

# Supplemental Summary of Comments and Responses on the Regulatory Package for Proposed Amendments to Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units

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## List of Commenters

The following table lists the individuals and organizations from whom Air District staff received written comments after the April 30, 2021, comment deadline.

<b>Abbreviation</b>	<b>Commenter / Reference</b>
Bay Area Council	Jim Wunderman President & CEO Bay Area Council Letter, April 6, 2021
Building & Construction Trades Council	Andreas Cluver, Secretary-Treasurer, Alameda County Building & Construction Trades Council Bill Whitney, CEO, Contra Costa County Building & Construction Trades Council Danny Bernardini, Business Manager, Napa-Solano County Building & Construction Trades Council David Bini, Executive Director, Santa Clara County Building & Construction Trades Council Cherie Cabral, CEO, Marin-Sonoma County Building & Construction Trades Council James Ruigomez, Business Manager, San Mateo County Building & Construction Trades Council Manny Pinheiro, CEO, Monterey-Santa Cruz County Building & Construction Trades Council Rudy Gonzalez, Secretary-Treasurer, San Francisco County Building & Construction Trades Council Bay Area Regional Building & Construction Trades Council Letter, April 5, 2021
C. Gilbert	Chris Gilbert Resident Email, May 3, 2021
Chevron (AD)	Alan Davis Director, Richmond Refinery Chevron Products Company Letter, May 27, 2021
Chevron (MC)	Michael Carroll Latham & Watkins, LLP Letter, May 26, 2021
M. Steinberg	Mayoor Steinberg Resident Email, May 3, 2021
N. Ratto	Nicholas Ratto, Pharm. D. Resident Email, May 24, 2021
NCCRC	Curtis Kelly Assistant Executive Secretary-Treasurer Northern California Carpenters Regional Council Letter, April 6, 2021

Abbreviation	Commenter / Reference
P. Haan	Patrice Haan Resident Email, May 3, 2021
PBF Energy	Timothy Paul Davis Western Region President PBF Energy Letter, May 18, 2021
V. Van Kuran	Virginia Van Kuran Resident Email, May 3, 2021

## General Comments

### *Support for proposed amendments*

Comment: Several commenters expressed support for proposed amendments to achieve associated health benefits.

C. Gilbert, N. Ratto, M. Steinberg, P. Haan, San Pablo, V. Van Kuran

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 6).

### *Support for consideration of other options*

Comment: Several commenters expressed support for other control options instead of the proposed amendments. Several commenters stated that a less stringent PM limit of 0.020 gr/dscf, with flexibility as to how this would be met by each facility, would allow refining operations to remain economically feasible and still achieve substantial emission reductions.

Bay Area Council, Building & Construction Trades Council, Chevron (AD), NCCRC, PBF Energy

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 7).

## Cost-Effectiveness and Incremental Cost-Effectiveness

### *Cost-effectiveness and incremental cost-effectiveness have not been properly considered and are not supported*

Comment: Commenters stated that the Air District has not conducted the required cost-effectiveness analysis in a robust, transparent, or accurate way as required by California law, and the cost per ton is underestimated due to underestimated costs and overestimated emission reductions. Commenters stated that the Best Available Retrofit Control Technology is required to be cost-effective, and the proposed amendments do not meet this criterion. Commenters stated

that the cost per ton of the proposed amendments is substantially higher than other adopted Air District rules.

Commenters also stated that the Air District has not considered incremental cost-effectiveness of other control options as required by the California Health and Safety Code, and has not explained how cost-effectiveness and incremental cost-effectiveness were considered in the determination of the recommended controls.

Chevron (AD), Chevron (MC), PBF Energy

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 7).

## **Cost Estimates**

### ***Compliance costs are underestimated***

Comment: Commenters stated that cost estimates developed by staff for the proposed amendments are underestimated.

Chevron (AD), Chevron (MC), PBF Energy

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 8).

## **Emissions and Modeling**

### ***Estimates of emissions and reductions are not accurate***

Comment: Commenters stated that FCCU and refinery emissions are overestimated.

Chevron (AD), Chevron (MC), PBF Energy

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 12).

### ***Emissions from other refinery sources and other refineries should not be included in modeling***

Comment: One commenter stated that the health effects outlined in the March 2021 Staff Report used the entirety of refinery PM emission sources, however, the proposed amendments to Rule 6-5 are intended to further control PM emissions from refinery FCCUs, which represent a fraction of total refinery PM emissions.

The commenter stated that emissions from the Marathon Martinez Refinery should not be included in the Staff Report.

Chevron (AD)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 15).

