



BAY AREA  
AIR QUALITY  
MANAGEMENT  
DISTRICT

AGENDA: 4

# Particulate Matter Rule Update Stationary Source Committee

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Deputy Air Pollution Control Officer for  
Policy  
December 18, 2017



# Outline

- Particulate Matter (PM) basics
- PM Health Impacts
- Air Quality Trends
- PM Sources
- Rulemaking
- Next steps for PM



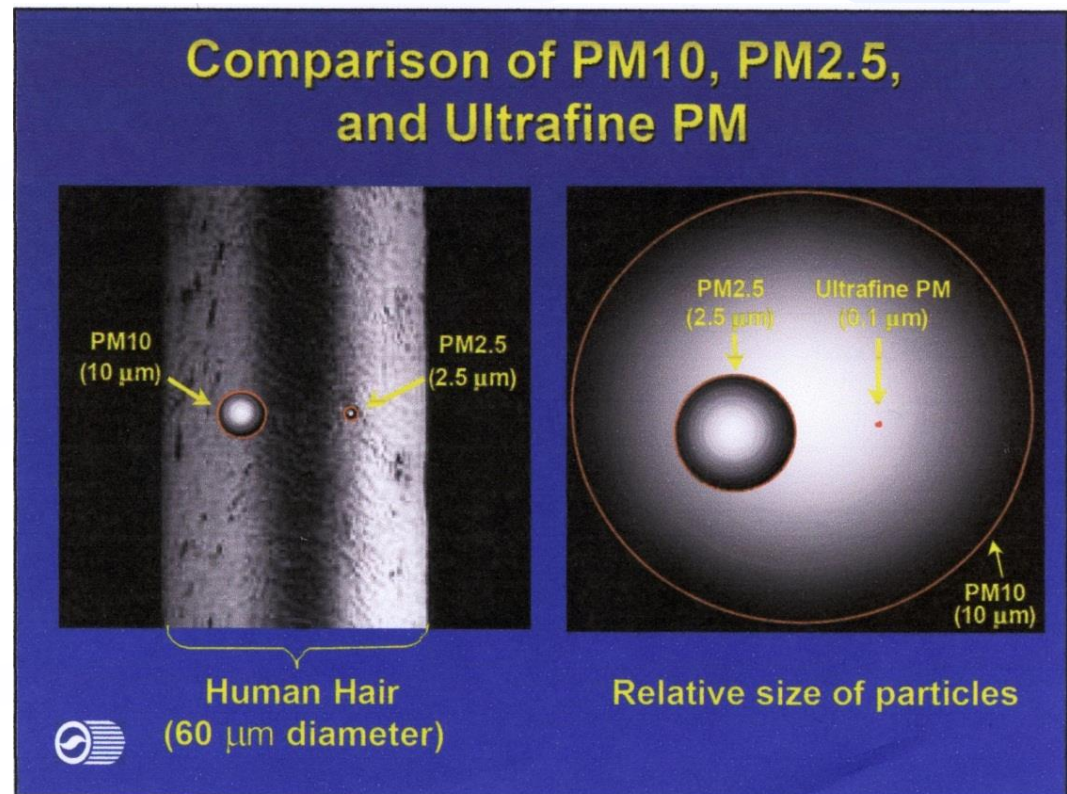
# PM Basics

Particulate Matter is a diverse mix of airborne solid particles and liquid droplets that differ in size, mass, toxicity, chemical properties & how they behave in the atmosphere

- **Total Suspended Solids (TSP):**  
~50 microns or less
- **PM<sub>10</sub>:** 10 microns or less
- **PM<sub>2.5</sub>:** “Fine” PM  
2.5 microns or less
- **Ultrafine PM:** 0.1 microns or less\*

