

Improving Air Quality for Environmental Justice Communities

Fact Sheet

Adopt the most stringent proposal to amendments to Regulation 6 Rule 5

BAAQMD is currently considering amendments to Regulation 6 Rule 5 on petroleum refinery *Fluidized Catalytic Cracking Units (FCCUs)*. The amendments would require refineries to install abatement equipment to reduce emissions of particulate matter smaller than 2.5 um (PM2.5). **We urge the District to adopt the more stringent standard proposed of 0.01 gr/dscf, which would likely require wet gas scrubbers.**

What is the Harm of FCCUs and PM2.5?

- FCCUs are the **heart** of petroleum refineries and are the largest source of PM2.5 across all refinery equipment. In Richmond, Chevron's FCCU is the largest single source of PM2.5 in the entire city.
- PM2.5 is the leading cause of death due to air pollution in the Bay Area. Every year, 2,000-3,000 people in the region die from particulate matter exposure.
- PM2.5 is a known exacerbator of COVID-19 outcomes and is also associated with increased asthma, hospital admissions, school absences, and lost workdays.



Chevron Richmond's FCCU, during major repairs

Why Adopt the More Stringent Rule?

The more stringent rule would...

...advance environmental justice. People of color are unjustly and disproportionately exposed to these emissions. Latinx and Black people are exposed to FCCU PM2.5 at rates **1.4** and **2.6** times higher, respectively, compared to their proportion of the Bay Area population.

...yield more public health benefits than costs to the refineries. The total value of public health benefits over the useful life of wet gas scrubbers would **exceed** the capital costs of the upgrades.

...eliminate the possibility of a costly and deadly explosion. The explosion of ExxonMobil's refinery in Torrance was caused by its electrostatic precipitator (ESP), the same technology used to abate emissions from Chevron and PBF's FCCUs. The explosion led to total economic losses of \$6.9 billion.

...create jobs. For instance, Valero's project including a wet gas scrubber added 200 construction workers.

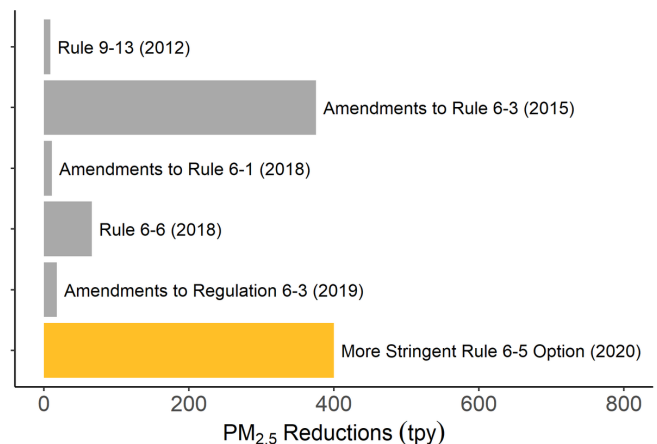
...require a technology already widely used. Wet gas scrubbers are already used by **a majority** of FCCUs across the country. So can Chevron and PBF.

This Rule is a Rare Opportunity to Address PM2.5 Emissions

FCCU emissions alone represent **15%** of the PM from all BAAQMD-permitted sources. In total, an estimated 3/4 of a million Bay Area residents live under current FCCU plumes.

A more stringent rule would reduce emissions from these sources **by nearly three-quarters** using an industry-standard technology.

A more stringent rule **on just two FCCUs** would reduce PM2.5 **more than any other BAAQMD rule in the last decade**, including the 2015 Amendments to Rule 6-3 that reduced wood burning emissions from tens of thousands of sources across the Bay Area.



