CITY OF OAKLAND

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Date: ~~July 14, 2016~~
To: City Council
From: Councilmember Rebecca Kaplan & Councilmember Dan Kalb

Re: Adopt a Resolution Urging Bay Area Air Quality Management District Board of Directors to Adopt the Refinery Emission Limits Detailed in the Community-Worker Alternative for Proposed Rule 12-16 to Ensure Community and Refinery Worker Heath and Safety.

Dear Colleagues on the City Council and Members of the Public,

As you know, the air we breathe affects the health and well being of everyone in our community. Bay Area residents already suffer disproportionally from diseases related to emissions. To make matters worse, the five Bay Area oil refineries are seeking to process dirtier crude slates, which has the potential to greatly increase release of dangerous emissions into the air.

This is unacceptable, which is why I along with Councilmember Kalb have worked to bring forward this Resolution urging the Bay Area Air Quality Management District (BAAQMD) Board of Directors to adopt the Community-Worker Alternative for Proposed Rule 12-16. Adopting this rule will accomplish the following:

- Prevent Bay Area oil refineries from processing dirtier crude slates.
- Prohibit any further increase of emissions from the five Bay Area oil refineries.
- Protect the health and safety of Bay Area residents and refinery workers.

We respectfully ask for your support.

Best,

Councilmember At-Large Rebecca Kaplan

Councilmember District One Dan Kalb

Approved as to Form and Legality

City Attorney

OAKLAND CITY COUNCIL

RESOLUTION NO. _____ C.M.S.

Introduced by Councilmember Kaplan and Councilmember Kalb

RESOLUTION URGING BAY AREA AIR QUALITY MANAGEMENT DISTRICT BOARD OF DIRECTORS TO ADOPT THE REFINERY EMISSION LIMITS DETAILED IN THE COMMUNITY-WORKER ALTERNATIVE FOR PROPOSED RULE 12-16 TO ENSURE COMMUNITY AND REFINERY WORKER HEALTH AND SAFETY

WHEREAS, the Bay Area Air Quality Management District (BAAQMD) is charged by the federal and state governments to enforce federal and state air quality laws against industrial sources; and

WHEREAS, the mission statement of BAAQMD is, "to create a healthy breathing environment for every Bay Area resident while protecting and improving public health, air quality, and the global climate"; and

WHEREAS, the Air District's Board of Directors is made up of 24 locally elected representatives from nine Bay Area counties; and

WHEREAS, the American Lung Association in its 2016 "State of the Air" report gave the Bay Area a "Grade D" for air quality; and

WHEREAS, residents in the Bay Area Refinery corridor and other Bay Area communities already suffer disproportionately from emissions related diseases, including cancers, asthma, stroke, and autoimmune related diseases; and

WHEREAS, the shift to dirtier crude slates by Bay Area refineries has the potential to greatly increase dangerous emissions; and

WHEREAS, the five Bay Area oil refineries are seeking to adapt their facilities to process dirtier, higher sulfur crude slates, including Canadian Tar Sands, among the dirtiest crudes on the planet; and

WHEREAS, the Community-Worker Alternative for Proposed Rule 12-16 is intended to not allow any further increase of emissions from the five Bay Area petroleum refineries; and

WHEREAS, adoption of the Community-Worker Alternative for Proposed Rule 12-16

will ensure that future emissions limits will prohibit Bay Area refineries from processing these extreme dirty crudes, thereby reducing the harm to Bay Area residents from dangerous emissions and reducing the amount of harmful, heat-trapping greenhouse gases that damage the global climate; now, therefore be it

RESOLVED: That the City of Oakland hereby urges the Bay Area Air Quality Management District staff to fully present the Community-Worker Alternative for Proposed Rule 12-16; and be it

FURTHER RESOLVED: That the City of Oakland urges the Bay Area Air Quality Management District Board of Directors to adopt the Community-Worker Alternative for Rule 12-16 to ensure community and refinery worker health and safety.

IN COUNCIL, OAKLAND, CALIFORNIA, _____

PASSED BY THE FOLLOWING VOTE:

AYES - BROOKS, CAMPBELL WASHINGTON, GALLO, GUILLÉN, KALB, KAPLAN, REID, AND PRESIDENT GIBSON MCELHANEY

NOES -

ABSENT -

ABSTENTION -

ATTEST:_____
LaTonda Simmons
City Clerk and Clerk of the Council
of the City of Oakland, California

18 September 2015
[Revised 21 Sep 2015]

COMMUNITIES FOR A BETTER ENVIRONMENT

Jack Broadbent
Air Pollution Control Officer
Bay Area Air Quality Management District
939 Ellis Street
San Francisco, CA 94109

Attention: Eric Stevenson (Estevenson@baaqmd.gov)

Re: **Proposal for enforceable numeric limits on refinery-wide emissions to stop increasing greenhouse gas and particulate matter air pollution [Rule 12-16]**

Mr. Broadbent,

The undersigned community, environment, labor and academic groups continue to seek enforceable numeric limits on refinery-wide emissions of greenhouse gas (GHG) and particulate matter air pollution that would prevent further increases in these emissions. These emission limits are needed now, in proposed Rule 12-16.

GHG and particulate matter (PM) are among the most harmful air pollutants known. GHG threatens climate catastrophe and PM kills thousands in the Bay Area each year. Oil refining is the largest industrial emitter of GHG and PM in the Bay Area, and yet refineries here have *no* facility-wide limits on these emissions, though other industries do. In the absence of such limits—and despite actions to cut emissions from some *parts* of refineries—Bay Area refinery emissions of GHG and PM have continued to increase. Worse, planned projects for low-quality oil could increase these emissions *even more*.

Keeping emissions from increasing would not require any change in current operations of any refinery. This is, therefore, clearly feasible. And it is urgent, as we outline above. We agree with the observation made by Board Member Gioia, at the 3 June 2015 Air District Board Meeting, that the Board's decision making process is frustrated by the absence of a specific proposal for such refinery-wide emission limits. We have identified specific examples of these limits in previous comments since at least 27 March 2015, however, District Staff has not yet proposed specific limits based on existing data.

