

Bay Area Air Quality Management District

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**Draft
Permit Evaluation
and
Statement of Basis
For**

MAJOR FACILITY REVIEW PERMIT

Minor Revision and Administrative Amendment

for
**ConocoPhillips – San Francisco Refinery
Facility #A0016**

Facility Address:
1380 San Pablo Avenue
Rodeo, CA 94572

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January 2005

A. Background

This minor revision and administrative amendment to the Major Facility Review Permit will incorporate actions taken in response to the following applications:

Application	Revision
9060	This application resulted in an Authority to Construct to physically modify the S-307 uncracker unit and the S-308 reformer unit to allow an increase in production rate. As a result, an increase in annual throughput has been permitted at S-308, and increases in both daily capacity and annual throughput have been permitted at S-307.
9498	This application resulted in a permitted increase in the hourly sludge capacity of S-386 and the associated annual throughput limit for this source. These increases are considered to be corrections to the values currently in the Major Facility Permit.
10116	This application resulted in a decision to allow 11 combustion devices that are normally controlled by SCR and equipped with NOx CEMS to operate without SCR abatement during maintenance activities as long as the CEMs are in service and no emission limits are violated.
10332	This application resulted in an Authority to Construct to increase the processing capacity of the S-305 naphtha hydrotreater by optimizing unit relief valve settings and by replacing some of these valves. As a result, increases in daily capacity and annual throughput have been permitted at S-305.
10872	This application resulted in a change to Condition 1694 to specify how to implement the calculation procedures of Regulation 9, Rule 10 for combustion devices subject to this rule. Because these rule provisions are not included in the SIP, this is an administrative amendment to the Major Facility Permit.

The treatment of Application 10872 as an administrative amendment, and Applications 10116 and 10332 as minor revisions is justified in the associated evaluations for those applications. Copies of these evaluations are attached.

Application 9060 proposes increases in processing capacity and annual throughput at the S-307 and S-308 processing units. These increases are the result of modifications to S-307 (which is upstream of S-308). S-307 and S-308 have only one process vent: a scrubber vent with an assigned emission limit that will not increase. All process units and other sources related to S-307 and S-308 have throughput or emission limits that will not increase. The number of fugitive emission components will not increase as a result of the modifications. As discussed in section C.I of this evaluation, no change to monitoring is proposed. Therefore, these increases may be treated as a minor revision.

Application 9498 proposes increases in processing capacity and annual throughput at the S-386 sludge thickener. These increases reflect a correction to data previously submitted by the facility operator rather than physical or operational changes. Emissions from S-386 are considered negligible. As discussed in section C.II of this evaluation, no change to monitoring is proposed. Therefore, these increases may be treated as a minor revision.

B. Proposed Changes

I. Table II-A

The daily capacity increase at S-305 is discussed in the evaluation for Application 10332. The daily capacity increase at S-307 is discussed in the evaluation for Application 9060. Copies of these evaluations are attached.

Table II A - Permitted Sources

Each of the following sources has been issued a permit to operate pursuant to the requirements of BAAQMD Regulation 2, Permits. The capacities in this table are the maximum allowable capacities for each source, pursuant to Standard Condition I.J and Regulation 2-1-301.

S-#	Description	Make or Type	Model	Capacity
305	U230 Prefractionator/Naphtha Hydrotreater	NA	NA	28,000 25,300 bbl/day
307	U240 Unicracking Unit	NA	NA	42,000 38,000 bbl/day

II. Condition 1694

Only revised parts of Condition 1694 are shown. The revisions to Parts B.1, C.1, D.1 and E.1 are discussed in the evaluation for Application 10116. The addition of Part G is discussed in the evaluation for Application 10872. Copies of these evaluations are attached.

