

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT ENGINEERING & COMPLIANCE DIVISION APPLICATION PROCESSING AND CALCULATIONS	APPL. NO. 525797	DATE 9/14/11	PAGE 1 of 24
	PROCESSED BY Angelita Alfonso	CHECKED BY	

PERMIT TO CONSTRUCT
-Modification-

COMPANY NAME: PARAMOUNT PETROLEUM CORP
 ID No. 800183

EQUIPMENT LOCATION: 14700 Downey Ave
 Paramount, CA 90745

CONTACT PERSON: June Christman
 (562) 748-4704

EQUIPMENT DESCRIPTION

Additions to the Facility Permit are noted in underlines and deletions are noted in ~~strikeouts~~.

SECTION H: PERMIT TO CONSTRUCT AND TEMPORARY PERMIT TO OPERATE

Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
Process 9 : OIL AND WATER SEPARATION SYSTEM					P13.1
System 1 : WASTEWATER SEPARATION FAC (CRUDE UNIT AREA)					
OIL WATER SEPARATOR, FLOATING ROOF; 2 CHANNEL TYPE, WITH A RESILIENT TOROIDAL VAPOR TIGHT SEAL; WIDTH:14 FT 6 IN; DEPTH: 12 FT; LENGTH: 39 FT 4 IN API TYPE, CONSISTING OF <u>THREE COMPARTMENTS AND OIL</u> <u>BAYS</u> <u>FOREBAY, FIXED ROOF,</u> <u>PASSIVELY VENTING TO CARBON</u> <u>WIDTH:14 FT 6 IN; DEPTH: 11 FT;</u> <u>LENGTH: 10 FT 3 IN</u> <u>MAINBAY, FLOATING ROOF,</u> <u>WIDTH:14 FT 6 IN; DEPTH: 11 FT;</u> <u>LENGTH: 16 FT 11 IN</u> <u>AFTERBAY, FIXED ROOF,</u> <u>PASSIVELY VENTING TO CARBON</u> <u>WIDTH:14 FT 6 IN; DEPTH: 11 FT;</u> <u>LENGTH: 15 FT 4 IN</u>	D254	<u>Dx1</u>		VOC: 500 PPMV (5)[RULE 1176, 9-13- 1996]	H23.21 <u>A99.x</u> <u>K171.x</u>

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Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
<u>OILBAY, WEST, FIXED COVER,</u> <u>WIDTH: 4 FT 8 IN;</u> <u>DEPTH: 11 FT 6 IN; LENGTH: 6 FT 4 IN</u> <u>OILBAY, EAST, FIXED COVER,</u> <u>WIDTH: 4 FT 8 IN;</u> <u>DEPTH: 11 FT 6 IN; LENGTH: 6 FT 4 IN</u> A/N: 171548 <u>525797</u> Permit to Construct Issued:					
<u>KNOCKOUT POT, D-942,</u> <u>HEIGHT: 8 FT S/S; DIAMETER: 30 IN</u> A/N: <u>525797</u> Permit to Construct Issued:	<u>Dx1</u>	<u>Cx1A</u> <u>Cx1B</u> <u>Cx1C</u> <u>D254</u>			
<u>CARBON ADSORBER, TWO (2) IN</u> <u>SERIES, 200 LBS EACH</u> A/N: <u>525797</u> Permit to Construct Issued:	<u>Cx1A</u>	<u>Dx1</u>			<u>D90.x1</u> <u>E128.1</u> <u>E153.x</u> <u>K67.x</u>
<u>CARBON ADSORBER, TWO (2) IN</u> <u>SERIES, 200 LBS EACH</u> A/N: <u>525797</u> Permit to Construct Issued:	<u>Cx1B</u>	<u>Dx1</u>			<u>D90.x1</u> <u>E128.1</u> <u>E153.x</u> <u>K67.x</u>
<u>CARBON ADSORBER, TWO (2) IN</u> <u>SERIES, 200 LBS EACH</u> A/N: <u>525797</u> Permit to Construct Issued:	<u>Cx1C</u>	<u>Dx1</u>			<u>D90.x1</u> <u>E128.1</u> <u>E153.x</u> <u>K67.x</u>
<u>SUMP, OIL, WITH VAPOR TIGHT</u> <u>STEEL PLATE COVER, WIDTH: 4 FT 8</u> <u>IN; DEPTH: 12 FT; LENGTH: 3 FT 4 IN</u> A/N: 171548	<u>D255</u>			VOC: 500 PPMV (5)[RULE 1176, 9-13-1996]	<u>H23.21</u>
<u>SUMP, OIL, WITH VAPOR TIGHT</u> <u>STEEL PLATE COVER, WIDTH: 4 FT 8</u> <u>IN; DEPTH: 12 FT; LENGTH: 3 FT 4 IN</u> A/N: 171548	<u>D256</u>			VOC: 500 PPMV (5)[RULE 1176, 9-13-1996]	<u>H23.21</u>
<u>SUMP, OIL SKIMMER IN VAPOR</u> <u>TIGHT STEEL BOX, LENGTH: 5 FT 0.5</u> <u>IN DIAMETER: 8 FT;</u> A/N: 171548 Note: This is a skimmer that is internal to the API Separator Afterbay.	<u>D257</u>			VOC: 500 PPMV (5)[RULE 1176, 9-13-1996]	<u>H23.21</u>