**Smallest particles have the greatest health impacts!**

\* One million microns = one meter



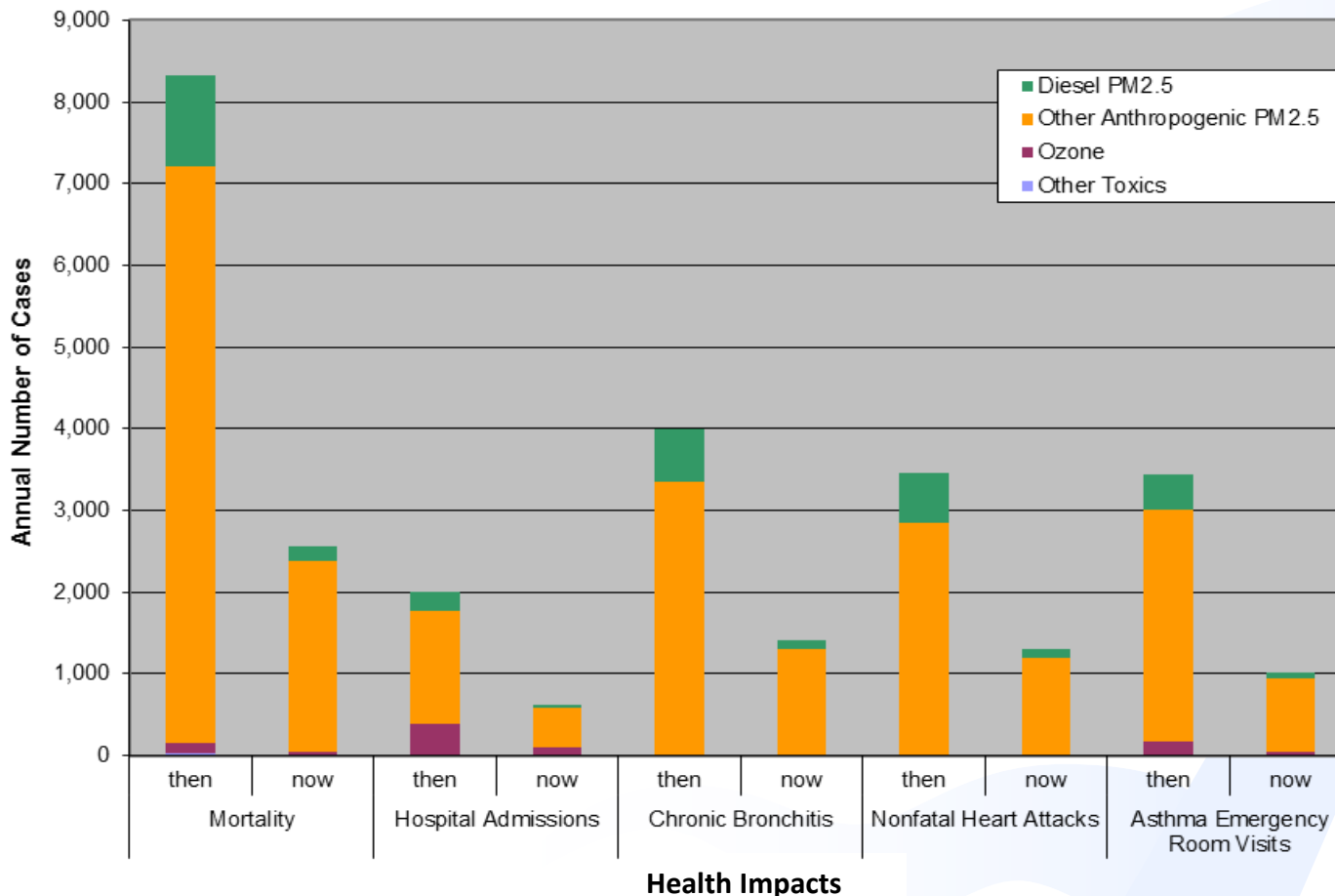
# PM Health Impacts

- **Premature mortality**
  - Higher PM<sub>2.5</sub> levels → higher death rates
  - PM<sub>2.5</sub> accounts for 2,000-3,000 premature deaths each year in the Bay Area
- **Respiratory problems**
  - asthma, bronchitis, impaired lung development
- **Cardiovascular problems**
  - atherosclerosis, heart attacks, strokes
- **Cancer**
  - diesel soot contains carcinogens
- **Adverse health impacts even at moderate levels**
  - from both short-term & long-term exposure
  - children & elderly are most at risk
  - small particles penetrate deep into lungs, bloodstream, organs, and cells