Accordingly, we propose that the Air District consider, for adoption in Rule 12-16, enforceable numeric limits on refinery-wide emissions of GHG (as CO_2e), particulate matter (PM), and PM precursors (NO_x and SO_2) based on existing data, plus the additional allowance identified by the Air District in March 2015 (*see* § 12-16-301.1). Specifically, we propose enforceable numeric limits on mass emissions of each of these pollutants from each facility, set to require that emissions shall not exceed the facility's greatest annual emissions of each pollutant, as reported during 2011–2013, by an amount greater than +10,000 metric tons of GHG or +7% of PM, NO_x, or SO_2 emissions.

We urge the Air District to consider our proposal for Rule 12-16 favorably.

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Pittsburg Defense Council

Steve Nadel
Sunflower Alliance

Miya Yoshitani
Asian Pacific Environmental Network

Janet S. Johnson
Richmond Progressive Alliance

Jessica Hendricks
Global Community Monitor

Katherine Black
Benicians for a Safe and Healthy Community

Jed Holtzman
350 Bay Area

Luis Amezcua
Sierra Club San Francisco Bay Chapter

Bradley Angel
Greenaction for Health and Environment

Nazima El-Askari
Labor Occupational Health Center at UC Berkeley

Copy: John Gioia, Chair, Stationary Source Committee of the Board
Directors, Air District Board
Ken Alex, Senior Advisory, Office of Governor Brown
Interested individuals and groups

Proposal for Enforceable Numeric Limits on Refinery-wide Emissions to Stop Increasing Greenhouse Gas & Particulate Matter Air Pollution, Including Revision to Proposed Rule 12-16:

Technical Report; CBE September 2015 Comments Part 1

By
Greg Karras, Senior Scientist,
and Roger Lin, Staff Attorney,
Communities for a Better Environment (CBE)
Revised 21 September 2015

Contents

PURPOSE OF THE PROPOSED FACILITY EMISSION LIMITS

The purpose of the limits is to better protect air quality, health, and climate by prohibiting any substantial increase in facility-wide particulate matter (PM), PM precursor, or greenhouse gas (GHG) mass emission rate from petroleum refining facilities in the Air District's jurisdiction that are major emitters of these air pollutants.

Stopping increasing refinery-wide emissions is consistent with, complementary to, and necessary to achieve fully the benefits of, other separately proposed policies that seek source-specific reductions in emissions from selected parts of these facilities.

DESCRIPTION OF THE PROPOSED LIMITS

The proposed limits are shown in Table 1. A numeric limit on the annual mass emission rate of each air pollutant specified is applied to each facility specified in the table. The limit is equal to the maximum-year actual emissions reported in 2011–2013 ***plus*** the additional numeric allowance calculated previously by Air District Staff. (These additional allowances, or 'threshold factors,' are +10,000 metric tons for GHG, +7% for PM, and +7% for each of the PM precursors, NO_x and SO_2.)

Table 1. The enforceable numeric limits on refinery-wide emissions proposed[a]

Facility	GHG (metric tons/yr)	PM (tons/yr)	NO_x (tons/yr)	SO_2 (tons/yr)
Chevron Refinery, Plt. A-0010	4,473,000	529	974	400
Shell Refinery, Plt. A-0011	4,272,000	569	1,040	1,340
Phillips 66 Refinery, Plt. A-0016	1,512,000	56.0	275	433
Tesoro Refinery, Plt. B-2758/2759	2,456,000	180	1,080	707
Valero Refinery, Plt. B-2626	2,950,000	134	1,410	138
Martinez Cogen LP,[b] Plt. A-1820	431,000	18.8	119	2.30
Air Liquide H_2 Plant,[b] Plt. B-7419	855,000	17.3	12.9	2.48
Air Products H_2 Plant,[b] Plt. B-0295	281,000	10.4	3.40	2.31

[a] Annual facility-wide emission limits. **GHG:** greenhouse gas emissions (CO_2e) as reported under Air Resources Board Mandatory Reporting; **PM:** filterable and condensable particulate matter; **NO_x:** oxides of nitrogen; **SO_2:** sulfur dioxide. PM, NO_x and SO_2 as reported in the Facility's annual emission inventory.
[b] The Martinez Cogen and Air Products facilities support Tesoro; Air Liquide supports Phillips 66.

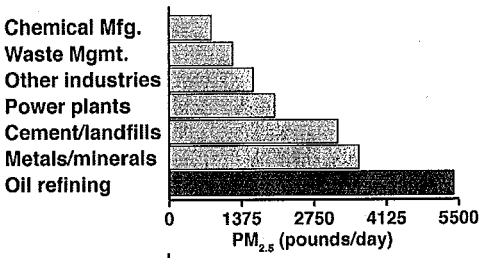
These limits are thus specific, numeric, transparent, and enforceable upon adoption.

Anticipated future improvements in monitoring are facilitated and addressed by providing for re-calibration of compliance demonstrations to account for potential differences in the emission quantities reported that are due solely to changes in monitoring methods.

DEVELOPMENT OF THE PROPOSED LIMITS

Selection of air pollutants: Air pollutants to be limited were screened based on severity of harm, emission source strength, emission trends and forecasts, and available facility emission data. PM is associated with the vast majority of the thousands of deaths caused by air pollution that are estimated to occur in the Bay Area each year,[1] and GHG is linked to increasingly severe climate disruption that poses an existential threat to human societies as we know them unless deep cuts in emissions are made quickly.[2] As to source strength, Air District[3, 4] and State Air Board[5] data indicate that oil refining is the largest industrial emitter of both PM and GHG in the region. *See* Chart 1.

Particulate matter ($PM_{2.5}$): direct industrial emissions in the San Francisco Bay Area.
BAAQMD data (2010 SIP).