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Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
<u>SUMP, OIL SKIMMER IN VAPOR TIGHT STEEL BOX, LENGTH: 5 FT 0.5 IN DIAMETER: 8 FT;</u> A/N: 171548 This is a skimmer that is internal to the API Separator Afterbay.	D258			<u>VOC: 500 PPMV</u> <u>(5)[RULE 1176, 9-13-1996]</u>	H23.21
<u>SUMP, WASTEWATER, CONTROL LAB, WITH A FIXED COVER,</u> <u>WIDTH: 7 FT; DEPTH: 5 FT;</u> <u>LENGTH: 13 FT</u> A/N: 525797 <u>Permit to Construct Issued:</u>	<u>Dx2</u>	<u>Cx2</u>		<u>VOC: 500 PPMV</u> <u>(5)[RULE 1176, 9-13-1996]</u>	
<u>CARBON ADSORBER, TWO (2) IN SERIES, 200 LBS EACH</u> A/N: 525797 <u>Permit to Construct Issued:</u>	<u>Cx2</u>	<u>Dx2</u>			<u>D90.x2</u> <u>E128.1</u> <u>E153.x</u> <u>K67.x</u>
<u>SUMP, DEPENTANIZER WASTEWATER, WITH A FIXED COVER,</u> <u>WIDTH: 4 FT ; DEPTH: 6 FT;</u> <u>LENGTH: 4 FT</u> A/N: 525797 <u>Permit to Construct Issued:</u>	<u>Dx3</u>	<u>Cx3</u>		<u>VOC: 500 PPMV</u> <u>(5)[RULE 1176, 9-13-1996]</u>	
<u>CARBON ADSORBER, TWO (2) IN SERIES, 200 LBS EACH</u> A/N: 525797 <u>Permit to Construct Issued:</u>	<u>Cx3</u>	<u>Dx3</u> <u>Dx4</u>			<u>D90.x2</u> <u>E128.1</u> <u>E153.x</u> <u>K67.x</u>
<u>SUMP, DEPENTANIZER STORMWATER & WASTEWATER, WITH A FIXED COVER,</u> <u>SIDE STORMWATER ENTRANCES (2) WITH WATER SEALS;</u> <u>WIDTH: 8 FT 8 IN; DEPTH: 8 FT;</u> <u>LENGTH: 8 FT</u> A/N: 525797 <u>Permit to Construct Issued:</u>	<u>Dx4</u>	<u>Cx3</u>		<u>VOC: 500 PPMV</u> <u>(5)[RULE 1176, 9-13-1996]</u>	
<u>SUMP, COLLECTIVE WASTEWATER, WITH A FIXED COVER,</u> <u>WIDTH: 7 FT 6 IN;</u> <u>DEPTH: 6 FT; LENGTH: 8 FT 6 IN</u> A/N: 525797 <u>Permit to Construct Issued:</u>	<u>Dx5</u>	<u>Cx4</u>		<u>VOC: 500 PPMV</u> <u>(5)[RULE 1176, 9-13-1996]</u>	

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Equipment	ID No.	Conn To	RECLAIM Source Type/ Monitoring Unit	Emissions * And Requirements	Conditions
<u>CARBON ADSORBER, TWO (2) IN SERIES, 200 LBS EACH</u> A/N: <u>525797</u> Permit to Construct Issued:	<u>Cx4</u>	<u>Dx5</u>			<u>D90.x2</u> <u>E128.1</u> <u>E153.x</u> <u>K67.x</u>
<u>SUMP, KEYRACK SPILL CONTAINMENT, WITH A FIXED COVER, WIDTH: 10 FT; DEPTH: 8 FT; LENGTH: 23 FT</u> A/N: <u>525797</u> Permit to Construct Issued:	<u>Dx6</u>	<u>Cx5</u>		<u>VOC: 500 PPMV (5)[RULE 1176, 9-13-1996]</u>	
<u>CARBON ADSORBER, TWO (2) IN SERIES, 200 LBS EACH</u> A/N: <u>525797</u> Permit to Construct Issued:	<u>Cx5</u>	<u>Dx6</u>			<u>D90.x2</u> <u>E128.1</u> <u>E153.x</u> <u>K67.x</u>
<u>DRAIN SYSTEM COMPONENT</u> A/N: <u>471548 525797</u> Permit to Construct Issued:	<u>D717</u>			<u>VOC: 500 PPMV (5)[RULE 1176, 9-13-1996]</u>	<u>H23.24</u>
<u>FUGITIVE EMISSIONS, MISCELLANEOUS</u> A/N: <u>471548 525797</u> Permit to Construct Issued:	<u>D707</u>				<u>H23.2</u>

CONDITIONS

PROCESS CONDITIONS

P13.1 All devices under this process are subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
<u>VOC</u>	<u>District Rule</u>	<u>1176</u>
<u>VOC</u>	<u>District Rule</u>	<u>464</u>

[RULE 1176, 9-13-1996; RULE 464, 12-7-1990]

[Processes subject to this condition: 9]

DEVICE CONDITIONS

A99.x The 500 PPM VOC emission limit(s) shall only apply when the nitrogen purge is set at 0 scfm. Otherwise, the VOC limits shall be 217 ppm as methane when the nitrogen purge is set at 0.3 scfm or below; 93 ppm when the Nitrogen purge is set above 0.3 scfm but not greater than 1.0

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scfm; 36 ppm when the Nitrogen purge is set above 1.0 scfm but not greater than 3.0 scfm; and 22 ppm when the Nitrogen purge is set above 3.0 scfm.

[RULE 1176, 9-13-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997]

[Devices subject to this condition: D254]

D90.x1 The operator shall periodically monitor the VOC concentration at the outlet of the first and second carbon canisters according to the following specifications:

The operator shall monitor once every week.

The operator shall use EPA Reference Method 21 to monitor the parameter.

The operator shall calibrate the instrument used to monitor the parameter in ppmv methane.

Alternatively, the operator may use the District Grab Sample Method, as specified in Rule 1176, to measure VOC concentration.

[RULE 1176, 9-13-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997]

[Devices subject to this condition: Cx1A, Cx1B, Cx1C]

D90.x2 The operator shall periodically monitor the VOC concentration at the outlet of the first and second carbon canisters according to the following specifications:

The operator shall monitor once every month.

The operator shall use EPA Reference Method 21 to monitor the parameter.

The operator shall calibrate the instrument used to monitor the parameter in ppmv methane.

Alternatively, the operator may use the District Grab Sample Method, as specified in Rule 1176, to measure VOC concentration.

[RULE 1176, 9-13-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997]

[Devices subject to this condition: Cx2, Cx3, Cx4, Cx5]

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 1401, 9-10-2010]

[Devices subject to this condition: Cx1A, Cx1B, Cx1C, Cx2, Cx3, Cx4, Cx5]

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E153.x The operator shall change over the spent carbon with fresh activated carbon, within 24 hours of detection, in the adsorber whenever breakthrough occurs.

The operator shall replace the carbon as follows: The primary carbon canister shall be replaced with either a fresh carbon canister or the secondary carbon canister, and the secondary carbon canister shall be replaced with a fresh carbon.

For the purpose of this condition, breakthrough occurs when the VOC concentration at the outlet of the first carbon canister exceeds 500 ppm as methane.

[RULE 1176, 9-13-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997]

[Devices subject to this condition: Cx1A, Cx1B, Cx1C, Cx2, Cx3, Cx4, Cx5]

H23.2 This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
VOC	District Rule	1173

[RULE 1173, 5-13-1994; RULE 1173, 2-6-2009]

[Devices subject to this condition: D707]

~~H23.21 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: D254, D717]~~

Note: This condition is already under Process Condition P13.1.

