

 SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT OFFICE OF ENGINEERING AND COMPLIANCE APPLICATION PROCESSING AND CALCULATIONS	PAGES 43	PAGE 1
	APPL. NO. 405268 & 527112	DATE 11/1/11 (revised)
	PROCESSED BY: Bob Sanford	CHECKED BY <i>KN-11/3/11</i>

PERMIT TO OPERATE

COMPANY NAME: Chevron Products Company

MAILING ADDRESS: P.O. Box 97
El Segundo, CA 90245

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

BACKGROUND/SUMMARY

The Steam Naphtha Reformer (SNR) Heater and associated SCR are operating under temporary permits to operate in Section H of Chevron’s RECLAIM/Title V Facility Permit (FP). Chevron has submitted change of condition application nos. (A/Ns) 405269 and 527112 for the heater and change of condition A/N 405268 for the SCR. A/N 405269 will be cancelled and the requested changes consolidated under A/N 527112. This document serves the dual purpose of evaluating the validity of issuance of regular permits to operate for each permit unit and evaluating the requested condition changes. The permit condition changes requested by Chevron are summarized below.

SNR Heater

- Specify a 60-minute averaging period for the 25 ppmv CO limits.
- Specify a 1-hour averaging period for the 100 ppm fuel total sulfur limit.
- Replace “MODEL FPMR-5 (320 BURNERS)” with “MODEL FPMR-6 (320 BURNERS)” in the equipment description of the heater.
- Modify source test condition D28.9 as follows: “Source test shall be conducted when this equipment is operating at ~~80~~ 70 percent or greater of maximum design capacity or at ~~90~~ 80 percent or greater ~~based on~~ of the maximum demonstrated daily hydrogen production rate ~~demonstrated over the last one year period~~ capacity if it is not possible to reach 80 percent of the heater maximum design capacity.”

SNR Heater SCR

- Specify a 60-minute averaging period for the 20 ppmv NH3 emission limit.
- Remove NOx, SOx, CO, and O2 from the source test requirements in condition D28.9.
- Add “OR APPROVED EQUIVALENT CATALYST” to the equipment description for the SCR catalyst.

The SNR heater was originally constructed in 1999/2000 under A/N 341340, which was issued in March 1999. The current SNR Heater replaced two existing SNR heaters (F-1330A&B) and some existing package boilers (F-1300 & F-1310). The SNR Hydrogen Plant project that included construction of the new SNR Heater gave the plant, which previously processed only liquid feed (butane/naphtha), the capability to process gaseous feed (refinery fuel gas and natural gas). Other equipment installed under this project includes a feed gas compressor with associated equipment and a hydrogen booster compressor, which increased reliability of the existing hydrogen compression system.

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EQUIPMENT DESCRIPTION:

Construction of the SNR Heater and SCR has been completed so the permits in Section H are acting as the temporary permits to operate (PO). The temporary P/Os in Section H will be converted to permanent P/Os in Section D of the permit. The proposed Section D permit pages are shown below. In these proposed permit pages, new text is indicated by underline and deleted text is indicated by strikethrough.

Section D: Facility Description and Equipment Specific Conditions

Equipment	ID No.	Connect To	RECLAIM Source	Emissions and Requirements	Conditions
PROCESS 6: HYDROGEN GENERATION					P13.1
SYSTEM 5: SNR HEATING SYSTEM					<u>S31.12.</u>
HEATER, REFORMER, F-1330, REFINERY/NATURAL GAS, BORN HEATERS, WITH LOW NOX BURNER, 653 MMBTU/HR WITH BURNER, REFINERY/NATURAL GAS, JOHN ZINK, MODEL FPMR-4 (64 BURNERS), MODEL FPMR-5 <u>6</u> (320 BURNERS) WITH LOW NOX BURNER, 384 TOTAL; 653 MMBTU/HR A/N: 374144 <u>527112</u>	D3530	C3533	NOX: MAJOR SOURCE**; SOX: MAJOR SOURCE**	CO: 25 PPMV (4) [RULE 1303(a)(1)-BACT, 5-10-1996]; CO: 2000 PPMV (5) [RULE 407, 4-2-1982]; NOX: 5 PPMV (4) [RULE 2005, 4-20-2001]; PM: (9) [RULE 404, 2-7-1986]; PM: 0.1 GRAINS/SCF (5) [RULE 409, 8-7-1981]	A63.24, A99.1, A99.2, A195.1, <u>A195.27</u> , B61.1, B61.6, C1.30, <u>C1.152</u> , D42.40 , <u>D29.15</u> , D82.4 , <u>D82.4</u> , D90.20, E71.6 , <u>H23.2</u> , H23.20
STACK, REFORMER A/N: 374144 <u>527112</u>	S3532	C3533			
BOILER, WASTE HEAT, E-1330, 148.53 MMBTU/HR (UNFIRED) A/N: 374144 <u>527112</u>	D3518				
BLOWER, FURNACE FORCED DRAFT, K-1330, 900 H.P. A/N: 374144 <u>527112</u>	D3523				
BLOWER, FURNACE INDUCED DRAFT, K-1331, 1750 H.P. A/N: 374144 <u>527112</u>	D3524				
SELECTIVE CATALYTIC REDUCTION, HALDOR TOPSOE, <u>OR APPROVED EQUIVALENT CATALYST</u> , 691 CU. FT. TOTAL WITH AMMONIA INJECTION, AQUEOUS A/N: 341341 <u>405268</u>	C3533	D3530 S3532		NH3: 20 PPMV (4) [RULE 1303(a)(1)-BACT, 5-10-1996]	A99.3, <u>A195.28</u> , D12.3, D12.11, D28.9 , <u>D29.4</u> , E71.5, <u>E193.5</u>

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Equipment	ID No.	Connect To	RECLAIM Source	Emissions and Requirements	Conditions
BLOWER, K-1332A, SCR FLUE GAS, 75 H.P. A/N: 37444 <u>527112</u>	D3525				
BLOWER, K-1332B, SCR FLUE GAS, 75 H.P., (SPARE) A/N: 37444 <u>527112</u>	D3526				

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
Benzene	40CFR61	Subpart FF

[**40CFR 61 Subpart FF, 12-4-2003**]

[Processes subject to this condition: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 16]

SYSTEM CONDITIONS

S31.12 The following BACT requirements shall apply to VOC service fugitive components associated with the devices that are covered by application number(s) 341340, 358451 and 391638:

The operator shall provide to the District, no later than 60 days after initial startup, a recalculation of the fugitive emissions based on actual components installed and removed from service. The valves and flanges shall be categorized by size and service. The operator shall submit a listing of all new non-bellows seal valves which shall be categorized by tag no., size, type, operating temperature, operating pressure, body material, application, and reasons why bellows seal valves were not used.

All new valves in VOC service, except those specifically exempted by Rule 1173, shall be bellows seal valves, except as approved by the District, in the following applications: heavy liquid service, control valve, instrument piping/tubing, applications requiring torsional valve stem motion, applications where valve failure could pose safety hazard (e.g., drain valves with valve stems in horizontal position), retrofits/special applications with space limitations, and valves not commercially available.

Valves not commercially available include valves with sizes above 8", special alloys for sizes above 2", and special connections for sizes above 2". All new valves and major components in VOC service as defined by Rule 1173, except those specifically exempted by Rule 1173 and those in heavy liquid service as defined in R1173, shall be distinctly identified from other components through

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their tag numbers (e.g., numbers ending in the letter "N"), and shall be noted in the records.

All new components in VOC service as defined in Rule 1173, except valves and flanges, shall be inspected quarterly using EPA reference Method 21. All new valves and flanges in VOC service, except those specifically exempted by Rule 1173, shall be inspected monthly using EPA Method 21.

If 98.0 percent or greater of the new (non-bellows seal) valves and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppmv for two consecutive months, then the operator may change to a quarterly inspection program with the approval of the District.

The operator shall revert from quarterly to monthly inspection program if less than 98.0 percent of the new (non-bellows seal) valves and the new flange population inspected is found to leak gaseous or liquid volatile organic compounds at a rate less than 500 ppmv.

All new components in VOC service with a leak greater than 500 ppmv but less than 1,000 ppmv, as methane, measured above background using EPA Method 21 shall be repaired within 14 days of detection. Components shall be defined as any valve, fitting, pump, compressor, pressure relief valve, diaphragm, hatch, sight-glass, and meter, which are not exempted by Rule 1173.

The operator shall keep records of the monthly inspection (quarterly where applicable), subsequent repair, and reinspection, in a manner approved by the District. Records shall be kept and maintained for at least two years, and shall be made available to the Executive Officer or his authorized representative upon request.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996]

[Systems subject to this condition: Process 6, System 4, **5**; Process 20, System 31]

[Note: The original permit to construct was tagged with conditions S4.2 and S4.4, which were subsequently erroneously dropped from the permit. Condition S31.12 will be tagged as a replacement for these conditions.]

DEVICE CONDITIONS

A63.24 The operator shall limit emissions from this equipment as follows:

Contaminant	Emissions Limit
VOC	Less than or equal to 48.6 lbs in any one day
PM10	Less than or equal to 117.5 lbs in any one day
CO	Less than or equal to 297.5 lbs in any one day

~~The operator shall calculate the emission limit(s) for compliance determination purposes for VOC and PM10 based on a three-hour source test using District-approved test methods for emission rates and fuel usage as determined by a RECLAIM-certified fuel meter during the day of the test (0000—2400 hours).~~

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For compliance purposes, the operator shall calculate the PM10 and VOC emissions using fuel usage during the calendar month as determined by a RECLAIM certified fuel meter and emission data from the most recent source test performed according to permit condition D29.15. The source test emissions data will be converted to lb/mmcf, multiplied by the actual calendar month fuel usage, and divided by 30 to determine the daily mass emissions. For compliance determination purposes, CO emissions shall be calculated based on certified continuous monitor, which shall have the capability to show cumulative daily emissions.

[RULE 1303(b)(2)-Offset, 5-10-1996]

[Devices subject to this condition: [D3530](#)]

A99.1 The 5 PPM NOx emission limit(s) shall not apply during startup and shutdown.

[Rule 2005, 5-6-2005]

Devices subject to this condition: [D3530](#)]

A99.2 The 25 PPM CO emission limit(s) shall not apply during startup and shutdown.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: [D3530](#)]

A99.3 The 20 PPM NH3 emission limit(s) shall not apply during startup and shutdown.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: C1967, [C3533](#)]

A195.1 The 5 PPMV NOx emission limit(s) is averaged over 3 hours, 3 percent O2, dry basis.

[Rule 2005, 5-6-2005]

[Devices subject to this condition: [D3530](#)]

A195.27 The 25 PPMV CO emission limit(s) is averaged over 1 hour, 3 percent O2, dry basis.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: [D3530](#)]

A195.28 The 20 PPMV NH3 emission limit(s) is averaged over 1 hour, 3 percent O2, dry basis.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: [C3533](#)]

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B61.1 The operator shall not use refinery gas containing the following specified compounds:

Compound	ppm by volume
Total Sulfur as H ₂ S greater than	100

The 100 ppmv total sulfur limit shall be based on a rolling 1-hour averaging period.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: **D3530**]

B61.6 The operator shall not use fuel gas, except uncombined natural gas, containing the following specified compounds:

Compound	ppm by volume
H ₂ S greater than	160

The H₂S concentration limit shall be based on a rolling 3-hour averaging period

[40CFR 60 Subpart J, 6-24-2008]

[Devices subject to this condition: D84, D471, D472, D473, D641, D643, D3031, **D3530**, C3805, C3806]

C1.30 The operator shall limit the duration of startup or shutdown to no more than 21 hour(s).

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

[RULE 2012, 1-7-2005]

[Devices subject to this condition: **D3530**]

C1.152 The operator shall limit the firing rate to no more than 653 MM Btu per hour.

For the purpose of this condition, firing rate shall be defined as the sum total of energy or heat inputs to the equipment combustion chamber based on the higher heating values (HHVs) of the natural gas and/or refinery fuel gas used.

