



BAY AREA
AIR QUALITY
MANAGEMENT
DISTRICT

AGENDA: 4

Regulation 12, Rule 16

Board of Directors Regular Meeting
May 31, 2017

Jack P. Broadbent
Executive Office



Staff Recommendation

- Revise Regulation 12, Rule 16 to:
 - ✓ remove the smog pollutant cap provisions
 - ✓ cap GHG emissions only
- Bring Regulation 12, Rule 16 to your June 21, 2017 Board meeting for final consideration
- Allows public input and process
- Prioritize Smog Pollutant Emission Reduction Rules
- Bring Toxics Rule for all sources in September



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Why this Approach

- Local leadership
- Backstop for dramatic shifts in crude slate
- Setting the stage for further actions
- Aligns with State AB 32 Scoping Plan
- Part of a suite of actions to address community and regional concerns



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Next Steps

- Revise 12-16 Staff Report and response to comments
- Public review and comment
- Board considers revised 12-16 at its' June 21, 2017 Regular Board Meeting



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Regulation 12, Rule 16

**Eric Stevenson
Director of Meteorology, Measurement, and Rules**

**Board of Directors Meeting
May 31, 2017**



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Summary of Presentation

- Recent Refinery Rulemaking History
- Progress to Date
- Addressing Criteria Pollutants
- Addressing Toxic Air Contaminants
- Addressing Greenhouse Gas (GHG)
- Revised Timeline for Changes to Rule 12-16



Refinery Rulemaking History

Board Resolution 2014-07

In October 2014, Board provided direction to staff to:

- Continue work on Rule 12-15 to monitor refinery emissions;
- Develop Rule 12-16 to prevent increases in refinery emissions; and
- Develop additional rules to reduce refinery emissions by 20% by 2020, or as much as feasible

In 2015 and 2016, the first suite of emission reduction rules were approved. These rules will reduce refinery emissions by more than 15%.



Refinery Rulemaking History

Progress

On track towards *Refinery Strategy* goals

- Six rules adopted
- Criteria pollutant emissions reductions of over 15%

Rule	Addresses	Adopted
6-5	Reduces PM from FCCUs	Dec. 2015
8-18	Reduces VOC from equipment leaks	
11-10	Reduces VOC and toxics from cooling towers	
9-14	Reduces SO ₂ from coke calcining operations	Apr. 2016
12-15	<i>Tracks crude slate changes and emissions</i>	
2-5	<i>New Source Review for Toxics</i>	Dec. 2016



Refinery Rulemaking History

Work on Rule 12-16

2015

OCT

First version of proposed Rule 12-16 released. Significant number of comments received. Staff responded by evaluating alternative approaches.

2016

Staff presents four options to address refinery GHGs:

- Focus on methane
- Refinery-wide combustion emissions
- BARCT on refinery processes
- Numeric emissions cap (CBE's proposal)

JUN

JUL

Board directs staff to analyze CBE's proposal (as Rule 12-16) and staff proposal (Rule 11-18) in one EIR.



Rule 12-16

Limits refinery GHG & criteria pollutant emissions

- Affects five refineries and three associated facilities
- Caps GHG, PM₁₀, PM_{2.5}, SO₂ and NO_x emissions
- Limits set at 7% above each refinery's five-year max

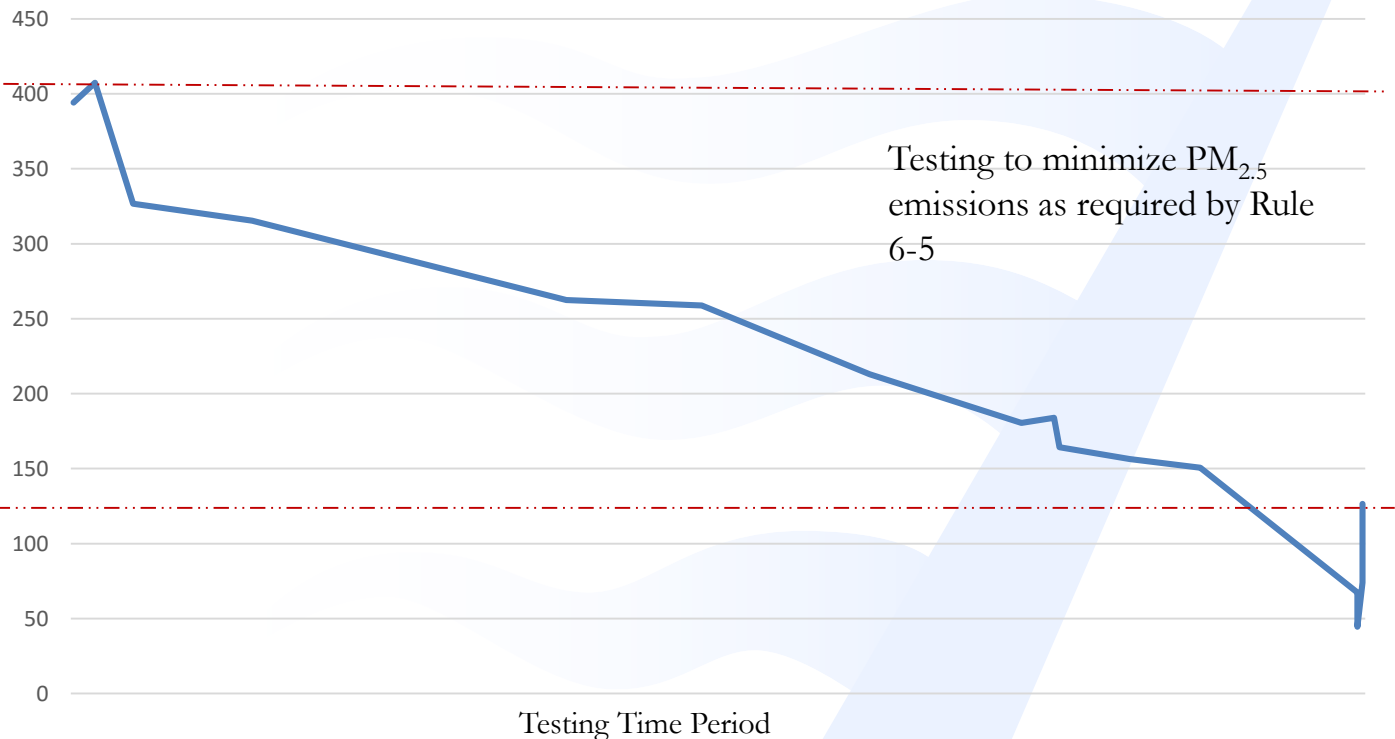
Has significant issues with criteria pollutants