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

Monitor and replacement of carbon canister

[RULE 1176, 9-13-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997]

[Devices subject to this condition: Cx1A, Cx1B, Cx1C, Cx2, Cx3, Cx4, Cx5]

K171.x The operator shall provide to the District the following items:

Within 60 days after the construction is completed, an updated construction drawing of

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the Crude Unit API Separator and the associated carbon adsorbers.

[RULE 1176, 9-13-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997]

[Devices subject to this condition: D254]

BACKGROUND

Paramount Petroleum Corporation (Paramount) operates a petroleum refinery located at 14700 Downey Avenue in the city of Paramount in the southern portion of Los Angeles County. Paramount processes crude oil into marketable products including gasoline, diesel fuel, jet fuel and other products. Emission sources at the refinery include combustion sources (heaters, boilers, and IC engines), fugitive components pumps, valves, flanges, compressors, drains, etc.), cooling towers, storage tanks, flares and loading/unloading facilities. The South Coast Air Quality Management District (AQMD) identification number for the facility is 800183.

As required by Variance Case No. 2914-111, Paramount submitted A/N 525797 to modify the API Wastewater Separator by installing a new fixed roof on the afterbay section of the API and venting the afterbay to a carbon filtration system. Currently, Paramount is not in compliance with Rule 1176(e)(2)(A)(ii), but has not received a Notice of Violation. This modification will bring Paramount into compliance with the rule.

As shown on the map provided by Paramount, the API Wastewater Separator is not within 1000 feet of a school.

There are also two additional open applications for the Crude Unit Area Wastewater Separation Facility: **A/Ns 364611 and 417078.**

A/N 364611 is a Class III application for:

- Addition of an Hydrochloric Acid tank, 1900 gallons, 10ft high x 4 ft 10 in diameter, venting to a sparger drum with a minimum of 35 gallons of water, in response to Notice of Violation (NOV) P28362. Paramount withdrew this request since the hydrochloric acid has been replaced several years ago with sulfuric acid, the storage of which is exempt from permitting requirements.
- Addition of long-existing refinery wastewater sumps into the permit
- Addition of carbon canisters for existing API, sumps and junction boxes for compliance with Rule 1176

A/N 417078 is a Class I application for:

- Installation of a fixed steel roof over the API separator and connect vapor space to carbon adsorbers. This project was canceled.

Changes sought by Paramount in these two applications will be evaluated and incorporated in this engineering evaluation. **A/Ns 364611 and 417078 will therefore be canceled.**

Table 1 lists permit processing tracking information and fees. No additional fees are required for this permit application.

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Table 1: PERMIT ADMINISTRATION & APPLICATION TRACKING INFORMATION

<i>Application No.</i>	525797
Equipment Description	Wastewater Treating, >50,000 gp
Date Received	8/04/2011
Deemed Complete Date	9/14/2011
Application Type	50: Alteration/Modification
Application Status	20: Class I
Previous Application No.	436741, Status 31, Active
B-CAT No.	294962, Schedule E
C-CAT No.	00
Schedule E Fee	\$5,330.66
Expedited Fee	\$ 2,665.33
Title V Revision Fee (<i>A/N 525798</i>)	\$ 1,747.19
Total Fees Required	\$ 9,743.18
Fees Submitted	\$ 9,743.18

COMPLIANCE RECORD REVIEW

A review of the AQMD Compliance Database showed 33 Notices of Violation (NOV) and Notices to Comply (NC) issued to Paramount in the past five years (8/01/06 - 8/26/11). All notices are either closed or in compliance status. The Stipulated Orders for Abatement (SOFA) are closed. Paramount is on a schedule to compliance on the Variance Cases.

PERMIT HISTORY

Crude Unit Area Wastewater Separation Facility

<i>Permit to Construct</i>		<i>Permit to Operate</i>		<i>Description of Permitting Activity</i>
<i>A/N</i>	<i>Issue Date</i>	<i>No</i>	<i>Issue Date</i>	
A29047		P13726	4/66	Not clear from existing documentation. Appears that a water collection pit was installed. The configuration of the wastewater system permitted under this application is significantly different than the current wastewater treatment system.
104257		M59466	11/87	This application covered a change of ownership from Douglas Oil Co. of

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<i>Permit to Construct</i>		<i>Permit to Operate</i>		<i>Description of Permitting Activity</i>
<i>A/N</i>	<i>Issue Date</i>	<i>No</i>	<i>Issue Date</i>	
				California to Pacific Oasis (1982) and name change from Pacific Oasis to Paramount Petroleum (1987). The equipment description for this permit unit was updated and it is significantly different from the previous permit. The existing API Separator is included in this permit but there is no discussion of when it was built.
171548	1987	D10846	10/89	Installed a floating steel cover to replace a floating fiberglass cover, which had broken down due to weathering. This resulted in a violation of R464.
364611	Still open			Submitted as a Class III application for an HCl tank and carbon adsorbers that were already installed.
417078	Still open			Proposed to install a fixed steel roof over the entire API Separator (forebay, mainbay and afterbay) and connect vapor space under the roof to carbon adsorbers. This project was canceled.

PROCESS AND PROJECT DISCUSSION

API WASTEWATER SEPARATOR

The API Wastewater Separator is made up of the following sections:

- Forebay (14 ft 6 in wide x 10 ft 3 in long x 11 ft deep)
- Mainbay (14 ft 6 in wide x 16 ft 11 in long x 11 ft deep), split into two parallel channels that each having an internal width of 6 ft
- Afterbay (14 ft 6 in wide x 15 ft 4 in long x 11 ft deep)
- Oilbay (4 ft 8 in wide x 6 ft 4 in long x 11 ft 6 in deep), two total, one on each side of the separator

Process water from refinery processes enter the forebay, which is primarily for separation of solids from liquids. The solids drop from the waste stream at a weir and drop to the sludge trough below. The liquids then pass over the weir and travel through the mainbays, which allow residence time for the oil and water to separate. The water then flows over an outfall weir into the afterbay. The afterbay has a skimmer that skims oil from the top of the liquid stream. Two oil bays on the NE and NW sides of the API accept the oil from the skimmers and are suction reservoirs for pumping the oil from the API. The oil bays have a separate cover and are sealed to the concrete walls of the afterbay where the oil skimmer is located.

Currently, the forebay has a fixed cover connected to a knockout pot and three 200 lb carbon drums. The mainbay has a floating pontoon type roof. The afterbay has a fixed cover with numerous seams and

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hatches that are sealed with silicon sealant. Under this application, a new fixed roof will be installed on the afterbay section. The new cover will minimize seams and hatches requiring sealant with welded seams and bolted connections and will include a connection to the same knockout pot as the forebay. The three existing carbon drums will be upgraded to a configuration of three parallel sets of two drums in series. In order to extend the life of the carbon drums, Paramount proposes to maintain a nitrogen blanket on the system to reduce moisture content in the vapors. The simplified process flow diagram for the existing and proposed API control is shown in Figures 1 and 2.

