**OKLAHOMA DEPARTMENT OF ENVIRONMENTAL QUALITY**
**AIR QUALITY DIVISION**

**MEMORANDUM** **February 5, 2018**

**TO:** Phillip Fielder, P.E., Permits and Engineering Group Manager

**THROUGH:** Phil Martin, P.E., Manager, Existing Source Permits Section

**THROUGH:** Amalia Talty, P.E., Existing Source Permits Section

**FROM:** David Schutz, P.E., New Source Permit Section

**SUBJECT:** Evaluation of Permit Application No. **2010-599-C (M-8)(PSD)**
HollyFrontier Tulsa Refining LLC (Formerly Holly Refining & Marketing)
Tulsa Refinery West
Expansion of Tulsa Refinery
1700 South Union
Tulsa, Tulsa County, OK (36.13765° N, 96.01154° W)
FAC ID 1477

## SECTION I. INTRODUCTION

HollyFrontier Tulsa Refining (HFRT) has requested a modification to their PSD construction permit, Permit No. 2010-599-C (M-7)(PSD) issued January 8, 2016. The overall project will now involve the following units:

- The MEK Unit itself has fugitive VOC leakage components in EUG-7. The component counts are being updated. The "MEK Unit" uses methyl ethyl ketone to extract wax from paraffins from the Lube Extraction Unit (LEU). Since the unit was considered "modified" previously, making it subject to NSPS Subpart GGGa, the counts update is not a "modification" in the context of NSPS but does change emission rates.

- The external shell of the Crude Distillation Unit (CDU) will be repaired. The permit application is treating this repair project as a "life extension" project subject to PSD permitting analyses. The primary effect of this change is moving the fugitive components from EUG-7 to EUG-8; all other changes in throughputs and emissions are part of the overall project to expand the refineries.

- The HFTR-West Refinery Asphalt Truck Loading Dock has four bays. Since about 1992, only one bay has been needed; the other three have been out of service. One of the out of service bays has been reactivated, and an additional loading bay was installed in August 2016. The re-activated and new bays allow East Refinery VTB and PDA to be sent to the Coker. The resulting emissions have been added to EUG 32.

The two refineries owned by HFTR were acquired at separate times, therefore, are permitted separately. The loading terminal is owned operated by HEP, resulting in another separate permit for it. However, the two refineries and loading terminal are interconnected and collocated, requiring that they be treated as a single facility when conducting a PSD analysis. For the purpose of the PSD analysis only, HFTR and HEP together are at times referred to as "Holly."

Part of the change in the net emissions change analysis involves a heater at the East Refinery. A heater designated 1H-101 in EUG-27 serving the Distillate Hydrotreating Unit (DHTU) was previously stated as having a capacity of 55 MMBTUH, but the firing rate is being corrected to 80 MMBTUH. Although the heater is not being physically modified, the different capacity will impact previous PSD permit analyses including emissions changes and ambient impacts. Additionally, the emissions from the sulfur recover unit (SRU-2) have been updated to reflect the results of the stack test plus a safety factor and modeling changes were incorporated to reflect the reduction in FCCU heater stack height.

HFTR and HEP proposed a construction project to expand the refineries and loading terminals. The project commenced in the 2014-2015 time frame. There will be new process units added and modification of existing process units such that the total capacities of the refineries will be increased to 170,000 BPD from the current capacity of 160,000 BPD. There will be "associated" emissions increases from most units in the refinery, excepting those emissions units which are independent of unit process rates such as emergency engines, fugitive VOC leakage from valves, flanges, etc.

The six proposed changes to the two PSD permits (three at the West Refinery and three at the East Refinery) are evaluated in the following updated PSD analysis.

The net emissions change analysis applies to all three, and all PSD analyses other than BACT will encompass all three facilities. The BACT analysis in this permit will be limited to the types of units being added to the West Refinery. Reductions required for netting have been added to the East Refinery construction permit.

Over the previous 5 years, there have been multiple construction projects which were subject either to PSD review or to requirements to keep records of actual emissions to show that the difference between Baseline Actual Emissions and Actual Emissions did not exceed PSD levels of significance. Those permits will be superseded by this construction permit, incorporating those preceding changes as part of the "net emissions changes" in the PSD netting analysis.

The proposed project is subject to Prevention of Significant Deterioration (PSD) review for added emissions of greenhouse gases (GHG), carbon monoxide (CO), nitrogen oxides (NOx), and particulate matter ($PM_{10}$ / $PM_{2.5}$). Full PSD review consists of:

**A.** determination of best available control technology (BACT)
**B.** evaluation of existing air quality and determination of monitoring requirements
**C.** evaluation of PSD increment consumption
**D.** analysis of compliance with National Ambient Air Quality Standards (NAAQS)
**E.** ambient air monitoring
**F.** evaluation of source-related impacts on growth, soils, vegetation, visibility

**G.** evaluation of Class I area impacts.

The refinery will also accept NSPS Subpart Ja limits on $SO_2$ emissions on all fuel gas combustion devices to net out from PSD for $SO_2$. New tanks will be added to the West Refinery, but the final designs are not yet ready. As an interim measure, a limit of 26.7 TPY VOC from the new tanks will be established.

## SECTION II. FACILITY DESCRIPTION

HFTR's crude is received by pipeline and tanker truck. The crude is a mixture of purchased crude oils from various sources, which, when blended, has the required properties to make the petroleum products. Refinery fuel gases, propane, butane, isobutane, normal butane, gasolines, kerosene, No. 2 fuel oil, paraffin wax, petroleum coke, and Lube Extracted Feedstock (LEF) are some of the current byproducts from making the lube oils. LEF is a mixture of unfinished streams that may also be transferred to third party purchasers.

The specific types of refining process and support facilities in current use in the HFTR West Refinery are discussed in the following paragraphs. All of the process units and associated support equipment at HFTR operate as a whole (one primary operating scenario). Individual units or pieces of equipment undergo periodic scheduled shutdown for maintenance, but no one unit or piece of equipment has any permit restrictions on potential operating hours. Therefore, total potential operating hours per year for all equipment is 24 hours per day, seven days per week, for every day of the year.