***Air quality model selection is not appropriate***

Comment:

One commenter stated that the environmental consultant ERM performed PM2.5 dispersion modeling in the AERMOD model using the same modeling inputs (source emissions and stack parameters) and surface data from Chevron's onsite meteorological station, with upper air and supplemental surface data from Oakland International Airport obtained from the Air District. The commenter states that the results show that modeled ground-level concentrations resulting from FCCU emissions occur over the Bay, avoiding populated areas near the refinery, and the magnitude of these maximum concentrations are significantly less than the District's reported maximum concentration. The commenter stated that the Air District should use AERMOD for their FCCU PM dispersion modeling.

Chevron (MC)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 17).

***Meteorological data used in the modeling are not appropriate***

Comment: One commenter stated that on-site meteorological data should have been used in the Air District's modeling

Chevron (MC)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 20)

***Modeling results should be compared and calibrated to monitoring data***

Comment: One commenter stated that ambient data does not show a statistically significant difference in ambient PM2.5 concentrations during periods in which the Chevron Refinery FCCU was shut down and not operational.

Bay Area Council

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 22).

## **Environmental Impacts**

### ***CEQA requirements have not been fulfilled***

Comment: Commenters stated the Air District has not conducted an adequate CEQA analysis for the Proposed Amendments. One commenter stated that the Air District is relying on an inappropriate CEQA EIR and needs to prepare an EIR for this rule development. The commenter stated that there is significant new information that requires that the District conduct additional environmental review and prepare a subsequent or supplemental EIR.

The commenter stated that the proposed amendments could cause the foreseeable closure of one or more Bay Area refineries, which could lead to severe economic and social impacts. The commenter stated that while CEQA does not require a stand-alone analysis of social or economic impacts, an agency must consider economic and social consequences when they are related to a physical change in the environment. The commenter stated that if evidence suggests that the economic and social effects caused by the project ultimately could result in urban decay or deterioration, then the lead agency is obligated to assess this indirect impact.

Chevron (AD), Chevron (MC)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 24).

### ***The Air District has not fully analyzed and mitigated water impacts under CEQA***

Comment: Commenters stated that the District has failed to fully analyze and mitigate the significant environmental impacts of multiple mandated wet gas scrubbers that would be required under the proposed amendments. Commenters stated that wet gas scrubbers would significantly increase freshwater demand in a region already constrained by water supply and in drought conditions. Commenters stated that the EIR does not address whether recycled water would be available to the facilities. One commenter also stated that the District has failed to fully analyze and mitigate the potentially significant water quality impacts of wet gas scrubbers

Bay Area Council, Chevron (AD), Chevron (MC)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 28).

### ***The Air District has not properly analyzed and mitigated GHG impacts under CEQA***

Comment: One commenter stated that the Air District has failed to properly analyze Greenhouse Gas Emissions impacts.

Chevron (MC)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 29).

***The Air District has not properly analyzed energy impacts under CEQA***

Comment: Commenters stated that the Air District did not adequately consider energy impacts in the EIR. One commenter stated that it is not evident how energy usage estimates were developed.

Chevron (AD), Chevron (MC)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 30).

***The Air District has not properly analyzed air quality impacts under CEQA***

Comment: One commenter stated that the Air District has failed to fully analyze significant air quality impacts for wet gas scrubbers.

Chevron (AD)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 31).

***The Air District has not properly analyzed aesthetics impacts under CEQA***

Comment: One commenter stated that the EIR fails to account for changes to aesthetics that could result from the increased visibility of the new wet gas scrubber plume.

Chevron (AD)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 33).

**Feasibility of Controls and Proposed Limits**

***Wet gas scrubbing controls are not technically feasible***

Comment: One commenter stated that installation of a wet gas scrubber at the PBF Martinez Refinery is not technically feasible.

PBF Energy

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 33).



### ***Proposed limits are not achievable***

Comment: Commenters stated that the Air District has not demonstrated that the proposed limits are achievable or technically feasible. One commenter stated that there is no allowance for testing or process variability.

Chevron (AD), Chevron (MC)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 34).

## **Health Impacts**

***The health benefits of the proposed amendments (Scenario B) are indistinguishable from those of a less stringent control option (Scenario A)***

Comment: One commenter stated that, in terms of health benefits, it may be just as beneficial to choose the less stringent control option (Scenario A) over the proposed amendments (Scenario B). A figure (“Figure 3”) was provided, in which the reported ranges of benefits attributable to mortality reductions were drawn in a manner similar to confidence intervals. A second figure (“Figure 4”) was provided, in which similar depictions were rendered for four other health endpoints.

Chevron (MC)

Response: The commenter’s statement misinterprets the meaning of the health benefit ranges for Scenario A and Scenario B, and compares the data in an inconsistent manner to draw an improper conclusion.