To comply with this condition, the operator shall install and maintain continuous fuel flow meters for the refinery fuel gas and natural gas streams fed to the heater. The operator shall also install a continuous or semi-continuous HHV analyzer for the refinery fuel gas stream. The operator shall use the RECLAIM default HHV value for natural gas.

The operator shall also install and maintain a device to continuously record the parameters being measured.

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This limit shall be based on a rolling 1 hour averaging period

[RULE 1303(b)(2)-Offset, 5-10-1996]

[Devices subject to this condition: **D3530**]

D12.3 The operator shall install and maintain a(n) differential pressure gauge to accurately indicate the differential pressure across the SCR catalyst beds in inches water column.

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within +/- 5 percent. It shall be calibrated once every twelve months.

For the purpose of this condition, continuously record shall be defined as recording at least once every week and shall be calculated based upon the average of the continuous monitoring for that week.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: C85, C162, C469, C1967, **C3533**]

~~**D12.10** The operator shall install and maintain a(n) continuous monitoring system to accurately indicate the oxygen concentration at the exhaust stack.~~

~~**[RULE 1303(a)(1)-BACT, 5-10-1996]**~~

~~[Devices subject to this condition: **D3530**]~~

[Note: This requirement is included in condition D82.4 that is being tagged to this heater.]

D12.11 The operator shall install and maintain a(n) continuous monitoring system to accurately indicate the temperature at the inlet to the SCR catalyst bed.

The operator shall also install and maintain a device to continuously record the parameter being measured.

The measuring device or gauge shall be accurate to within +/- 5 percent. It shall be calibrated once every 12 months according to manufacturers recommended procedure.

For the purpose of this condition, continuously record shall be defined as recording at least once every hour and shall be calculated based upon the average of the continuous monitoring for that hour

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: **C3533**]

~~**D28.9** The operator shall conduct source test(s) in accordance with the following specifications:~~

~~The test shall be conducted annually after the initial source test for NO_x, SO_x, NMHC, CO, PM-10, Total PM, NH₃, and O₂.~~

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~~The test shall be conducted within 90 days after achieving maximum production rate, but no later than 180 days after initial start up.~~

~~Source test shall be conducted when this equipment is operating at 80 percent or greater of maximum design capacity or at 90 percent or greater based on the maximum demonstrated hydrogen production capacity if it is not possible to reach 80 percent of the heater maximum design capacity.~~

~~The test shall be conducted after District approval of a source test protocol submitted in accordance with Section E—Administrative Conditions.~~

~~The District shall be notified of the date and time of the test at least 10 days prior to the test.~~

~~The test shall be conducted to determine the NOX emissions at the outlet.~~

~~The test shall be conducted to determine the SOX emissions at the outlet.~~

~~The test shall be conducted to determine the non-methane hydrocarbon emissions at the outlet.~~

~~The test shall be conducted to determine the CO emissions at the outlet.~~

~~The test shall be conducted to determine the PM10 emissions at the outlet.~~

~~The test shall be conducted to determine the total PM emissions at the outlet.~~

~~The test shall be conducted to determine the oxygen concentration at the outlet.~~

~~The test shall be conducted to determine the NH3 emissions at the outlet.~~

~~The test shall be conducted to determine the Benzene at the outlet.~~

~~The test shall be conducted to determine the Toluene at the outlet.~~

~~The test shall be conducted to determine the Ethyl benzene at the outlet.~~

~~The test shall be conducted to determine the Xylene at the outlet.~~

~~The test shall be conducted to determine the Acetaldehyde at the outlet.~~

~~The test shall be conducted to determine the Formaldehyde at the outlet.~~

~~The test shall be conducted to determine the Cadmium at the outlet.~~

~~The test shall be conducted to determine the Nickle, subsulfide at the outlet.~~

~~The test shall be conducted and test report submitted to the District in accordance with Section E—Administrative Conditions.~~

~~The District shall be notified of the date and time of the test at least 7 days prior to the test.~~

[RULE 1303(a)(1) BACT, 5-10-1996; RULE 3004(a)(4) Periodic Monitoring, 12-12-1997]

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~~{Devices subject to this condition: C3533}~~

[Note: This source test will be replaced by proposed condition D29.15.]

D29.4 The operator shall conduct source test(s) for the pollutant(s) identified below.

Pollutant(s) to be tested	Required Test Method(s)	Averaging Time	Test Location
NH3 emissions	Approved District Method(s)	District-approved averaging time	Outlet

The test(s) shall be conducted at least annually.

The District shall be notified of the date and time of the test at least 10 days prior to the test.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997]

[Devices subject to this condition: C85, C162, C469, [C3533](#)]

D29.15 The operator shall conduct source test(s) for the pollutant(s) identified below.

<u>Pollutant(s) to be tested</u>	<u>Required Test</u>	<u>Averaging Time</u>	<u>Test Location</u>
<u>NOx emissions</u>	<u>District Method 100.1</u>	<u>1 hour</u>	<u>Stack Outlet</u>
<u>SOx emissions</u>	<u>District Method 100.1 or 6.1</u>	<u>1 hour</u>	<u>Stack Outlet</u>
<u>CO emissions</u>	<u>District Method 100.1 or 10.1</u>	<u>1 hour</u>	<u>Stack Outlet</u>
<u>ROG emissions</u>	<u>District Method 25.1 or 25.3</u>	<u>1 hour</u>	<u>Stack Outlet</u>
<u>PM emissions</u>	<u>District approved method</u>	<u>District approved averaging time</u>	<u>Stack Outlet</u>
<u>PM10 emissions</u>	<u>District approved method</u>	<u>District approved averaging time</u>	<u>Stack Outlet</u>

The test(s) shall be conducted at least annually.

Source test shall be conducted when this equipment is operating at 70 percent or greater of maximum design capacity or at 80 percent or greater of the maximum daily hydrogen production rate demonstrated over the last one year period.

The test shall be conducted to determine the concentration and report the mass emission rate in pounds per hour for NOx, SOx, ROG, CO, Total PM, and PM10.

The test shall be conducted to determine the oxygen concentration. In addition, the tests shall measure the fuel flow rate (CFH), the flue gas flow rate, and the electricity generation of the turbines in MW.

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Source test data for NO_x, SO_x, CO and O₂ may be substituted with CEMS data. The CEMS data for the time period of the ROG and PM₁₀ source tests shall be included in the source test report.

The test shall be conducted after District approval of a source test protocol submitted in accordance with Section E- Administrative Conditions.

The test shall be conducted and test report submitted to the District in accordance with Section E - Administrative Conditions.

The District shall be notified of the date and time of the test at least 10 days prior to the test.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 1303(b)(2)-Offset, 5-10-1996; RULE 1401, 3-5-2005; RULE 2005, 4-20-2001; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 407, 4-2-1982]

[Devices subject to this condition: [D3530](#)]

D82.1 The operator shall install and maintain a CEMS to measure the following parameters:

CO concentration in ppmv

Concentrations shall be corrected to 3 percent oxygen on a dry basis.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 407, 4-2-1982]

[Devices subject to this condition: [D3530](#), D3695]

[Note; This condition will be replaced with condition D82.4.]

D82.4 The operator shall install and maintain a CEMS to measure the following parameters:

CO concentration in ppmv

Concentrations shall be corrected to 3 percent oxygen on a dry basis.

Oxygen concentration in percent volume

The CEMS shall be installed to continuously record the actual stack concentration and the corrected stack concentration for CO along with the stack O₂ concentration. The monitoring system shall comply with the requirements of District Rule 218.

[RULE 1303(a)(1)-BACT, 5-10-1996; RULE 3004(a)(4)-Periodic Monitoring, 12-12-1997; RULE 407, 4-2-1982]

[Devices subject to this condition: D2216, [D3530](#)]

D90.20 The operator shall continuously monitor the H₂S concentration in fuel gases before being burned in this device according to the following specifications:

The operator shall use Gas Chromatograph meeting the requirements of 40CFR60 Subpart J to monitor the parameter.

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The operator shall also install and maintain a device to continuously record the parameter being monitored.

The operator may monitor the H2S concentration at a single location for fuel combustion devices, if monitoring at this location accurately represents the concentration of H2S in the fuel gas being burned in this device.

[40CFR 60 Subpart J, 6-24-2008]

[Devices subject to this condition: D84, D471, D472, D473, D641, D643, D3031, **D3530**]

E71.5 The operator shall only inject ammonia into this equipment if the flue gas inlet temperature is at least 510 degrees F.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: **C3533**]

E193.5 The operator shall construct, operate, and maintain this equipment according to the following specifications:

To establish equivalency of a catalyst, the operator shall submit the following information for the catalyst to the District permitting engineer: manufacturer, description (type), configuration, dimensions (per block), number of blocks, total volume, space velocity, life, vendor performance guarantee, performance curve (versus temperature), minimum operating temperature, estimated SO₂ to SO₃ conversion, estimated NO to NO₂ conversion, and concentration of Rule 1401 TACs.

The operator shall not install and use an “equivalent” catalyst until approval is received in writing from the District.

[RULE 1303(a)(1)-BACT, 5-10-1996]

[Devices subject to this condition: C2210, C2213, C2217, C3058, **C3533**]

~~**E71.6** The operator shall only operate this equipment if Heaters F-1330A/B and Boiler F-1300 are removed from service prior to startup.~~

~~**[RULE 1303(a)(1)-BACT, 5-10-1996]**~~

~~[Devices subject to this condition: **D3530**]~~

[Note: The F-1330A/B Heaters and F-1300 Boiler have been removed from the refinery.]

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

Contaminant	Rule	Rule/Subpart
H2S	40CFR60, Subpart	J

[40CFR 60 Subpart J, 6-24-2008]

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[Devices subject to this condition: D84, D471, D472, D473, D641, D643, D3031, C3148, [D3530](#), C3805, C3806]

~~H23.20~~ This equipment is subject to the applicable requirements of the following rules or regulations:

Contaminant	Rule	Rule/Subpart
H2S	40CFR60, Subpart	J
CO	District Rule	218

~~[Rule 218, 5-14-1999; Rule 218, 5-14-1999; 40CFR 60 Subpart J, 6-24-2008]~~

~~[Devices subject to this condition: [D3530](#)]~~

FEE ANALYSIS

As shown in the following table, Chevron has paid all applicable fees for all of the subject applications.

Summary of Fee Analysis

A/N	Equipment Description	BCAT/CCAT	Fee Schedule	Fee Type	Fiscal Year (1)	Fee
405268	Selective Catalytic Reduction	81 (CCAT)	C	Change of Condition	02-03	\$ 1,175.13
405269	Htr/Furnace (>50 MMBtu/hr) Proc Gas	059605 (BCAT)	E	Change of Condition	02-03	\$ 2,950.83
527112	Htr/Furnace (>50 MMBtu/hr) Proc Gas	059605 (BCAT)	E	Change of Condition	10 - 11	\$ 6,858.93 (2)
527111	RECLAIM/Title V Permit	555009 (BCAT)	na.	Facility Permit Amendment	10 - 11	\$ 1,747.19
					Total Due	\$ 10,445.77
					Fees Paid	\$ 12,732.08
					Outstanding Balance	\$ - 2,286.31

(1) Based on the date that the application was submitted.

(2) Includes 50% additional fee for expedited permit processing per Rule 301(v). No overtime was spent on this application so the expedited permit processing fee of \$2286.31 will be refunded.

PERMIT HISTORY

Permit History for SNR Heater (A/N 527112)

Permit to Construct		Permit to Operate		Description of Modification
No.	Issue Date	No.	Issue Date	
341340	3/23/99	na.	na.	Original Construction.
371111	9/21/05	na.	na.	Revised permit to allow 44 hours for initial startup including refinery dry-out instead of the originally permitted

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Permit to Construct		Permit to Operate		Description of Modification
No.	Issue Date	No.	Issue Date	
				31 hours.
405269	na.	na.	na.	Application for change of permit conditions. Application will be cancelled and proposed condition changes evaluated under subsequent A/N 527112.
527112	na.	na.	na.	Application for change of permit conditions that is being evaluated in this document.

Permit History for SNR Heater SCR (A/N 405268)

Permit to Construct		Permit to Operate		Description of Modification
No.	Issue Date	No.	Issue Date	
341341	3/23/99	na.	na.	Original Construction.
405268	na.	na.	na.	Application for change of permit conditions that is being evaluated in this document.