Greenhouse gasses (CO_2e): direct industrial emissions in the San Francisco Bay Area.
Calif. ARB data (2012 MRR).

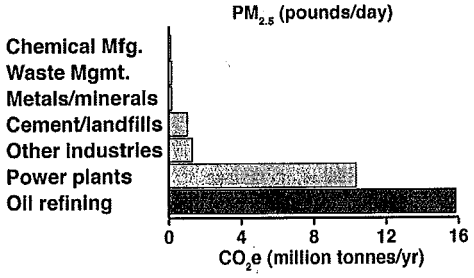


Chart 1. Direct industrial emissions of $PM_{2.5}$ and GHG in the Bay Area.

As to emission trends, Air District[4, 6] and Air Board[5] emission data indicate that over many years—and unlike some other monitored emissions—Bay Area refinery emissions of both PM and GHG increased steadily and substantially. *See* Chart 2.

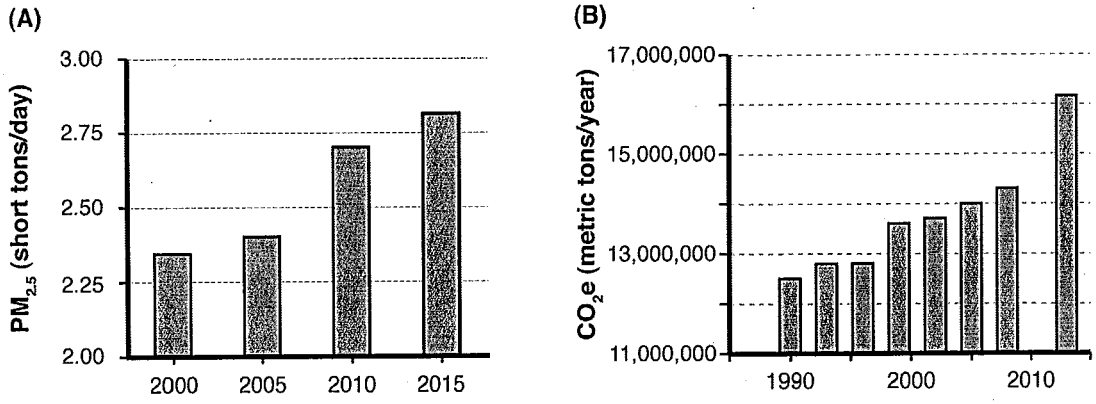


Chart 2. Bay Area oil refining (A) $PM_{2.5}$ and (B) GHG emission trends.
$PM_{2.5}$ emitted from 2000–2015[6] and GHG emitted from 1990–2008[4] and 2013.[5]

Forecasts strongly suggest that, in the absence of new policy intervention, this trend will continue and accelerate. Plans to replace dwindling current oil sources for Bay Area refineries with low-quality imports such as tar sands oils have been documented by community and worker experts and confirmed by industry statements to investors.[7–15] Meanwhile, the increasing use of imported crude to produce exported refinery products renders market-based policies, such as cap–and–trade and gasoline demand reduction in California, increasingly ineffective for curbing the resultant refinery emissions.[16, 17]

Low-quality oil can greatly increase refinery cracking process, fuel combustion, and hydrogen production emissions.[18–24] These are the major PM and GHG emission sources in refineries.[18, 24, 25] A substantial increase in refinery energy intensity for the increase in processing intensity required to maintain gasoline, diesel and jet fuel production from denser, more contaminated crude increases these emissions. This causal mechanism is well documented by peer reviewed work.[18–23] It is illustrated in the excerpt shown below.

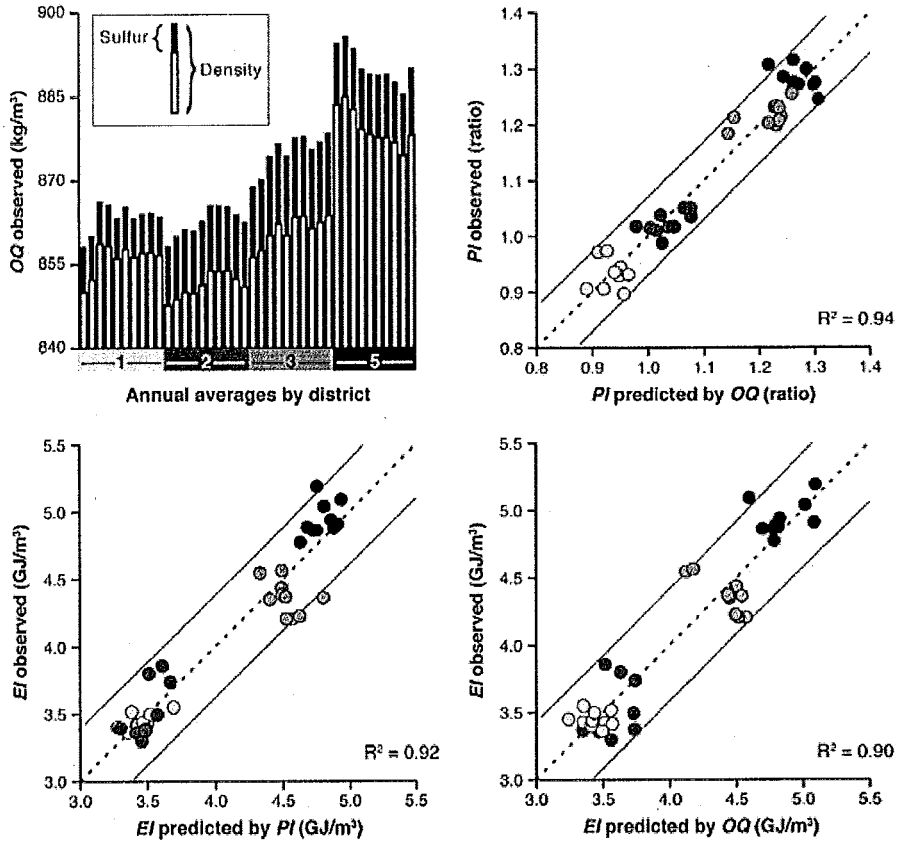


Figure 1 in Karras, 2010 (*Env Sci Technol.;* American Chemical Society):[18] Increasing crude processing intensity and energy intensity with worsening oil quality. ***OQ:*** Crude feed oil quality. ***PI:*** Crude processing intensity. ***EI:*** Refinery energy intensity. Observations are annual weighted averages for districts 1 (yellow), 2 (blue), 3 (orange), and 5 (black) in 1999–2008. Diagonal lines bound the 95% confidence of prediction for observations.