CONDITION 1694

CONDITIONS FOR COMBUSTION SOURCES AND SO₂ CAP, EXCEPT FOR GAS TURBINES AND DUCT BURNERS

B. S-351 PREHEATER

1. The S-351 heater shall be abated by the A-6 SCR unit at all times, except that S-351 may operate without SCR abatement on a temporary basis for periods of planned or emergency maintenance. A District-approved NO_x CEM shall monitor and record the S-351 NO_x emission rate whenever S-351 operates without abatement. All emission limits applicable to S-351 shall remain in effect whether or not it is operated with SCR abatement. [BACT, Cumulative Increase]
2. The concentration of NO_x from S-351 shall not exceed 20 ppmv @ 3% oxygen, dry, averaged over any consecutive 3 hour period. This limit shall not apply during a startup period which shall not exceed 12 hours. The startup exemption period may last up to 24 hours to allow the proper ammonia injection temperature to be reached provided that the temperature is monitored at least once per hour and that ammonia injection begins within 2 hours of reaching the proper temperature. This limit shall also not apply during a shutdown period which shall not exceed 9 hours. [BACT, Cumulative Increase]

3. The following instruments shall be installed and maintained to demonstrate compliance with Part 2:
 - a. continuous NOx analyzer/recorder
 - b. continuous O2 or CO analyzer/recorder [BACT, Cumulative Increase]

C. S-371 AND S-372 FURNACES

1. The S-371 furnace shall be abated by the A-16 SCR unit at all times- and the The S-372 furnace shall be abated by the A-17 SCR unit at all times, except that S-371 and S-372 may operate without SCR abatement on a temporary basis for periods of planned or emergency maintenance. A District-approved NOx CEM shall monitor and record the NOx emission rates from these heaters whenever they operate without abatement. All emission limits applicable to S-371 and S-372 shall remain in effect whether or not they are operated with SCR abatement.
[BACT, Cumulative Increase]
2. The concentration of NOx from S-371 and S-372 shall not exceed 20 ppmv, dry, corrected to 3% oxygen, averaged over any consecutive 3 hour period. This limit shall not apply during a startup period, which shall not exceed 12 hours. The startup exemption period may last up to 24 hours to allow the proper ammonia injection temperature to be reached provided that the temperature is monitored at least once per hour and that ammonia injection begins within 2 hours of reaching the proper temperature. This limit shall also not apply during a shutdown period which shall not exceed 9 hours. [BACT, Cumulative Increase]
3. The concentration of CO emissions from S-371 and S-372 shall not exceed 50 ppmv, dry, corrected to 3% oxygen, averaged over any consecutive 3 hour period. This limit shall not apply during a startup period, which shall not exceed 12 hours. The startup exemption period may last up to 24 hours to allow the proper ammonia injection temperature to be reached provided that the temperature is monitored at least once per hour and that ammonia injection begins within 2 hours of reaching the proper temperature. This limit shall also not apply during a shutdown period, which shall not exceed 9 hours. [BACT, Cumulative Increase]

D. S-43 Coking Furnace (Unit 200 B-202) and S-44 (Unit 200 B-201 PCT Reboil Furnace)

1. Nitrogen oxide emissions from the S-43 Coking Furnace (Unit 200 B-202) shall be abated by Selective Catalytic Reduction Unit A-4 at all times, except that S-43 may operate without SCR abatement on a temporary basis for periods of planned or emergency maintenance. A District-approved NOx CEM shall monitor and record the S-43 NOx emission rate whenever S-43 operates without abatement. All emission limits applicable to S-43 shall remain in effect whether or not it is operated with SCR abatement.
[BACT, Cumulative Increase]
2. The nitrogen oxides in the flue gases for S-43, Unit 200 B-202 Coking Furnace and S-44, Unit 200 B-201 PCT Reboil Furnace shall not exceed 40 ppmv corrected to 3% oxygen, dry, over any consecutive 8 hour period. This limit shall not apply during a startup period which shall not exceed 12 hours. The

startup exemption period may last up to 24 hours to allow the proper ammonia injection temperature to be reached provided that the temperature is monitored at least once per hour and that ammonia injection begins within 2 hours of reaching the proper temperature. This limit shall also not apply during a shutdown period which shall not exceed 9 hours.