COMPLIANCE RECORD REVIEW

There are no ongoing violations for any of the equipment covered in this evaluation.

PROCESS DESCRIPTION:

The Steam Naphtha Reformer (SNR) plant produces hydrogen and high pressure steam for use at the refinery. The hydrogen is utilized within the refinery for removal of sulfur and nitrogen from refinery gas oils (hydrotreating). The radiant firebox sections of the reformer furnace contain vertical catalyst filled tubes in which a mixture of clean (low-sulfur) light hydrocarbons and steam are reformed into hydrogen, carbon monoxide (CO), and carbon dioxide (CO₂). This product stream is cooled and steam is produced in the waste heat (convective) section of the furnace. In high and low temperature shift reactors, which are located downstream of the furnace, the CO is reacted with additional steam in the presence of a catalyst to produce additional CO₂ and hydrogen. A majority of the CO₂ is removed from the hydrogen product in downstream steps in the SNR Plant.

Prior to the SNR Hydrogen Plant project in 1999/2000, which included the construction of the new SNR Heater, the SNR Plant processed a feed that included butane and naphtha. The project in 1999/2000 included modification of SNR plant and feed system to provide the capability to process alternative feedstocks including refinery fuel gas and nat. gas.

The reformer furnace, which has a maximum permitted heat input rating of 653 MMBtu/hr is equipped with 320 John Zink FPMR-6 low NO_x burners and 64 John Zink FPMR-4 low NO_x burners. Refinery fuel gas is the primary fuel and natural gas is a secondary fuel. John Zink guarantees the burner CO and NO_x emissions to be less than 25 and 50 ppmv (3% O₂), respectively. The furnace is equipped with a selective catalyst reduction (SCR) system for additional NO_x control. The SCR catalyst utilizes injected ammonia in the presence of the catalyst to reduce NO_x concentrations. Diluted ammonia vapor is injected into the exhaust gas stream via a grid of nozzles located upstream of the catalyst module.

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The specifications for the SCR are contained in the table below.

Specifications for Selective Catalyst Reduction (SCR)

Catalyst Properties	Specifications
Manufacturer	Haldor Topsoe A/S
Catalyst Type	DNX 930, Monolithic Catalyst
Catalyst Volume	691 ft ³
Space Velocity	12,200 hr ⁻¹
Catalyst Life (performance guarantee)	5 years
Optimum Operating Temperature	562 - 622°F
Ammonia Injection Rate	67 lb/hr aqueous ammonia (30% by weight)
NOx Removal efficiency	90 percent
NOx Concentration @ Stack Outlet	5 ppmvd, 3-hr average, 3% O ₂
NH ₃ Concentration @ Stack Outlet	20 ppmvd, 1-hr average, 3% O ₂
SO ₂ Oxidization Rate	0.25 percent

CALCULATIONS

None of the proposed permit condition changes will impact the maximum potential emissions of CO, NO_x, PM₁₀, ROG, SO_x. The SNR Heater was subject to NSR upon original construction. This section contains a review of the emission estimates for original construction of the SNR Heater under A/N 341340.

Some of the emission increases for the new heater were offset through contemporaneous emission reductions achieved by shutdown of two existing heaters and a boiler. As specified in Rule 1304(c)(2), *an exemption from the offset requirement of Rule 1303(b)(2) shall be allowed for a source that is part of a concurrent facility modification with emission reductions occurring after the submittal of an application for a permit to construct a new or modified source, but before the start of operation of the source, provided that it results in a net emission decrease, as determined by Rule 1306.* The methodology for calculating emission increases and emission decreases is specified in Rule 1306(b) and Rule 1306(c), respectively.

Combustion Emissions

Maximum potential combustion related emissions for the new SNR Heater were estimated based on the maximum permitted firing rate of 653 MMBtu/hr along with manufacturer guaranteed emission rates for PM₁₀ and VOC, exhaust gas concentration limits for CO and NO_x, and a fuel sulfur limit for SO_x.

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$$\begin{aligned} \text{CO Emissions} &= \left[653 \text{ MMBtu/hr} \times F_d \times \left(\frac{25 \text{ ppmvd}}{1000000} \right) \times \left(\frac{1}{MV} \right) \times MW \times \left(\frac{20.9}{20.9 - 3} \right) \right] \\ &= 12.4 \text{ lb/hr} \\ &= 297.6 \text{ lb/day} \end{aligned}$$

$$\begin{aligned} \text{NOx Emissions} &= \left[653 \text{ MMBtu/hr} \times F_d \times \left(\frac{5 \text{ ppmvd}}{1000000} \right) \times \left(\frac{1}{MV} \right) \times MW \times \left(\frac{20.9}{20.9 - 3} \right) \right] \\ &= 4.07 \text{ lb/hr} \\ &= 98. \text{ lb/day} \end{aligned}$$

$$\begin{aligned} \text{SO}_2 \text{ Emissions} &= \left[653 \text{ MMBtu/hr} \times \left(\frac{1}{HHV} \right) \times 100 \text{ ppmvd} \times MW \times \left(\frac{1}{MV} \right) \right] \\ &= 9.72 \text{ lb/hr} \\ &= 234 \text{ lb/day} \end{aligned}$$

where,

- HHV = High heating value of fuel (HHV for refinery fuel gas is 1132 Btu/scf)
- Fd = Dry F factor (dry F factor for refinery fuel gas is 8815 dscf/MMBtu)
- MW = Molecular weight (CO=28 lb/lb-mol; NOx=46 lb/lb-mol, SO2=64 lb/lb-mol)
- MV = Molar volume at 60°F = 379.5 dscf/lb-mol

PM10 and VOC emissions were calculated based on manufacturers guaranteed emissions of 0.0075 lb/MMBtu and 0.0031 lb/MMBtu, respectively. The District's AER emission factors for external natural gas combustion (other) are 7.5 lb/mmcf for PM10 and 7.0 lb/mmcf for VOC, which equates to 0.0071 lb/MMBtu and 0.0067 lb/MMBtu, respectively, using a default natural gas high heating value (HHV) of 1050 Btu/scf. Based on the maximum permitted firing rate of 653 MMBtu/hr and the manufacturers guaranteed emission factors, the estimated maximum PM10 and VOC emissions are 4.90 lb/hr and 2.02 lb/hr, respectively.

Maximum potential criteria pollutant emissions are shown in the following table.

Estimated Maximum Potential CO, PM10, VOC, NOx and SOx Emissions

Maximum Potential Emissions (lb/day)				
CO	PM10	VOC	NOx	SO2
297.5 (1)	117.5 (1)	48.6 (1)	98.	234.

(1) Mass emission limit imposed on permit condition A63.24.

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The emission reductions due to the shutdown of two existing heaters and one boiler were calculated according to Rule 1306(c) as the average daily emissions for the last two year period prior to the processing of A/N 341340. One existing heater and one boiler were not operated during this two year period so the emission decrease for each device is 0 lb/day. The 2-year average emission for Heaters F1330A&B and Boiler F-1300 are summarized in the table below. The calculations are documented in the file for A/N 341340.

Two-Year Average Emissions for Period of May 1996 through April 2008

Pollutant	F-1330A	F-1330B	F-1300	Total
CO	112.7	11.4	2.6	126.7
PM10	49.6	45.6	11.5	106.7
VOC	22.5	20.8	5.2	48.6
NO _x	328.7	281.2	171.7	781.6
SO _x	146.7	113.5	33.2	293.4

The net emission increases for the SNR heater, which is the maximum potential emissions for the new SNR Heater (F-1330) minus the 2-year average emissions for Heaters F1330A&B and Boiler F-1300, are summarized in the table below.

Net Emission Increase for New SNR Heater

Pollutant	Contemporaneous Emission Reduction (lb/day) (1)	Max. PTE for New SNR Heater (lb/day)	Net Change in Emissions (lb/day)
CO	126.7	297.5	+170.8
PM10	106.7	117.5	+10.8
VOC	48.6	48.6	+ 0.0
NO _x	781.6	98	-683.6
SO _x	293.4	234	-59.4

(1) Two-year average emissions for two heaters (F-1330A&B) and a boiler (F-1300) that were taken out of service.

Ammonia emissions were not previously estimated for the SNR Heater SCR. Ammonia is the only pollutant that is generated and emitted directly from the subject SCR. To achieve optimum NO_x reduction efficiency, greater than stoichiometric amounts of ammonia are injected upstream of the catalyst. The excess ammonia that flows through the SCR system is commonly referred to as ammonia "slip". The amount of ammonia slip is limited through a stack gas ammonia concentration limit of to 20 ppmv (@ 3% O₂) as specified in the "Emissions and Requirements" column of the permit. The estimate of maximum potential ammonia emissions is based on the maximum permitted heat input of the SNR Heater and

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the subject 20 ppmv ammonia concentration limit. This ammonia emission estimate is documented below.

$$\begin{aligned}
 \text{NH}_3 \text{ Emissions} &= 653 \text{ MMBtu/hr} \times \left(\frac{\text{ppmvd}}{1000000} \right) \times \text{MW} \times \left(\frac{1}{\text{MV}} \right) \left(\frac{20.9}{17.9} \right) \times F_d \times 24 \times 365 \\
 &= 52,119 \text{ lb/yr} \\
 &= 145 \text{ lb/day (30-day avg.)}
 \end{aligned}$$

where,

ppmvd	= Pollutant concentration limit at stack outlet at 3% O ₂ , dry basis
	= 20 ppmv
MW	= Molecular weight = 17 lb/lb-mol
MV	= Molar volume at 60°F = 379.5 dscf/lb-mol
F _d	= Dry oxygen f-factor for natural gas = 8,710 dscf/MMBTU

Fugitive Emissions

The refinery fuel gas supply system for the SNR heater contains fugitive components (valves, connectors, flanges, pumps, compressors, etc.). VOC emissions for these fugitive components are estimated by multiplying the total number of each fugitive component type by an appropriate emission factor. Subsequent to the issuance of the original permits for construction of the SNR Heater and SCR (341340 & 341341), the District switched to the use of emission factors based on the correlation equations from the following document: *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities* (CARB/CAPCOA - 1999).

As shown in the Appendix to this evaluation, maximum potential VOC emissions from fugitive components based on the post-construction fugitive component count and the new emission factors are 38.9 lb/day. The reduction in fugitive VOC emissions for the removal of fugitive components related to the Heaters F1330A&B and Boiler F-1300 was also calculated with the new emission factors. As seen in the Appendix, the removal of these combustion devices causes a reduction in estimated fugitive VOC emissions of 51.0 lb/day. The net VOC emission reduction for the concurrent facility modifications was 12.1 lb/day (51.0 lb/day – 38.9 lb/day). Total VOC emissions including combustion and fugitive emissions is 87.5 lb/day (48.6 lb/day + 38.9 lb/day)

EVALUATION OF REQUESTED CHANGES OF PERMIT CONDITIONS

This section contains a review and analysis of the permit condition changes proposed by Chevron for the SNR Heater and associated SCR.

SNR HEATER

1. Specify a 60-minute averaging period for the 25 ppmv CO limit.

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An averaging period is not currently specified for the subject CO concentration limit, which was imposed as a BACT requirement. The averaging period is not discussed in the engineering evaluation or associated documentation for the original permit to construct for the SNR Heater. CO BACT emission limits are routinely specified with a 60-minute (1-hr) averaging period. In an August 7, 2007 SCAQMD Policies and Procedures memo from Mr Mohsen Nazemi, it is specified that BACT emission limits for all new permits for combustion equipment shall be imposed on a one-hour averaging period. This is consistent with the shortest averaging period for Federal and State Ambient Air Quality Standards (AAQSs). It is also specified that conversion of a BACT limit to a one hour averaging period from a shorter averaging period would probably not trigger an NSR event if the hourly emission of the equipment is not increased.

Since an averaging period is not specified for this BACT CO limit, it is appropriate to specify an averaging period of 1 hour. Specification of a 1 hour averaging period has no impact on the estimated maximum potential CO emissions under NSR. Therefore, for consistency with other CO emission limits, it is recommended that a 1 hour averaging period be specified for the CO limit. Condition A195.27, which will specify that the CO limit is averaged over a 1 hour period at 3% O₂, will be tagged to the SNR Heater (D3530).