### A. Crude Distillation Unit (CDU)

The Crude Distillation Unit is the first process and is used to separate crude oil or mixtures of crude and other purchased crude fractions into specific boiling-range streams suitable either for further processing in downstream units or in some cases, for direct sale after mild treating or blending. The primary equipment associated with this operation is a main atmospheric pressure fractionator, a light ends fractionator called the "stabilizer tower," and two in-series vacuum distillation units. The atmospheric tower recovers streams that boil at approximately atmospheric pressure. The stabilizer tower feeds overhead gas to the crude tower and, at high pressure, effects a first separation of gases (which go to the refinery fuel gas system) from crude gasoline. The vacuum towers recover high boiling point fractions that can be recovered only by lowering the pressure and operating at elevated temperatures. The energy for the distillation steps is provided by a main crude heater and two vacuum charge heaters, all gas fired. Other equipment important to crude and vacuum distillation is an extensive heat exchange system, a crude desalter system, and a vacuum producing system.

### B. Light Ends Recovery Unit (LERU)

The light gases from the Crude Unit Stabilizer are processed in a deethanizer tower and a depropanizer tower in the LERU. The deethanizer is a high-pressure fractionator that separates ethane and lighter fuel gases from propane and heavier hydrocarbons. The depropanizer tower is a pressurized tower that fractionates deethanizer bottoms into a liquid propane stream and a liquid mixed butane/pentane stream. The propane is treated with potassium hydroxide for sulfur removal, stored in tankage, and sold as commercial liquefied petroleum gas (LPG). The mixed

butane/pentane from the depropanizer is stored in pressurized storage prior to further fractionation. Energy for the LERU process is provided by steam passing through reboilers (heat exchangers).

**C. Isomerization Unit Towers**

The isomerization reactors are shut down, but an associated fractionation system for separating manufactured and natural isobutane from normal butane remains in operation. Feed is the LERU butane/pentane stream from storage. The butane/pentane is brought from storage and treated with potassium hydroxide for sulfur removal and fed to the deisobutanizer which first creates a propane/isobutane feed for a depropanizer that separates propane as an overhead stream from isobutane as a bottoms stream. The propane is stored and sold as LPG. The isobutane is stored in a pressurized tank and sold as isobutane. Deisobutanizer bottoms are fed to a debutanizer for recovery of normal-butane as an overhead product (to sales or to gasoline blending), and pentane bottoms which goes to gasoline blending.

**D. Depentanizer and Naphtha Splitter**

The Crude Unit Stabilizer tower bottoms charge the fraction tower called the de-pentanizer. This de-pentanizer makes an overhead liquid stream called light straight run gasoline which goes to gasoline blending. Bottoms, called naphtha, are split via level control with part going to the Unifiner and part to Lube Extracted Feedstock (LEF) and shipped to the Sunoco Toledo Refinery or other third party purchasers. Splitter bottoms join crude naphtha as feed to the downstream Unifiner Unit. Energy for the de-pentanizer is supplied by a gas fired heater.

**E. Unifiner**

The Unifiner Unit has the purpose of treating naphtha from the Crude Unit and the depentanizer bottoms in preparation for conversion to high-octane gasoline in the downstream No. 2 Platformer Unit. The Unifiner includes a hydrogen-treating reactor that removes sulfur and other contaminants that would be detrimental to the downstream Platformer. Other major equipment includes a hydrogen compressor, gas/liquid reactor effluent separator vessels, a stripper column to remove gases from the reactor product, and heat exchange systems. Two gas-fired heaters supply energy for the reactors and stripper column.

**F. No. 2 Platformer**

Unifiner effluent charges the Platformer, which catalytically converts the low-octane paraffin hydrocarbons to high-octane aromatics for gasoline blending. Naphtha feed is preheated by heat exchange, charged to a series of four endothermic catalytic reactors (four gas-fired heaters supply the heat of reaction), flashed to separate gas from product, and distilled through a debutanizer tower. The debutanizer is energized by a gas-fired reboiler heater. Hydrogen and other light gases are by-products that are primarily sent to refinery fuel gas, although a hydrogen-rich stream is used to provide hydrogen to the Unifiner reactors and the lube hydrotreater.

**G. Lube Oil Extraction and Hydrogenation**

This unit is charged with vacuum gas oil fractions and paraffinic deasphalted oil which flows into two parallel counter-current solvent extraction towers that utilize furfural as a solvent. As a result, two streams are produced, a waxy paraffinic stream suitable for lube oil manufacture and an aromatic stream that is either blended with lube oil extracted feedstock for pipeline shipment to the Sunoco Toledo Refinery or sold as extract product. The waxy paraffinic stream is fed to a hydrogenation unit to improve its stability and remove impurities before going to a downstream dewaxing operation. The hydrotreater is a fixed bed catalytic unit that uses hydrogen from the No. 2 Platformer. The unit employs towers, vessels, heat exchangers, pumps, etc., to remove and recycle the furfural solvent from the product streams. Three gas-fired heaters provide energy for the process.

**H. MEK Dewaxing Unit**

This unit removes wax from the hydrotreated paraffins from the Lube Extraction Unit. The process employs two solvents in mixture, toluene and methyl-ethyl-ketone. Fabric filters on rotating drums are used to physically separate wax from oil. A propane refrigeration system provides cooling to effect wax precipitation out of oil/wax solutions. Paraffin streams are fed in blocked out batches (the boiling range of the various batches having been set when recovered as separate streams at the Crude Unit vacuum towers). The dewaxed oil batches are stored and used for finished lube oil blending. The deoiled wax batches are stored and sold as various melt point products. The unit equipment includes oil/solvent contactors, rotating drum fabric filters, towers and vessels for solvent recovery and recycle, a propane refrigeration compressor system, a flue gas compressor system associated with the fabric filters, pumps, heat exchangers, etc. Two gas fired process heaters are employed, one for oil/solvent separation, and one for soft wax/solvent separation.