[BACT, Cumulative Increase]

3. The carbon monoxide in the flue gas for S-43, Unit 200 B-202 Coking Furnace and S-44, Unit 200 B-201 PCT Reboil Furnace shall not exceed 50 ppm_{dv} corrected to 3% oxygen averaged over any calendar month. This condition shall not apply during start-up and shutdown. [BACT, Cumulative Increase]
4. Instruments shall be installed and operated to continuously monitor the percentage of oxygen and the concentration of nitrogen oxides from the following sources: S-43, Unit 200 B-202 Coking Furnace and S-44, Unit 200 B-201 PCT Reboil Furnace. [BACT, Cumulative Increase]

E. S-438 FURNACE

1. The S-438 furnace shall be abated by the A-46 SCR unit at all times, except that S-438 may operate without SCR abatement on a temporary basis for periods of planned or emergency maintenance. A District-approved NO_x CEM shall monitor and record the S-438 NO_x emission rate whenever S-438 operates without abatement. All emission limits applicable to S-438 shall remain in effect whether or not it is operated with SCR abatement.

[BACT, Cumulative Increase]

2. Total fuel fired in S-438 shall not exceed 2.04 E 12 BTU in any rolling consecutive 365 day period. [Cumulative Increase]
3. Pressure swing adsorption (PSA) off gas used as fuel at S-438 shall not exceed 1.0 ppm (by weight) total reduced sulfur (TRS). TRS shall include hydrogen sulfide, methyl mercaptan, methyl sulfide, dimethyl disulfide. [BACT, Cumulative Increase]
4. The following emission concentration limits from S-438 shall not be exceeded. These limits shall not apply during startup periods not exceeding 24 hours (72 hours when drying refractory or during the first startup following catalyst replacement) and shutdown periods not exceeding 24 hours. The District may approve other startup and shutdown durations.

NO_x: 10 ppmv @ 3% oxygen, averaged over any 3 hour period

CO: 32 ppmv @ 3% oxygen, averaged over any calendar day

[BACT, Cumulative Increase]

5. The concentration of TRS in the blended fuel gas shall not exceed 50 ppmv averaged over any calendar month. [BACT, Cumulative Increase]
6. Daily records of the type and amount of fuel combusted at S-438 and of the TRS and hydrogen sulfide concentration in the blended fuel gas, and monthly records of average blended fuel gas TRS concentration, shall be maintained for at least five years and shall be made available to the District upon request.

G. Regulation 9-10 Startup / Shutdown Provisions [Basis: 9-10-301]

For determining compliance with Regulation 9-10-301, the contribution of each affected unit that is in a startup or shutdown condition shall be based on the methods described in 9-10-301.1, and the contribution of each affected unit that is in an out of service condition shall be based on the methods described in 9-10-301.2. Low-firing conditions (no higher than 20% of a unit's rated capacity), including refractory dryout periods, shall be considered out of service conditions subject to the 30-day averaging procedure in Regulation 9-10-301.2, including the 60-day annual limit for this procedure.

1. Heaters S-8 (Unit 240, B-1), S-14 (Unit 240, B-401) and S-44 (Unit 200, B-201) shall be considered to be in normal operation whenever they have detectable fuel flow, and shall be considered to be out of service for the purpose of Regulation 9-10-301 whenever they have undetectable fuel flow.

2. For heaters S-43 (Unit 200, B-202), S-351 (Unit 267, B-601/602) and S-371/372 (Unit 228, B-520/521), the durations of startups, shutdowns and refractory dryout periods are defined in Condition 1694, Part D.2 (S-43), Part B.2 (S-351) and Part C.2 (S-371, S-372).