- Specify a 1-hour averaging period for the 100 ppm fuel total sulfur limit of permit condition B61.1.

The averaging time for the 100 ppmv total sulfur limit was not clearly specified or documented when the BACT determination was made for the SNR Heater under permit to construct A/N 341340, which was issued in 1999.

The SNR Heater receives refinery fuel gas from the V-1800 Fuel Gas Mix Drum (D833 in P21S18). This mix drum is equipped with a fuel sulfur GC that utilizes a Flame Photometric Detector (FPD) to quantify total reduced sulfur emissions. This fuel sulfur GC is a semi-continuous monitor that operates on a 15 minute cycle. A sample aliquot is collected by the GC every 15 minutes. The 15 minute cycles are required for the sulfur compounds to elute from the capillary column and be quantified with the FPD.

Due to the 15-minute sample cycle length, an averaging period of less than 15 minutes is not feasible. An averaging period of 15-minutes is not feasible since it does not provide the operator adequate time to respond to changes in the fuel sulfur concentration once the results from analysis of the sample aliquot are reported. A three or four hour limit is also not appropriate since at the time that this BACT limit was imposed Rule 431.1 included a limit of 40 ppmv with a 4-hour averaging period.

Based on this analysis, an averaging period of 1-hour is judged to be appropriate since it provides the refinery time to respond to SO₂ excursions due to plant upsets, etc. and is not considered to be less stringent than the Rule 431.1 limit of 40 ppmv with a 4-hour averaging period. Condition B61.1, which specifies the 100 ppmv total sulfur (as H₂S) limit, will be modified to include a 1 hour averaging period.

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3. Replace “MODEL FPMR-5 (320 BURNERS)” with “MODEL FPMR-6 (320 BURNERS)” in the equipment description of the heater.

The SNR Heater was originally permitted for 64 John Zink FPMR-4 burners and 320 John Zink FPMR-5 burners. Born Heaters LTD, the heater manufacturer, actually installed 320 John Zink FPMR-6 burners instead of the FPMR-5 burners. As discussed elsewhere in this evaluation, the heater has been able to meet all existing emission limits with the FPMR-6 burners. It is not believe that this change in burners has significantly impacted emissions. The equipment description will be changed as proposed.

4. Modify source test condition D28.9 as follows: “Source test shall be conducted when this equipment is operating at ~~80~~ 70 percent or greater of maximum design capacity or at ~~90~~ 80 percent or greater ~~based on~~ of the maximum ~~demonstrated~~ daily hydrogen production ~~rate demonstrated over the last one year period~~ capacity if it is not possible to reach 80 percent of the heater maximum design capacity.”

Chevron is currently unable to perform the specified source test at 80% of heater capacity or 90% of hydrogen production capacity due to operational limitations in the hydrogen plant. Performance of the source test under the specified operating conditions has been a recurring problem for this heater. The proposed permit conditions will provide Chevron additional flexibility and assure that the annual source test is performed under conditions that are more representative of recent operation of the heater and plant.

The source test is performed to determine compliance with the PM10 and VOC mass emission limits of permit condition A63.32. NOx and CO CEMS are utilized to determined compliance with the CO and NOx concentration limits. Performance of the source test at the proposed lower heater load is not expected to significantly impact PM10 and VOC emissions. Note that the heater permit is not conditioned with any short term (hourly) emission limits for PM10 and VOC. The PM10 and VOC emission limits are determined on 30-day average emissions. The following language will be added to permit condition A63.32 to require that Chevron utilize the source test data to develop PM10 and VOC emission factors that will be used to confirm compliance with the 30-day average PM10 and VOC mass emission limits throughout the year following each annual source test:

For compliance purposes, the operator shall calculate the PM10 and VOC emissions using fuel usage during the calendar month as determined by a RECLAIM certified fuel meter and emission data from the most recent source test performed according to permit condition D29.15. The source test emissions data will be converted to lb/mmcf, multiplied by the actual calendar month fuel usage, and divided by 30 to determine the daily mass emissions.

SNR HEATER SCR

1. Specify a 60-minute averaging period for the 20 ppmv NH3 emission limit.

Based on the discussion above regarding the averaging period for the CO concentration limit, it is recommended that a 60-minute (1-hour) averaging period be imposed on the subject NH3 concentration limit. Condition A195.28, which will specify that the NH3

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limit is averaged over a 1 hour period at 3% O₂, will be tagged to the SCR for the SNR Heater (C3533).

- Remove NO_x, SO_x, CO, and O₂ from the source test requirements in condition D28.9.

It is of value to know the NO_x, SO_x and CO concentrations during the time period when PM₁₀ and VOC (ROG) concentrations are measured. Therefore, the following language will be added to proposed source test condition D29.15 (formerly D28.9): *Source test data for NO_x, SO_x, CO and O₂ may be substituted with CEMS data. The CEMS data for the time period of the ROG and PM₁₀ source tests shall be included in the source test report.*

- Add “OR APPROVED EQUIVALENT CATALYST” to the equipment description for the SCR catalyst.

An SCR catalyst is replaced every 5 years or so. An operator will often have to replace an existing catalyst with a different catalyst for a number of reasons including: manufacturer going out of business, manufacturer merging another manufacturer, catalyst manufacturer discontinuing production of the catalyst, etc. As a catalyst nears the end of its useful life, it tends to require higher and higher ammonia concentrations to achieve the required NO_x control efficiency due to inactivation of the catalyst. Timely replacement of the catalyst minimizes both NO_x and ammonia emissions. It is believed that addition of the phrase “OR APPROVED EQUIVALENT CATALYST” to the equipment description will improve Chevron’s ability to make timely catalyst replacements. The following condition will be added to the permit to assure that Chevron chooses an appropriate catalyst.

Condition E193.5 - The operator shall construct, operate, and maintain this equipment according to the following specifications:

To establish equivalency of a catalyst, the operator shall submit the following information for the catalyst to the District permitting engineer: manufacturer, description (type), configuration, dimensions (per block), number of blocks, total volume, space velocity, life, vendor performance guarantee, performance curve (versus temperature), minimum operating temperature, estimated SO₂ to SO₃ conversion, estimated NO to NO₂ conversion, and concentration of Rule 1401 TACs.

The operator shall not install and use an “equivalent” catalyst until approval is received in writing from the District.

RULE COMPLIANCE REVIEW

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

The California Environmental Quality Act (CEQA), Public Resources Code Section 21000 et seq., requires that the environmental impacts of proposed “projects” be evaluated and that feasible methods to reduce, avoid or eliminate significant adverse impacts of these projects be identified and implemented. For the project to replace the old SNR Heaters with a new heater, the City of El Segundo issued a mitigated negative declaration of environmental impacts under Resolution No. 2433 on November 12, 1998.

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The proposed permit condition changes do not cause an increase in the emission of any air pollutants and there are no other significant environmental impacts. On the 400-CEQA form, Chevron marked “No” to all of the additional criterion that may trigger CEQA. For these reasons, CEQA does not apply for the proposed permit condition changes.

REGULATION II: PERMITS

Rule 212: Standards for Approving Permits

A public notice is not required for the proposed condition changes since there is no increase in the emission of any criteria or toxic air pollutants. As discussed below, a public notice was also not required for the original permits to construct for the SNR Heater and SCR.

212(c)(1): Public notice is required for a project if any of the modified permit units are located within 1000 feet of a school. Public notice was not required under this clause because St. Anthony’s, which was the closest school, is over 2000 feet away from the SNR Heater and SCR.

212(c)(2): Public notice is required for any “new or modified facility”, which has on-site emission increases exceeding any of the daily maximums specified in subdivision (g) of Rule 212. The table below contains a comparison of the net emission increase of criteria pollutants for the construction of the SNR Heater versus the emission increase thresholds contained in 212(g). Public notice was not required under this clause for the original permit to construct for the SNR Heater since the net change of CO, NOx, PM10, SOx and VOC did not exceed the Rule 212(g) thresholds.

Air Contaminant	R212(g) Daily Maximum Threshold (lb/day)	Estimated Net Emission Change for SNR Heater (lb/day)
CO	220	+ 171.
NOx	40	- 683.
PM10	30	+ 11.
SO2	60	- 60.
VOC	30	+ 21. (2)

- 1) Increase in 30-day average maximum potential to emit.
- 2) This VOC emission increase was for the SNR Hydrogen Plant permit unit.

212(c)(3): Public notice is required for any new or modified permit units that have an increase in toxic air contaminants that results in an increase of maximum individual cancer risk (MICR) of more than one in a million (1×10^{-6}) during a lifetime (70 years). Public notice was not required for the original construction of the SNR Heater since the unit passed a Tier 2 health risk screening.

212(g): 212(g) specifies that any new or modified sources subject to Regulation XIII which undergo construction or modifications resulting in an emissions increase exceeding any of the daily maximum emission thresholds (listed in the table above) will require notification. From Regulation XIII (Rule 1302), the definition of “Source” is any permitted individual

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unit, piece of equipment, article, machine, process, contrivance, or combination thereof, which may emit or control an air contaminant. This includes any permit unit at any non-RECLAIM facility and any device at a RECLAIM facility.

Public notice was not required under this clause for the original permit to construct for the SNR Heater since the net change of CO, NO_x, PM₁₀, SO_x and VOC did not exceed the Rule 212(g) thresholds.

Rule 218 – Continuous Emission Monitoring

The rule sets certification standards and QA/QC procedures for CEMS that are required by permit conditions and/or regulations with the following exceptions:

- CEMS subject to RECLAIM (Regulation XX); Regulation IX - “New Source Performance Standards (NSPS)”, Regulation X - National Emission Standards for Hazardous Air Pollutants (NESHAPS), or Regulation XXXI - "Acid Rain Program".
- CEMS subject to permit conditions where the purpose of the CEMS is to monitor the performance of the basic and/or control equipment and not to determine compliance with any applicable limit or standard.
- CEMS where alternative performance specifications are required by another District rule.

The CO CEMS for the SNR Heater is subject to the requirements of this rule. The NO_x and SO_x CEMS are not subject to this rule since they are subject to RECLAIM.

Requirements [218(c)(1)]:

CEMS Certification: An applicant must choose one of the following options for certification, operation, and maintenance of a CEMS:

- Certify the CEMS according to District Rule 218.1(b) and operate and maintain the CEMS according to Rule 218(b), (e), (f) and (g) and Rule 218.1(b) and (d), or,
- Certify the CEMS according to 40CFR60 (NSPS) Appendix B - "Performance Specifications" and operate and maintain the CEMS according to Rule 218(b), (e), (f) and (g) and 40CFR60 Appendix F - "Quality Assurance Procedures"

Chevron chose to certify, operate, and maintain the subject CO CEMS according to the second (NSPS) option. The subject CO CEMS met all certification requirements and received certification from the District Source Test Group.

Quality Assurance Procedures [40CFR60 Appendix F]: The CO CEMS are subject to Procedure 1 in this appendix. This procedure is used to evaluate the effectiveness of quality control (QC) and quality assurance (QA) procedures and the quality of data produced by a CEMS. One function of this procedure is to assess the quality of the CEMS data by estimating accuracy. The other function is to control the quality of the CEMS data by implementing QC policies and corrective actions. When the assessment function indicates that the data quality is inadequate, the control effort must be increased until the data quality is acceptable.

Data Accuracy Assessment: Each CEMS must be audited at least once each calendar quarter. The audits shall be conducted as follows:

- Relative Accuracy Test Audit (RATA). A RATA must be conducted at least once every four calendar quarters. A RATA involves conducting a minimum of nine reference

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method (RM) test runs and comparing the results to CEMS data collected during each of the RM test runs.

- Cylinder Gas Audit (CGA). A CGA may be conducted in three of four calendar quarters, but in no more than three quarters in succession. In a CGA, the CEMS is challenged with two audit gases of known but different concentrations.
- Relative Accuracy Audit (RAA). An RAA may be conducted three of four calendar quarters, but in no more than three quarters in succession. The RAA utilizes the same procedures as a RATA except that only three sets of measurement data are required.

