



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

AGENDA: 2

Continued Public Hearing on Amendments to Rule 6-5: *Proposed Amendments*

Board of Directors Special Meeting
July 21, 2021

Greg Nudd
Deputy Air Pollution Control Officer
gnudd@baaqmd.gov

Requested Action



- Consider adoption of proposed amendments to Regulation 6, Particulate Matter, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units

Background



- Fluidized Catalytic Cracking Units (FCCUs) convert heavy components of crude oil into gasoline and high-octane products
- Four of the five Bay Area refineries have FCCUs
 - Three FCCUs currently in operation, one already has a wet gas scrubber
 - Marathon FCCU has been indefinitely idled, but would be subject to rule and amendments if restarted
- Large source of particulate matter (PM) emissions
 - Over 800 tons per year of PM₁₀
 - Approximately 50% of overall PM₁₀ emissions at these refineries
 - 17% of PM₁₀ emissions from all permitted stationary sources

Proposed Amendments to Rule 6-5



Pollutant	Limit	Monitoring Requirement
Ammonia (NH₃)	10 ppm at 3% O ₂ (daily average)	No proposed changes
Sulfur dioxide (SO₂)	25 ppm at 0% O ₂ (365-day average) 50 ppm at 0% O ₂ (7-day average)	Continuous Emission Monitoring (CEM)
Total PM₁₀	0.010 gr/dscf at 5% O ₂ (four quarter rolling average)	Quarterly source testing, or other emission monitoring system approved by APCO
Effective date	5 years after adoption date	5 years after adoption date

ppm = parts per million

gr/dscf = grains per dry standard cubic foot

- Reflects levels of stringency that have been achieved at units using wet gas scrubbing controls
- Anticipate Chevron Richmond and PBF Martinez would be required to install WGS
- Marathon Martinez would be required to install WGS if petroleum refining operation restarted
- Valero Benicia anticipated to comply using existing WGS

Emission Reductions, Cost Impacts, and Incremental Cost Analysis



Refinery	PM ₁₀ Reductions	Est. Capital Cost	Est. Total Annualized Cost	Cost Effectiveness	Incremental Cost Effectiveness
Proposed Amendments					
Chevron Richmond	160 TPY	\$241 MM	\$39 MM/year	\$242,700/ton	\$430,200/ton
PBF Martinez	240 TPY	\$255 MM	\$40 MM/year	\$165,000/ton	\$359,400/ton
<i>Marathon Martinez</i>	<i>93 TPY</i>	<i>\$235 MM</i>	<i>\$38 MM/year</i>	<i>\$406,400/ton</i>	—
Less Stringent Control Option					
Chevron Richmond	80 TPY	\$30 MM	\$4.4 MM/year	\$55,300/ton	—
PBF Martinez	170 TPY	\$80 MM	\$14 MM/year	\$84,900/ton	—

TPY = tons per year, MM = million

Socioeconomic Impacts



- Significant impacts expected when costs exceed 10% of net income
- Facilities expected to implement adjustments to reduce significant impacts
- Based on most recent financial information for year 2019

Refinery	Estimated Annual Net Income (2019)	Est. Total Annualized Cost	Compliance Cost (% of Income)	Expected Annual Adjustment
Chevron Richmond	\$283 MM	\$39 MM	13.7%	\$11 MM
PBF Martinez	\$178 MM	\$40 MM	22.3%	\$22 MM
<i>Marathon Martinez</i>	<i>\$147 MM</i>	<i>\$38 MM</i>	<i>25.8%</i>	<i>\$23 MM</i>

MM = million

Socioeconomic Impacts (cont.)



- Refineries would be expected to reduce cost impacts below significant level (10%)
- Potential adjustments:
 - Reduce labor costs – Equivalent to reducing employment by:
 - 62 jobs at Chevron Richmond
 - 128 jobs at PBF Martinez
 - 136 jobs at Marathon Martinez (*facility has been indefinitely idled*)
 - Increase gas prices – Equivalent to approximately \$0.02 per gallon increase
- Feasibility of cost/revenue adjustments uncertain:
 - Feasibility of operating at reduced staffing
 - Equivalent price increases within normal fluctuations, but individual refineries Limited ability for have limited ability to unilaterally increase pricing
 - Cannot predict individual business decisions or actions that the affected facilities may elect to take

Environmental Impacts



- Final Environmental Impact Report (EIR) for the AB 617 Expedited BARCT Implementation Schedule certified by Board of Directors in December 2018
- Identified significant impacts:
 - Air quality impacts during construction of pollution control equipment
 - Water usage impacts from use of Wet Gas Scrubbing (WGS)
 - Board of Directors adopted a Statement of Overriding Consideration in Resolution 2018-08
- Proposed amendments do not present substantial changes to the project or new information requiring new analysis
- Air District continues to rely on the EIR pursuant to CEQA section 21166

Health Impacts Estimates



Impacts and Benefits in Modeled Study Area Only

- Localized PM_{2.5} impacts from Chevron Richmond and PBF Martinez
- Equity and health benefits of Control Scenario A and B

Facility	Control Scenario	Modeled Health Benefits ^{1,2}
Chevron Products Richmond	A (ESP)	\$6.8 MM to \$15.2 MM/yr
	B (WGS)	\$12.2 MM to \$27.4 MM/yr
PBF Martinez Refinery	A (ESP)	\$10.1 MM to \$22.7 MM/yr
	B (WGS)	\$14.4 MM to \$32.4 MM/yr

ESP = electrostatic precipitator

WGS = wet gas scrubber

¹ Based on conventional US EPA valuations of selected health impacts.

² Valuations are in 2015 US dollars, calculated using the US EPA BenMAP system.



- White
- Hispanic / Latino
- Asian / Pacific Isl.
- Afr. Amer. / Black
- Other

Study Area for Health Impacts

Study area is the region inside the outermost contour

+0.1 $\mu\text{g}/\text{m}^3$

Contours correspond to modeled contributions of +1.0, +0.9, ... +0.1 $\mu\text{g}/\text{m}^3$

Study area population (2020) is about 1 million residents

Complete Continued Public Hearing



- Public hearing commenced June 2, 2021
- Pursuant to the discussion at the June 2, 2021, Board of Directors meeting, members of the public who previously had an opportunity to speak, will not be entitled to speak to this item again. For those who wish to speak on this item, will be allowed 2 minutes
- Receive further public comments and close public hearing

Feedback Requested/Prompt



- Recommend adoption of proposed amendments to Regulation 6, Rule 5: Particulate Emissions from Refinery Fluidized Catalytic Cracking Units