3. For heaters S-10 (Unit 240, B-101) and S-15 through S-19 (Unit 244, B-501 through B-505), the duration of startups, shutdowns and low-firing periods are defined as follows:

- a. startup and shutdown periods are not to exceed 24 hours
- b. low-firing periods are not to exceed 72 hours

4. For heater S-13 (Unit 240, B-301), the duration of startups, shutdowns and low-firing periods are defined as follows:

- a. startup and shutdown periods are not to exceed 72 hours
- b. low-firing periods are not to exceed 72 hours

5. For heaters with no CEMS:

- S-2 (Unit 229, B-301)
- S-3 (Unit 230, B-201)
- S-4 (Unit 231, B-101)
- S-5 (Unit 231, B-102)
- S-7 (Unit 231, B-103)
- S-9 (Unit 240, B-2)
- S-11 (Unit 240, B-201)
- S-12 (Unit 240, B-202)
- S-20 (Unit 244, B-506)
- S-22 (Unit 248, B-606)
- S-29 (Unit 200, B-5)
- S-30 (Unit 200, B-101)
- S-31 (Unit 200, B-501)
- S-336 (Unit 231, B-104)
- S-337 (Unit 231, B-105).

startups, shutdowns, and out of service conditions shall each not exceed 5 days in succession at each source.

III. Condition 12122

The revisions to Parts 3, 4 and 5 are discussed in the evaluation for Application 10116. A copy of this evaluation is attached.

CONDITION 12122

CONDITIONS FOR S-352, 353, 354, 355, 356, 357

1. The gas turbines (S-352, S-353 and S-354) and the heat recovery steam generator (HRG) duct burners (S-355, S-356 and S-357) shall be fired on refinery fuel gas or natural gas. [Cumulative Increase]
2. A HRG duct burner shall be operated only when the associated gas turbine is operated. [Cumulative Increase]
3. The exhaust from S-352 and S-355 shall be abated at all times by SCR unit A-13, except that S-352 and S-355 may operate without SCR abatement on a temporary basis for periods of planned or emergency maintenance. A District-approved NOx CEM shall monitor and record the S-352 and S-355 NOx emission rate whenever S-352 and S-355 operate without abatement. All emission limits applicable to S-352 and S-355 shall remain in effect whether or not they are operated with SCR abatement. [BACT, Cumulative Increase]
4. The exhaust from S-353 and S-356 shall be abated at all times by SCR unit A-14, except that S-353 and S-356 may operate without SCR abatement on a temporary basis for periods of planned or emergency maintenance. A District-approved NOx CEM shall monitor and record the S-353 and S-356 NOx emission rate whenever S-353 and S-356 operate without abatement. All emission limits applicable to S-353 and S-356 shall remain in effect whether or not they are operated with SCR abatement. [BACT, Cumulative Increase]
5. The exhaust from S-354 and S-357 shall be abated at all times by SCR unit A-15, except that S-354 and S-357 may operate without SCR abatement on a temporary basis for periods of planned or emergency maintenance. A District-approved NOx CEM shall monitor and record the S-354 and S-357 NOx emission rate whenever S-354 and S-357 operate without abatement. All emission limits applicable to S-354 and S-357 shall remain in effect whether or not they are operated with SCR abatement. [BACT, Cumulative Increase]
6. Total fuel fired in S-355, S-356, and S-357 shall not exceed 2.42 E 12 BTU in any consecutive 365 day period. [Cumulative Increase]
7. CO emissions from each turbine/duct burner set shall not exceed 39 ppmv at 15% oxygen, averaged over any consecutive 30 day period. Emissions during startup periods, which shall not exceed four hours, and shutdown periods, which shall not exceed two hours, may be excluded when averaging emissions. [BACT, Cumulative Increase]