Chevron has been performing the required audits of the CO CEMS. A copy of the summary and cover pages for the report of a recent (3rd quarter 2010) CO CEMS CGA was reviewed. The CEMS passed this CGA. Compliance with the requirements of this regulation is expected.

REGULATION IV - PROHIBITIONS

Rule 401: Visible Emissions

This rule specifies that a person shall not discharge emissions from a source for a period or periods aggregating more than three minutes in any one hour which are as dark or darker in shade as that designated No. 1 on the Ringelmann Chart or emissions of such opacity that it obscures an observers view to an equal or greater level. This is equivalent to opacity of 20%.

Visible emissions are not normally an issue with natural gas and refinery fuel gas fired process heaters. There is no history of visible emissions for this process heater. Compliance with this rule is expected.

Rule 402: Nuisance

This rule requires that a person not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which cause, or have a natural tendency to cause injury or damage to business or property.

Nuisance is not normally an issue with natural gas and refinery fuel gas fired process heaters. There is no history of nuisance for this process heater. Compliance with this rule is expected.

Rule 404: Particulate Matter – Concentration

This rule sets concentration limits for total PM (solid and condensable) emissions. The rule limit varies based on the quantity of exhaust gas (dry basis) discharged from a source. PM emission limits, which vary with exhaust gas flow rate, are specified in Table 404(a).

The following table contains a comparison of PM source test results for the last three years with the PM emission limit from Table 404(a).

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Summary of PM10 Source Test Results

Test Date	Measured PM Conc. (gr/dscf)	Measured Stack Flow (scfm)	Rule 404 Limit (gr/dscf)	Compliance Achieved
9/15/10	0.0021	112,437	0.032	Yes
9/29/09	0.0049	104,827	0.033	Yes
11/20/08	0.0047	105,193	0.033	Yes

With the large margin of compliance shown in the table above, continued compliance with this regulation is expected. The permit is conditioned with an annual PM source test to verify compliance with this rule.

Rule 405: Solid Particulate Matter – Weight

This rule sets solid PM mass emission limits for the processing of solid materials. It is not applicable to combustion sources such as the SNR Heater.

Rule 407: Liquid and Gaseous Air Contaminants

This rule contains the following emission limits:

- Carbon monoxide (CO) - 2,000 ppmv (dry; 15 minute average) [407(a)(1)]
- Sulfur Compounds - 500 ppmv (calculated as SO₂; 15 minute average) [407(a)(2)(B)]

CO Limit

The permit for the SNR Heater is conditioned with a CO emission limit of 25 ppmv. The hourly CO CEMS data for a recent two-month period was reviewed. The highest CO concentration measured by the CEMS during this period is 1.1 ppmv (1-hr avg.; 3% O₂). Compliance with the 2000 ppmv CO limit is expected.

Sulfur Compound Limit:

The 500 ppmv sulfur compound limit is subsumed by RECLAIM [Rule 2001(j)].

Rule 409: Combustion Contaminants

This rule contains limit on combustion contaminants from the combustion of fuel of 0.23 gram per cubic meter (0.1 grain per cubic foot) of flue gas (15 minute avg. at 12% CO₂).

As seen in the table in the Rule 404 evaluation, the measured PM during the last three source tests is well below the Rule 409 limit of 0.1 gr/dscf. With this large margin of compliance, continued compliance with this regulation is expected. The permit is conditioned with an annual PM source test to verify compliance with this rule.

Rule 431.1: Sulfur Content of Gaseous Fuels

This rule is subsumed by RECLAIM [Rule 2001(j)] for SO_x RECLAIM facilities such as the Chevron Refinery.

Rule 474: Fuel Burning Equipment – Oxides of Nitrogen

This rule is subsumed by RECLAIM [Rule 2001(j)] for NO_x RECLAIM facilities such as the Chevron Refinery.

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REGULATION IX - NEW SOURCE PERFORMANCE STANDARDS (NSPS)

40CFR60 Subpart J- Standards of Performance for Petroleum Refineries

The provisions of this subpart are applicable to fuel gas combustion device which commences construction or modification after June 11, 1973. Fuel gas combustion device is defined as “any equipment, such as process heaters, boilers and flares used to combust fuel gas, except facilities in which gases are combusted to produce sulfur or sulfuric acid”. Fuel gas is defined as any gas which is generated at a petroleum refinery and which is combusted. Fuel gas also includes natural gas when the natural gas is combined and combusted in any proportion with a gas generated at a refinery. The SNR Heater is subject to this regulation when combusting refinery fuel gas, which meets the definition of “fuel gas”.

This regulation has a limit of 160 ppm H₂S (3-hr avg.) for any fuel gas combusted in a fuel gas combustion device as specified in §60.104(a)(1). It is specified in §60.105(a)(3) and (4), that a fuel gas combustion device must be equipped with an instrument to continuously monitor the SO₂ concentration of the flue gas or, alternatively, an instrument that continuously monitors the H₂S concentration of the fuel gases that are combusted in the combustion device. The refinery fuel gas stream to the SNR Heater is supplied from the V-1800 fuel mix drum, which is equipped with a fuel sulfur GC for measurement of H₂S and total reduced sulfur (TRS).

§60.7(c) requires that “each owner or operator required to install a continuous monitoring device shall submit excess emissions and monitoring systems performance report and/or the summary report form to the administrator semiannually”. Chevron’s semi-annual report for the last six months of 2010 was reviewed. The subject summary report contains all of the information specified in §60.7(d). There were no excess emissions reported and the total CEMS downtime for calibrations, maintenance and malfunctions during the 6-month period was 37 hours, which is within the allowed downtime specification of this regulation.

Chevron has made improvements to their H₂S treating plants over the last decade. Fuel gas from the V-1800 fuel drum is routinely well below 160 ppmv. The V-1800 fuel sulfur GC hourly data for a recent two month period was reviewed. The average and maximum fuel total reduced sulfur (TRS) concentration during this time period was 32 ppmv and 49 ppmv, respectively.

Compliance with both the 160 ppmv H₂S fuel gas limit and monitoring requirements of this regulation is expected.

40CFR60 Subpart Ja - Standards of Performance for Petroleum Refineries for Which Construction, Reconstruction or Modification Commenced After May 14, 2007

This NSPS is applicable to the following affected facilities in petroleum refineries which were constructed, reconstructed, or modified after May 14, 2007:

- Fluid Catalytic Cracking Unit Catalyst Regenerators,
- Fluid Coking Units,
- Delayed Coking Units,
- Fuel Gas Combustion Devices (except flares), and

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- Claus Sulfur Recovery Plants (SRPs)

The SNR Heater is not subject to this regulation because it has not been reconstructed or modified after May 17, 2007. The proposed condition changes are not considered to be a modification under this regulation.

40CFR60 Subpart GGG – Standards of Performance for Equipment Leaks of VOCs in Petroleum Refineries and 40CFR60 Subpart GGGa – Standards of Performance for Equipment Leaks of VOCs in Petroleum Refineries for Which Construction, Reconstruction or Modification Commenced After November 7, 2006

These NSPSs are applicable to the following affected facilities in refineries:

- Compressors
- The group of all the equipment within a process unit.

The SNR Heater is not a process unit as defined in these regulations and there are no compressors in the subject permit unit. Therefore, the SNR Heater does not contain any fugitive components that are subject to these regulations.

REGULATION X - NATIONAL EMISSION STANDARD FOR HAZARDOUS AIR POLLUTANTS (NESHAPS)

40CFR63 Subpart CC: National Emission Standards for Hazardous Air Pollutants From Petroleum Refineries

This Subpart applies to petroleum refining sources and related emission sources that are specified in section 63.640 (c)(5) through (c)(7) (e.g. miscellaneous process vents (except for FCCU, SRU, and CRU vents), storage vessels, wastewater stream, equipment leaks, gasoline loading racks, marine vessel loading, etc.) that are located in a major source and emit or have equipment contacting one or more of the hazardous air pollutants (HAPs) listed in Table 1 of this subpart.

The only sources in the SNR Heater permit unit that must be evaluated as potential affected sources under this NESHAP are fugitive components in the refinery fuel gas and natural gas supply systems. The equipment leak standards as specified in 63.648 are applicable to fugitive components that are “in organic hazardous air pollutant service”. In “organic hazardous air pollutant service” is defined as a piece of equipment that either contains or contacts a fluid (liquid or gas) that is at least 5% by weight of total organic HAPs as determined according to 63.180(d).

63.640(d)(5) specifies that refinery fuel gas systems or emission points routed to refinery fuel gas systems are not affected sources, which are subject to this subpart. The refinery fuel gas system qualifies for this exemption. The natural gas supply system does not qualify as a refinery fuel gas system since the gas is not generated at the refinery but the HAP content of the natural gas is well below 5 percent so these components are also not subject to this regulation.

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Due to the reasons stated above, the SNR Heater and associated equipment are not subject to this regulation.

40CFR63 Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants For Industrial, Commercial and Institutional Boilers and Process Heaters

This maximum achievable control technology (MACT) standard was originally promulgated by EPA on September 13, 2004 and was vacated and remanded by the US Court of Appeals for the District of Columbia Circuit on June 19, 2007. A new rule was proposed on June 4, 2010. The public comment period for the proposed rule ended on August 23, 2010 but the proposed rule has not yet been approved. The evaluation below assumes that there are no major modifications to the proposed emission standards and other requirements of this regulation.

In the proposed regulation, *process heater* is defined as a unit in which the combustion gases do not directly come into contact with process material or gases in the combustion chamber (e.g., indirect fired). Based on this definition, the SNR Heater will be subject to this proposed regulation as an existing process heater. Existing units will be required to comply with the regulation within three years after the final rule is published in the federal register.

The proposed regulation defines eleven (11) subcategories of boilers and process heaters. The SNR Heater fits into the subcategory specified as *units designed to burn natural gas/refinery gas*. Emission limits for new and existing boilers and process heaters are specified in Tables 1 and 2 of the proposed regulation. The tables do not contain any emission limits for new or existing boilers or process heaters in the natural gas/refinery gas category. As specified in Table 3 of the proposed regulation, boilers and process heaters in the natural gas/refinery gas subcategory that have a heat input capacity greater than 10 MMBtu/hr would be subject to an annual tune-up. Additionally, all existing boilers and process heaters would be subject to a one-time energy assessment performed by qualified personnel.

Since the SNR heater will not be not subject to any emission limits, it will also not be subject to any of the operating limits, performance testing, or other compliance requirements specified in Tables 4 through 8 of the proposed regulation. Based on past compliance with similar regulations, it is expected that Chevron would comply with the limited requirements of this regulation. No changes to the permit or additional action are required at this time.

REGULATION XI: SOURCE SPECIFIC STANDARDS

Rule 1109: Emission of Oxides of Nitrogen From Boilers and Process heaters in Petroleum Refineries

Chevron is subject to the requirements of Regulation XX (RECLAIM), which supersedes the requirements of Rule 1109 per Rule 2001(j). Therefore, the SNR Heater is not subject to the requirements of Rule 1109.

Rule 1146: Emission of Oxides of Nitrogen From Industrial, Institutional and Commercial Boilers, Steam Generators and Process Heaters

This regulation contains NOx and CO emission limits for certain boilers, steam generators, and process heaters. According to 1146(b), this rule applies to boilers, steam generators, and

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process heaters of equal to or greater than 5 million Btu per hour rated heat input capacity used in all industrial, institutional, and commercial operations with the exception of:

- (1) boilers used by electric utilities to generate electricity; and
- (2) boilers and process heaters with a rated heat input capacity greater than 40 million Btu per hour that are used in petroleum refineries; and
- (3) sulfur plant reaction boilers.

The SNR Heater is not subject to this regulation since it is located in a refinery and has a rated heat input capacity greater than 40 MMBtu/hr. Also, the NOx related requirements of this rule have been subsumed by RECLAIM per 2001(j) for RECLAIM facilities.

Rule 1173: Control of Volatile Organic Compound Leaks From Components of Petroleum Facilities and Chemical Plants

This rule is intended to control volatile organic compound (VOC) leaks from fugitive components at refineries, chemical plants, oil and gas production fields, natural gas processing plants, and pipeline transfer stations. It contains identification requirements, leak standards, inspection requirements, maintenance and repair requirements, and recordkeeping and reporting requirements for fugitive components.