**I. Coker Unit**

HFTR's Coker Unit produces solid coke particles in a batch process. The Coker Unit equipment list includes two gas fired process heaters, two coke drums, a main fractionator, and other towers, vessels, pumps, heat exchangers, etc. The Coker Unit alternates the process between two vessels called drums. One drum is being charged for processing while the other is being emptied or "de-headed." The process begins by charging one of the coke drums with the asphaltic stream from the Deasphalting Unit. The process thermally separates the heavy molecules into carbon (coke) and light hydrocarbons. The charge is heated to 900°F using two gas-fired process heaters and then is allowed to have residence time while the coke and the light hydrocarbons separate. The light hydrocarbons flow to the product fractionation system (a part of the Coker Unit) for separation into gas for refinery fuel, and liquids which are pipe to the Sunoco Toledo Refinery or to third party purchasers, and gasoline for recovery back through the Crude Unit stabilizer. After a drum is de-headed it is cleaned out with steam for the next batch. Coke is stored in piles on-site, for bulk shipment by rail or trucks. Air emissions from handling the finished coke are insignificant.

**J. ROSE Unit**

The existing Propane Deasphalting Unit (PDA) will be modified and expanded to be a ROSE Unit. Residuum Oil Supercritical Extraction (ROSE) is a process where a light, condensable hydrocarbon such as liquid propane or isobutene is used to treat the "residuum oil," or bottoms from the vacuum distillation unit. Residuum contains a mixture of heavy oils from which FCCU feed ("gas oil") can be separated from asphaltenes. The process mixes the light hydrocarbon with the residuum, extracting the gas oil from the asphaltenes. Asphaltenes are processed off-site to produce road and roofing asphalt, and the light hydrocarbon is evaporated out from the gas oil. The light hydrocarbons are condensed back to liquids then recycled to the process. The unit capacity, as a PDA Unit, is 12,000 BPD; it will be modified to 15,000 BPD capacity.

**K. Lube/Wax Blending and Sales/Service Operations**

This refinery produces finished paraffinic lubricating oils. These waxes are also an important by-product of lube oil manufacturing process. To provide the specialty products required by HFTR's diverse customers, there is a product blending and shipping operation at the site. The blending primarily occurs in cone roof tank areas. Packaging and package storage is conducted in the Lube Service Center building. Shipment is by bulk in tank trucks and tank railcars.

**L. Steam Generation**

There are four gas-fired boilers that produce steam for general refinery use. The individual boiler units are numbered Nos. 7, 8, 9 and 10.

**M. Wastewater Treatment**

Facility wastewaters are conveyed in combined storm/process sewers, through oil/water separators and to a treatment area that employs storm surge capacity, clarification, dissolved air floatation, equalization, and aerobic waste digestion. Treated water is discharged to the Arkansas River. Recovered sludges are deoiled at a centrifuge facility and the oil is fed to the Coker Unit or Crude Unit.

**N. Cooling Towers**

The refinery employs 8 non-contact cooling towers. These are systems that circulate captive waters that provide a heat sink for various process units or equipment. Water is circulated through heat exchangers to indirectly cool hydrocarbon or other streams. Hot water from these exchangers is collected by pipelines and sprayed over packed towers in counter current flow to atmospheric air. The evaporation of a portion of the hot (typically 100 to 120°F) circulated water provides cooling to about 85°F (summer) for recirculation back to the heat exchangers. The white plumes observed from these towers are the evaporated water that sometimes re-condenses cloud-like at certain atmospheric conditions. The cooling towers have not used chrome-based systems since before 1994 and are not subject to MACT Subpart Q.

**O. Flare Stacks**

The refinery employs three vertical, piloted flare stacks for the emergency containment and combustion of certain hydrocarbon releases. Various HFTR process equipment is fitted with pressure relief valves to protect against overpressure conditions. These pressure relief valve outlets discharge into a gas collection flare piping system. Each flare stack uses a continuous pilot light that assures ignition of any gaseous discharges. Each flare also uses a steam system that supplies steam for mixing with the gas being flared (as needed) to reduce/prevent the combustion products from smoking.

**P. Logistics and Storage**

The HFTR logistics system involves feed and product receipt and shipment systems, as well as extensive internal movements. Crude feed material is primarily received by pipeline into large tanks. Product shipments are also made by pipeline, tank truck, rail tank car, and package truck trailer. This refinery does not have a marine terminal. There is an extensive storage tank system that handles crude feeds, finished products, and process intermediates. Types of material are generally in common geographical areas, but there are many exceptions due to the long history of the site.

**Q. Sulfur and Other Impurity Treatments**

This refinery processes feeds that are low in sulfur content, and does not employ a fluid catalytic cracker or a large hydrotreater or hydrocracker. The refinery fuel gas loop shall meet the $H_2S$ limit set forth in 40 C.F.R. §60.104(a); and (b) at least 95% of the sulfur removed shall be recovered. Refined product sulfur impurities are addressed within specific process units by caustic or chemical treatment steps.

## SECTION III. PROPOSED PROJECT DESCRIPTIONS

The proposed projects for each facility are listed following. The new and modified units are categorized as combustion units (heaters); process units with fugitive VOC leakage from valves, flanges, etc.; the Fluid Catalytic Cracking Unit (FCCU); the Continuous Catalyst Regenerator serving the Platformer Unit; and storage tanks.

**West Refinery**

- Propane Deasphalter (PDA) Unit revamp and modification to become a Residuum Oil Supercritical Extraction (ROSE) Unit, with a new 76 MMBTUH HHV heater;
- A new 10 MMSCFD Hydrogen ($H_2$) Plant will be constructed, with a reformer heater sized at 125 MMBTUH. The heater will be fueled with natural gas or refinery fuel gas, which may include Pressure Swing Absorption (PSA) off-gas.
- New tanks will be added to the West Refinery, but the final designs are not yet ready. As an interim measure, a limit of 26.69 TPY VOC from the new tanks will be established.

**HEP (Loading Terminal and Storage)**
• A new 90,000 BPCD Inline Gasoline Blender.
• A new Propane Loading Unit will replace the existing Propane Loading Unit.
• Construction of new tanks with VOC emissions up to 22.1 TPY will be authorized, but specifications for the new tanks are not yet known.