8. POC emissions from each turbine/duct burner set shall not exceed 6 ppmv at 15% oxygen, averaged over any consecutive 30 day period. Emissions during startup periods, which shall not exceed four hours, and shutdown periods, which shall not exceed two hours, may be excluded when averaging emissions.
[BACT, Cumulative Increase]
- 9a. The combined NOx emissions from S- 352, S-353, S-354, S-355, S-356 and S-357 shall not exceed 66 lb/hr (averaged over any 3 hour period), nor 167 tons in any consecutive 365 day period. NOx emissions from each turbine/duct burner set shall not exceed 528 lb/day.
[BACT, Cumulative Increase]
- 9b. NOx emissions from S- 352, S-353, S-354, S-355, S-356 and S-357 shall be monitored with a District-approved continuous emission monitor.
[BACT, Cumulative Increase]
- 10a. The combined CO emissions from S-352, S-353, S-354, S- 355, S-356 and S-357 shall not exceed 200 tons in any consecutive 365 day period.
[BACT, Cumulative Increase]
- 10b. CO emissions from S- 352, S-353, S-354, S-355, S-356 and S-357 shall be monitored with a District-approved continuous emission monitor.
[BACT, Cumulative Increase]
11. The combined POC emissions S-352, S-353, S-354, S-355, S-356 and S-357 shall not exceed 8.3 lb/hr nor 30.5 tons in any consecutive 365 day period.
[BACT, Cumulative Increase]
12. The refinery fuel gas shall be tested for total reduced sulfur (TRS) concentration at least once per 8 hour shift (3 times per calendar day). At least 90% of these samples shall be taken each calendar month. No readable samples or sample results shall be omitted. TRS shall include hydrogen sulfide, methyl mercaptan, methyl sulfide, dimethyl disulfide.
[Cumulative Increase]
13. The average of the 3 daily refinery fuel gas TRS sample results shall be reported to the District in a table format each calendar month, with a separate entry for each daily average. Sample reports shall be submitted to the District within 30 days of the end of each calendar month. Any omitted sample results shall be explained in this report.
[Cumulative Increase]
14. A source test to verify compliance with Parts 8 and 11 shall be performed each calendar year in accordance with District source test methods or other methods approved in advance by the District. A copy of the test report shall be provided to the District Director of Compliance and Enforcement within 45 days of completion of the test.
[Regulation 2-6-409.2]
15. Records shall be maintained to allow verification of compliance with all permit conditions. Records shall be retained for at least five years and shall be made available to the District upon request.
[BACT, Cumulative Increase]

IV. Condition 20989

Only revised entries in the table in Condition 20989, Part A are shown. The annual throughput increase at S-305 is discussed in the evaluation for Application 10332. The annual throughput increases at S-307 and S-308 are discussed in the evaluation for Application 9060. The hourly capacity and annual throughput increase at S-386 are discussed in the evaluation for Application 9498. Copies of these evaluations are attached. Although it was not discussed in the evaluation for Application 9060, the annual throughput limit for S-308 will be changed from “non-federally enforceable” to federally enforceable” because the throughput limit increase is related to a physical modification.

FACILITY-WIDE REQUIREMENTS

CONDITION 20989

A. THROUGHPUT LIMITS

The following limits are imposed through this permit in accordance with Regulation 2-1-234.3. Sources require BOTH hourly/daily and annual throughput limits (except for tanks and similar liquid storage sources, and small manually operated sources such as cold cleaners which require only annual limits). Sources with previously imposed hourly/daily AND annual throughput limits are not listed below; the applicable limits are given in the specific permit conditions listed above in this section of the permit. Also, where hourly/daily capacities are listed in Table II-A, these are considered enforceable limits for sources that have a New Source Review permit. Throughput limits imposed in this section and hourly/daily capacities listed in Table II-A are not federally enforceable for grandfathered sources. Grandfathered sources are indicated with an asterisk in the source number column in the following table. Refer to Title V Standard Condition J for clarification of these limits.

In the absence of specific recordkeeping requirements imposed as permit conditions, monthly throughput records shall be maintained for each source.

source number	hourly / daily throughput limit	annual throughput limit (any consecutive 12-month period unless otherwise specified)
305	Table II-A	10,229.23 E 6 bbl
307	Table II-A	1,5334.39 E 7 bbl
*308	Table II-A	5,875.44 E 6 bbl
386	3,600+800 gal/hr	3,21.6 E 7 gal

V. Table VII-G

The annual throughput increase at S-386 is discussed in the evaluation for Application 9498. A copy of this evaluation is attached.