Thus, PM and GHG are the most harmful air pollutants known to our local health and our climate, respectively; more PM and GHG emit from oil refining than from any other industry in the Air District's jurisdiction; and, absent new action, a trend of substantially increasing refinery PM and GHG emissions is likely to continue and to accelerate. For these reasons, the proposed limits seek to stop increasing PM and GHG air pollution.

PM air pollution is caused by 'condensable' PM and the PM 'precursors' nitrogen oxides (NO_x) and sulfur dioxide (SO_2) as well as by 'filterable' PM emissions, and refineries are strong sources for each of these emissions.[3] Therefore, limits on PM (condensable and filterable PM), NO_x, SO_2, and GHG (measured as CO_2e, the 'carbon dioxide equivalents' of CO_2, methane, and nitrous oxide) are proposed.

With respect to air pollutants that are not limited directly in this proposal, this does not suggest any lack of harm from refinery emissions of those pollutants. Instead, for example, options for preventing or controlling carcinogenic refinery emissions are limited by the relatively poor—and for many pollutants nonexistent—reporting of monitored refinery-wide toxic air contaminant emissions.[25, 26]

Selection of facilities: Although it reports different ownership, emits under a different air permit and does not process crude oil directly, the Air Liquide Rodeo hydrogen plant, Plant B-7419, is used in functions that are necessary to the operation of the Phillips 66 refinery at Rodeo.[27] Similarly, though reporting different owners, emitting under different air permits and not refining crude directly, the Air Products hydrogen plant (Plant B-0295)[28] and Martinez Cogen LP (Plant A-1820)[29] are integral 'support facilities' for the Tesoro refinery.

Each of these three refinery support facilities is a major emitter of PM, NO_x, SO_2, GHG, or more than one of these pollutants.[25, 27–29] Further, the main sources of those emissions—hydrogen steam reforming, cogeneration, and the heaters and turbines associated with those operations—are ***not*** sources targeted specifically by the Air District for additional emission control at this time.[30] For these reasons the proposed facility emission limits would apply to each of the five major refineries in the region that are identified in Table 1 ***and*** to each of these three refinery support facilities.

Selection of current actual emissions 'baseline' period: The baseline period was chosen to most accurately and consistently represent current actual emissions, including variability due to normal short-term changes in business factors and random factors while excluding effects of past conditions that already have changed permanently.

Emissions before reporting year (RY) 2011 represent past conditions that have now changed.[4–6] PM and GHG emissions have increased (Chart 2), and the hypothesis that this was caused by normal short-term business cycles must be rejected given the more fundamental long-term changes in oil import volume refined, oil feed quality, and refined product export volume associated with these long-term emission trends.[16] Similarly, the idea that incident emissions solely reflect random variability must be rejected in light of recurrent major Bay Area refinery fires linked to those long-term crude feed changes[31–33]

(nevertheless, ***annual*** facility emissions reported[25] reflect little or no difference attributable to those ***episodic*** incident emissions). Permanent changes in emissions also include the pre-RY2011 regionwide reductions in refinery NO_x and SO_2 that Air District Staff has attributed to many control measures implemented before RY2011.[6]

Indeed, even post-RY2011, some permanent reductions in emissions occurred. The permanent shutdown of Heater B-401[10, 26] reduced Rodeo refinery NO_x emissions significantly after RY2012[25] and a scrubbing measure installed to control catalytic cracking and coking emissions[26, 30] reduced Valero refinery PM, NO_x and SO_2 emissions significantly after RY2011.[25] These permanent changes in the baseline are addressed further in the 'baseline data' discussion below.

Annual PM, NO_x, SO_2, and GHG mass emissions from each targeted facility are reported through RY2013.[5, 25] After accounting for the two permanent post-RY2011 changes identified above, year-to-year differences among the RY2011–2013 facility emissions[5, 25] were compared with quantitative allowances derived by statistical analysis of refinery emissions variability that were reported by Air District Staff in early 2015.[26, 34] This comparison showed that facility emissions variability during RY2011–2013 is similar to or greater than that estimated by Air District Staff, further supporting the RY2011–2013 data as reasonably representative of current emissions, for the targeted pollutants.

For these reasons the period RY2011–2013 was chosen as the baseline period.

Current actual emissions 'baseline' data: Emissions baseline data that are reported and analyzed herein for GHG (non-biogenic CO_2e) are from the State Air Resources Board and are freely available to the public for download from its website.[5] However, with the exception of limited summary data for RY2013 facility emissions[30] access to public data for recent refining facility emissions held by the Air District was more difficult.

CBE accessed the actual reported PM, NO_x, and SO_2 emissions baseline data reported and analyzed herein through a request to review Air District documents pursuant to the California Public Records Act that was filed in March 2015 (*see* Exhibit 1), to which the Air District completed its response in August 2015.

Exhibit 2 summarizes the scope of these Air District emissions data in some detail. When each set of equipment permitted to emit and the material fed to it is considered a unique source—different feed material causes different emissions—the eight facilities addressed in this comment combined reported emitting PM from 305–309 sources during RY2011–2013. For NO_x and SO_2, the eight facilities emitted from 380–382 sources and 291–299 sources, respectively. Total source counts were stable, changing by < 3% for PM, NO_x and SO_2 from RY2011–2013. Including any pollutant among the criteria pollutants and GHG, the eight facilities collectively reported emissions from more than a thousand (1,198–1,239) unique sources. The vast majority (99%) of emitting sources were in refineries; support facilities reported very few sources. However, some of these sources emit hundreds of times more than others, and some high GHG-emitting sources are in the support facilities.[25] The full data set provided by the Air District to CBE for each of these facilities is incorporated herein as Attachment 1.