Additionally, the current description and dimensions of the API will be corrected and the long-existing refinery wastewater sumps and carbon drums will be added to the permit for completeness.

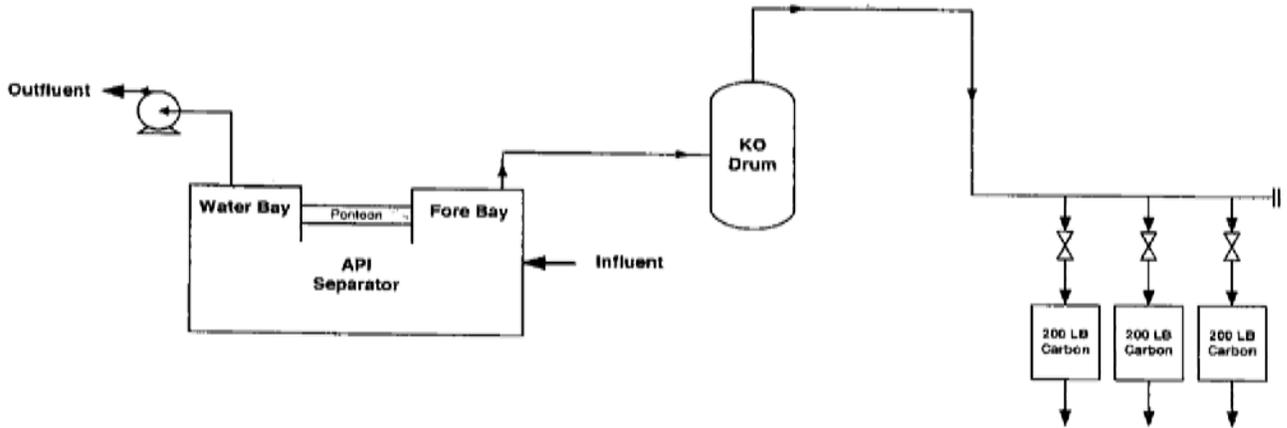
Waste Streams that Feed to the Crude Unit Area API Separator

Waste streams throughout the refinery are collected through a series of drains and sumps. The streams that feed into the Crude Unit API Separator include:

- Crude Desalters
- Crude Unit Wash Water Drum
- Crude Atmospheric Distillation Unit 1 Flash Tower Overhead Accumulator
- Crude Atmospheric Distillation Unit 1 Distillate Tower Accumulator
- Crude Atmospheric Distillation Unit 2 Water Settling Pot
- Crude Vacuum Distillation Unit 1 Tower Overhead Accumulator
- Crude Vacuum Distillation Unit 2 Tower Overhead Accumulator
- Catalytic Reforming Unit
- Asphalt Blowing Plant Drains
- Tank Farm Water Drains
- Refinery Ground Water Recovery
- Thermal Oxidizer
- ESPs in the Jet Treating Plant

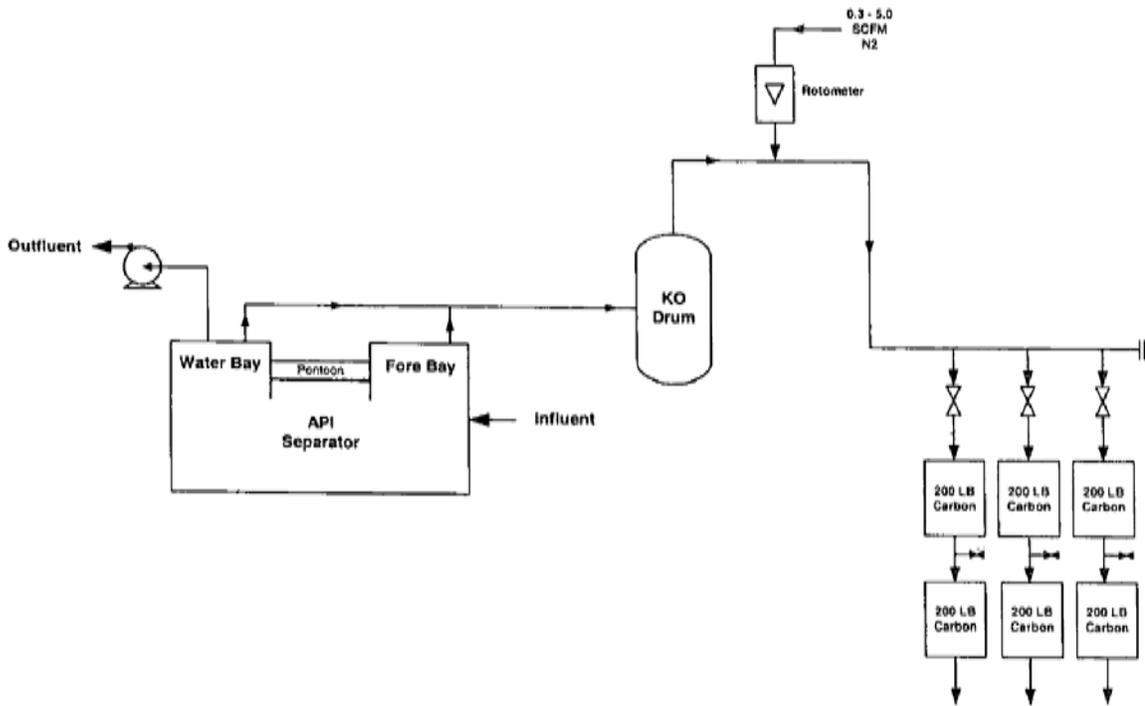
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Figure 1: EXISTING API WASTEWATER CONTROL CONFIGURATION



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Figure 2: PROPOSED API WASTEWATER CONTROL CONFIGURATION



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Sumps that Feed to the Crude Unit Area API Separator

Paramount provided the current list and location of sumps and junction boxes for the refinery. The following sumps, which are not currently listed in the Facility Permit, are connected via pipeline to the Crude Unit API. These sumps will be permitted as part of this engineering evaluation:

- Control Lab Sump
- Depentanizer Wastewater Sump
- Depentanizer Stormwater/Wastewater Sump
- Collective Sump
- KeyRack Sump

Table 2: LIST OF SUMPS

<i>Sump</i>	<i>Rule 1176 DSC No.</i>	<i>Dimensions (W x D x L)</i>	<i>Existing Vapor Control Device</i>
Control Lab	874	7' x 5' x 13'	200 lb carbon
Depentanizer Wastewater	881	4' x 6' x 4'	200 lb carbon
Depentanizer Stormwater/Wastewater	883	8'8" x 8' x 8'	
Collective	880	7'6" x 6' x 8'6"	200 lb carbon
KeyRack	775	10' x 8' x 23'	200 lb carbon

Junction Boxes

In the Paramount Rule 1176 plan, which was submitted in July 1997, the facility wide inventory included 14 active junction boxes. All of them were reported by Paramount to be sealed. In a more recent inventory, Paramount provided an inventory of 27 junction boxes. According to Paramount, 22 of these junction boxes are sealed and the other five vent to carbon adsorbers.