Sources & Calculations

- Total public health benefits from mortality of the more stringent rule were calculated as (1.7 lives / year) X (\$10 million / life) X 25 years = \$425 million, using the District's estimate of 1.7 lives saved per year from the October 1, 2020 Stationary Source Committee meeting, an estimate of the Value of a Statistical Life in 2020 dollars of \$10 million, and SCAQMD's estimate of the usable life of a wet gas scrubber of 25 years (see SCAQMD Proposed Amendments to SOX RECLAIM Program (Regulation XX) Appendix E). Capital costs estimates are taken as those cited during the October 1, 2020 Committee meeting.
- Relative impacts of FCCU PM2.5 exposures on racial groups were determined using the results from population exposure analysis from the October 1, 2020 Stationary Source Committee meeting. Rate were determined using the emission-weighted populations by each racial group, compared against the population by race of BAAQMD's 9 counties as of the 2010 Census.
- See the average daily construction workforce for the Valero Improvement Detailed Project Description for cited job estimates. https://www.ci.benicia.ca.us/vertical/sites/%7BF991A639-AAED-4E1A-9735-86EA195E2C8D%7D/uploads/VIP_Detailed_Project_Description.pdf
- Prevalence of wet gas scrubbing technology among refinery FCCUs nationwide determined using non-CBI results from Component 1 Data of 2011 U.S. EPA Information Collection Request to the U.S. petroleum refining industry. 56 of the 110 refinery units that reported non-CBI data listed wet scrubbing as a PM control technology for their catalytic cracking units. See Tables *catalytic_cracking_unit_pm_cont* and *lookup_catalytic_cracking_unit_*. <https://www.epa.gov/stationary-sources-air-pollution/comprehensive-data-collected-petroleum-refining-sector>
- During staff presentation at the October 1, 2020 Stationary Source Committee meeting, staff reported that the total PM emissions from two refineries represent 30% of total PM from BAAQMD-permitted sources, and that FCCUs contribute roughly one-half of emitted PM from the refineries. Total impacted population is the population found to be exposed to higher than 0.1 ug/m³ from the FCCU PM2.5.
- For reported PM2.5 reductions cited, see the following:
 - **For Rule 9-13 (2012):** https://www.baaqmd.gov/~media/files/planning-and-research/public-hearings/2012/0913_stfr_072012.pdf
 - **For Amendments to Rule 6-3 (2015):** <https://www.baaqmd.gov/~media/files/compliance-and-enforcement/wood-burning/2015-amendments/reg-6-rule-3-staff-report-081715-pdf.pdf>
 - **For Amendments to Rule 6-1 (2018):** https://www.baaqmd.gov/~media/dotgov/files/rules/archive-2018-regulation-6/bundled-documents/20180801_92_fsr_0601-pdf.pdf?la=en
 - **For Amendments to Rule 6-6 (2018):** https://www.baaqmd.gov/~media/dotgov/files/rules/archive-2018-regulation-6/bundled-documents/20180801_91_fsr_0606-pdf.pdf?la=en
 - **For Amendments to Rule 6-3 (2019):** https://www.baaqmd.gov/~media/dotgov/files/rules/regulation-5/documents/20190920_2_sr_rg05_r0603-pdf.pdf?la=en
 - **For Amendments to Rule 6-5 (2020):** https://www.baaqmd.gov/~media/files/board-of-directors/2020/ssc_presentations_10012020-pdf.pdf?la=en
- See the Gonzales et al. (2016) RAND report, finding the lost supply associated with Torrance explosion reduced the size of the California economy by \$6.9 billion. https://www.rand.org/pubs/research_reports/RR1421.html
- See Appendix C of BAAQMD's Final 2017 Clean Air Plan, finding that anthropogenic sources of PM2.5 cause approximately 2,500 deaths each year in the Bay Area. https://www.baaqmd.gov/~media/files/planning-and-research/plans/2017-clean-air-plan/attachment-a_-proposed-final-cap-vol-1-pdf.pdf?la=en
- See video from Crane Market of Chevron maintenance project for photo of Chevron Richmond's FCCU. <https://cranemarket.com/blog/lampson-and-bigge-team-up-at-chevrons-richmond-refinery-on-the-san-francisco-bay-for-maintenance-project/>