Initial validation analysis discovered that some condensable PM emissions measured by FCC source testing[30] were inadvertently omitted from the Air District data provided to CBE,[25] and had to be added to the Shell facility emissions.[26] This inquiry also found that the Air District PM emission estimate for Tesoro[30] is based in part on that Shell FCC source testing instead of on Tesoro data.[26] Setting the Air District's uncertain Tesoro PM estimate aside, CBE's's separately-developed estimates of refinery and hydrogen plant PM, NO_x and SO_2 emissions in RY2013 are essentially identical to the Air District estimates in 19 of 20 comparisons—95% of the comparisons. *See* Table 2.

Table 2. RY2013 emissions (tons/y) from Bay Area refineries & 2 support facilities: Comparison of CBE estimate from public records[a] to Air District Staff estimate.[b]

	Chevron	Shell	Phillips	Tesoro	Valero	Air Liq.[c]	Air Prod[c]
PM							
CBE value	428	500[d]	52	159	123	16	10
District val.	428	507	53	171[d]	123	16	10
Difference	—	< 1%	< 2%	??[d]	—	—	—
NO_x							
CBE value	910	840	256	752	1,190	2	3
District val.	910	971	266	763	1,205	2	3
Difference	—	< 14%	< 4%	< 2%	< 2%	—	—
SO_2							
CBE value	339	1,080	405	572	111	2	2
District val.	339	1,084	409	572	111	2	2
Difference	—	< 1%	< 1%	—	—	—	—

(a) Baseline estimated from Public Records Act data[25] by this analysis. (b) Air District Staff estimate in its Sept. 2015 Workshop Draft.[30] (c) The Air Liquide and Air Products hydrogen plants support Phillips 66 and Tesoro, respectively; the Air District did not report estimated emissions from the Martinez Cogen LP support facility for Tesoro. (d) CBE estimate for Shell includes FCC source test emissions of condensable particulate inadvertently omitted from PRA response; Air District Tesoro estimate is based in part on the Shell FCC test instead of data from Tesoro.[26, 30]

Validation analysis also confirmed that reported data[25] reflect important source-specific changes in the baseline. Two separately-reported source-specific changes were addressed. First, Phillips 66 permanently shut down Heater B-401, eliminating a significant NO_x source at its refinery, by RY2012.[10, 26] The data show that NO_x emissions from this specific source were cut by roughly 42 tons in RY2013 versus RY2011–2012, confirming that the equal reduction in refinery-wide emissions[25] is a permanent change and not transient variability. Second, Valero installed a catalytic cracking and coking emissions scrubber before RY2012.[26, 30] The data show this cut annual PM, NO_x and SO_2 emissions, from the reconfigured set of specific sources, by approximately 127 tons, 555 tons, and 3,933 tons respectively after RY2011,[25] allowing these permanent changes in emissions to be reflected more accurately in the baseline.

GHG emissions, as reported by the Air Resources Board, were validated and certified by independent third-party auditors for these facilities and years,[5] and are included in the baseline as reported. Baseline emissions by year are shown in Table 3 along with the results of emission limit calculation analysis that is discussed directly below.

Maximum-year emissions and additional 'threshold' factors: One approach to account for residual short-term variability in these emissions proposes to set thresholds for compliance action higher than observed emissions by a pre-set, statistically derived factor "designed to take into account fluctuations that occur in refineries on a year to year basis."[34] Another proposes to allow the maximum observed emissions in the baseline, regardless of what other data in the baseline say. This proposal uses both approaches. That may seem generous to big polluters, but it addresses uncertainty transparently and further bolsters the enforceability of limits it is obviously feasible to meet now, consistent with the purpose to prohibit a substantial refinery-wide emission increase.

Calculation of proposed limits: Table 3 shows the calculation of the proposed limits. Each limit is calculated by adding the appropriate threshold factor designed by Air District Staff (+10,000 metric tons for GHG and +7% for PM, NO_x, and SO_2)[34] to the maximum-year emissions in the baseline for that particular facility and air pollutant.

For example:

(1) Chevron's PM baseline is 455 tons, 494 tons, and 428 tons of PM emitted in reporting years 2011, 2012, and 2013 respectively. *See* Table 3 at the upper left of the table.

(2) Thus, Chevron's maximum-year PM emission in the baseline is 494 tons.

(3) The applicable threshold factor is +7% of 494; 7% of 494 tons is 34.6 tons.

(4) The threshold factor is added to its maximum-year emission; 34.6 + 494 = 528.6.

(5) So the table shows Chevron's PM emission limit (rounded to 3 digits) is 529 tons.

Change of monitoring method allowance and demonstrations: This provision would better improve monitoring and air quality protection in concert by setting up the protocol for calibrating the emission limits to changes in compliance demonstration methods due to potential changes in emissions monitoring. Future improvement in emissions monitoring is likely, and such changes in the method of demonstrating compliance with a requirement would inevitably change the actual requirement itself. Thus, the need for such re-calibration is foreseeable. This provision would facilitate and encourage anticipated future improvements in monitoring that maintain and improve upon air quality and environmental health protection.

Table 3. Derivation of numeric facility emission limits to prevent increased emission.

