Engineering Evaluation
CONOCOPHILLIPS SAN FRANCISCO REFINERY; PLANT 16
APPLICATION 11630

1.0 BACKGROUND

ConocoPhillips has applied for changes to BAAQMD Conditions 21096 and 21097 for Sources S-36 and S461 in Application 11630. The original Authority to Construct for these sources was Application 5814. These sources have been built and will start up in March 2005. The facility has also applied for a Title V schedule of compliance regarding alternative monitoring at these sources in Application 11953. Application 11953 will be cancelled and the alternative monitoring will be considered as part of Application 11626.

1.1 Changes to SCR Condition

ConocoPhillips has applied in order to allow 2 combustion devices (S36 and S461) to operate without normal selective catalytic reduction (SCR) abatement during maintenance, as long as all applicable emission limits and other requirements are satisfied. SCR is an abatement technology used to reduce NOx emission rates from combustion operations. During certain maintenance activities, SCR systems do not operate properly. The affected sources, the associated SCR systems and permit conditions are:

source	Description	SCR system	permit condition #
S-36	B-102 heater	A-36	21097, Part 3a
S-461	B-701 heater	A-6	21096, part 3a

Copies of Conditions 21096 and 21097 are attached.

These sources are each subject to a permit condition that requires abatement with SCR at all times. The proposed amendment would modify this requirement for the purpose of planned or emergency maintenance, as long as applicable emission rate limits for NOx are not exceeded. Such maintenance is required periodically to maintain SCR operation. For example, ammonia injection systems associated with the SCR system may require washing or other maintenance to eliminate plugging of the system. In some cases such maintenance can be performed without removing the heater from service, and while maintaining compliance with emission limits.

Each source is equipped with a NOx continuous emission monitor (CEM) that allows verification of compliance with NOx emission rate limits. The District permit conditions and the Major Facility Permit require monitoring of NOx at each of these sources with a CEM. The District CEM procedure (Section 5.1) in the Manual of Procedures allows periods of CEM inoperation up to 15 consecutive days, with no overall limit on the number of days of inoperation per year. Nonetheless, the proposed amendments require that the CEMs operate during any period when SCR abatement is not used on these sources.

1.2 Changes to TRS Monitoring

ConocoPhillips has also applied to modify the permit conditions for monitoring of TRS concentration so that they are similar to the conditions for monitoring of TRS in Condition 1694, part 3a. In that

case, the total sulfur in refinery fuel gas is monitored 3 times per day as a surrogate for TRS. Once a month, the gas is analyzed to determine the ratio of total sulfur to TRS, which is defined as hydrogen sulfide, methyl mercaptan, methyl sulfide, and dimethyl disulfide. This test applies to all the gas in the refinery fuel gas system.

In this case, refinery fuel gas from the main fuel gas header is processed through two new caustic scrubbers of a novel design before combustion at S36 and S461 in order to meet lower BACT limits for TRS. The facility will be allowed to use total sulfur as a surrogate for TRS, but will be required to determine the TRS level whenever the total sulfur is over the annual average limit for TRS. Since TRS must be below the total sulfur, this monitoring is equivalent.

However, the equivalent monitoring is not feasible for every sample. An outside lab in Sacramento that only works Mondays through Fridays performs the TRS analysis. The samples cannot be held for more than 36 hours before they deteriorate. Since the analysis is not feasible on Saturdays and Sundays, the facility will not be required to analyze any samples pulled on Friday and Saturday.

This is a significant revision of the Title V permit because it is a relaxation of monitoring pursuant to BAAQMD Regulation 2-6-226.3.

The reason for the revision is that the facility does not have the capability of monitoring TRS directly at these sources. Since the total sulfur is expected to be extremely low, the District does not expect that determination of TRS will be necessary for every sample.

After the permittee has some data on the ratio of TRS to total sulfur, the permittee intends to apply to use the ratio together with the total sulfur analysis for compliance, and only analyze for TRS on a monthly basis.

1.3 Subpart J Monitoring

Application 5814, the original application for these sources, stated that the sources would comply with the H2S limit in 40 CFR 60, Subpart J: 230 mg/dscm in the fuel gas. The application also states that "... The fuel gas system header will continue to be sampled to verify compliance." However, the refinery has now stated that the fuel gas that is sampled is not representative of the fuel gas that is fed to the caustic scrubbers. Therefore, the facility must monitor this stream for compliance with Subpart J.

As discussed above, the facility is proposing alternate monitoring for these sources, as allowed by 40 CFR 60.106(i)(12). Until EPA approves the alternate monitoring, the facility will be out of compliance with Subpart J. A custom schedule of compliance will be written for the Major Facility Review permit.

BAAQMD Regulation 10 adopted Subpart J by reference. Therefore, Subpart J is an "applicable regulation" of the District and the state board (Air Resources Board.) Since California Health and Safety Code Section 42301(b) prohibits the issuance of a permit to any equipment

that does not comply with an "applicable regulation," the authority to construct will be issued, but the permit to operate for these sources cannot be issued until EPA approves the alternate monitoring and brings the sources into compliance.

2.0 Emissions Increase

Because each source is subject to a NOx emission rate limit imposed in an NSR permit evaluation, and because none of these limits will be changed, no annual average emission increase will be considered to occur, and no change will be made to the facility cumulative increase. Also, permitted daily emissions will not increase because refinery sources are assumed to operate 24 hr/day. Thus, if the emission rate limit is not increased, and the source is not physically modified to increase exhaust flowrate, the resulting daily emissions will also not increase.

SO2 emissions are not expected to increase as a result of the proposed monitoring changes.

Because no annual average or daily emission increase is permitted, no NSR requirements (e.g. BACT, offsets) are applicable to this application.