EMISSIONS CALCULATION

The proposed modifications to the permit do not involve an increase in criteria pollutant emissions. Actually, the proposed installation of new fixed roof cover on the API afterbay and venting the afterbay to an improved carbon filtration system are expected to result in reductions in VOC emissions. The original wastewater treatment system was installed in 1966. Modifications made since 1966 have been improvements to the wastewater separator, wastewater sumps and stormwater sumps that did not result in emission increases. Paramount cannot document the exact construction dates of the sumps. According to Paramount, an employee of 34 years recalls that the sumps were in existence when he started work in 1971.

Emissions are being calculated for this application to establish the New Source Review emissions baseline and to evaluate the proper size of the carbon adsorbers. An overall emission estimate for the Crude Unit Wastewater System is comprised of emission estimates for the following components of the wastewater system: API Separator, Sumps, Process Drains and Fugitive Components. The only criteria

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pollutant that is expected to be emitted from this system is VOC. Emissions from process drains are normally included with the processes that they serve.

API Separator

An accurate estimation of the VOC emissions from an API separator is difficult due to the wide variety of design parameters and variety of physical and chemical characteristics of the treated effluent as previously itemized. The best available emission factor for wastewater treatment system emissions is from "VOC Emissions From Petroleum Refinery Wastewater Systems – Background Information for Proposed Standards" EPA-450/3-85-001a, February 1985. EPA AP-42 also has an emission factor of 0.2 lb/1000 gal. This is equivalent to the District's AER default annual emission factor of 73 lb/1000 gal/year (note that $0.2 \times 365 = 73$) [see AQMD AER Form R5 default emission factors]. This emission factor is from data collected in 1958 and is not believed to be as accurate as the emission factor from the 1985 document listed above. Thus, the emission factor for a covered API wastewater separator from the 1985 study of **0.0275 lb ROG per 1000 gallons** of wastewater is used in the calculations. According to Paramount, the maximum design flow to the API is 400 gallons/minute. Emissions from the covered API will be controlled with carbon adsorbers with assumed 95% control efficiency. A conservative assumption of the capacity of the activated carbon is 0.2 lb VOC per lb carbon. The 1200 lb carbon adsorbers are expected to last 16 days. Table 3 tabulates the calculations summary.

**Table 3: MAX POTENTIAL VOC EMISSIONS FROM
API WASTEWATER SEPARATOR**

<i>API Wastewater Separator</i>		<i>Baseline</i>
Maximum Design Flow Rate, (400 gpm), gal/day		576,000
Emission Factor, lb/1000 gal		0.0275
Uncontrolled Emissions (R1)	lbs/yr	5,781.6
	lbs/day	15.84
	lbs/hr	0.66
Controlled Emissions (R2)	lbs/yr	289.08
	R2 = R1 x (1-0.95)	lbs/day
	0.792	lbs/hr
		0.033
Weight of carbon, lbs		1200
Carbon (20% ads cap of carbon), lbs		240
VOC adsorbed by carbon, lbs/day (R2-R1)		15.048
Calculated life of carbon, days		16

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This emission estimate can be compared to the sampling and actual runs conducted by Paramount. Siemens, Paramount's carbon vendor and consultant, performed vapor phase isotherm computer modeling to calculate the proper sizing of activated carbon adsorbers, carbon life and breakthrough. The highest vapor flow rate from the API was measured at 0.23 scfm before the nitrogen and measured at 1847.5 ppm (non-methane/non-ethane). The N₂ addition was at 0.30 scfm. Therefore, the total flow to the carbon drums (API vapors + N₂) equals 0.53 scfm. The temperature before the carbon is 100°F. The VOC concentration from the GC analysis was adjusted to ratio in the 0.3 scfm of additional N₂. Using three sets of carbon drums with two in series with a total of 1200 lbs, Siemens calculated the carbon usage to be 30 lbs/day with carbon life of 40 days.

The above data is measured at an average of 120 gpm wastewater flow to the API. For the maximum potential to emit calculations, the maximum design flow rate of 400 gpm will factored in.

$$\begin{aligned}
 \text{Uncontrolled VOC} &= ((0.23\text{cf/min}) * 60 * 24 * 1847.5\text{ppm} * 86.16\text{lb/lb-mole}) / (10^6 * 379\text{cf/lb-mole} *) \\
 &= 0.14 * 400 / 120 \\
 &= \mathbf{0.46 \text{ lb/day}}
 \end{aligned}$$

The activated carbon canisters are assumed to give 95% VOC control:

$$\begin{aligned}
 \text{Controlled VOC} &= 0.46 * (1 - 0.95) \\
 &= \mathbf{0.023 \text{ lb/day}}
 \end{aligned}$$

Using 500 ppm to calculate controlled VOC:

$$\begin{aligned}
 \text{Controlled VOC} &= ((0.23\text{cf/min}) * 60 * 24 * 500\text{ppm} * 86.16\text{lb/lb-mole}) / (10^6 * 379\text{cf/lb-mole} *) \\
 &= 0.037 * 400 / 120 \\
 &= \mathbf{0.12 \text{ lb/day}}
 \end{aligned}$$

The more conservative estimate summarized in Table 3 will be used for NSR purposes and for sizing of the carbon drums.

Although Rule 1176 requires monthly monitoring, a permit condition requiring a *weekly monitoring* schedule will be imposed to account for the lower carbon life calculated using the conservative method.