	RY	PM (tons) [a]	NO_x (tons) [a]	SO_2 (tons) [a]	GHG (metric tons) [b]
A-0010	2011	455	835	367	4,463,000
Chevron	2012	494	877	374	3,946,000
Refinery	2013	428	910	339	3,915,000
Find maximum year		494	910	374	4,463,000
Add threshold factor [c]		+ 7.0 %	+ 7.0 %	+ 7.0 %	+ 10,000
Chevron refinery annual limits		**529**	**974**	**400**	**4,473,000**
A-0011	2011	532	974	1,160	4,262,000
Shell	2012	518	922	1,250	4,057,000
Refinery	2013	500	840	1,080	4,192,000
Find maximum year		532	974	1,250	4,262,000
Add threshold factor [c]		+ 7.0 %	+ 7.0 %	+ 7.0 %	+ 10,000
Shell refinery annual limits		**569**	**1,040**	**1,340**	**4,272,000**
A-0016	2011	50.6	256	360	1,502,000
Phillips 66	2012	51.2	257	342	1,321,000
Refinery	2013	52.3	256	405	1,364,000
Find maximum year		52.3	257	405	1,502,000
Add threshold factor [c]		+ 7.0 %	+ 7.0 %	+ 7.0 %	+ 10,000
Phillips refinery annual limits		**56.0**	**275**	**433**	**1,512,000**
B-2758/2759	2011	158	1,010	470	2,401,000
Tesoro	2012	168	820	661	2,090,000
Refinery	2013	159	752	572	2,446,000
Find maximum year		168	1,010	661	2,446,000
Add threshold factor [c]		+ 7.0 %	+ 7.0 %	+ 7.0 %	+ 10,000
Tesoro refinery annual limits		**180**	**1,080**	**707**	**2,456,000**
B-2626	2011	125	1,320	129	2,268,000
Valero	2012	120	1,030	115	2,940,000
Refinery	2013	123	1,190	111	2,738,000
Find maximum year		125	1,320	129	2,940,000
Add threshold factor [c]		+ 7.0 %	+ 7.0 %	+ 7.0 %	+ 10,000
Valero refinery annual limits		**134**	**1,410**	**138**	**2,950,000**
A-1820	2011	17.1	107	2.08	421,000
Martinez Cogen LP	2012	17.6	111	2.15	413,000
Cogen Plant	2013	17.3	109	2.12	386,000
Find maximum year		17.6	111	2.15	421,000
Add threshold factor [c]		+ 7.0 %	+ 7.0 %	+ 7.0 %	+ 10,000
Martinez Cogen annual limits		**18.8**	**119**	**2.30**	**431,000**
B-7419	2011	14.9	12.0	1.97	645,000
Air Liquide	2012	13.8	1.39	1.75	771,000
Hydrogen Plant	2013	16.2	1.59	2.32	845,000
Find maximum year		16.2	12.0	2.32	845,000
Add threshold factor [c]		+ 7.0 %	+ 7.0 %	+ 7.0 %	+ 10,000
Air Liquide annual limits		**17.3**	**12.9**	**2.48**	**855,000**
B-0295	2011	9.62	3.15	2.15	258,000
Air Products	2012	8.04	2.65	1.79	217,000
Hydrogen Plant	2013	9.69	3.18	2.16	271,000
Find maximum year		9.69	3.18	2.16	271,000
Add threshold factor [c]		+ 7.0 %	+ 7.0 %	+ 7.0 %	+ 10,000
Air Products annual limits		**10.4**	**3.40**	**2.31**	**281,000**

(a) AQMD data validated by CBE.[25] (b) ARB data for non-biogenic CO_2e.[5] (c) From AQMD Staff.[34]

CBE's September 2015 Comments on Rule 12-16 Part 1

REVISION TO PROPOSED RULE 12-16: PROPOSED EMISSION LIMITS

Add the provisions as follows.

Under Part 12-16-200 DEFINITIONS, add:

§ 12-16-225 **Support Facility:** A facility that is not directly involved in the processing of petroleum but is used in functions that are necessary to the operation of a petroleum refinery and is permitted by the Air District separately from the petroleum refinery. For the purposes of §§ 304 and 305, support facilities include, but are not limited to, Plant No. B-7419, a hydrogen plant in Rodeo; Plant No. B-0295, a hydrogen plant in Martinez, and Plant No. A-1820, a cogeneration plant in Martinez.

Under Part 12-16-300 STANDARDS, add:[1]

§ 12-16-304 **Facility Emission Limits:** Annual emissions of air pollutants from a petroleum refinery or support facility shall not exceed the following emission limits:

Facility number	GHG[a] (metric tons)	PM[b] (short tons)	NO_x[b] (short tons)	SO_2[b] (short tons)
A-0010 [Chevron][c]	4,473,000	529	974	400
A-0011 [Shell]	4,272,000	569	1,040	1,340
A-0016 [Phillips 66]	1,512,000	56.0	275	433
B-2758/2759 [Tesoro]	2,456,000	180	1,080	707
B-2626 [Valero]	2,950,000	134	1,410	138
A-1820 [Martinez Cogen LP]	431,000	18.8	119	2.30
B-7419 [Air Liquide]	855,000	17.3	12.9	2.48
B-0295 [Air Products]	281,000	10.4	3.40	2.31

[a] Greenhouse gas (CO_2e) as reported under Air Resources Board Mandatory Reporting, or under § 12-16-305.
[b] PM (the sum of filterable and condensable particulate matter), NO_x (oxides of nitrogen), and SO_2 (sulfur dioxide) as reported in the Facility's annual emission inventory, except as provided in § 12-16-305.
[c] Facility owners or operators, as of September 2015, shown for information and context only.

§ 12-16-305 **Change in Monitoring:** An emission monitoring or estimation method that is used to demonstrate compliance with the limits in § 12-16-304 may be changed, provided that all of the following has been demonstrated:

(a) The new method will improve the accuracy and reliability of emission monitoring;

(b) Any difference in reported emissions caused by the change in method has been quantified accurately, reliably, and separately from any actual change in emissions; and

(c) The facility owner or operator has ensured that increased emissions will not be allowed as a result of the change by demonstrating that it has adjusted each affected limit in § 12-16-304 by the difference quantified in § 12-16-305 (b), that the adjusted emission limit will be in enforceable effect concurrently with the change in monitoring, and that it has applied for a permit revision to include the adjusted limit in its Title V permit along with the other applicable emission limits in § 12-16-304.