Chevron has an existing fugitive emission component inspection and monitoring (I&M) program for compliance with the requirements of this rule. Chevron has integrated the fugitive components associated with the SNR Heater fuel gas system into this I&M program. Compliance with the requirements of this regulation is expected.

Rule 1176: Sumps and Wastewater Separators

The purpose of this rule is to limit VOC emissions from wastewater systems located at petroleum refineries, on-shore oil production fields, off-shore oil production platforms, chemical plants, and industrial facilities. The rule specifies requirements for wastewater sumps, separators, sewer lines, process drains, junction boxes, and air pollution control equipment.

The area around the SNR Heater contains 12 process drains. According to Rule 1176(e)(5), new process drains installed after September 13, 1996, shall be equipped with water seal controls or any other alternative control measure which is demonstrated by the applicant to be equivalent. According to Chevron, all of the drains located in the SNR Heater area are equipped with water seal controls and are included in their current Rule 1176 monitoring and inspection program. Compliance with this rule is expected.

REGULATION XIII - NEW SOURCE REVIEW

As specified in Rule 1301, Regulation XIII, sets forth pre-construction review requirements for new, modified, or relocated facilities, to ensure that the operation of such facilities does not interfere with progress in attainment of the national ambient air quality standards (NAAQS), and that future economic growth within the South Coast Air Quality Management District (District) is not unnecessarily restricted. The specific air quality goal of this regulation is to achieve no net increases from new or modified permitted sources of nonattainment air contaminants or their precursors.

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The South Coast Air Basin (SOCAB) is designated in attainment of the NAAQSs for CO, NO_x and SO_x. The following are currently considered nonattainment air contaminants that are subject to new source review (NSR): NO_x, SO_x, PM_{2.5}, PM₁₀, and VOC. NO_x and VOC are included since they are precursors for ozone. NO_x, SO_x and VOC are included as PM_{2.5} and PM₁₀ precursors.

NSR requirements for these attainment pollutants are specified in the following rules:

- Rule 1303 – PM₁₀ and VOC (all facilities); NO_x and SO_x (non-RECLAIM facilities)
- Rule 1325 – PM_{2.5}
- Rule 2005 – NO_x and SO_x (RECLAIM facilities)

Since Chevron is a RECLAIM facility, it is subject to the NSR requirements for NO_x and SO_x specified in Rule 2005 of the RECLAIM regulation (Regulation XX). Sources that emit ammonia, CO, and Ozone Depleting Compounds (ODCs) are subject to only the BACT requirements of Rule 1303. As specified in a Policy and Procedures memo from Mr. Mohsen Nazemi, Deputy Executive Officer for the District’s Engineering and Compliance Office, combustion sources are subject to only the BACT requirements for CO. However, during original permitting of the SNR heater in 1999, the District was non-attainment for CO so the heater was subject to all applicable requirements for CO.

Rule 1303: Requirements

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 CO, PM₁₀, VOC, 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 PM₁₀ or VOC emissions for any new or modified source. The definition of “Source” in Rule 1302(ao) is “any permitted individual unit, piece of equipment, article, machine, process, contrivance, or combination thereof, which may emit or control an air contaminant. This includes any permit unit at any non-RECLAIM facility and any device at a RECLAIM facility.”

1303(a)(1): Best Available Control Technology (BACT):

Any new or modified source which results in an emission increase of any nonattainment air contaminant, any ozone depleting compound, or ammonia, must employ BACT for the new or relocated source or for the actual modification to an existing source. Per District policy, BACT is required for any increase in emissions that exceeds 1.0 lb per day on a maximum daily basis.

BACT means the most stringent emission limitation or control technique which:

- (1) has been achieved in practice for such category or class of source; or
- (2) is contained in any State Implementation Plan (SIP) approved by the US EPA for such category or class of source. A specific limitation or control technique shall not apply if the owner or operator of the proposed source demonstrates to the satisfaction of the Executive Officer or designee that such limitations or control technique is not presently achievable; or
- (3) is any other emission limitation or control technique, found by the Executive Officer or designee to be technologically feasible for such class or category of sources or for a

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specific source, and cost effective as compared to measures as listed in the Air Quality Management Plan (AQMP) or rules adopted by the District Governing Board.

Although BACT for NOx and SOx are specified in Rule 2005, the evaluation of NOx and SOx BACT is included in this section with the discussion of BACT for CO, VOC and PM10.

The proposed permit condition changes do not cause an increase in the emission of any criteria pollutants so BACT is not required. For original construction of the SNR Heater in 1999, BACT was triggered for all criteria pollutants. The following BACT, which was based primarily on a reformer heater that was put into operation at the Tosco (now ConocoPhillips) Refinery in 1998, was required and was implemented by Chevron during original construction of the SNR Heater under permit to construct A/N 341340:

- NOx: Use of Low-NOx burners and SCR and compliance with a NOx emission limit of 5 ppmv (3-hr avg. @ 3% O2).
- PM10/SOx: Use of natural gas and/or treated refinery fuel gas with a TRS concentration limit of 100 ppmv.
- CO & VOC: Use of gaseous fuel, properly designed burner, and good combustion practice. Compliance with a 25 ppmv CO emission limit.
- Ammonia: Compliance with an ammonia slip concentration limit of 20 ppmvd.

The heater is equipped with certified CO and NOx CEMs to show continuous compliance with the stack gas CO and NOx concentration limits. The V-1800 fuel mix drum, which supplies refinery fuel gas to the SNR Heater is equipped with a certified fuel sulfur gas chromatograph based semi-continuous emission monitoring system to monitor TRS concentration.

CEMS emissions for the last year period are summarized in the table below. As seen in the table below, CO and NOx emissions and fuel TRS concentrations were below applicable limits during the period. Note that Chevron also performed an initial source test for NOx and CO as required by permit condition D28.9. Subsequent NOx and CO source tests were not required due to certification of the NOx and CO CEMS by the District.

Pollutant	Average Concentration	Maximum Concentration	Permit Limit
CO (stack)	0.3 ppmvd	20 ppmvd	25 ppmvd (3% O2; 3-hr avg.)
NOx (stack)	3.0 ppmvd	5.0 ppmvd	5 ppmvd (3% O2; 3-hr avg.)
TRS (fuel)	33 ppmvd	68 ppmvd	100 ppmvd

Fugitive Components: The following BACT was applicable to new refinery fuel gas fugitive components installed with the new SNR Heater. The original permit for the SNR Heater contained condition S4.2, which specified BACT requirements for fugitive components. This condition was subsequently dropped for unknown reasons. Condition S31.12 will be added to the SNR Heater permit as a replacement for condition S4.2.

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- Valves: Bellow-sealed valves are required with the following exemptions.
 1. Heavy liquid service (i.e., streams with a vapor pressure <0.1 psia @ 100 °F (kerosene) based on the most volatile class present > 20% by volume)
 2. Control valve
 3. Instrument tubing application
 4. Applications requiring torsional valve stem motion
 5. Applications where valve failure could pose safety hazard (e.g., drain valves with valve stem in horizontal position)
 6. Retrofit/special applications with space limitation (special applications such as skid mounted standard packaged systems)
 7. Valves not commercially available (including valves with sizes above 8")

Chevron installed bellows sealed valves as required.

- Relief Valves: The SNR Heater does not contain any PRVs.
- Process Drain: BACT for new process drains was installation of p-traps or seal pots and inclusion in an approved I&M program. According to Chevron, new process drains were equipped with p-traps for VOC control.
- Pumps: No new pumps were installed.
- Flanges: BACT for new flanges was compliance with ANSI/API standards and inclusion in an approved I&M program.
- Compressors: No new compressors were installed.

1303(b) – The following requirements apply to any new or modified source which results in a net emission increase of any nonattainment air contaminant. The proposed condition changes do not cause an increase in the emission of any pollutants. This section contains a review of the requirements for the original construction of the SNR Heater under A/N 341340.

1303(b)(1): Modeling - The applicant must substantiate with modeling that the new facility or modification will not cause a violation, or make significantly worse an existing violation of any state or national ambient air quality standards at any receptor location in the District. Modeling for NO_x is specified in Rule 2005 but a discussion of the NO_x modeling is contained here.

It is specified in Appendix A of Rules 1303 and 2005, respectively, that modeling is not required for VOC and SO_x. Therefore, for replacement of the SNR Heater, modeling had to be evaluated for only CO, NO_x and PM₁₀. According to Appendix A of both Rule 1303 and Rule 2005, an applicant must either (1) provide an analysis approved by the Executive Officer or designee, or (2) show by using the Screening Analysis in Appendix A, that a significant change (increase) in air quality concentration will not occur at any receptor location for which the state or national ambient air quality standard for CO, NO_x or PM₁₀ is exceeded.

The NO_x and PM₁₀ screening thresholds for combustion sources up to 40 MMBtu/hr are contained in Table A-1 Rule 2005 and Rule 1303, respectively. Although this table only

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contains thresholds for combustion source up to 40 MMBtu/hr, it is specified in an SCAQMD *Policies and Procedures* memo that it can be assumed that a source rated at greater than 40 MMBtu/hr with emissions less than or equal to the allowable emissions levels specified in Table A-1 for a 40 MMBtu/hr source “will not cause a significant increase in an air quality concentration and no further modeling is required”.

As seen in the table below, there was a large net decrease in NOx emissions with the replacement of the SNR Heater. Therefore, it was judged that the replacement of the heater would not cause a violation of the state or national ambient air quality standard for NOx. Also, as seen in the table below, CO and PM10 passed the Appendix A screening since the maximum potential emissions are below the Table A-1 thresholds in Appendix A.

Pollutant	Max. Potential Emission		Net Emission Increase		Applicable Threshold from Appendix A
	(lb/day)	(lb/hr)	(lb/day)	(lb/hr)	(lb/hr)
CO	297.5	12.4	170.8	7.1	72.1
NOx	98.	4.1	- 684.	-29.	1.3
PM10	117.5	4.9	10.8	0.5	7.9

Compliance with the modeling requirements of Rules 1303 and 2005 is achieved.

1303(b)(2): Offsets – Unless exempt from offsets requirements pursuant to Rule 1304, emission increases shall be offset by either Emission Reduction Credits approved pursuant to Rule 1309, or by allocations from the Priority Reserve.

The following table contains a summary of the emission offsets that were provided by Chevron for replacement of the old SNR Heaters with a new SNR Heater.

Pollutant	Net Emissions Increase (lb/day)	ERCs Required (lb/day)(1)
CO	170.8	205
PM10	10.8	13

(1) Net emission increase multiplied by ERC ratio of 1.2-to-1.0 for facilities in the South Coast Air Basin (SOCAB).

1303(b)(3) - Sensitive Zone Requirements: This section pertains to Emission Reduction Credits (ERCs) for facilities in the South Coast Air Basin (SOCAB). Except for credits that are obtained from the Priority Reserve, facilities are subject to the Sensitive Zone requirements (H&SC Section 40410.5) for ERCs. A facility in zone 1 may obtain ERCs originated in zone 1 only, and a facility in zone 2A may obtain ERCs from either zone 1 or zone 2A.

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The El Segundo Refinery is located in Zone 1. Chevron utilized the following ERCs that were generated in Zone 1:

1303(b)(4) - Facility Compliance: The facility must be in compliance with all applicable rules and regulations of the District.

For the SNR Heater Construction Project, there were no non-compliance issues noted in the engineering evaluation.

1303 (b)(5) - Major Polluting Facilities: Any new major polluting facility or major modification at an existing major polluting facility must comply with the requirements summarized below. A major modification is defined in 1302(r) as any modification at an existing major source that will cause

- an increase of one pound per day or more, of the facility's potential to emit (PTE) for NO_x or VOC if the facility is located in the SOCAB, or
- an increase of 40 tons per year or more, of the facility's PTE for SO_x, or
- an increase of 15 tons per year or more, of the facility's PTE for PM₁₀; or,
- an increase of 50 tons per year or more, of the facility's PTE for CO.