**East Refinery**
• A new 10,000 BPCD Liquid Petroleum Gas (LPG) Recovery Unit charging 32 MMSCFD gas;
• A new 10,000 BPCD Residuum Oil Supercritical Extraction (ROSE) Unit with a new 42 MMBTUH HHV heater;
• Expanded Diesel Hydrotreater Unit (DHTU), with a new 50 MMBTUH HHV helper heater;
• Revamped FCCU, increasing process throughput from 24,000 BPCD to capacity of approximately 28,400 BPCD;
• Modified Naphtha Hydrodesulfurizer (NHDS) Unit, with a new 10 MMBTUH HHV helper heater;
• Modified Continuous Catalytic Reforming (CCR) Unit, with a new 25 MMBTUH HHV helper heater and re-rating of the existing 141.8 MMBTUH heater to 155 MMBTUH;
• A new Naphtha Fractionation Column which will require steam from facility boilers; and
• Expansion of the Alkylation (ALKY) Unit to 6,500 BPD, using steam from existing boilers for process heat;
• The CDU Atmospheric Tower Heater will be modified from 200 MMBTUH capacity to 248 MMBTUH capacity.

• Construction of new tanks with VOC emissions up to 1.24 TPY will be authorized, but specifications for the new tanks are not yet known.

## SECTION IV. EQUIPMENT AND EMISSIONS

HFTR is a Part 70 and PSD major facility for all criteria pollutants (including HAPs) except for $PM_{10}$ / $PM_{2.5}$ emissions.

The West Refinery emission sources may be grouped into three primary categories, as shown in the following list.

1. Combustion stack emissions from heaters and boilers (GHG, VOC, CO, PM, $NO_X$, $SO_2$). The refinery fires only gaseous fuels.
2. Fugitive emissions from valves, fittings, equipment seals, and other sources (VOC, including VHAP).
3. Emissions from hydrocarbon service storage tanks (VOC, including VHAP).

**Combustion Sources**
Combustion sources at the refinery are referred to either as "grandfathered" or "non-grandfathered." Since all boilers and heaters are subject to NESHAP Subpart DDDDD, these designations are for state regulatory and NSPS purposes. The grandfathered units are fueled by refinery fuel gas, which is composed of residual "off gases" from various refinery process units. These units do not have emissions limits in terms of pollutants. The permitted units burn commercial grade natural gas, its equivalent, or RFG.

**Fugitive VOC Leaks**
The refinery fugitive equipment is controlled by the existing LDAR program. The basis for the emission calculations shown in HFTR's emission tables to follow in this section are shown individually on each table.

The following list groups all facility EUGs.

**Grandfathered Fuel Burning Units**
EUG 1, Existing Refinery Fuel Gas Burning Equipment

**Non Grandfathered Fuel Burning Units**
EUG 1A, PH-4
EUG 2, Boilers #7, #8, and #9
EUG 2A, Boiler No. 10
EUG 3, #2 PLAT PH-5 Heater
EUG 3A, #2 PLAT PH-6 Heater
EUG 4, Coker H-3 Heater
EUG 5, Coker B-1 Heater
EUG 6, MEK H-101 Heater
EUG 37, CDU H-2, CDU H-3, and LEU H-102 Heaters
EUG-39, ROSE Unit Heater
EUG-40, Hydrogen Plant Heater

**Piping System Fugitives**
EUG 7, Refinery Fugitive Emissions Subject to NSPS
EUGs 8 and 9, Existing Refinery Fugitive Emissions

**Tank VOC Emissions**
EUG 18, 63.640 (Subpart CC), Existing Group 1 Internal Floating Roof Storage Vessels
EUG 19, 63.640 (Subpart CC) Existing Group 1 External Floating Roof Storage Vessels
EUG 20, 63.640 (Subpart CC) Group 2 Storage Vessels
EUG 21, NSPS 60.110b (Subpart Kb) Internal Floating Roof Storage Vessels Storing Volatile Organic Liquids (VOL) Above 0.75 psia Vapor Pressure
EUG 22, NSPS 60.110b (Subpart Kb) External Floating Roof Storage Vessel Storing VOL Above 0.75 psia Vapor Pressure
EUG 23, NSPS 60.110b (Subpart Kb) Storing VOL Below 0.507 psia Vapor Pressure
EUG24, NSPS 60.110a (Subpart Ka) Storage Vessels Storing Petroleum Liquids Below 1.0 psia Vapor Pressure

EUG 25, NSPS 60.110 (Subpart K) Storage Vessels Storing Petroleum Liquids Below 1.0 RVP
EUG 26, Internal Floating Roof Storage Vessels Subject to OAC 252:100-39-41
EUG 27, External Floating Roof Storage Vessels Subject to OAC 252:100-39-41
EUG 28, Cone Roof Tanks

**OTHERS**

EUG 11, Lube Extraction Unit (LEU) and Coker Flare Subject to 40 CFR 63, Subpart GGG, J/Ja
EUG 11A, Platformer Flare Suject to 40 CFR 60, Subpart Ja
EUG 12, Wastewater Processing System
EUG 13, Truck Loading Dock Subject to 40 CFR 63, Subpart CC
EUG 14, Group 1 Process Vents Subject to 40 CFR 63, Subpart CC
EUG 15, Group 2 Process Vents Subject to 40 CFR 63, Subpart CC
EUG 16, Process Vent Subject to 40 CFR 63, Subpart UUU by April 11, 2005
EUG 17, Coker Enclosed Blowdown
EUG 29, Pressurized Spheres
EUG 30, Pressurized Bullet Tanks
EUG 31, Underground LPG Cavern
EUG 32, Non-Gasoline Loading Racks
EUG 33, LPG Loading Racks
EUG 34, Cooling Towers
EUG 35, Oil/Water Separators Subject to OAC 252:100-37-37 and 39-18
EUG 36, Natural Gas Fired Engines
EUG 38, Internal Combustion Engines Subject to 40 CFR 63, Subpart ZZZZ

**New / Modified Units Emissions**

Emissions from the ROSE Unit heater and Hydrogen Unit heater are based on continuous operation at rated heat input, using NSPS Subpart Ja limits for $SO_2$ (162 ppm in RFG, 3-hour basis and 60 ppm in RFG, 365-day rolling average), and all other factors from Tables 1.4-1 and 2 of AP-42 (7/98). A heating value of 1020 BTU/SCF was used for refinery fuel gas.