# Estimated PM Health Burden in Bay Area

## Health Burden: Past and Present



Then = 1970's for ozone,  
1980's for toxics and PM

Now = 2015

Source: Figure C-1, 2017 Plan Appendix C – Air Pollution Health Burden: Past & Present



# Stationary Source PM Control Measures in 2010 CAP

## Stationary Source Measures (SSM) in 2010 Clean Air Plan

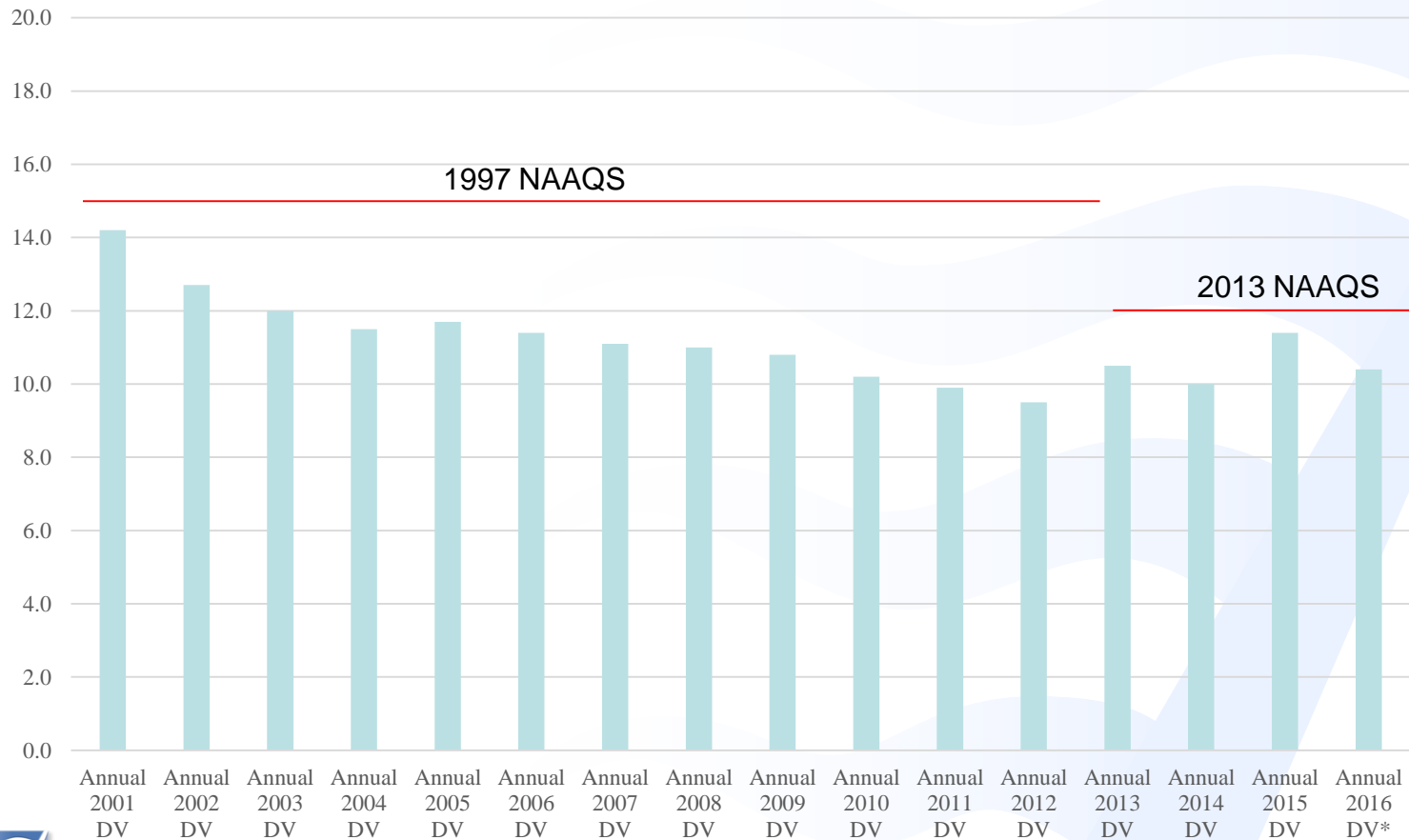
- SSM 1: **Metal-Melting Facilities** - New Reg 12-13 & 12-14 to reduce PM from foundries & scrap recyclers - **Complete**
- SSM 6: **General PM** - Amend Regulation 6-1 to reduce allowable PM emissions rate from a variety of sources - **This project**
- SSM 7: **Open Burning** - Amend Regulation 5 to limit amount that can be burned on permitted burn days - **Complete**
- SSM 9: **Cement Kilns** - Reduce PM, NO<sub>x</sub>, toxics - **Complete**
- SSM 16: **New Source Review** - Amendments for PM<sub>2.5</sub> - **Complete**
- FSM 12: **Wood Smoke** - Further study resulted in amendments to Regulation 6-3 - **Complete**
- SSM 8: **Coke Calcining** - will reduce SO<sub>x</sub> - **Complete**