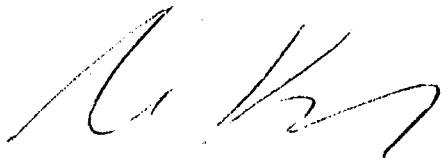
[1] Replaces Staff-proposed language in §§ 304, 305, 405 and 406.

CONCLUSION

As discussed more fully in our 27 March 2015 letter to the District,[35] it is well within the broad powers of the Board to adopt these proposed facility emission limits. It is further wholly appropriate to base those emission limits on the District's own emission inventories. The District already uses that data in two particular ways: first, it is required to do so by law[36] for emission control policy; and second, it uses this data quantitatively to yield substantial income through permitting fees based on the level of emissions.[37]

~~We ask the Air District to adopt these urgently needed limits in proposed Rule 12-16.~~

In Health,



Greg Karras
Senior Scientist

Roger Lin
Staff Attorney

End Notes

1 AQMD, 2012. *Understanding Particulate Matter;* Bay Area Air Quality Management District: San Francisco, CA. *See* esp. pp. 26–27 ("vast majority of premature deaths associated with air pollution—more than 90%—are related to exposure to fine particulate matter" and chart showing mortalities "now" approaching 3,000/year).

2 Fifth Assessment Report of the Intergovernmental Panel on Climate Change (AR-5).

3 AQMD, 2010. Emissions Inventory submitted to U.S. EPA for State Implementation Plan (SIP) requirements. *See* Table 1 therein ($PM_{2.5}$, NO_x and SO_2). Bay Area Air Quality Management District: San Francisco, CA.

4 AQMD, 2010. *Source Inventory of Bay Area Greenhouse Gas Emissions, Updated: February 2010;* Bay Area Air Quality Management District: San Francisco, CA.

5 ARB, various years. *Annual Summaries of Greenhouse Gas Emissions Data Reported to the California Air Resources Board;* data reported through 2013 pursuant to ARB's Mandatory GHG Reporting Rule. California Air Resources Board: Sacramento, CA. http://www.arb.ca.gov/cc/reporting/ghg-rep/reported-data/ghg-reports.htm

6 AQMD, 2015. *Regulations to Track and Mitigate Emissions from Petroleum Refineries, Regulation 12, Rules 15 and 16: Public Workshop March 2015;* Staff Report (Powerpoint). Bay Area Air Quality Management District: San Francisco, CA.

7 Fox, 2013. *Comments on Initial Study/Mitigated Negative Declaration (IS/MND) for the Valero Crude by Rail Project.* 1 July 2013. Use Permit Application 12PL-00063; City of Benicia: Benicia, CA.

8 Goodman and Rowan, 2013. *Comments on Initial Study/Mitigated Negative Declaration (IS/MND), Valero Crude by Rail Project, Benicia, California.* 1 July 2013. Use Permit Application 12PL-00063; City of Benicia: Benicia, CA.

9 Fox, 2013. *Comments on Environmental Impact Report for the Phillips 66 Propane Recovery Project, Rodeo, California;* Prepared on behalf of Rodeo Citizens Association. 15 November 2013. SCH #2012072046; County File #LP12-2073. Contra Costa County: CA.

10 Fox and Pless, 2015. *Comments on Recirculated Final Draft Environmental Impact Report for the Phillips 66 Propane Recovery Project, Rodeo, California;* 2 February 2015. SCH #2012072046; County File #LP12-2073. Contra Costa County: CA.

11 Karras, 2013. *Expert Report of Greg Karras, Communities for a Better Environment (CBE), Regarding the Phillips 66 Company Propane Recovery Project Draft Environmental Impact Report;* 4 September 2013. SCH #2012072046; County File #LP12-2073. Contra Costa County: CA.

12 Karras and Lin, 2013. *Comment on behalf of Communities for a Better Environment Regarding WesPac Pittsburg Energy Infrastructure Project, Recirculated Draft Environmental Impact Report (RDEIR), SCH #2011072053.* 12 September 2013. Planning Department; City of Pittsburg: CA.

13 Karras, 2014. *CBE RDEIR Comment–2, Refinery FCC Emissions Increase;* 2 May 2014. Submitted on behalf of Communities for a Better Environment, Regarding the Chevron Richmond Refinery–Proposed Revised Project. City of Richmond Planning File PLN11-089; Revised Draft Environmental Impact Report SCH #201106042. Richmond: CA.

14 Karras, 2014. *Expert Report of Greg Karras, Communities for a Better Environment (CBE), Regarding the Phillips 66 Company Propane Recovery Project Recirculated Draft*

Environmental Impact Report; 5 December 2014. SCH #2012072046; County File #LP12-2073. Contra Costa County: CA.; County File #LP12-2073. Contra Costa County: CA.

15 Karras, 2015. *Expert Report of Greg Karras, Communities for a Better Environment (CBE), Regarding the Phillips 66 Company Propane Recovery Project Recirculated Final Environmental Impact Report;* 2 February 2015. SCH #2012072046; County File #LP12-2073. Contra Costa County: CA.

16 Karras, 2015. *Emergency need for a moratorium on new infrastructure for extreme oil; followup information requested in our discussion on 13 April 2015;* 1 May 2015. Letter responding to a technical request by the Governor's Office on behalf of Communities for a Better Environment to Cliff Rechtschaffen and Ken Alex, Senior advisors, Office of the Governor, State of California.

17 Lin and Karras, 2015. *Emissions from the end-use of California refinery products that are exported are exempt from State Cap-and-Trade requirements: additional documentation;* 10 June 2015. Correspondence to Jack Broadbent, Air Pollution Control Officer, Bay Area Air Quality Management District: San Francisco, CA.

18 Karras, 2010. Combustion emissions from refining lower quality oil: What is the global warming potential? *Environmental Science & Technology* **44**(24):9584–9589. DOI:10.1021/es1019965.