**A. ROSE Unit Heater (EUG-39)**

| Unit Capacity | Pollutant | Emission Factor, lb/MMBTU | Emissions | |
|---|---|---|---|---|
| | | | lb/hr | TPY |
| 76 MMBTUH | $NO_X$ | 0.03 | 2.28 | 10.0 |
| | CO | 0.04 | 3.04 | 13.3 |
| | VOC | 0.0054 | 0.41 | 1.79 |
| | $SO_2$ | 0.026 hourly<br>0.0098 annual | 2.00 | 3.25 |
| | $PM_{10}$ / $PM_{2.5}$ | 0.0075 | 0.57 | 2.48 |
| | GHG | 163.29 | 12,410 | 54,356 |

**B. New Hydrogen Plant Heater (EUG-40)**

| Unit Capacity | Pollutant | Emission Factor, lb/MMBTU | Emissions | |
|---|---|---|---|---|
| | | | lb/hr | TPY |
| 125 MMBTUH | $NO_X$ | 0.03 | 3.75 | 16.4 |
| | CO | 0.04 | 5.00 | 21.9 |
| | VOC | 0.0054 | 0.67 | 2.95 |
| | $SO_2$ | 0.026 hourly<br>0.0098 annual | 3.30 | 5.34 |
| | $PM_{10}$ / $PM_{2.5}$ | 0.0075 | 0.93 | 4.08 |
| | GHG | 163.29 | 20,411 | 89,401 |

**C. ROSE Unit Heater Fugitive VOC Leaks (EUG-9)**

| EU | Description | Equipment | Number of Items | Emission Factor, lb/hr/source | Control Eff. | lb/hr | TPY |
|---|---|---|---|---|---|---|---|
| New ROSE Heater | VOC Leakage at ROSE Unit Heater | gas valves | 62 | 0.059 | 97% | 0.11 | 0.48 |
| | | lt liq valves | 76 | 0.024 | 97% | 0.04 | 0.16 |
| | | flanges | 292 | 0.00055 | 30% | 0.11 | 0.49 |
| | | lt liq pumps | 2 | 0.251 | 85% | 0.08 | 0.33 |
| | | gas relief valves | 6 | 0.35 | 97% | 0.06 | 0.28 |
| **TOTALS** | | | | | | **0.42** | **1.82** |

Control efficiencies are from TCEQ – Control Efficiencies for TCEQ Leak Detection and Repair Programs Revised 07/11 (APDG 6129v2).

**D. New Hydrogen Plant Fugitive VOC Leaks (EUG-7)**

| EU | Description | Equipment | Number of Items | Emission Factor, lb/hr/source | Control Eff. | lb/hr | TPY |
|---|---|---|---|---|---|---|---|
| New Hydrogen Plant | VOC Leakage at New Hydrogen Plant | gas valves | 250 | 0.059 | 97% | 0.44 | 1.94 |
| | | lt liq valves | 50 | 0.024 | 97% | 0.04 | 0.16 |
| | | flanges | 610 | 0.00055 | 30% | 0.23 | 1.03 |
| | | lt liq pumps | 2 | 0.251 | 85% | 0.08 | 0.33 |
| | | compressors | 1 | 1.399 | 85% | 0.21 | 0.92 |
| | | gas relief valves | 2 | 0.35 | 97% | 0.02 | 0.09 |
| **TOTALS** | | | | | | **1.02** | **4.47** |

### E. PDA / ROSE Unit Fugitive VOC Leaks (EUG-7)

| EU | Description | Equipment | Number of Items | Emission Factor, lb/hr/source | Control Eff. | lb/hr | TPY |
|---|---|---|---|---|---|---|---|
| PDA/ ROSE | VOC Leakage at PDA/ROSE Unit | gas valves | 30 | 0.059 | 97% | 0.05 | 0.23 |
| | | lt liq valves | 30 | 0.024 | 97% | 0.02 | 0.09 |
| | | flanges | 100 | 0.00055 | 30% | 0.04 | 0.17 |
| | | lt liq pumps | 2 | 0.251 | 85% | 0.08 | 0.33 |
| | | gas relief valves | 4 | 0.35 | 97% | 0.04 | 0.18 |
| **TOTALS** | | | | | | **0.23** | **1.01** |

### F. New Tanks (EUG-21, EUG-22, and EUG23)

New tanks will go into EUG-21 for internal floating roof tanks, EUG-22 for external floating roof tanks, or EUG 23 for cone roof tanks (low vapor pressure products such as diesel).

**Existing Facility Emissions**

Criteria pollutant emissions for EUG 1 are based on rated heat inputs, continuous operation, and Tables 1.4-1 and 2 of AP-42 (7/98) for all pollutants except $SO_2$, which is based on 162 ppm sulfur and 1020 BTU/SCF in the refinery fuel gas (RFG). The facility monitors the RFG system.

**EUG 1: EXISTING REFINERY FUEL GAS BURNING EQUIPMENT & POTENTIAL TO EMIT (PTE)**

| Constr. Date | MM BTUH | EU | Point ID | NOx | | CO | | $PM_{10}$ | | $SO_2$ | | VOC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 1961 | 160 | 201N | CDU H-1,N#7 | 44.6 | 195.4 | 13.7 | 60.6 | 1.21 | 5.33 | 4.80 | 21.03 | 0.88 | 3.89 |
| 1961 | 160 | 201S | CDU H-1,S#8 | 44.6 | 195.4 | 13.7 | 60.6 | 1.21 | 5.33 | 4.80 | 21.03 | 0.88 | 3.89 |
| 1957 | 36.7 | 206 | Unifiner H-2 | 3.70 | 16.20 | 3.20 | 14.00 | 0.28 | 1.22 | 1.10 | 4.82 | 0.20 | 0.90 |
| 1957 | 59.5 | 207 | Unifiner H-3 | 6.00 | 26.30 | 5.10 | 22.30 | 0.45 | 1.98 | 1.79 | 7.82 | 0.33 | 1.50 |
| 1957 | 86.8 | 209 | #2 Plat PH-1/2 | 8.70 | 38.00 | 7.50 | 32.90 | 0.66 | 2.89 | 2.60 | 11.41 | 0.48 | 2.10 |
| 1957 | 36.3 | 210 | #2 Plat PH-3 | 3.60 | 15.80 | 3.10 | 13.60 | 0.28 | 1.22 | 1.09 | 4.77 | 0.20 | 0.90 |
| 1971 | 25.6 | 214 | #2 Plat PH-7 | 2.60 | 11.40 | 2.20 | 9.60 | 0.20 | 0.85 | 0.77 | 3.36 | 0.14 | 0.60 |
| 1963 | 22.4 | 242 | LEU H101 | 2.20 | 9.60 | 1.92 | 8.30 | 0.17 | 0.75 | 0.67 | 2.94 | 0.12 | 0.53 |
| 1963 | 22.4 | 244 | LEU H-201 | 2.20 | 9.60 | 1.90 | 8.30 | 0.17 | 0.75 | 0.67 | 2.94 | 0.12 | 0.53 |
| 1960 | 49.0 | 246 | MEK H-2 | 4.9 | 21.5 | 4.20 | 18.4 | 0.37 | 1.63 | 1.47 | 6.44 | 0.27 | 1.20 |
| **Totals** | | | | **123.1** | **539.2** | **56.52** | **248.6** | **5.00** | **21.95** | **19.76** | **86.56** | **3.62** | **16.04** |

CDU H-1 has two stacks, H-1 North and H-1 South.