3.0 CUMULATIVE INCREASE

Because no annual average or daily emission increase is permitted, there is no cumulative increase associated with this application.

4.0 NSR, OFFSETS, PSD

Because no annual average or daily emission increase is permitted, no NSR requirements (e.g. BACT, offsets) or PSD requirements are applicable to this application.

5.0 Federal Requirements

As stated in Section 1.3, the sources will be out of compliance with Subpart J until EPA approves the alternate monitoring. The Major Facility Review permit can be issued with a schedule of compliance, but the final District permit cannot be issued until the monitoring is approved.

These sources are not subject to any NESHAPS in 40 CFR 61 or 40 CFR 63.

6.0 Other District Rules and Regulations

The sources are expected to be in compliance with Regulation 6. Regulation 9, Rule 1, Sulfur Dioxide applies only generally because the facility has ground level monitors for SO2. Because the sources were built after 1994, they are not subject to Regulation 9, Rule 10, NO_x and CO from Boilers, Steam Generators, and Process Heaters in Petroleum Refineries. The District regulations are fully discussed in Application 5814.

7.0 CEQA and Other Regulations

This application is categorically exempt from CEQA in accordance with Regulation 2-1-312.1 because the proposed permit condition amendments

apply to permitted equipment and do not involve permitted emission increases or physical modifications. No Appendix H form is provided because no physical modifications or site development are proposed. The only potential impacts are related to air quality. As discussed in Section 1.0, no emission increase is permitted since all existing emission limits will remain in effect at all times. Not operating SCR systems when not necessary to achieve compliance with emission limits will result in a reduction in ammonia slip emissions.

8.0 Toxic Risk Management

Since this application will result in no increase in toxic air contaminants, additional consideration of toxic risk is not required.

9.0 PERMIT CONDITIONS

The changes to permit conditions described in Section 2.0 will be made in the District Databank when the final permit is issued.

9.1 Amend Condition 21097, Parts 3a, 7a, and 7b for S-36:

3a. The owner/operator of S-36 shall abate emissions from S-36 at the A-36 SCR system whenever S-36 is operated, except that S-36 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-36 NOx emission rate whenever S-36 operates without abatement. All emission limits applicable to S-36 shall remain in effect ~~whether or not~~ even if it is operated without SCR abatement. [BACT, Cumulative Increase]

7. The owner/operator shall test refinery fuel gas prior to combustion at S-36 to determine total reduced sulfur (TRS) concentration by GC analysis 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, and dimethyl disulfide. As an alternative to GC TRS analysis, the fuel gas total sulfur content may be measured with a dedicated total sulfur analyzer (Houston Atlas or equivalent). If the measured total sulfur concentration exceeds 45 ppm, the owner/operator shall analyze the sample for TRS, provided that:
   a. Only one sample per day shall be analyzed;
   b. If more than one sample on one day is over 45 ppm of total sulfur concentration, the highest sample for that day shall be analyzed;
   c. Analysis shall only be performed on samples that are collected on Sundays through Thursday. No sample will be analyzed on a holiday.
   d. If all samples are under 45 ppm of total sulfur concentration, one sample per week shall be analyzed.

   Within 2 months of startup, the owner/operator shall submit a report to the Engineering Division and to the Compliance

and Enforcement division that contains the following information:

d. The total sulfur for all samples collected in the two months;

e. The TRS results for all samples that are analyzed in the two months.

7b. If the TRS value, averaged over any rolling consecutive 365-day period, exceeds 35 ppmv, the owner/operator shall install and operate a District-approved continuous monitor/recorder to determine the total reduced sulfur content of the refinery fuel gas prior to combustion in S-36 within the time period specified in the District Manual of Procedures. [BACT, Cumulative Increase]

9.2 Amend Condition 21096, Part 3a, 7a, and 7b for S-461:

3a. The owner/operator of S-461 shall abate emissions from S-461 at the A-461 SCR system whenever S-461 is operated, except that S-461 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-461 NOx emission rate whenever S-461 operates without abatement. All emission limits applicable to S-461 shall remain in effect whether or not it is operated with SCR abatement. [BACT, Cumulative Increase]

7. The owner/operator shall test refinery fuel gas prior to combustion at S-461 to determine total reduced sulfur (TRS) concentration by GC analysis 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. As an alternative to GC TRS analysis, the fuel gas total sulfur content may be measured with a dedicated total sulfur analyzer (Houston Atlas or equivalent). If the measured total sulfur concentration exceeds 45 ppm, the owner/operator shall analyze the sample for TRS, provided that:

a. Only one sample per day shall be analyzed;

b. If more than one sample on one day is over 45 ppm of total sulfur concentration, the highest sample for that day shall be analyzed;

c. Analysis shall only be performed on samples that are collected on Sundays through Thursday.

d. If all samples are under 45 ppm of total sulfur concentration, one sample per week shall be analyzed.

Within 2 months of startup, the owner/operator shall submit a report to the Engineering Division and to the Compliance and Enforcement division that contains the following information:

d. The total sulfur for all samples collected in the two months;

e. The TRS results for all samples that are analyzed in the two months.

7b. If the TRS value, averaged over any rolling consecutive 365-day period, exceeds 35 ppmv, the owner/operator shall install and operate a District-approved continuous monitor/recorder to determine the total reduced sulfur content of the refinery fuel gas prior to combustion in S-461 within the time period specified in the District Manual of Procedures. [BACT, Cumulative Increase]

10.0 RECOMMENDATION

Recommend that an Authority to Construct be issued to Sources S-36 and S-461 for the above changes in permit conditions.

By: _____ 3/10/05

Brenda Cabral **Date**
Senior Air Quality Engineer