- Criteria pollutant emission caps conflict with state and federal laws and regulations for New Source Review (NSR) permits
- GHG emission caps are more defensible given recent actions by the State of California
- May require extensive staff resources and cause enforcement issues

Criteria Pollutants Addressed Through Source-Oriented Rules

Regulation 6, Rule 5 example with Fluidized Catalytic Cracking Units results in $PM_{2.5}$ reductions

Refinery FCCU PM Emissions (tons/year)



Preliminary results indicate ~ 200 to 300 tons of potential emissions reductions from one refinery due to rule!



Draft Rule 11-18

Addresses Localized Impacts

Reduces public's exposure to localized health risks

- Hundreds of facilities will be evaluated, including refineries
- Health Risk Assessments (HRAs) conducted by Air District staff using latest OEHHA guidelines
- Threshold for facilities to develop and execute District-approved Risk Reduction Plans reduced from 100 per million (100/M) to 10/M
- Refineries have among highest priority for HRAs (Phase 1)
- Rule 11-18 ensures public transparency and continuous improvement



Addressing GHG

Change Rule 12-16 to a GHG Cap

- Make changes to address legal defensibility
 - Remove criteria pollutant cap
 - Revise as backstop rule, allowing for State/ Air District cooperative action on new GHG Rule to garner more localized GHG reductions
- Update the Staff Report as needed
- Circulate updated Rule and Staff Report for comment
- Bring revised Rule, Staff Report and Rule 12-16-focused EIR back to the Board for action on June 21st



Timeline for Proposed Next Steps for Rule 12-16

Date	Activity
May 31	<p>Board directs staff to modify Rule 12-16</p> <ul style="list-style-type: none"> • Remove criteria pollutant limits • Make other necessary changes to minimize legal risk, while still capping GHG emissions <p>Board also directs staff to:</p> <ul style="list-style-type: none"> • Accelerate rulemaking to reduce criteria pollutants • Work with ARB and other Air Districts to develop statewide rules to reduce refinery pollution and impacts on communities (including PM) • Public Hearing is Continued
June 1 – 5	<p>Staff develops new Rule 12-16 hearing package for public review</p> <ul style="list-style-type: none"> • Revised rule language • Expanded analysis of need for GHG caps • Updated socioeconomic document
June 6 – 12	<p>Public review and comment on revised documents</p>
June 13 – 16	<p>Staff reviews and responds to comments on revised documents</p>
June 21	<p>Board considers new version of Rule 12-16</p>
Sept 20	<p>Board considers Rule 11-18 and revised EIR</p>



Further Action

Directly regulate combustion sources to reduce emissions of criteria pollutants

- Further reduce PM_{2.5} and SO₂ from FCCUs
- Further address SO₂ in refinery fuel gas and other sources
- Reduce NOx from gas turbines

Consider Adoption of Rule 11-18: Toxic Risk Reduction

- Reduce risk from refineries and other major sources
- Work with OEHHA and CARB to develop strategy to address risk from undifferentiated PM