19 Bredeson et al., 2010. Factors driving refinery CO_2 intensity, with allocation into products. *International Journal of Life Cycle Assessment* **15:** 817–826. DOI: 10.1007/s11367-010-0204-3.

20 Brandt, 2012. Variability and Uncertainty in Life Cycle Assessment Models for Greenhouse Gas Emissions from Canadian Oil Sands Production. *Environmental Science & Technology* **46:** 1253–1261. DOI: 10.1021/es202312p.

21 Karras, 2001. Oil Refinery CO_2 Performance Measurement. Peer-reviewed and published by the Union of Concerned Scientists (UCS): Berkeley, CA. Technical analysis prepared by Communities for a Better Environment for UCS. File No. COMMBETTERENVFY11103.

22 Abella and Bergerson, 2012. Model to investigate energy and greenhouse gas emissions implications of refining petroleum: Impacts of crude quality and refinery configuration. *Environmental Science & Technology.* DOI: 10.1021/es3018682.

23 Gordon et al., 2015. *Know Your Oil; Creating a Global Oil–Climate Index;* Carnegie Endowment for International Peace: Washington, DC.

24 Karras, 2015. *Toxic and fine particulate emissions from U.S. refinery cracking and coking of 'tar sands' oil.* Technical report on work conducted as part of a technical assistance contract with the Natural Resources Defense Council (NRDC). Author contact: G. Karras, Senior Scientist, Communities for a Better Environment: Oakland, CA.

25 AQMD, 2015. Facility- and source-specific oil refinery and refinery support facility emissions data for reporting years 2011–2013 provided in response to CBE's request to review Bay Area Air Quality Management District documents pursuant to the California Public Records Act that was filed in March 2015. *See* Exhibit 1 for CBE's request to review public records; and Attachment 1 for the complete data response.

26 Nudd and Stevenson, 2015. Personal Communication: G. Nudd, AQMD and E. Stevenson, AQMD with G. Karras at the Bay Area Air Quality Management District in San Francisco, CA on 25 August 2015.

27 Title V Permit and Statement of Basis, Air Liquide, Facility #B-7419, Contra Costa County, CA; www.baaqmd.gov/permits/major-facility-review-title-v/title-v-permits.

28 Title V Permit and Statement of Basis, Air Products, Facility #B-0295, Contra Costa County, CA; www.baaqmd.gov/permits/major-facility-review-title-v/title-v-permits.

29 Title V Permit and Statement of Basis, Martinez Cogen LP, #A-1820, Contra Costa County, CA; www.baaqmd.gov/permits/major-facility-review-title-v/title-v-permits.

30 BAAQMD, 2015. *Petroleum Refinery Emission Reduction Workshop Report;* September 2015. *See* esp.: Table 3 (emissions estimates and condensable particulate emission estimate based on source testing of Shell FCC); Table 4 (Phase I rule changes exclude any emission controls targeting hydrogen or cogeneration plants); and Appendix A at A:1 ("Valero refinery recently has retrofitted its FCCU with a wet scrubber and its FCCUs have lower $PM_{2.5}$ and SO_2 emissions than those at other refineries as a result").

31 U.S. Chemical Safety and Hazard Investigation Board, 2013. *Investigation Report, Refinery Fire Incident (4 Dead, 1 Critically Injured), Tosco Avon Refinery, Martinez, California, February 23, 1999;* (Switch to denser crude overwhelms desalter, downstream salt corrosion plugging in crude unit piping contributes to fatalities during unsafe hot work.) Chemical Safety Board: Washington, DC. www.CSB.gov.

32 Chevron, 2007. *Final Investigation Report of Fire That Occurred Monday January 15, 2007 in the Crude Unit at the Chevron Richmond Refinery;* Submitted to Contra Costa County Hazardous Materials Program Director by T. Lizarraga, Chevron. *See* esp. "Causes," page 1 ("the failed section of the [pipe] was thinned by high temperature sulfidation corrosion").

33 U.S. Chemical Safety and Hazard Investigation Board, 2013. *Interim Investigation Report, Chevron Richmond Refinery Fire, Chevron Richmond Refinery, Richmond, California, August 6, 2012;* Chemical Safety Board: Washington, DC. www.CSB.gov. *See* esp. "Operational Changes" (higher sulfur oil feed accelerated corrosion of pipe that failed catastrophically in this fire).

34 AQMD, 2015. *Workshop Report, Proposed Air District Regulation 12, Rule 15: Petroleum Refining Emissions Tracking and Regulation 12, Rule 16: Petroleum Refining Emissions Analysis, Thresholds and Mitigation;* Bay Area Air Quality Management District: San Francisco, CA. February 2015. *See* esp. page 22 ("The trigger levels for criteria pollutant levels described in Section 12-16-301.1 were designed to take into account fluctuations that occur in refineries on a year to year basis, such as the reduced efficiency of heat exchanges, which may be the result of process changes and degradation of processes … . Emissions variations like these are considered to be in the 'noise' of emissions inventories and the ability of the inventory calculations to provide accurate, repeatable results. By allowing these thresholds, staff believes ERPs will be able to better identify and address equipment that can produce effective and lasting emission reductions.") District Staff's 'threshold trigger levels' that it proposed in February 2015 (then-proposed § 12-16-301.1) are +7% of baseline emissions and +10,000 metric tons as CO_2e, for criteria pollutants and GHGs, respectively.

35 *Comment on the Authority of the Bay Area Air Quality Management District to Adopt Regulations to Decrease Air Emissions from Petroleum Refineries;* 27 March 2015 letter from CBE to Jack Broadbent, Air Pollution Control Officer.

36 *See e.g.,* Cal. Health and Safety Code § 40913.

37 *See* BAAQMD Budget, Fiscal Year Ending 2016, Appendix D: *Sources of Revenue Trends;* and BAAQMD Regulation 3, Fees, Schedules M and T.