The proposed permit condition changes are not a major modification since they do not cause an increase in the emission of any criteria air pollutants. The project for replacement of the SNR Heater was a major modification.

(A) Alternative Analysis – Applicant must conduct an analysis of alternative sites, sizes, production processes, and environmental control techniques for such proposed source and demonstrate that the benefits of the proposed project outweigh the environmental and social costs associated with that project.

As specified at 1303(b)(5)(D)(ii), the requirements for an alternative analysis under this subparagraph may be met through compliance with the California Environmental Quality Act if the proposed project qualifies for a negative declaration pursuant to Title 14 California Code of Regulations Section 15070, or for a mitigated negative declaration as defined in Public Resources Code Section 21064.5; subparagraph (b)(5)(A) shall not apply to that project. As discussed earlier, for the project for construction of the new SNR Heater, the City of El Segundo issued a mitigated negative declaration of environmental impacts under Resolution No. 2433 on November 12, 1998. No additional analysis is required under this clause.

(B) Statewide Compliance: The applicant must demonstrate that all major stationary sources, as defined in the jurisdiction where the facilities are located, that are owned or operated by the applicant in the State of California are subject to emission limitations and are in compliance or on a schedule for compliance with all applicable emission limitations and standards under the Clean Air Act.

This pre-construction requirement was satisfied during evaluation for the original permit to construct for the heater.

(C) Protection of Visibility - A modeling analysis for plume visibility is required if the net emission increase exceeds 15 tons/yr of PM₁₀ or 40 tons/yr of NO_x and the location

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of the source, relative to the closest boundary of a specified Federal Class I area, is within the distance specified in the table below.

Federal Class I Area	Threshold Distance	Distance from Chevron Refinery
Agua Tibia	28 km (17.4 miles)	135 km
Cucamonga	28 km (17.4 miles)	71 km
Joshua Tree	29 km (18.0 miles)	178 km
San Gabriel	29 km (18.0 miles)	50.5 km
San Gorgonio	32 km (19.9 miles)	133 km
San Jacinto	28 km (17.4 miles)	135 km

A plume visibility analysis is not required since none of the Federal Class I Areas are closer to the refinery than the distances specified in the table. Additionally, the SNR Hydrogen Plant Project caused a net decrease in NO_x emissions and a net increase in PM₁₀ emissions of about 2 tons/year.

(D) Compliance through California Environmental Quality Act- As discussed previously, CEQA requirements were fulfilled for the SNR Hydrogen Plant Project (See CEQA Evaluation).

Rule 1325: Federal PM_{2.5} New Source Review Program

This NSR rule for PM_{2.5} was adopted by the District's Governing Board on June 3, 2011. The requirements of this rule are not applicable to the permit condition changes proposed under A/Ns 405268, 405269 and 527112 since they will not cause an increase in estimated PM_{2.5} emissions. The permit to construct for original construction of the SNR Heater was not subject to this rule since it was not adopted until June of 2011.

Regulation XIV - TOXICS AND OTHER NON-CRITERIA POLLUTANTS

Rule 1401: New Source Review of Carcinogenic Air Contaminants

A/N 341340 for the construction of the SNR Heater was submitted on June 5, 1998. Therefore, the application was subject to the December 7, 1990 version of this rule. Source test condition D28.9 required Chevron to perform a one-time source test for BTEX (benzene, ethyl benzene, toluene, and xylenes), aldehydes (acetaldehyde and formaldehyde), and metals (cadmium and nickel). Maximum individual cancer risk (MICR) was evaluated during the original evaluation of A/N 341340 but MICR must be re-evaluated using the source test results. This re-evaluation must be performed according to the same version of Rule 1401. Note that ethyl benzene, toluene, xylenes and nickel were not listed as Toxic Air Contaminants (TACs) in the December 7, 1990 version of the rule so they will not be included in this evaluation.

The 1990 version of Rule 1401 specified contains the following requirements:

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- 1) (d)(1) MICR and Cancer Burden - The cumulative increase in MICR which is the sum of the calculated MICR values for all toxic air contaminants emitted from the new, relocated or modified permit unit will not result in any of the following:
- (A) an increased MICR greater than one in one million (1.0×10^{-6}) at any receptor location, if the permit unit is constructed without T-BACT;
 - (B) an increased MICR greater than ten in one million (1.0×10^{-5}) at any receptor location, if the permit unit is constructed with T-BACT;
 - (C) a cancer burden greater than 0.5.

The table below contains a summary of TAC emissions and of a Tier 3 screening health risk assessment. PAH emissions were estimated with an emission factor developed by the California Air Resources Board from source testing performed to develop emission factors for use in AB 2588 emission inventories. This emission factor was developed from source testing of natural gas fired external combustion devices. It is believed to be the most accurate available factor for natural gas and refinery fuel gas fired process heaters such as the subject SNR Heater. The factor is 0.004 lb PAH per MMcf fuel. Emission factors were also developed for ethyl benzene, toluene, xylenes, acrolein, propylene and hexane but these were not listed TACs in the Dec. 1990 version of Rule 1401. Source test results are used to estimate emissions of benzene, acetaldehyde, and formaldehyde since the source test results yield higher estimated emissions than the CARB AB 2588 factors for these TACs. Cadmium emissions are estimated from the source test results since CARB did not develop an emission factor for metals.

EPA SCREEN3 is utilized to determine the maximum 1-hour pollutant concentration for these TACs at ground level. The SCREEN3 model is a simplified single source model that assumes a worst case meteorology. The SCREEN3 model was run for the heater operating at the maximum permitted load of 653 MMBtu/hr. A fuel HHV of 1050 btu/scf was assumed. Stack flow was estimated to be 242571 acfm based on a stack flow of 181278 acfm for the heater firing at 488 MMBtu/hr during the source testing. Stack temperature of 402°F was also based on the source test. The SCREEN3 model was run with full meteorology and no building downwash. The SCREEN3 dispersion modeling results were utilized with Tier 2 MICR estimation equations to estimate MICR. As a worst case estimate, contemporaneous emission reductions from shutdown of the old SNR heaters and the package boilers were not utilized in this screening assessment.

TAC	Emission Rate (lb/hr)	MICR Residential	MICR Commercial
Benzene	9.3E-03 (2)	1.08E-08	2.10E-09
Acetaldehyde	8.3E-02 (2)	9.61E-09	1.88E09
Formaldehyde	1.6E-02 (2)	3.89E-09	7.60E-10
PAHs	2.5E-04 (1)	3.36E-07	3.22E-08
Cadmium	2.0E-04 (2)	3.47E-07	6.78E-09
Total		3.95E-07	4.37E-08

- (1) Based on CARB AB2588 emission factor
- (2) Based on January 2001 source tests. Source tests were performed at an average firing rate of 488 MMBtu/hr. Therefore, the results were multiplied by 653/488 to estimate emissions at the permitted firing rate of 653 MMBtu/hr. Benzene is reported at the method detection limit since it was not detected in the source test sample.

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Compliance with the requirements of the December 1990 version of this regulation is achieved from construction of the heater since the MICR is less than one in one million. Compliance with the current version of this rule is achieved since the subject permit condition changes will not impact TAC emissions.

REGULATION XVII - PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

The PSD program is the federal New Source Review (NSR) program for pollutants for which an area is in attainment with or unclassified with respect to a National Ambient Air Quality Standard (NAAQS) as well as greenhouse gases (GHG).

Rule 1703 – PSD Analysis (& Associated Rules 1701, 1702, 1704, 1706, 1710 & 1713)

These rules contain the PSD requirements for attainment pollutants and selected unclassified pollutants. As discussed earlier, SOCAB is currently designated as attainment with NAAQSS for SO₂, NO₂, CO, and Lead. On March 3, 2003, AQMD’s PSD delegation was rescinded by EPA. AQMD and EPA signed a “Partial PSD Delegation Agreement” effective July 11, 2007. According to a memo from Mr. Mohsen Nazemi, who is the Deputy Executive Officer of the AQMD Engineering and Compliance Division, this Partial Delegation Agreement is intended to delegate the authority and responsibility to AQMD for issuance of initial PSD permits and for PSD permit modifications where the applicant seeks to use the emissions calculation methodology set forth in AQMD Regulation XVII instead of those promulgated in 40 CFR 52.21 (NSR Reform).

There is no increase in the emission of any of the subject pollutants for the permit condition changes proposed under A/Ns 405268, 405269 and 527112. Therefore, PSD permitting requirements are not applicable.

At the time of issuance of the original permit to construct for the new SNR Heater in 1999, SOCAB was in attainment for only SO₂. With the contemporaneous shutdown of the two old SNR Heaters (F-1330A/B) and a package boiler (F-1300), the project for construction of the new SNR Heater resulted in a net reduction in SO₂ emissions. Therefore, the construction of the new SNR Heater did not trigger the requirements of this regulation.

Rule 1714 – Prevention of Significant Deterioration for Greenhouse Gases

This rule sets forth preconstruction review requirements for greenhouse gases (GHG), which is defined as an aggregate group of six GHGs: carbon dioxide, nitrous oxide, methane, hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride. This rule was adopted on November 5, 2010, therefore, it did not exist during the previous SNR Heater permitting projects covered in this evaluation.

For the proposed change of condition applications, the pollutant GHG is subject to requirements under this regulation if either of the following apply:

- A stationary source, which is an existing major stationary source for a regulated non-GHG NSR pollutant, has an emissions increase of at least 75,000 tpy CO₂e and also an emissions increase of a regulated NSR pollutant.

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- A stationary source, which is an existing major stationary source that emits or has the potential to emit 100,000 tpy CO_{2e}, undertakes a physical change or change in the method of operation that will result in an emissions increase of 75,000 tpy CO_{2e} or more.

The requirements of this rule are not applicable to the proposed permit condition changes since they will not cause an increase in GHG emissions.

REGULATION XX - REGIONAL CLEAN AIR INCENTIVES MARKET (RECLAIM)

RECLAIM is a market incentive program designed to allow facilities flexibility in achieving emission reduction requirements for Oxides of Nitrogen (NO_x), and Oxides of Sulfur (SO_x). The Chevron Refinery (ID 800030) is a Cycle II RECLAIM facility. The SNR Heater is subject to the NO_x and SO_x requirements of this regulation.

Rule 2005: New Source Review for RECLAIM

Sources that are subject to RECLAIM must comply with the New Source Review requirements of Rule 2005 instead of Regulation XIII.

2005 (c): Requirements for Existing Facilities

According to this section, a permit to construct (RECLAIM Facility Permit Amendment) cannot be approved for installation of a new source or modification of an existing source that results in an emission increase of NO_x or SO_x at an existing RECLAIM unless the following requirements are met:

- 1.) Best Available Control Technology is applied to the source [2005(c)(1)(A)]
- 2.) The operation of the source will not result in a significant increase in the air quality concentration for NO₂ as specified in Appendix A [2005(c)(1)(B)], and
- 3.) The applicant demonstrates that the facility holds sufficient RECLAIM Trading Credits to offset the annual emission increase for the first year of operation at a 1-to-1 ratio [2005(c)(2)].

According to 2005(d), “An increase in emissions occurs if a source's maximum hourly potential to emit immediately prior to the proposed modification is less than the source's post-modification maximum hourly potential to emit. The amount of emission increase will be determined by comparing pre-modification and post-modification emissions on an annual basis by using: (1) an operating schedule of 24 hours per day, 365 days per year; or (2) a permit condition limiting mass emissions.”

The proposed permit condition changes do not result in an increase of NO_x or SO_x emissions so the requirements of Rule 2005 are not applicable. For original construction of the SNR Heater in 1999, BACT was triggered for both NO_x and SO_x since the new SNR heater emits both of these pollutants. The BACT evaluation performed under A/N 341340 determined that BACT for NO_x was determined to be Selective Catalytic Reduction (SCR) with a NO_x emission limit of 5 ppmv (3% O₂, 3-hr. avg.) and BACT for SO_x was determined to be the use of natural gas or treated refinery gas with less than 100 ppmv total sulfur. The 5 ppmv NO_x limit was based on the performance of a similar reformer heater at the Tosco (now ConocoPhillips) Refinery.