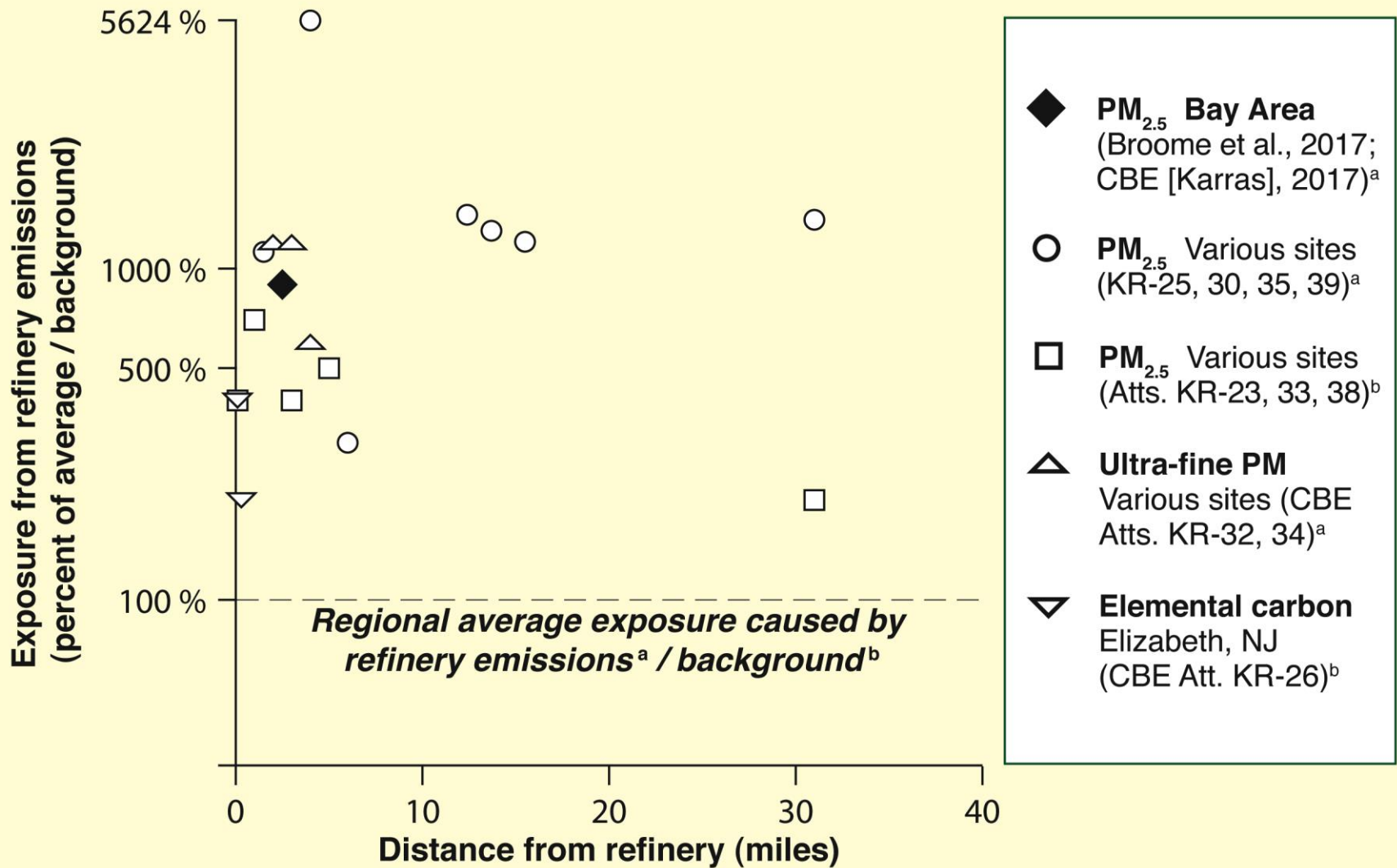
Continue to develop rules targeting methane and other GHGs