Table VII – G
Applicable Limits and Compliance Monitoring Requirements

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
VOC	BAAQMD Condition 1440, Part 4.c	Y		no detectable VOC emissions	BAAQMD Condition 1440, Part 5	P/SA	VOC analyzer
Through-put	BAAQMD Condition 20989, Part A	Y		S-385: 3.68 E 9 gal/yr S-386: 3.24 6 E 7 gal/yr, S-387: 7.884 E 6 gal/yr S-390: .884 E 6 gal/yr S-392: 7.884 E 6 gal/yr	BAAQMD Condition 20989, Part A	P/M	records

VI. Table VII-N

The annual throughput increase at S-305 was permitted in the evaluation for Application 10332. The annual throughput increases at S-307 and S-308 were permitted in the evaluations for Application 9060. Although these evaluations neglected to note that this particular table required revision, the revisions are the same as those noted in Part IV of this evaluation, and are necessary for consistency and completeness.

Table VII – N
Applicable Limits and Compliance Monitoring Requirements

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
POC	BAAQMD 8-10-301	Y		abatement of emissions from process vessel depressurization is required until pressure is reduced to less than 1000 mm Hg	8-10-401.2 (SIP) and 8-10-501 & 502 (non-SIP)	P/E	Records
VOC (S-307 only)	BAAQMD Condition 6671, Part 2 and 8-2-301	Y		emission streams with 15 lb/day AND 300 ppm total carbon on a dry basis prohibited	BAAQMD Condition 6671, Part 4 BAAQMD Condition 6671, Part 6	P/D P/A	visual inspection source test

Table VII – N
Applicable Limits and Compliance Monitoring Requirements

Type of Limit	Citation of Limit	FE Y/N	Future Effective Date	Limit	Monitoring Requirement Citation	Monitoring Frequency (P/C/N)	Monitoring Type
throughput (S-304 only)	BAAQMD Condition 21095, Part 1	Y	when modified in accordance with A/C 5814	12,198 bbl/day (monthly average)	BAAQMD Condition 21095, Part 2	P/D	records
throughput (S-460 only)	BAAQMD Condition 21094, Part 1	Y	startup	35,000 bbl/day (monthly average)	BAAQMD Condition 21094, Part 2	P/D	records
throughput	BAAQMD Condition 20989, Part A	Y		S-304: 3.47 E 6 bbl/yr (only until modified in accordance with A/C 5814) S-305: 10.229-23 E 6 bbl/yr S-306: 5.66 E 6 bbl/yr S-307: 1.5331-39 E 7 bbl/yr <u>S-308: 5.87 E 6 bbl/yr</u> S-435: 6.6 E 6 bbl/yr S-436: 4.7 E 6 bbl/yr S-437: 9.1 E 9 ft3/yr	BAAQMD Condition 20989, Part A	P/M	records
throughput	BAAQMD Condition 20989, Part A	N		S-308: 5.11 E 6 bbl/yr S-309: 6.6 E 8 bbl/yr S-318: 3.3 E 7 bbl/yr S-319: 3.51 E 6 bbl/yr	BAAQMD Condition 20989, Part A	P/M	records

VII. Table VII-G

REVISION HISTORY

Initial Major Facility Review Permit Issuance (Application 16487):

December 1, 2003

Administrative Amendment (no application):

May 27, 2004

Reopening (Application 9296):

December 16, 2004

C. Monitoring Changes

I. Application 9060

As shown in Table VII-N in Part B.VI of this evaluation, the monitoring for the annual throughput limits at S-307 and S-308 will not change although the limits will increase.

II. Application 9498

As shown in Table VII-G in Part B.V of this evaluation, the monitoring for the annual throughput limit at S-386 will not change although the limit will increase.

III. Application 10116

The revisions shown to Condition 1694 in Part B.II of this evaluation allow certain combustion sources to operate without abatement under certain circumstances, but compliance with NO_x emission limits will continue to be monitored at each sources with a continuous emission monitor (CEM).

IV. Application 10332

As shown in Table VII-N in Part B.VI of this evaluation, the monitoring for the annual throughput limit at S-305 will not change although the limit will increase.

V. Application 10872

As noted in Part A of this evaluation, the requirements of Regulation 9-10-301, which are the subject of this application, are not federally-enforceable. Therefore, these changes are administrative and changes in monitoring are irrelevant. However, it may be noted that no changes in monitoring are proposed.