# Air Quality Trends

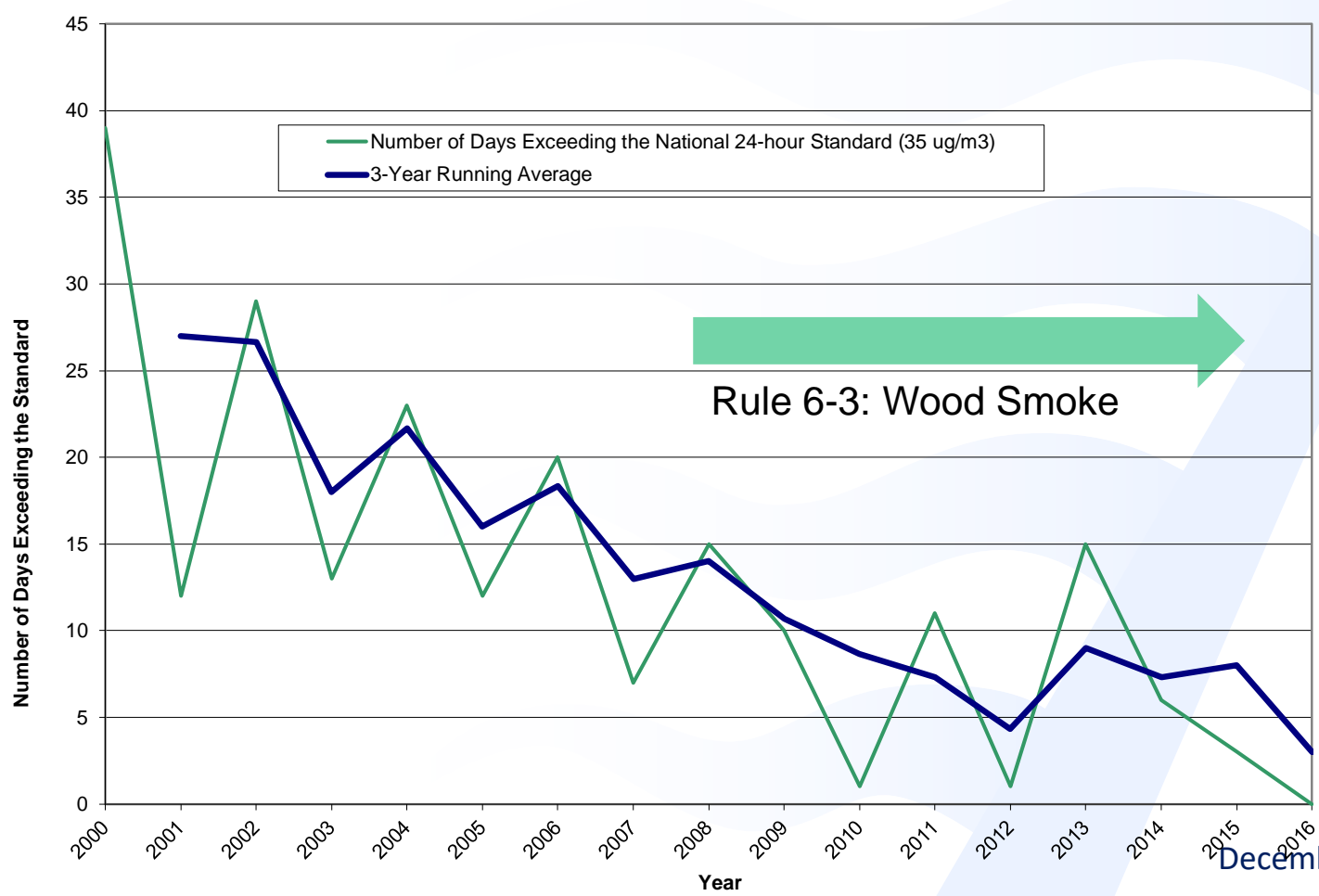
## Annual PM<sub>2.5</sub> Average (Design Value)