**Emission, Exposure, and Health Impact
Potential of Refining Lower Quality Oil
in the Bay Area**

Need for Particulate Emission Prevention

Co-benefits of Refinery-level GHG Caps

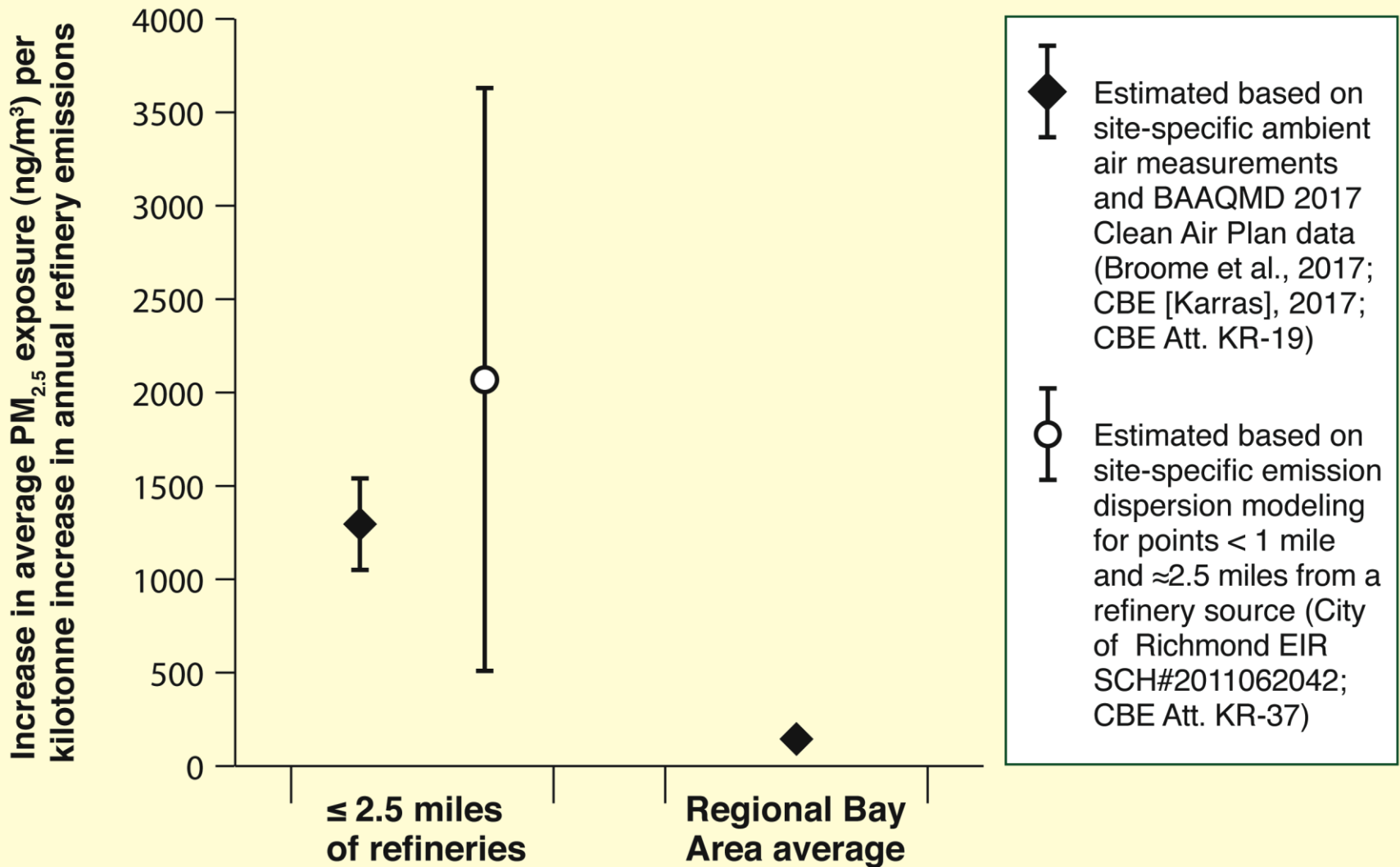
**Greg Karras, Senior Scientist,
Communities for a Better Environment
31 May 2017**



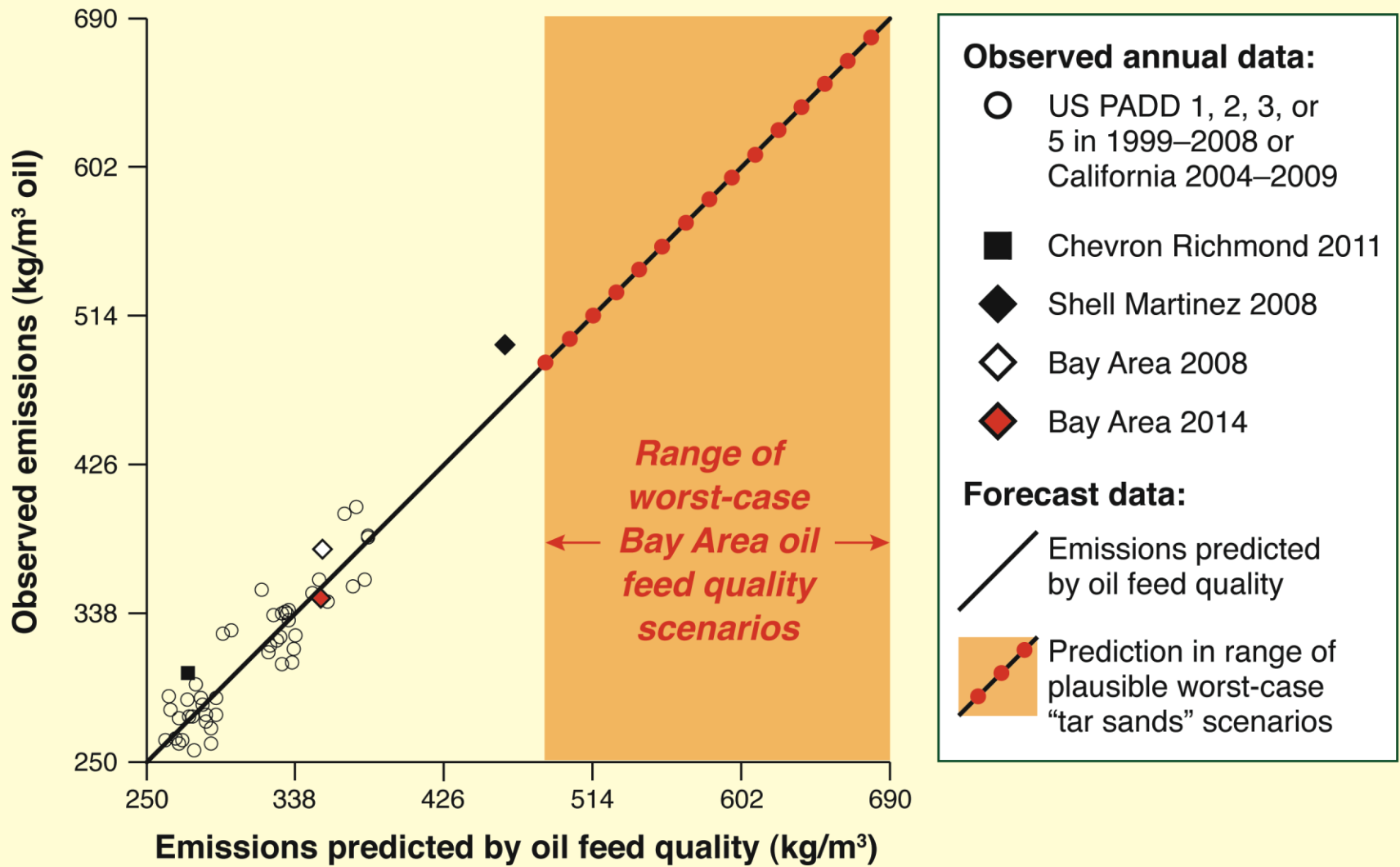
Ambient air measurements prove disparately elevated exposures to particulate matter air pollution from refineries in nearby communities