**EUG 1A: MODIFIED REFINERY FUEL GAS BURNING EQUIPMENT & POTENTIAL TO EMIT (PTE)**

| Constr. Date | MFR, BTUH, MM | EU | Point ID | NOx | | CO | | $PM_{10}$ | | SOx | | VOC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 1957 | 44.8 | 211 | #2 Plat PH-4 | 4.48 | 19.62 | 3.76 | 16.48 | 0.34 | 1.49 | 1.16 | 1.92 | 0.25 | 1.08 |

**EUG 2: NON-GRANDFATHERED BOILERS & PTE**

| CD | EU | Point ID | CO | | NOx | | $PM_{10}$ | | SOx | | VOC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 1975 | 109 | #7 Boiler*, 150 MMBTUH | 12.6 | 55.2 | 30.00 | 131.4 | 1.12 | 4.90 | 3.90 | 17.08 | 0.83 | 3.62 |
| 1976 | 110 | #8 Boiler*, 150 MMBTUH | 12.6 | 55.2 | 30.00 | 131.4 | 1.12 | 4.90 | 3.90 | 17.08 | 0.83 | 3.62 |
| 1976 | 111 | #9 Boiler*, 150 MMBTUH | 12.6 | 55.2 | 30.00 | 131.4 | 1.12 | 4.90 | 3.90 | 17.08 | 0.83 | 3.62 |
| **TOTALS** | | | **37.8** | **165.6** | **90.0** | **394.2** | **3.36** | **14.7** | **11.70** | **51.24** | **2.49** | **10.86** |

* subject to NSPS Subpart J.

**EUG 2A: BOILER SUBJECT TO NSPS Db and Ja**

| CD | EU | Point ID | CO | | NOx | | $PM_{10}$ | | $SO_2$ | | VOC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 2013 | --- | #10 boiler, 215 MMBTUH | 18.06 | 79.10 | 12.88 | 39.00 | 1.63 | 7.16 | 5.59 | 9.23 | 1.18 | 5.18 |

Criteria pollutant emissions for EUG 3 & 3A are based on continuous operation at listed rated heat input, using factors taken from Tables 1.4-1 and 2 of AP-42 (7/98) with the exception of $SO_X$. $SO_X$ emissions are based on continuous operation at rated heat input and the 162 ppm sulfur limit in NSPS Subpart J. PH-6 is not subject to NSPS Subpart J.

**EUG 3: #2 PLAT PH-5 HEATER NSPS J (AUTHORIZED EMISSIONS IN TPY)**

| CD | EU | Point ID | CO | NOx | $PM_{10}$ | $SO_2$ | VOC |
|---|---|---|---|---|---|---|---|
| 1990 | 212 | #2 Plat PH-5 65.3 MMBTUH | 23.55 | 28.04 | 2.13 | 7.43 | 1.54 |

**EUG 3A: #2 PLAT PH-6 HEATER STATE (AUTHORIZED EMISSIONS IN TPY)**

| CD | EU | Point ID | CO | NOx | $PM_{10}$ | $SO_2$ | VOC |
|---|---|---|---|---|---|---|---|
| 1957 | 213 | #2 Plat PH-6 34.8 MMBTUH | 12.55 | 14.94 | 1.14 | 3.96 | 0.82 |

Emissions for EUG 4 are based on continuous operation at rated heat input, using manufacturer's suggested emission factor for $NO_X$, VOC, and CO, NSPS Subpart Ja compliant fuel, and $PM_{10}$ from Table 1.4-2 of AP-42 (7/98).

**EUG 4: COKER H-3 HEATER & PTE**

| CD | EU | Point ID | CO | | NOx | | $PM_{10}$ | | $SO_2$ | | VOC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 1995 | 224 | Coker H-3, 32.2MMBTUH | 2.70 | 11.85 | 3.22 | 14.10 | 0.25 | 1.07 | 0.84 | 1.38 | 0.18 | 0.78 |

Emissions for EUG 5 and 6 are based on continuous operation at rated heat input, using 162 ppm Subpart J for $SO_2$, and all other factors from Tables 1.4-1 and 2 of AP-42 (7/98).

**EUG 5: COKER B-1 HEATER & PTE**

| CD | EU | Point ID | CO | | NOx | | $PM_{10}$ | | $SO_2$ | | VOC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 1992 | 225 | Coker B-1, 60 MMBTUH | 5.04 | 22.08 | 6.00 | 26.28 | 0.46 | 2.00 | 5.85 | 25.63 | 0.33 | 1.45 |

**EUG 6: MEK H-101 HEATER**

| CD | EU | Point ID | CO | | NOx | | $PM_{10}$ | | $SO_2$ | | VOC | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 1977 | 245 | MEK H-101, 81 MMBTUH | 6.80 | 29.8 | 8.10 | 35.5 | 0.62 | 2.70 | 2.11 | 9.24 | 0.45 | 1.95 |

**EUGs 7, 8, and 9: REFINERY FUGITIVE GROUPS & PTE**

Emission factors are from EIIP Volume II (11/29/96) Table 4.4-4, and are related to the type of service for each component. The following estimates are from the facility's 2001 annual emission inventory, as submitted to DEQ. Because the refinery is a dynamic operation, components are shifted in use, added or deleted, or replaced continuously. Thus, the following listing reflects estimates of components in place, and is not an actual count.