In order to extend the life of the carbon drums, Paramount proposes to maintain a nitrogen blanket on the system of up to 5.0 scfm to reduce moisture content in the vapors. Paramount proposes purging 0.3 scfm of Nitrogen for an influent vapor flow rate to the carbon of 0.23 scfm. To account for dilution at the exhaust due to Nitrogen purging, the Rule 1176 VOC limit of 500 ppm will be lowered as follows:

- 0 scfm N₂ 500 ppm
- < 0.3 scfm N₂ 217 ppm (500*.23/0.53)
- > 0.3 ≤ 1.0 scfm N₂ 93 ppm (500*.23/1.23)
- > 1.0 ≤ 3.0 scfm N₂ 36 ppm (500*.23/3.23)
- > 3.0 scfm N₂ 22 ppm (500*.23/5.23)

The above estimate is the basis of Condition A99.x.

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Sumps

All of the sumps are underground and are covered. There are minimal or no breathing losses from the sumps since they are insulated from diurnal changes in temperature. The primary losses are working losses from the filling of the sump. The default emission factor for sumps from the District's Annual Emissions Report (AER) Forms P2U and R5 is **1.8 lbs ROG/ sq ft-yr**. The estimated VOC emissions for each of the sumps using this emission factor are shown in Table 4.

Table 4: VOC EMISSIONS FROM SUMPS

<i>Source</i>	<i>Surface Area (sq. ft)</i>	<i>Max Yearly Emissions (lbs/yr)</i>	<i>Max Daily (lb/day)</i>	<i>Max Hourly (lb/hr)</i>
Control Lab Sump	91	164	0.45	0.019
Depentanizer WW	16	29	0.08	0.003
Depentanizer SW/WW	69	124	0.34	0.014
Collective Sump	64	115	0.31	0.013
Keyrack Sump	230	414	1.13	0.047

A control efficiency of 95% is assumed for the carbon adsorbers. The uncontrolled and controlled emission estimates are summarized in Table 5.

Table 5: CONTROLLED VOC EMISSIONS FROM SUMPS

<i>Source</i>	<i>Uncontrolled VOC Emissions</i>			<i>Controlled VOC Emissions</i>		
	lb/yr	lb/day	lb/hr	lb/yr	lb/day	lb/hr
Control Lab Sump	164	0.45	0.019	8.2	0.022	0.0009
Depentanizer WW	29	0.08	0.003	1.45	0.004	0.0002
Depentanizer SW/WW	124	0.34	0.014	6.2	0.017	0.0007
Collective	115	0.31	0.013	5.75	0.016	0.0006
Keyrack Sump	414	1.13	0.047	20.70	0.057	0.0024

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An estimate of the capacity of the activated carbon is 0.2 lb VOC per lb of carbon. The estimated life of a 200 lb carbon canister on each of the sump (33- 138 days) is contained in Table 6. The District proposed that a second carbon drum be installed in series with the first carbon drum in all the sumps to ensure that the 500 ppm limit is not exceeded at the exhaust. As required by Rule 1176, a permit condition requiring a *monthly monitoring* schedule will be imposed. Further, the last six months of actual monitoring data on the sumps submitted by Paramount show a consistently low VOC reading (1ppm–49 ppm), thus a monthly monitoring schedule is sufficient.

Table 6: SUMPS: CARBON ADSORBER LIFE

<i>Source</i>	<i>Uncontrolled Emissions (lbs/day)</i>	<i>Carbon Consumed (lbs/day)</i>	<i>200-lb Canister Life (days)</i>
Control Lab Sump	0.45	2.25	89
Depentanizer WW	0.08	2.1	95
Depentanizer SW/WW	0.34		
Collective	0.31	1.55	129
Keyrack Sump	1.13	5.65	35

Process Drain

Although process drains are part of the wastewater system, the estimated VOC emissions are routinely accounted for in each individual process unit they serve as fugitive components.

Fugitive Components

Paramount provided the number of fugitive components in the Crude Unit Wastewater System. Fugitive components are monitored according to the facility’s approved Rule 1173 plan. Emissions from fugitive components are calculated using recent fugitive component counts and the CAPCOA-revised 1995 EPA Correlation Equations. (Table IV-3a from AQMD Guidelines for Fugitive Emissions Calculations, June 2003). Fugitive emissions from the wastewater treatment system were calculated as 9.93 lbs/day VOC. Details on the component counts and associated emissions are provided in Table 7.

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**Table 7: FUGITIVE COMPONENTS COUNT AND EMISSIONS
FOR CRUDE WASTEWATER SEPARATION FACILITY, A/N 525797**

Source Unit		Service	No of Existing Components (1)	No. of New Components to be Installed (2)	Correlation Equation Factor, 500 ppm Screening Value (lbs/year)	Pre-Mod Emissions (lbs/year)	Post-Mod Emissions (lbs/year)
Valves	Sealed Bellows	All					
	SCAQMD Approved I & M Program	Gas / Vapor	17		4.55	77.28	77.28
		Light Liquid (3)		124	0	4.55	563.67
		Heavy Liquid (4)		0			
Pumps	Sealless Type	Light Liquid (3)		0			
	Double Mechanical Seals or Equivalent Seals	Light Liquid (3)	6	0	46.83	280.95	280.95
		Single Mechanical Seals	Heavy Liquid (4)		0		
Compressors		Gas / Vapor		0			
Flanges (ANSI 16.5-1988)		All	168		6.99	1174.35	1174.35
Connectors		All	459		2.86	1313.37	1313.37
Pressure Relief Valves		All		0			
Process Drains with P-Trap or Seal Pot		All	4	0	9.09	36.36	36.36
Other (including fittings, hatches, sight-glasses, and meters)		All	14	0	9.09	127.25	127.25
Total Emissions (lbs/year)						3573.24	3573.24
Total Emissions (lbs/day)						9.93	9.93
Emissions Increase (lbs/day)							0.00

- (1) Any component existing prior to the modification.
- (2) Any new component proposed to be installed due to the modification; this also includes new components to be installed to replace existing components.
- (3) Light liquid and gas/liquid streams: Liquid or gas/liquid stream with a vapor pressure greater than that of kerosene (>0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.
- (4) Heavy liquid: streams with a vapor pressure equal to or less than that of kerosene (<0.1 psia @ 100°F or 689 Pa @ 38°C), based on the most volatile class present at 20% by volume.

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Total Baseline VOC Emissions

The combined baseline PTE emissions from equipment and fugitives are **10.84 lbs/day** VOC and are summarized in Table 8.