(a) Comparison is average Bay Area exposure from refinery emissions (from 2017 Clean Air Plan).

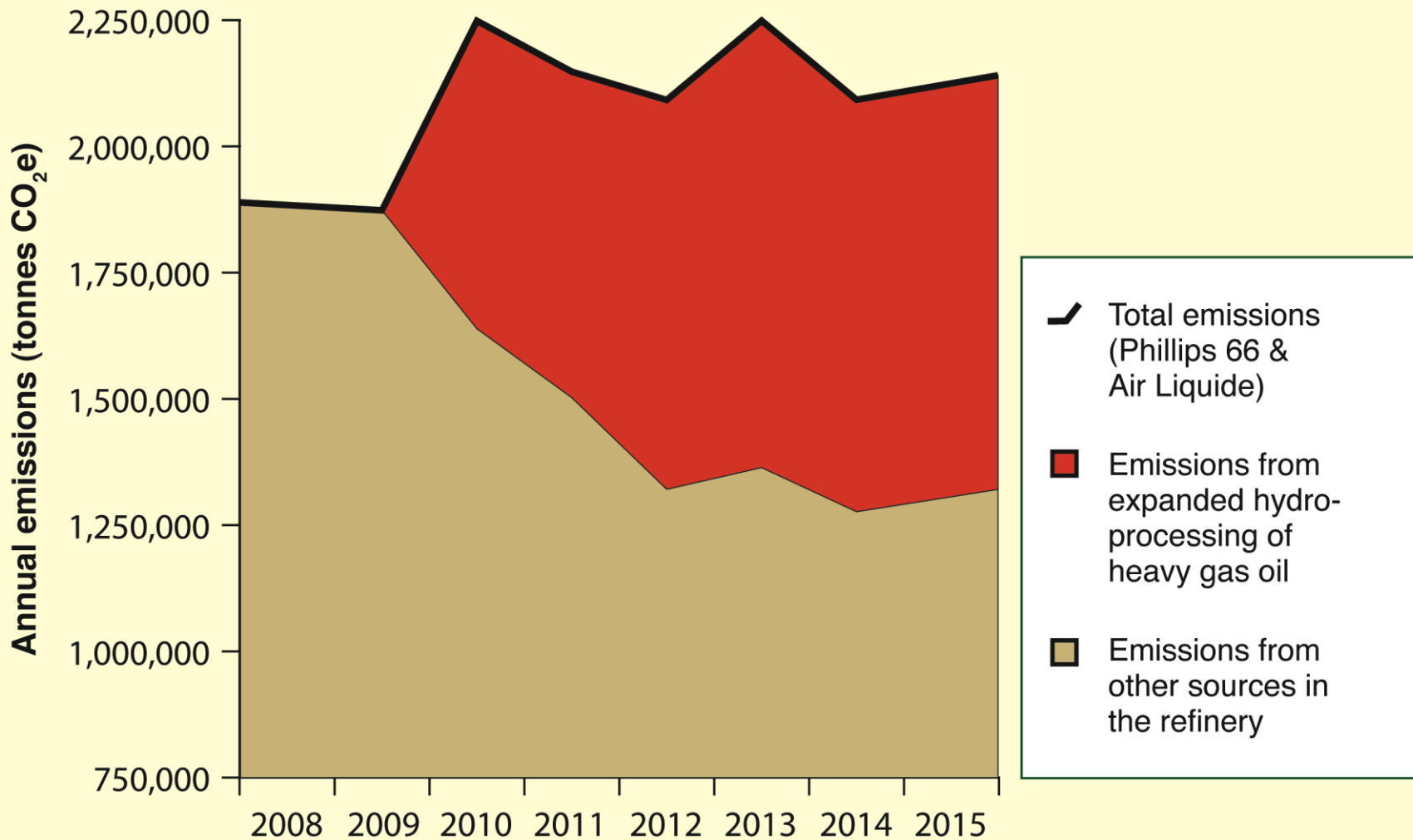
(b) Comparison is background measured by the original investigation (CBE Atts. KR-23, 26, 33, 38).