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Modeling and demonstration of sufficient ERCs was not required during original permitting of the new SNR Heater since there was a large net reduction in NO_x and SO_x emissions due to the implementation of BACT and the contemporaneous shutdown of the old SNR heaters and a package boiler.

Rule 2011: Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (SO_x) Emissions

This rule establishes the monitoring, reporting and recordkeeping requirements (MRR) for SO_x emissions under the RECLAIM program. According to 2011(c)(1)(D), any equipment that burns refinery, landfill or sewage digester gaseous fuel, except gas flares are Major SO_x sources. The SNR Heater, which is permitted to burn natural gas and/or refinery fuel gas, is a Major SO_x source that is subject to the maintenance, recordkeeping and reporting (MRR) requirements of this rule.

This rule requires that each major source be equipped with a CEMs or SCEMS (semi-continuous) that measures one of the following:

- Stack SO_x concentration and exhaust gas flow rate, or
- SO_x concentration, stack O₂ concentration, and fuel flow rate, or
- Fuel sulfur content and fuel flow rate

For the SNR Heater, Chevron utilizes a SO_x SCEMS consisting of a fuel sulfur GC, which measures the total reduced sulfur (TRS) concentration of the refinery fuel gas from the V-1800 Fuel Mix Drum and a fuel flow rate monitor, which measures the flow rate of refinery fuel gas from the V-1800 to the heater.

RECLAIM SO_x CEMS certification and QA/QC requirements are contained in Rule 2011, Appendix A, Chapter 2 and Attachment C. Quality Control requirements of this rule include semi-annual Relative Accuracy Test Audits (RATA). For the fuel sulfur GCs RATAs, Chevron performs semi-annual Cylinder Gas Audits as specified in Attachment C of the Rule 2011 Protocol, which is Appendix A to Rule 2011. The relative accuracy of the fuel flow meters is determined by semi-annual stack RATA. The District's Source Test group routinely reviews the reports for these CGAs/RATAs. The summary results pages for the most recent RATA of the fuel sulfur GC were reviewed. The fuel sulfur GC passed this RATA. Compliance with the QA/QC requirements of this rule is expected.

Rule 2012: Requirements for Monitoring, Reporting, and Recordkeeping for Oxides of Sulfur (NO_x) Emission

This rule establishes the monitoring, reporting and recordkeeping requirements (MRR) for NO_x emissions under the RECLAIM program. The SNR Heater is classified as Major NO_x source that is subject to the MRR requirements of this rule. It is specified at Appendix A, Chapter 2.A.1. that the Facility Permit holder of each major NO_x equipment shall install, calibrate, maintain, and operate an approved CEMS to measure and record the following:

- Nitrogen oxide concentrations in the gases discharged to the atmosphere
- Oxygen concentrations if required for calculation of the stack gas flow rate

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- Stack gas volumetric flow rate

This section also specifies that calculation of stack gas volumetric flow rate using one of the following alternative methods is acceptable: heat input, oxygen mass balance, or nitrogen mass balance. The CEMS on the SNR Heater utilizes heat input and oxygen concentration to calculate NO_x mass emissions. The CEMS system for this heater was certified by the District's source test group. The approved NO_x analyzer range is 0-10 ppmv.

RECLAIM NO_x CEMS certification and QA/QC requirements are contained in Rule 2012, Appendix A, Chapter 2 and Attachment C. The primary independent quality control assessment is a semi-annual RATA performed by an independent source test company. Chevron has been performing the required RATAs for the NO_x CEMS on the SNR Heater. As mentioned above, the District's Source Test group routinely reviews the reports for these semi-annual RATAs. A copy of the most recent CGA and RATA was reviewed. The CEMS passed both of these audits.

It is also specified at 2011(c)(3)(A) and 2012(c)(3)(A) that a Facility Permit holder of a major SO_x and NO_x source shall install, maintain and operate a reporting device to electronically report total daily mass emissions of SO_x and NO_x and daily status codes to the District Central SO_x and NO_x Stations by 5:00 p.m. of the following day. Chevron currently performs this daily reporting for the SNR Heater.

Based on Chevron's record of compliance with RECLAIM monitoring, recordkeeping and reporting requirements, compliance with the requirements of this regulation is expected.

Regulation XXX – TITLE V PERMITS

The initial Title V permit for the refinery was sent to Chevron on September 29, 2009 with an effective date of October 12, 2009. The permits issued for this project will be issued as a revision of the Title V permit. Permit revisions are categorized into the following four types: *administrative, minor, de minimis significant and significant*. The review and distribution requirements for each revision type are summarized in the following table.

Title V Permit Revisions: Review and Distribution Requirements

Revision Type	Permit Review and Distribution Requirements		
	EPA Review (45-day)	Public Notice (30-day)	Send Final Permit to EPA
Administrative	No	No	Yes
Minor	Yes	No	Yes
De Minimis Significant	Yes	No	Yes
Significant	Yes	Yes	Yes

As defined in Rule 3000, a minor Title V permit revision is any revision that:

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- (1) does not require or change a case-by-case evaluation of: reasonably available control technology (RACT) pursuant to Title I of the federal Clean Air Act; or maximum achievable control technology (MACT) pursuant to 40 CFR Part 63, Subpart B;
- (2) does not violate a regulatory requirement;
- (3) does not require any significant change in monitoring terms or conditions in the permit;
- (4) does not require relaxation of any recordkeeping, or reporting requirement, or term, or condition in the permit;
- (5) does not result in an emission increase of RECLAIM pollutants over the facility starting Allocation plus nontradeable Allocations, or higher Allocation amount which has previously undergone a significant permit revision process;
- (6) does not result in an increase in emissions of a pollutant subject to Regulation XIII - New Source Review or a hazardous air pollutant;
- (7) does not establish or change a permit condition that the facility has assumed to avoid an applicable requirement;
- (8) is not an installation of a new permit unit subject to a New Source Performance Standard (NSPS) pursuant to 40 CFR Part 60, or a National Emission Standard for Hazardous Air Pollutants (NESHAP) pursuant to 40 CFR Part 61 or 40 CFR Part 63; and,
- (9) is not a modification or reconstruction of an existing permit unit, resulting in new or additional NSPS requirements pursuant to 40 CFR Part 60, or new or additional NESHAP requirements pursuant to 40 CFR Part 61 or 40 CFR Part 63; or,
- (10) incorporates an existing general permit, as defined in subdivision (e) of Rule 3004, and its associated requirements, into another Title V permit.

The imposition of averaging periods for the exhaust gas CO and NH3 emission limits and fuel sulfur limit are a clarification of the emission limits since averaging period were not originally specified. These clarifications are not considered to be relaxations or significant changes to any terms or conditions of the permit. The change in operating conditions under which the annual source test can be performed is also not considered to be a relation or significant change to the terms and conditions of the permit. Therefore, the proposed condition changes are a minor revision of Chevron's Title V permit. This minor revision, which is being processed under Title V revision application no. 527111, will be sent to EPA for a 45-day review period. Public notice is not required.

ADDITIONAL FEDERAL REGULATIONS

40CFR Part 64 Compliance Assurance Monitoring

This regulation applies to stationary sources that utilize control equipment to comply with a criteria pollutant emission limit. The purpose is to ensure that the stationary source complies with the emission limit(s) by monitoring the operation and maintenance of the control equipment.

As specified at §64.2(a), the requirements of this regulation apply to a stationary source at a major source that is required to obtain a part 70 or 71 permit and satisfies all of the following criteria:

- (1) The source is subject to an emission limit or standard for an air pollutant (or a surrogate thereof) except for an emission limit that is exempt under §64.2(b)(1);
- (2) The source uses a control device to achieve compliance with the emission limit or standard; and

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(3) The potential pre-control emissions of the pollutant are greater than or equal to the major source threshold for the pollutant.

The exemptions at §64.2(b)(1) include:

- (i) Emission limits or standards for NSPSs or NESHAPs that were proposed after 11-15-90;
- (ii) Stratospheric ozone protection requirements under Title VI of the CAA;
- (iii) Acid rain requirements under 40CFR72;
- (iv) Emission limitations or standards that apply solely under an emissions trading program;
- (v) An emission cap that meets the requirements in §70.4(b)(12);
- (vi) Emission limits for which a part 70 (Title V) permit specifies a continuous compliance determination method.

Control device is defined as equipment, other than inherent process equipment, that is used to destroy or remove air pollutant(s) prior to discharge to the atmosphere. For purposes of this regulation, a control device does not include passive control measures that act to prevent pollutants from forming, such as the use of seals, lids, or roofs to prevent the release of pollutants, use of low-polluting fuel or feedstocks, or the use of combustion or other process design features or characteristics.

The only control device utilized by the SNR Heater is the SCR for NOx control. However, the heater is not subject to CAM requirements for the NOx limit because it is equipped with a NOx CEMS, which is a continuous compliance determination method. Therefore, the NOx limit is an exempt limit per §64.2(b)(1)(vi).

CONCLUSION / RECOMMENDATION

Based on the foregoing evaluation, it is expected that the subject applications will comply with all applicable District Rules and Regulations. It is recommended that permits to operate be issued to the SNR Heater and associated SCR.

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**Appendix: SNR Heater
VOC Emission Estimate for Fugitive Components Removed from Service**

Equipment Type	Service	No. of Sources	VOC Emission Factors lbs/yr*	Annual VOC Emission lb/yr
Valves - Sealed Bellow	Gas/Vapor	0	0.00	0.0
	Light Liquid	0	0.00	0.0
Valves - Low emission ≤ 500 ppmv, or Live loaded w/ dual seal system	Gas/Vapor	-657	4.55	-2986.6
	Light Liquid	0	4.55	0.0
	Heavy Liquid	0	4.55	0.0
Flanges	Light Liquid/Vapor	-1560 (1)	6.99	-10904.7
	Heavy Liquid	0	6.99	0.0
Connectors	Light Liquid/Vapor	-1559 (1)	2.86	-4460.9
	Heavy Liquid	0	2.86	0.0
Pumps	Light Liquid (double seal)	0	46.83	0.0
	Light Liquid (sealless type)	0	0	0.0
	Heavy Liquid (single seal)	0	46.83	0.0
Compressors	Gas/Vapor	0	9.09	0.0
PRV's	All (To Atmosphere)	0	9.09	0.0
	All (Closed Vent)	0	0	0.0
Drains (with p-trap)	All	0	9.09	0.0

Total Count: 155 Total (lb/yr) **-18,352**

Emissions (lbs/day)
(30-day Average) **-51.0**

(1) Component count did not delineate between flanges and connectors. Conservatively assumed that half of listed flanges were connectors.

* Emission factors based on correlation equations from the *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities* (CARB/CAPCOA - 1999)

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**Appendix: SNR Heater
Post-Modification Maximum Potential VOC Emission Estimate for Fugitive Components**

Equipment Type	Service	No. of Sources	VOC Emission Factors lbs/yr*	Annual VOC Emission lb/yr
Valves - Sealed Bellow	Gas/Vapor	75	0.00	0.0
	Light Liquid	0	0.00	0.0
Valves - Low emission ≤ 500 ppmv, or Live loaded w/ dual seal system	Gas/Vapor	787	4.55	3577.5
	Light Liquid	0	4.55	0.0
	Heavy Liquid	0	4.55	0.0
Flanges	Light Liquid/Vapor	1313	6.99	9178.1
	Heavy Liquid	0	6.99	0.0
Connectors	Light Liquid/Vapor	398	2.86	1138.8
	Heavy Liquid	0	2.86	0.0
Pumps	Light Liquid (double seal)	0	46.83	0.0
	Light Liquid (sealless type)	0	0	0.0
	Heavy Liquid (single seal)	0	46.83	0.0
Compressors	Gas/Vapor	0	9.09	0.0
PRV's	All (To Atmosphere)	0	9.09	0.0
	All (Closed Vent)	0	0	0.0
Drains (with p-trap)	All	12	9.09	109.1

Total Count: 2585 Total (lb/yr) **14,004**

Emissions (lbs/day)
(30-day Average) **38.9**

* Emission factors based on correlation equations from the *California Implementation Guidelines for Estimating Mass Emissions of Fugitive Hydrocarbon Leaks at Petroleum Facilities* (CARB/CAPCOA - 1999)