| EUG 7 (NSPS) | EU | Equipment Point ID | Estimated Number of Components | | VOC | |
|---|---|---|---|---|---|---|
| | | | | | lb/hr | TPY |
| | 13557 | LEU PsuedoRaffinate Stripper | Valves/HL | 1715 | 0.87 | 3.81 |
| | | | Flange/Connector/HL | 3204 | 1.77 | 7.74 |
| | | | Relief valves/HL | 11 | 0.26 | 1.16 |
| | | | Pump seals/HL | 31 | 1.43 | 6.29 |
| | | | Valves/Gas | 664 | 0.43 | 1.89 |
| | | | Relief valves/Gas | 11 | 0.00 | 0.00 |
| | | | Flange/Connector/Gas | 1383 | 0.76 | 3.34 |
| | | | Compressor seals/Gas | 1 | 0.00 | 0.00 |
| | | | **Total** | | **5.52** | **24.23** |
| | 13557 | Perc Filter | Valves/LL | 306 | 0.33 | 1.46 |
| | | | Flange/Connector/LL | 598 | 0.33 | 1.44 |
| | | | Agitator/LL | 7 | 0.00 | 0.00 |
| | | | Pump seals/LL | 5 | 1.28 | 5.40 |
| | | | Pump seals/HL | 36 | 1.67 | 7.30 |
| | | | Relief valves/LL | 2 | 0.05 | 0.21 |
| | | | Valves/HL | 572 | 0.29 | 1.27 |
| | | | Relief valves/Gas | 10 | 0.00 | 0.00 |
| | | | Flange/Connector/Gas | 13 | 0.00 | 0.03 |
| | | | Valves/Gas | 4 | 0.24 | 1.03 |
| | | | **Total** | | **4.19** | **18.14** |

| EUG 7 (NSPS) | EU | Equipment Point ID | Estimated Number of Components | | VOC | |
|---|---|---|---|---|---|---|
| | | | | | lb/hr | TPY |
| | 13557 | #2 Platformer | Valves/LL | 1168 | 1.49 | 6.54 |
| | | | Flange/connector/LL | 1227 | 0.38 | 1.64 |
| | | | Pump seals/LL | 19 | 0.50 | 0.21 |
| | | | Relief valves/LL | 12 | 0.29 | 1.26 |
| | | | Valves/Gas | 250 | 1.96 | 8.57 |
| | | | Relief valves/Gas | 4 | 0.00 | 0.00 |
| | | | Flange/connector/Gas | 300 | 0.19 | 0.82 |
| | | | **Total** | | **4.81** | **19.04** |
| | 13557 | FGRU West | Valves/Gas | 300 | 0.35 | 1.55 |
| | | | Valves/LL | 225 | 0.11 | 0.47 |
| | | | Valves, HL | 50 | 0.03 | 0.11 |
| | | | Pump seals/LL | 9 | 0.34 | 1.48 |
| | | | Flange/connector/LL | 1186 | 0.46 | 2.00 |
| | | | Compressors | 3 | 0.63 | 2.76 |
| | | | Relief valves/Gas | 6 | 0.04 | 0.18 |
| | | | **Total** | | **1.96** | **8.55** |
| | 13557 | MEK Unit | Valves/LL | 5560 | 5.37 | 23.42 |
| | | | Flanges/Connectors/LL | 8276 | 0.60 | 2.63 |
| | | | Pump seals/LL | 61 | 0.18 | 0.76 |
| | | | Agitators/L | 2 | 0.00 | 0.00 |
| | | | Relief valves/LL | 77 | 0.14 | 0.60 |
| | | | Valves/Gas | 1040 | 2.24 | 9.79 |
| | | | Relief valves/Gas | 11 | 0.00 | 0.00 |
| | | | Flange/Connector/Gas | 837 | 0.03 | 0.13 |
| | | | Compressor seals/Gas | 2 | 0.00 | 0.00 |
| | | | **Total** | | **8.55** | **37.44** |

| EUG 8 (MACT) | EU | Equipment Point ID | Estimated Number of Components | | VOC | |
|---|---|---|---|---|---|---|
| | | | | | lb/hr | TPY |
| | 13557 | Coker | Valves/LL | 224 | 0.18 | 0.80 |
| | | | Flange/ Connector/LL | 134 | 0.07 | 0.32 |
| | | | Pump seals/LL | 7 | 0.00 | 0.00 |
| | | | Relief valves/LL | 2 | 0.05 | 0.21 |
| | | | Valves/HL | 2 | 0.00 | 0.00 |
| | | | Valves/Gas | 348 | 0.57 | 2.48 |
| | | | Relief valves/Gas | 4 | 0.00 | 0.00 |
| | | | Flange/Connector/Gas | 288 | 0.19 | 0.82 |
| | | | Compressor seals/Gas | 2 | 0.00 | 0.00 |
| | | | **Total** | | **1.06** | **4.63** |
| | 13557 | CDU | Valves/LL | 1186 | 0.94 | 4.11 |
| | | | Valves/HL | 39 | 0.00 | 0.00 |
| | | | Flange/Connector/LL | 860 | 0.00 | 0.00 |
| | | | Pump seals/LL | 36 | 0.00 | 0.00 |
| | | | Relief valves/LL | 10 | 0.00 | 0.00 |
| | | | Valves/Gas | 821 | 1.78 | 7.81 |
| | | | Relief valves/Gas | 16 | 0.00 | 0.00 |
| | | | Flange/Connector/Gas | 404 | 0.22 | 0.97 |
| | | | Compressor seals/Gas | 2 | 0.24 | 1.06 |
| | 13557 | Truck Loading Dock | Valves/LL | 387 | 0.39 | 1.71 |
| | | | Flange/Connector/LL | 508 | 0.28 | 1.23 |
| | | | Relief valves/LL | 1 | 0.00 | 0.00 |
| | | | Pump seals/LL | 5 | 0.00 | 0.00 |
| | | | Valves/Gas | 16 | 0.00 | 0.00 |
| | | | Relief valves/Gas | 2 | 0.00 | 0.00 |
| | | | Flange/Connectors/Gas | 2 | 0.00 | 0.00 |
| | | | **Total** | | **0.67** | **2.94** |