Increasing PM_{2.5} exposure caused by increasing refinery emissions: Broome et al.'s estimate (bracketed diamonds) appears reasonable compared with refinery dispersion modeling (bracketed circle) that BAAQMD air permitting has relied upon.



Bay Area refinery combustion emissions could increase by $\approx 40\text{--}100\%$ in the plausible worst-case low quality oil scenarios, based on peer reviewed data and methods that predict current oil quality effects on Bay Area refinery emissions well. See CBE 8 May 2017; Att. KR-6.



Persistent refinery emissions increase caused by the expansion of infrastructure for hydrocracking lower quality oil feeds that started operating in 2010 at Rodeo, California

Emissions from CARB; infrastructure data from BAAQMD permit files.

“WHEREAS, all Bay Area refineries are in the process of infrastructure and crude oil changes that have the potential to result in significant worsening of air quality”

BAAQMD Board finding in Res. 2014-7 (15 Oct 2014)

“Rule 12-16 could cumulatively prevent 800 to 3000 deaths of Bay Area residents given a refinery facility lifetime of 40 years following conversion to heavier crude. The additional mortality burden for the Bay Area’s disadvantaged residents could be 8–12 times that of the Bay Area’s general population”

Broome et al. (8 May 2017 health experts’ report)

Health Comments for Rule 12-16 and final EIR

Bart Ostro PhD

Robert Gould MD

Jonathan Heller PhD

Heather Kuiper DrPH MPH

heatherkuiper@gmail.com

May 31, 2017

Health

in Rule 12-16 Decision-Making

The final EIR should:

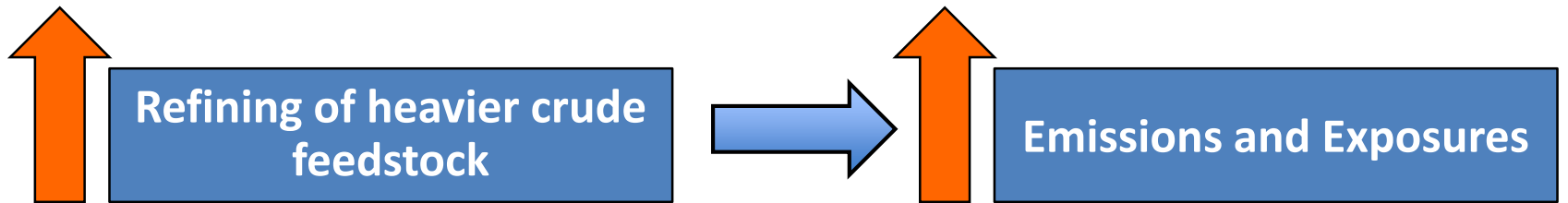
- Recognize that, without preventive action
 - refining of heavier crudes will increase
 - drive up population exposures to health hazards
 - especially particulate matter, a greenhouse gas co-pollutant
- Assess resulting health impacts of this No Project scenario
 - Experienced throughout the Bay Area
 - Disadvantaged, vulnerable populations and near refineries
- Include the health assessment submissions from December 2, 2016 and May 8, 2017

Future rule-making should emphasize direct regulation of particulate matter

Bart Ostro, PhD

- Former Chief of Air Pollution Epidemiology, California EPA
- Consultant to the World Health Organization
- Research Faculty, Air Quality Research Center, UC Davis

Health Hazards of Oil Refining



- Increased refining of heavier crudes (tar sands)

- Increased energy intensity
- Increased pet coke

- Heavy metals, SO₂, NO_x, VOCs, etc.
- Greenhouse Gas co-pollutant and local climate related hazards
- Increased Particulate Matter (PM_{2.5} and ultra fines)

Local & Regional Threat from Particulate Matter



Penetrate deeply into lungs, bloodstream, brain

Short & long-term exposures impact health

Well documented effect on mortality

No safe levels

Premature Mortality and Disadvantaged, Vulnerable Populations

Health Effect	Impact
Cumulative chronic exposure deaths in the Bay Area prevented by Rule 12-16 (40 yrs)	800 – 2900 deaths
Greater mortality burden for those living <2.5 miles from refinery	8-12 times the mortality burden (effects per 100,000)

