedule.

The junction boxes served by the subject APC systems handle benzene-containing wastes that are subject to 40 CFR 61 Subpart FF. However, no benzene concentration requirement is set in this Subpart. Compliance with this regulation can be achieved by limiting the VOC emission.

It is expected with proper maintenance and operation of the said APC systems, the subject junction boxes and APC systems connected to them will comply with Rule 1176 and 40CFR 61 Subpart FF. Based on the above evaluation and the information provided by Chevron, the continued operation of the subject systems should comply with the District Rules and Regulations as shown below:

**Rule 212:** No public notice is required because no emission increase is expected from the equipment since it is for the carbon adsorbers to control emission from the existing junction boxes. The controlled toxic emission from the equipment is very minimal which would not require further health risk analysis. Also, the equipment is not located within a 1,000-ft. of a school.

**Rule 401:** No visible emission to violate this rule is expected.

**Rule 402:** No nuisance problem is expected.

**Rule 1176:** **VOC Emissions from Wastewater Systems**

The junction boxes served by the subject APC systems are considered as drain system components subject to control under this rule.

*(e)(5)* Junction boxes:

*(A)* Junction boxes shall be totally enclosed with a solid, gasketed, fixed cover or a manhole cover. Each fixed cover shall be allowed to have an open vent pipe no more than four inches in diameter and at least three feet in length. Each manhole cover on junction boxes shall be allowed to have openings totaling no more than 12 square inches. The manhole cover shall remain fully closed, except when opened for active inspection, maintenance, sampling, or repair.

*(e)(6)* APC Devices shall meet **one** of the following requirements:

*(A)* An APC device receiving vapors from a closed vent system shall achieve a control efficiency of 95 percent by weight or greater of VOC. An annual performance test shall be conducted to determine the APC device control efficiency according to the test method specified in paragraph (h)(3).

*(B)* The outlet of the APC device shall not emit VOC emissions measured pursuant to paragraphs (h)(1) or (h)(2) to be greater than 500 ppm above background. The frequency of monitoring shall be at least monthly.

*(h)* Test Methods

*(1)* EPA Reference Method 21:

*(2)* District Grab Sample Method:

*(3)* EPA Reference Method 25

Based on monitoring data from 2008 to 2012 on the control equipment, monthly monitoring schedule was suggested in the condition D90.X. With proper monitoring, maintenance and operation of the subject APC systems, continued compliance with the 500 ppmv VOC limit of this rule is expected.

**Reg. XIII:** **New Source Review**

Emission Increase: Decreases in VOC emissions are expected as the results of the installations of the carbon adsorbers on existing junction boxes in the wastewater treatment systems. Therefore, BACT and emission offset are not required.

Modeling: There is no VOC dispersion modeling required under R1303(b)(1), Appendix A.

Sensitive Zone Requirements – Not applicable because no ERC is required for this application.

Facility Compliance - Not applicable since there is no emission increase from the APC equipment

**Rule 1401:** Potential toxic emissions from the existing junction boxes are expected to be reduced. As discussed above, benzene emissions from the junction boxes are within the Tier I prescreening thresholds and thus no further health risk analysis is required.

**CEQA:** The proposed modification is not a significant project or part of a significant project requiring a CEQA document.

**Reg. XX:** RECLAIM rules do not apply since the modification does not affect NOx and SOx emissions from the facility. The facility, however, is covered by a RECLAIM Permit that would incorporate this change.

**Reg. XXX:** Chevron has been issued an initial Title V permit effective 9/1/09. This application is considered a Minor Permit Revision per District Rule 3000(b)(15). This means that EPA review of the application is required, as per Rule 3003(j)(1)(A).

**40 CFR 61** **National Emission Standards For Hazardous Air Pollutants**
**Subpart FF** **National Emission Standard for Benzene Waste Operations**

§ 61.346 Standards: Individual drain systems

*(a)(1)* The owner or operator shall install, operate, and maintain on each drain system opening a cover and closed-vent system that routes all organic vapors vented from the drain system to a control device.

*(i)* The cover and all openings (e.g., access hatches, sampling ports) shall be designed to operate with no detactable emissions as indicated by an instrument reading of less than 500 ppmv above background.

*(ii)* The control device shall be designed and operated in accordance with §61.349 of this subpart.

§ 61.349 Standards: Closed-vent systems and control devices

*(a)(2)(ii):* A vapor recovery system (e.g., a carbon adsorption system or a condenser) shall recover or control the organic emissions vented to it with an efficiency of 95 weight percent or greater, or shall recover or control the benzene emissions vented to it with an efficiency of 98 weight percent or greater. With two activated carbon adsorbers arranged in series and very low flow rate of vent gas, the APC systems are expected to achieve the control efficiencies specified by this provision.

§ 61.354 Monitoring of operations

*(d)* For a carbon adsorption system that does not regenerate the carbon bed directly on site in the control device (e.g., a carbon canister), either the concentration level of the organic compounds or the concentration level of benzene in the exhaust vent stream from the carbon adsorption system shall be monitored on a regular schedule, and the existing carbon shall be replaced with fresh carbon immediately when carbon breakthrough is indicated. The device shall be monitored on a daily basis or at intervals no greater than 20 percent of the design carbon replacement interval, whichever is greater. As discussed above, a monthly monitoring frequency is the greater interval for of the carbon adsorbers.

§ 61.355 Test methods, procedures, and compliance provisions

*(h)* An owner or operator shall test equipment for compliance with no detectable emissions as required in §§61.346 in accordance with the requirements in this section. The approved test method of the concentration level of the organic compounds is the Method 21 from appendix A of 40 CFR part 60.

The subject APC systems serve wastewater junction boxes that are subject 40 CFR 61, Subpart FF.

**RECOMMENDATION:**

Based on the foregoing, it is recommended that Permits to Operate (P/O no P/C) be issued for the carbon adsorber APC systems subject to the conditions indicated on pages 3 to 4.

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# APPENDIX A

Compliance History

# APPENDIX B

Summary of Nine Applications Previously Submitted

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Location of Each Junction Box/Carbon Adsorber

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