Table 8: TOTAL BASELINE VOC EMISSIONS CALCULATIONS SUMMARY

<i>Source</i>	<i>Uncontrolled VOC Emissions</i>			<i>Controlled VOC Emissions</i>		
	lb/yr	lb/day	lb/hr	lb/yr	lb/day	lb/hr
API Separator	5,781.60	15.84	0.66	289.09	0.792	0.0330
Control Lab Sump	158	0.43	0.018	7.9	0.022	0.0009
Depentanizer WW	29	0.08	0.003	1.45	0.004	0.0002
Depentanizer SW/WW	126	0.35	0.015	6.3	0.017	0.0007
Collective	106	0.29	0.012	5.3	0.014	0.0006
Keyrack Sump	437	1.20	0.05	21.85	0.059	0.0025
Fugitive Emissions	3573.24	9.93	0.4138	3573.24	9.93	0.4138
TOTAL	10,210.84	28.12	1.1718	3,905.13	10.84	0.4517

RULES EVALUATION

PART 1: SCAQMD REGULATIONS

Rule 212 Standards for Approving and Issuing Public Notice (Amended Nov. 14, 1997)

- (a) The applicant is required to show that the equipment, the use of which may cause the issuance of air contaminants or the use of which may eliminate, reduce, or control the issuance of air contaminants, is so designed, controlled, or equipped with such air pollution control equipment that it may be expected to operate without emitting air contaminants in violation of provisions of Division 26 of the State Health and Safety Code of these rules. The operation of the proposed project is expected to comply with this requirement.

- (c)(1) Public notification is required if any new or modified permit unit, source under Regulation XX, or equipment under Regulation XXX may emit air contaminants located within 1000 feet from the outer boundary of a school. As shown on the map provided by Paramount, the source is not within 1000 feet of a school, public notification is therefore not required.

- (c)(2) Public notification is required if any new or modified facility has on-site increases exceeding any of the daily maximums specified in subdivision (g) of this rule. Since there is no increase in emissions with the operation of the proposed project, public notification is therefore not required.

- (c)(3) Public notification is required if the increase in maximum individual cancer risk (MICR), based on Rule 1401, exceeds one in a million (1 x 10⁻⁶), due to a

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project's new construction or proposed modification. Since there is no increase in emissions with the operation of the proposed project, public notification is therefore not required.

- (g) This subdivision sets forth the process for federal public notification and distribution and specifies the daily maximum emissions increase as follows:

<u>Air Contaminant</u>	<u>Daily Maximum in lbs/day</u>
Volatile Organic Compounds	30
Nitrogen Oxides	40
PM10	30
Sulfur Dioxide	60
Carbon Monoxide	220
Lead	3

Since there is no increase in emissions with the operation of the proposed project, federal public notification is not required.

Rule 401 Visible Emissions (Amended November 9, 2001)

Operation of this permit unit is not expected to result in visible emissions. Therefore, compliance with this rule is expected.

Rule 402 Nuisance (Adopted May 7, 1976)

Operation of this permit unit is not expected to result in a public nuisance. Therefore, compliance with this rule is expected.

Rule 464 Wastewater Separators (Amended December 7, 1990)

Rule 464 requirements apply to the wastewater separators in the wastewater treatment system. The wastewater separators are equipped with a solid cover with all openings sealed, as required. Compliance with this rule is expected.

Reg IX Standards of Performance for New Stationary Sources (NSPS)

40 CFR 60 Subpart QQQ: Standards of Performance for VOC Emissions from Petroleum Refinery Wastewater Systems

60.100 Applicability and designation of affected facility and reconstruction (Amended October 17, 2000)

This regulation is applicable to affected facilities located in Petroleum Refineries for which construction, modification or reconstruction is commenced after May 4, 1987. The following are separate affected facilities under this regulation:

- An individual drain system (all process drains connected to the first common downstream junction box, together with their associated sewer lines and junction boxes, downstream to the receiving oil-water separator)
- An oil-water separator
- An aggregate facility (individual drain system together with ancillary downstream sewer lines and oil-water separators)

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This NSPS is not applicable to the Crude Unit API Separator or the aggregate facility since it has not been a “modification” or “reconstruction” under the definitions in 40CFR60 since the applicability date of May 4, 1987.

According to EPA Applicability Determination Control No. 9700157, the NSPS applicability (under the MODIFICATION provisions of Part 60, A) is evaluated at the time of a physical or operational change based on a comparison of hourly potential emissions before and after the change. Since there is no change in the maximum processing capacity of the API, there will be no change in the hourly potential emissions before and after the change. This project does not constitute a “modification” and thus does not trigger applicability of an NSPS standard.

Additionally, this project is not considered “reconstruction” per 40 CFR 60.15 that may render the Wastewater System to be an affected facility. “Reconstruction” is defined as the replacement of components of an existing facility to such an extent that the fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility and it is technically and economically feasible to meet the applicable standards set forth in this part. This project involves piping, several knock-out pots and two blowers. Paramount recently obtained costs for new API Water Separator. This cost was approximately \$1.5 to 2 million installed. The cost of the API Water Separator Project is estimated to be \$80,000, which is far less than the 50% of the replacement value of the complex.

Rule 1173 Control of Volatile Organic Compound Leaks and Releases from Components at Petroleum Facilities and Chemical Plants (Amended 06/01/07)

The miscellaneous fugitive components of P9S1 are subject to Rule 1173 per Condition H23.1. The facility has an approved Inspection and Maintenance (I&M) program for monitoring and repairing fugitive components. All new and existing fugitive components are tagged with Rule 1173 and are monitored according to Paramount’s Rule 1173 leak detection and repair plan. Compliance with this rule is expected.

Rule 1176 VOC Emissions from Wastewater Systems (Amended 09/13/96)

The wastewater treatment system is subject to the requirements of Rule 1176 per Process Condition P13.1. Paramount submitted a Rule 1176 Compliance Plan (A/N 330575) in July 1997.

(e)(2)(A) Sumps and Wastewater Separators: All sumps and wastewater separators are required to have either: a) a floating cover equipped with seals, b) a fixed cover with a closed vent system vented to an air pollution control device (APCD), or c) an alternate control measure approved in writing by the Executive Officer. The fixed cover and carbon adsorbers proposed for the API Separator meet the requirement. Each wastewater sump is also equipped with a fixed cover and carbon adsorber.

(e)(6) Air Pollution Control (APC) Device: The APCDs are required to achieve $\geq 95\%$ VOC control efficiency by weight, or are not allowed to emit VOC emissions > 500 ppm above background [1176(e)(6)]. The oil/water separators (APIs D254) and sumps (Dx2, Dx3, Dx4, Dx5 & Dx6) are equipped with carbon adsorbers and are tagged with the Rule

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1176 emission limit of 500 ppm VOC. Conditions D90.x1 and D90.x2 require weekly and monthly monitoring of the VOC at the outlet of the carbon canisters and Condition E153.x requires changeout of the carbon canisters controlling the sumps when VOC concentration exceeds 500 ppm VOC. For the API Separator, Condition A99.x specifies a lower limit than 500 ppm to account for the Nitrogen purging.