*Effects of particulate matter are not limited to mortality and can occur with acute exposure as well
Sources draw from scientific literature, BAAQMD publications, and technical brief from Community for a Better Environment, see BAAQMD submission May 8, 2017 for full model*

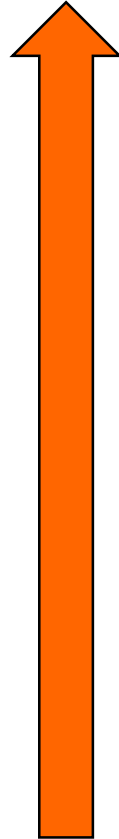
Health Assessment and Rule 12-16

1. There should be no further deterioration to the existing air quality levels in the Bay Area
2. There are significant health consequences *without* Rule 12-16, especially for **communities near refineries**
3. It is reasonable for the final EIR to further evaluate health impacts and benefits of Rule 12-16
4. Future rule-making should directly regulate PM2.5 (not only as GHG co-pollutant)
5. Rule 12-16 will protect health

Robert Gould, MD

- Associate Adjunct Professor, Program on Reproductive Health and the Environment, UCSF School of Medicine
- President, Physicians for Social Responsibility, San Francisco Bay Area Chapter

From Heavier Crudes to Health Impacts: Acute and Chronic Particulate Exposure



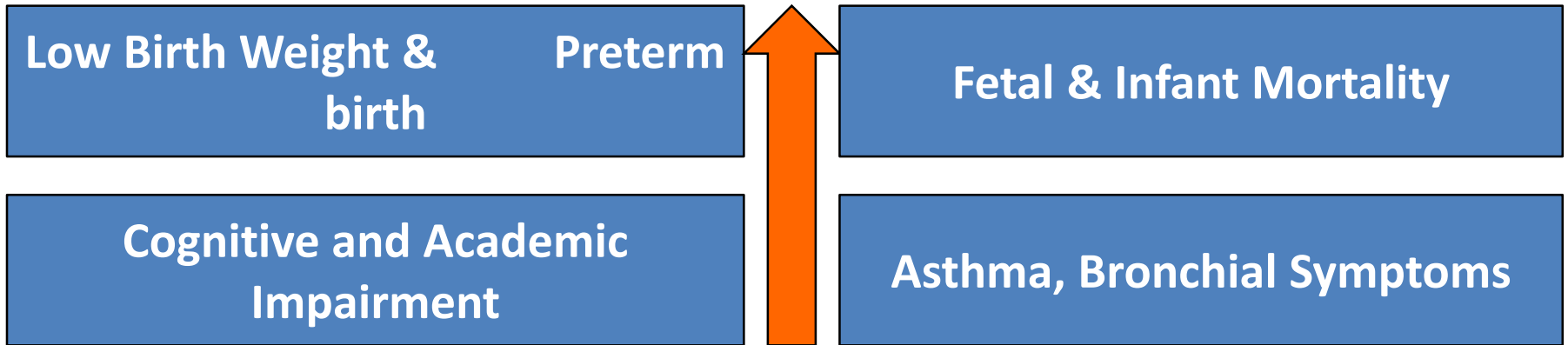
Mortality (including children)

Cardiovascular and respiratory disease, heart attacks, strokes

Exacerbated asthma, COPD, diabetes, Parkinson's, neurological conditions

Hospital admissions, ER visits, lost Productivity

Particulates and Refinery Exposure for Infants and Children



Local health impacts of increased GHG emissions

Heat-Induced Mortality

Respiratory disease and hospitalizations, vector and food-borne illness

Trauma, injury, lost housing and essential emergency services

Mental Health Problems



California's hotter future

Climate change caused by carbon emissions is projected to increase the amount of air conditioning needed in California.



Health Assessment and Rule 12-16

1. Both short and long-term exposure to particulate matter causes health and long term societal impacts for all in the Bay Area.
2. The effects are amplified when **disadvantaged** communities, especially **near refineries** are exposed; impacts on **infants and children** last for generations
3. Final EIR ideally should assess health impacts attributable to cumulative increases in PM2.5 and GHG
4. In this instance, the physicians creed to do no harm calls for preventive action – inaction is the hazard

Jonathan Heller, PhD

- Co-Director and Co-Founder,
Human Impact Partners
- Specialty in Health Impact Assessment

