

PHILLIPS 66
 RODEO RENEWABLE ENERGY COMPLEX
 1380 San Pablo Avenue
 Rodeo, CA 94572



PROVIDING ENERGY. IMPROVING LIVES.

April 30, 2024

162-ESDR-24
 02-E-01-B

Via E-Mail at Compliance@BAAQMD.gov

Mail Stop FM1
 Bay Area Air Quality Management District
 939 Ellis Street
 San Francisco, CA 94109

**Subject: Determination and Reporting of Cause:
 Main Flare (S-296) February 23, 2024
 BAAQMD 12-12-406 & Consent Decree 167 – 169
 Phillips 66, San Francisco Refinery (Plant 16)**

As required by BAAQMD 12-12-406 a Causal Analysis was conducted on the following flaring incident. A Causal Analysis is required when the volume flared exceeds 0.5 MMSCF or sulfur dioxide emissions are greater than 500 pounds. The flaring of scrubbed gas occurred intermittently from February 23, 2024, at approximately 01:54 a.m. until February 23, 2024, at approximately 08:41 a.m. The report contents are based on requirements of the Phillips 66 Consent Decree (CD) and the BAAQMD June 25, 2007 Compliance Advisory (BCA) and are referenced as such.

- The BAAQMD and Consent Decree 500 lb. SO₂ report threshold **was not** exceeded.
- The BAAQMD 500,000 scf/calendar day flow threshold was exceeded on February 23.

Total Volume and Emissions from Affected Flares [BCA 4, 5, 8, 9; CD 153(a) & (b)]:

Refinery Main Flare (S-296):

Date/Flare	Start Time	End Time	Duration (Hrs:Min)	Gas Flow Rate, SCF	Avg. H ₂ S Mole %	SO ₂ , lb.	CH ₄ , lb.	NMHC, lb.
2/23/2024	01:54 a.m.	08:41 a.m.	06:47	1,282,028	0.01%	21	216	555
Totals			06:47	1,282,028		21	216	555

SO₂ emissions are calculated using the following equation:

$$\text{SO}_2 \text{ (lb.)} = (\text{FR}) * (\text{H}_2\text{S conc.}) * (0.1689)$$

FR = total flow rate during flaring, scf

$$0.1689 = [\text{lb-mol H}_2\text{S}/379 \text{ scf H}_2\text{S}] * [64 \text{ lb SO}_2/\text{mol H}_2\text{S}]$$

Flaring Event Description [BCA 6, 7, 10, 11]

On February 23, 2024 while only one renewable process unit was operating, a sulfur plant upset led to higher than typical sulfur concentrations in the refinery fuel gas (RFG). Due to higher than typical sulfur concentrations in the RFG, RFG consumption was reduced at the SPP gas turbines. This was done to ensure meeting SPP permit conditions that limit SO₂ emissions. The reduction in consumption of RFG at the SPP resulted in excess RFG being sent to the flare and the flaring of scrubbed gas.

Primary Cause and Contributing Factors [BAAQMD 12-12-406.1, BCA 11, CD 153(d)]:

The primary cause of the flaring was excess RFG that could not be combusted in the gas turbines at the SPP due to the federally enforceable SPP permit conditions that limit SO₂ emissions. RFG consumption was reduced in the gas turbines at the SPP to ensure compliance with SO₂ emission limits, which led to excess RFG being sent to the flare. This was done by shutting out RFG fuel to SPP combustion and firing those sources on utility provided natural gas during the upset.

Excess sulfur was present in the RFG due to an upset at the Unit 238 sulfur recovery unit. Plugging in the sulfur plant resulted in inadequate RFG treatment which resulted in elevated sulfur in the RFG. During this event, operations at the refinery were not typical, with only one process unit operating and sulfur levels well below typical values that the sulfur plants handle.

Measures to Limit Duration/Quantity [BCA 10, 11, 12, CD 153€]

Rates were minimized at Unit 250 to reduce sulfur in the refinery fuel gas. Fuel gas balance was restored following the reduction of sulfur in the fuel gas.

Prevention Measures [BAAQMD 12-12-406.2, BCA 16, CD 153(e) & 154]:

No new prevention measures or corrective actions were identified. Operation of the Sulfur Recovery Unit 238 at low refinery sulfur levels contributed to this event. As part of the Rodeo Renewed permit, Sulfur Recovery Units 236 and 238 will be permanently shut down and a new unit, Sulfur Treatment Unit 237 (STU 237), will be put in service to handle the greatly decreased amount of sulfur generated by the facility in renewable feed operation.

Was the Flaring the Result of an Emergency [BAAQMD 12-12-406.4, BCA 13]:

No.

Was flaring due to a Regulatory Mandate to Vent to a Flare [BAAQMD 12-12-406.4, BCA 15]:

No.

Consistency with Flare Minimization Plan (FMP) [BAAQMD 12-12-406.3, BCA 14]:

The activities described that resulted in flaring are consistent with activities included in the Flare Minimization Plan. Specifically, these activities can be found described in the FMP in more detail in Section 4.2 as described below:

- Upset/Malfunction – Fuel Gas Quality Upset (Section 4.2.1.4)

Please contact Morgan Zellers at 510-245-5893 if you have any questions.

Sincerely,



Jennifer Ahlskog
Environmental Team Lead



Attachments

PFD Refinery Flare & Blowdown System (RVR-ENVRNM-YF-FLRE-001)

cc:

- C. Crowley – BAAQMD, via e-mail: CCrowley@baaqmd.gov
- D. Fung – BAAQMD, via e-mail: DFung@baaqmd.gov
- J. Kearns – BAAQMD, via e-mail: JKearns@baaqmd.gov
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Community Distribution via CFEP Community Agreement – Condition 11
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Name	Citizens Advisory Panel (CAP) Members	Memorandum of Understanding (dtd. 4/16/12) Signatories	Submit via
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C. Davis	x		Email
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C. Herrera	x		Email
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