(e)(7) Drain system Components (DSC): A DSC is defined as a process drain, manhole cover, junction box, or other wastewater system vent, excluding closed vent systems. For DSCs, a facility must comply with either (e)(7)(A) install a DSC control or more efficient DSC control within 60 days after a DSC becomes a repeat emitting DSC; or (e)(7)(B) install DSC controls according to the listed schedule (all by 12-31-2000). Paramount selected to comply with (e)(7)(B). According to June Christman, Paramount installed controls on all of the DSCs by 12-31-2000 as required in this section.

(f)(1)(B) Monitoring: As required for operators complying with (e)(7)(B), Paramount has been monitoring according to the following schedule:

- Wastewater separator(s)/closed vent system(s) – Monthly
- DSCs (Excluding Non-Emitting DSCs) – Quarterly
- Non-Emitting DSCs – Semi-Annually
- Inaccessible DSCs - Annually

(g)(1) Recordkeeping: Paramount has been keeping inspection records with dates and name and signature of certified inspector, VOC measurements (including background levels), repairs, replacement and reinspection reports.

(g)(2) Reporting: Paramount has been submitting semi-annual report required for operators complying with (e)(7)(B).

Compliance with Rule 1176 is expected.

Reg XIII

New Source Review (NSR)

Rule 1303: Requirements (Amended Dec. 6, 2002)

This rule allows the Executive Officer to deny a Permit to Construct for any new, modified or relocated source which results in an emission increase of any non-attainment air contaminant, any ozone depleting compound, or ammonia, unless BACT is used. This rule also requires modeling and offset (among other requirements) if there is a net increase in any non-attainment air contaminants for any new or modified source.

- (a) **Best Available Control Technology (BACT)**
 The Permit to Construct for any new or modified source which results in an emission increase of any nonattainment air contaminant shall be denied unless BACT is employed. Since the modification does not result in a net emission increase of any nonattainment air contaminant, it is exempt from this requirement.
- (b) This subdivision lists the following requirements for a Permit to Construct for any new or modified source which results in a net emission increase of any

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nonattainment air contaminant at a facility.

- (1) Modeling
- (2) Emission Offsets
- (3) Sensitive Zone Requirements
- (4) Facility Compliance
- (5) Major Polluting Facilities
 - A. Alternative Analysis
 - B. Statewide Compliance
 - C. Protection of Visibility
 - D. Compliance Through California Environmental Quality Act

Since the modification does not result in a net emission increase of any nonattainment air contaminant, all the requirements of this subdivision do not apply.

Reg XIV Toxics and Other Non-Criteria Pollutants

Rule 1401: New Source Review of Toxic Air Contaminants (Amended March 4, 2005)

This rule specifies that a project not result in an increase in maximum individual cancer risk (MICR) greater than 1×10^{-6} , or 10×10^{-6} if T-BACT is used, that the noncancer acute and chronic hazard index (HI) not exceed 1.0 and that the cancer burden not exceed 0.5 from new permit units, relocations or modifications to existing permit units which emit toxic air contaminants listed in Table 1 of this rule.

1401(g)(1)(B) Exemptions – Modification with No Increase in Risk

The requirements of this rule shall not apply to a modification of a permit unit that causes a reduction or no increase in the cancer burden, MICR or acute or chronic HI at any receptor location. Since the proposed changes will not cause an increase in toxic air contaminants, it is exempt from the requirements of this rule.

Reg XVII Prevention of Significant Deterioration (PSD)

This regulation sets forth preconstruction review requirements for stationary sources to ensure that air quality in clean air areas does not significantly deteriorate while maintaining a margin for future industrial growth.

The SCAQMD is presently considered in attainment for the following criteria pollutants: NO₂, SO₂, CO and Lead; thus these pollutants are subject to PSD regulations. The wastewater separators/sumps and carbon adsorbers will not emit these pollutants. Therefore, Reg XVII requirements do not apply to this modification.

Reg XX Regional Clean Air Incentives Market (RECLAIM)

Paramount is a Cycle 1 NO_x and SO_x RECLAIM facility and therefore is subject to RECLAIM requirements. However, the subject equipment (wastewater separators/sumps and carbon adsorbers) does not emit NO_x or SO_x and therefore RECLAIM requirements do not apply to this project.

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Reg XXX Title V Permits

Rule 3001(a): Applicability (Amended November 14, 1997)

The Title V Permit system is the air pollution control permit system required to implement the federal Operating Permit Program as required by Title V of the federal Clean Air Act as amended in 1990. Paramount has been designated as a Phase One Title V facility. The final initial Title V permit was issued on March 19, 2009.

Rule 3005: Permit Revisions (Amended March 16, 2001)

The permit for this project will be issued as a minor permit revision of the Title V permit as defined in 3000(b)(12)(A). Minor permit revisions are exempt from public participation per 3006(b) but are required to be submitted to the EPA per 3003(j)(1)(A).

PART 2: STATE REGULATIONS

CEQA California Environmental Quality Act (Amended 01/01/05)

CEQA requires that the environmental impacts of proposed projects be evaluated and that feasible methods to reduce, avoid or eliminate identified significant adverse impacts of these projects be considered. The CEQA Applicability Form (400-CEQA) submitted by Paramount indicates that the project does not have any impacts which trigger the preparation of a CEQA document; therefore a CEQA analysis is not required. (Note that Paramount notified the District of the typographical error in their response in Section C, Question No.6. The response should have been No instead of YES.)

PART 3: FEDERAL REGULATIONS

40 CFR 63 Subpart CC: National Emission Standards for Hazardous Air Pollutants (NESHAP) for Petroleum Refineries

Paramount has provided data to the District to show that Paramount Refinery is not a major HAP source which is defined as a source emitting 10 tons/year of any single HAP or 25 tons/year of all HAPs combined. Therefore, this subpart is not applicable because the refinery does not meet the criterion specified by paragraph (a)(1) of this section. Attachment 5 contains the Potential to Emit Hazardous Air Pollutants summary provided by Paramount to the District.

Note: Federal Rule 40CFR60 Subpart QQQ is evaluated under Regulation IX above.

CONCLUSION AND RECOMMENDATION

Based on the above evaluation, the operation of the crude unit wastewater treatment is expected to comply with all applicable District, State and Federal Rules and Regulations. Therefore, issuance of Permit to Construct is recommended.