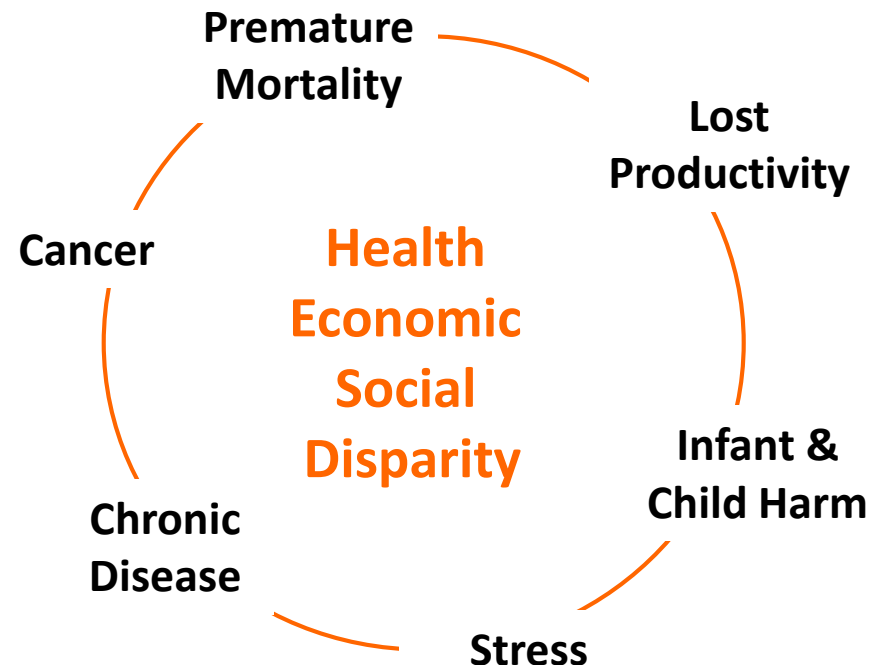
Health Disparity

Populations facing
inequities



Greater Exposure, Dose,
Adverse Impacts

- More exposed and susceptible, less able to recover
- Those near or at refineries
- Low Income
- Racial / ethnic minority
- Infants, children, and elderly
- Pre-existing health conditions
- Already polluted environment



Health Equity

Health in All Policies



Health Equity

- Integration of health considerations across sectors
- Health included in BAAQMD Mission
- Under the CA Health and Safety Code GHG emissions allowances shall:
 - **be equitable and not disproportionately impact low-income communities**
 - **Consider localized impacts in communities that are already adversely impacted by air pollution**
 - **Prevent increased toxic air contaminants or criteria air pollutants**
- Attainment of the highest level of health for all people

Co-Benefits through Prevention



Prevention (Rule 12-16)

Inaction

Valuation of premature mortality associated with un-prevented exposure to particulate matter (not considering other adverse impacts) could reach

Annually	\$123.2 million
Cumulatively	\$4.8 billion

- Rule 12-16 confers this impact as a benefit, a societal savings
- Inaction confers this impact as a burden

**Bay Area Air Quality Management District
Board of Directors Special Meeting of May 31, 2017**

ITEM 4; Public Hearing to Consider Staff's Evaluation of Regulation 12, Rule 16: Petroleum Refining Facility-Wide Emissions Limits and the Associated Environmental Impact Report

MOTION by Director Gioia; seconded by Director Kaplan

1. Direct staff to revise Rule 12-16 to cap GHG emissions from Bay Area refineries and to prepare a revised staff report and the Final EIR reflecting this revised rule; this revised staff report shall discuss GHG caps as a backstop to ensure that GHG emissions from refineries do not increase due to changing crude slates or other actions.
2. The revised staff report and Final EIR responses to comments shall further describe the co-pollutant health benefits of Rule 12-16, in particular with respect to fence line communities in close proximity to refineries, as well as the relationship of Rule 12-16 to the revised AB 32 Scoping Plan.
3. Bring the revised Rule 12-16, revised staff report and the Final EIR to the Board for consideration and action at the June 21, 2017 Board meeting.
4. Staff shall return to the Board no later than September 2017 with a plan of how to prioritize development of additional rules to achieve the goal of reducing criteria pollutants, including PM emissions, from refineries by 20% by 2020.
5. Staff will collaborate with CARB and CAPCOA to identify, and facilitate implementation of measures to protect the health of fence line communities by reducing air pollutant emissions from California refineries and to achieve the State's and BAAQMD's climate goals by reducing GHG emissions.
6. Bring Rule 13-1 (Refinery Carbon Intensity Cap) or other measure(s) developed through the CARB/CAPCOA collaboration to reduce GHG and other air pollutant emissions from refineries to the Board for consideration as expeditiously as practicable.
7. Bring Rule 11-18 to the Board for consideration **as expeditiously as practicable in-September 2017** to reduce health risks from toxic air contaminants emitted by refineries and other stationary sources throughout the Bay Area. (Friendly amendment made by Director Gioia.)

Summary of Ozone Seasons

Year	National 8-Hour	State 1-Hour	State 8-Hour
2014*	5	3	10
2015*	5	4	11
2016	15	5	15
2017	0	0	0

Spare the Air Alerts: 5/3/17, 5/22/2017

Days > 0.070 ppm 8-hour NAAQS:

***Based on NAAQS of 0.075 ppm that was in place during those years**

Winter PM_{2.5} Seasons

Year	Days > 35 µg/m ³	Winter Spare the Air Alerts
2013/2014	15	30
2014/2015	6	23
2015/2016	0	1
2016/2017	0	7

- **Spare the Air Alert Called for:** 12/19/16, 12/20/16, 12/21/16, 12/22/16, 1/17/17, 1/30/2017, 2/1/2017
- **Days > 35 µg/m³ 24-hr NAAQS:**