| EUG 8 (MACT) | EU | Equipment Point ID | Estimated Number of Components | | VOC | |
|---|---|---|---|---|---|---|
| | | | | | lb/hr | TPY |
| | 13557 | Tank Farm | Valves/LL | 2564 | 4.73 | 20.72 |
| | | | Agitator/LL | 17 | 0.00 | 0.00 |
| | | | Relief valves/LL | 32 | 0.77 | 3.37 |
| | | | Flange/Connectors/LL | 2753 | 1.52 | 6.65 |
| | | | Pump seals/LL | 43 | 0.08 | 0.33 |
| | | | Valves/Gas | 460 | 0.42 | 1.83 |
| | | | Relief valves/Gas | 52 | 0.00 | 0.00 |
| | | | Flange/Connectors/Gas | 353 | 0.19 | 0.85 |
| | | | Compressor seals/Gas | 1 | 0.00 | 0.00 |
| | | | **Total** | | **7.71** | **33.75** |
| | 13557 | Unifiner | Valves/LL | 84 | 0.15 | 0.66 |
| | | | Flanges/Connector/LL | 533 | 0.29 | 1.29 |
| | | | Pump seals/LL | 1 | 0.00 | 0.00 |
| | | | Valves/Gas | 547 | 1.67 | 7.32 |
| | | | Relief valves/Gas | 2 | 0.00 | 0.00 |
| | | | Flange/Connector/Gas | 338 | 0.19 | 0.82 |
| | | | **Total** | | **2.30** | **10.09** |
| | 13557 | #5 Boilerhouse | Valves/Gas | 131 | 0.61 | 2.69 |
| | | | Flange/Connector/Gas | 66 | 0.04 | 0.16 |
| | | | **Total** | | **0.65** | **2.85** |
| | 13557 | Butane Splitter Unit | Valves/LL | 360 | 3.05 | 13.34 |
| | | | Flange/Connector/LL | 288 | 0.16 | 0.70 |
| | | | Pump seals/LL | 11 | 0.00 | 0.00 |
| | | | Relief valves/LL | 6 | 0.00 | 0.00 |
| | | | Valves/Gas | 157 | 0.75 | 3.27 |
| | | | Relief valves/Gas | 8 | 0.00 | 0.00 |
| | | | Flange/Connector/Gas | 114 | 0.06 | 0.28 |
| | | | **Total** | | **4.02** | **17.59** |
| | 13557 | LERU | Valves/LL | 220 | 1.02 | 4.48 |
| | | | Flange/Connector/LL | 153 | 0.08 | 0.37 |
| | | | Pump seals/LL | 4 | 0.00 | 0.00 |
| | | | Valves/Gas | 191 | 0.60 | 2.66 |
| | | | Relief valves/Gas | 3 | 1.06 | 4.63 |
| | | | Flange/Connector/Gas | 114 | 0.06 | 0.27 |
| | | | **Total** | | **2.82** | **12.41** |
| **EUG 9 (State)** | **EU** | **Equipment Point ID** | **Estimated Number of Components** | | **VOC** | |
| | 13557 | MEROX Unit | Valves/HL | 69 | 0.04 | 0.15 |
| | | | Flange/Connector/LL | 208 | 0.12 | 0.50 |
| | | | Pump seals/HL | 1 | 0.05 | 0.20 |
| | | | Valves/Gas | 35 | 2.07 | 9.06 |
| | | | Flange/Connector/Gas | 104 | 0.06 | 0.25 |
| | | | **Total** | | **2.34** | **10.16** |
| **Total of EUGs 7, 8, 9** | | | | | **53.7** | **234.54** |

**EUG 11: Lube Extraction Unit (LEU) and Coker Flare Subject to 40 CFR 60, Subpart GGG (1)(2); 40 CFR 60, Subpart J/Ja**

Emissions for EUG 11 are based on continuous operation, using emission factors from Table 13.5-1 of AP 42 (9/91) and evaluating only the pilot. This is a minimal estimate, not full PTE.

| CD | EU | Point ID | Equipment | VOC | | CO | | NOx | | $SO_2$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 1976 | 269 | LEU Flare | John Zink EEF-QS-SA-18 smokeless flare tip | 0.04 | 0.19 | 0.12 | 0.51 | 0.04 | 0.19 | 0.12 | 0.51 |
| | 268 | Coker Flare | John Zink EEF-QS-30 smokeless flare tip | 0.13 | 0.55 | 0.33 | 1.5 | 0.06 | 0.27 | 0.12 | 0.5 |
| **Total** | | | | **0.17** | **0.74** | **0.45** | **2.01** | **0.10** | **0.46** | **0.24** | **1.01** |

(1) Group 1 vents go to this flare only under emergency conditions.

(2) Performance testing required by NSPS Subpart GGG also meets requirements of NESHAP Subpart CC (allowed Group 1 vents to flare).

**EUG 11a: Platformer Flare Subject to 40 CFR 60, Subpart Ja**

Emissions for EUG 11a are based on continuous operation, using emission factors from Table 13.5-1 of AP 42 (9/91) and evaluating actual emissions.

| CD | EU | Point ID | Equipment | VOC | | CO | | NOx | | $SO_2$ | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY | lb/hr | TPY |
| 1960 | 267 | Plat Flare | John Zink EEF-QS-30 smokeless flare tip | 8.5 | 37.3 | 3.7 | 16.4 | 0.7 | 3.02 | 1.74 | 7.66 |

**EUG 12: Wastewater Processing System**

VOC emissions for EUG 12 are based on EPA's Water Software Program No. 9. Input data combine model defaults and calendar year 2005 emission inventory.

| EU | Point ID | Equipment | VOC | |
|---|---|---|---|---|
| | | | lb/hr | TPY |
| 15943 | WPU-1 | Wastewater Processing Unit and Open Sewers | 35 | 153 |

**EUG 14: Group 1 Process Vents Subject to 40 CFR 63, Subpart CC**

| EU | Equipment Point ID | Control Device |
|---|---|---|
| N/A | CDU Vacuum Tower Vent | CDU H-2 |
| N/A | LEU T-201 Hydrostripper Tower Vent | LEU H-102 |
| N/A | Coker Enclosed Blowdown Vent | Platformer Flare, Coker Flare |

**EUG 15: Group 2 Process Vents Subject to 40 CFR 63, Subpart CC**

| EU | Equipment/ Point ID |
|---|---|
| N/A | MEK T-7 Vent |
| N/A | LEU T-101 Vent |
| N/A | LEU D-101 Vent |