For mortality, the lower and upper bounds of the reported ranges correspond to the estimates of PM<sub>2.5</sub> effects from two different studies—Krewski (2009) and Lepeule (2012), respectively. Both studies belong to the suite used by US EPA to inform regulatory decision-making.

- Using the estimates consistent with Krewski (2009), the baseline mortality is 5.1 deaths/year, and the calculated change in mortality (death/year) is -0.7 for Scenario A (a 13% reduction from the baseline mortality); and -1.2 for Scenario B (a 23% reduction from the baseline mortality). Using the estimate consistent with Krewski (2009), Scenario B results in a larger reduction.
- Using the estimates consistent with Lepeule (2012), the baseline mortality is 11.6 deaths/year, and the calculated change in mortality (death/year) is -1.5 for Scenario A (a 13% reduction from the baseline mortality); and -2.7 for Scenario B (a 23% reduction from the baseline mortality). Using the estimate consistent with Lepeule (2012), Scenario B results in a larger reduction.

When applying these estimates of PM<sub>2.5</sub> health effects in a consistent manner for both Scenario A and Scenario B, Scenario B results in a larger reduction. The commenter suggests that the health benefits of Scenario A calculated using estimates from Lepeule (2012) can be compared to

the health benefits of Scenario B calculated using estimates from Krewski (2009), however this is inconsistent and does not provide a meaningful comparison.

The same reasoning applies when evaluating different health endpoints, and also applies regardless of whether the baseline impact and corresponding reductions are framed in terms of (i) an entire facility, (ii) a collection of facilities, or (iii) FCCUs alone. Calculated in this consistent manner, Scenario B will always entail a larger reduction in health impacts than Scenario A.

The commenter also presented a figure (“Figure 4”) in support of the claim that “for hospital admissions and emergency room visits for respiratory and cardiovascular health outcomes, the effects are [...] indistinguishable from zero.” For cardiovascular (CV) impacts, BenMAP was used to pool multiple studies, including some studies whose individual CIs included zero. This is standard practice, and the existence of such studies in no way contradicts the established scientific consensus that PM2.5 causes cardiovascular impacts. The Air District provided a response to related comments in the Summary of Comments and Responses dated May 24, 2021 (page 41).

The Air District modeled many other health endpoints. For a subset of those, some of the relevant confidence intervals do include zero. Figure 4 of commenter’s letter highlighted Asthma ER, All-Respiratory HA, and Chronic Lung Disease HA. (It also, erroneously, included “CV Hospital Admissions” and “Asthma HA”.) Although every health impact is of concern, note that the total valuation for this subset of endpoints is less than 0.04% of the total valuation of all health impacts evaluated.

As a point of clarification, the Air District’s response to related comments in the Summary of Comments and Responses dated May 24, 2021 (page 39) that “[n]one of those confidence intervals include zero” refers specifically to the confidence intervals associated with the response functions (equivalently, modeled impacts) for mortality and cardiovascular endpoints. It does not refer to all modeled response functions, nor to every individual study used to construct those functions (some of which were pooled).

## **Socioeconomic Impact Analysis**

### ***Proposed amendments may cause significant impacts on the supply of aviation jet fuel and increase fuel imports***

Comment: Commenters stated that the proposed amendments may cause significant issues for the viability of the refining industry and impacts on the supply of conventional aviation jet fuel needed for airline operations.

Commenters stated that if refineries in the Bay Area are decommissioned due to regulations, fuel will be produced and imported from other countries with less stringent safety and environmental standards.

Bay Area Council, Building & Construction Trades Council, NCCRC, PBF Energy

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 47).

## **Testing requirements**

### ***EPA Method 202 used by the Air District overestimates PM***

Comment: Commenters stated that the test method used by the Air District results in artifacts that overestimate condensable PM.

Chevron (AD), Chevron (MC)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 50).

### ***Other measurements methods such as OTM-37 are more appropriate***

Comment: One commenter stated that the proposed amendments should allow the use of Method OTM-37 instead of EPA Method 202. The commenter stated that a study is being conducted under a Cooperative Research and Development Agreement (CRADA) between the American Petroleum Institute (API) and the National Risk Management Research Laboratory of the USEPA to compare results of EPA Method 202 and Method OTM-37, and support understanding of the application of these methods for regulatory purposes.

Chevron (MC)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 52).

### ***The proposed use of EPA Method 201A is not feasible when water droplets are present downstream of a wet gas scrubber***

Comment: One commenter stated that EPA Method 201A is inappropriate for filterable PM measurement in wet stacks where water droplets are present, such as downstream of a wet gas scrubber.

Chevron (AD)

Response: The Air District provided a response to similar comments in the Summary of Comments and Responses dated May 24, 2021 (page 53).