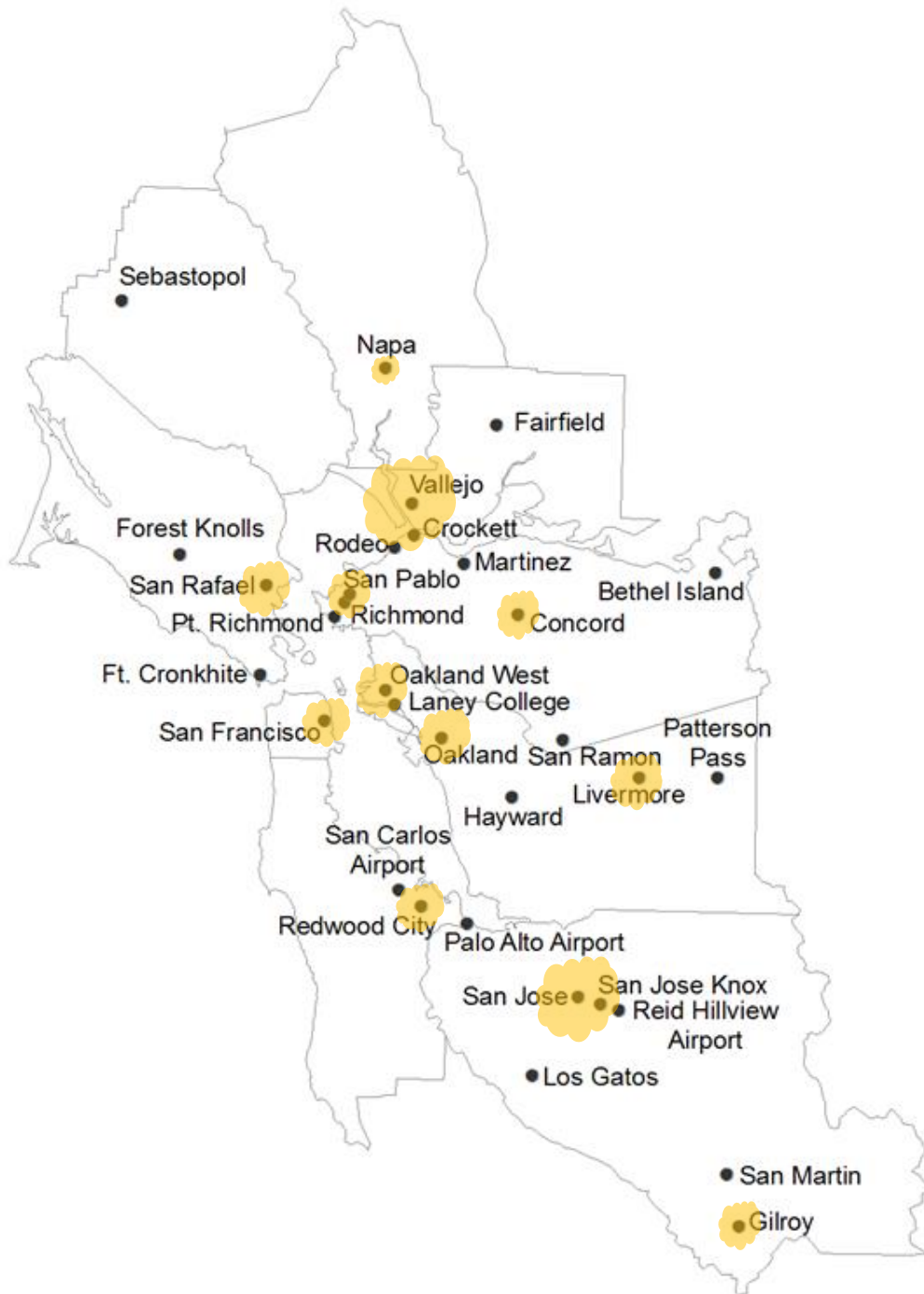
# Air Quality Trends

## 24-hr PM<sub>2.5</sub> Exceedances each Winter





# High PM<sub>2.5</sub> Locations



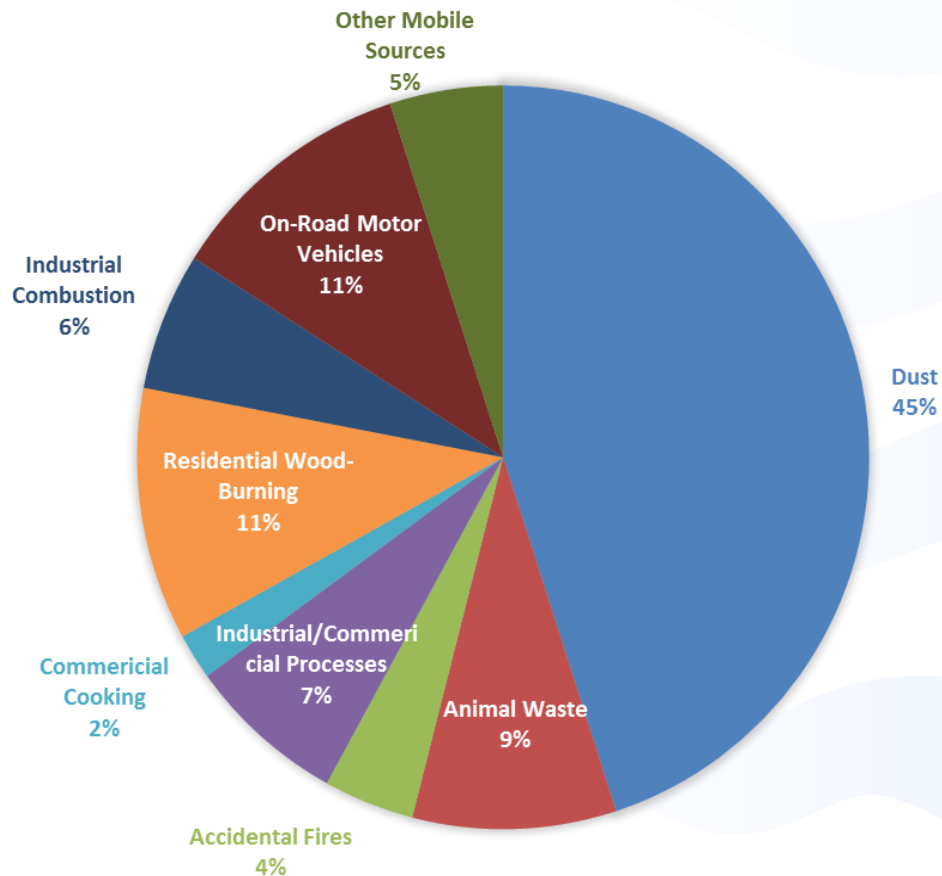
## 2011 - 2016

### PM<sub>2.5</sub> Exceedances

Vallejo	17
San Jose	15
Livermore	7
Oakland East	7
Oakland West	6
San Rafael	6
San Francisco	5
Redwood City	4
Concord	3
San Pablo	3
Gilroy	3
Napa	2
<b>Total</b>	<b>80</b>
Winter	73
Wildfires	7

# Sources of PM<sub>10</sub>

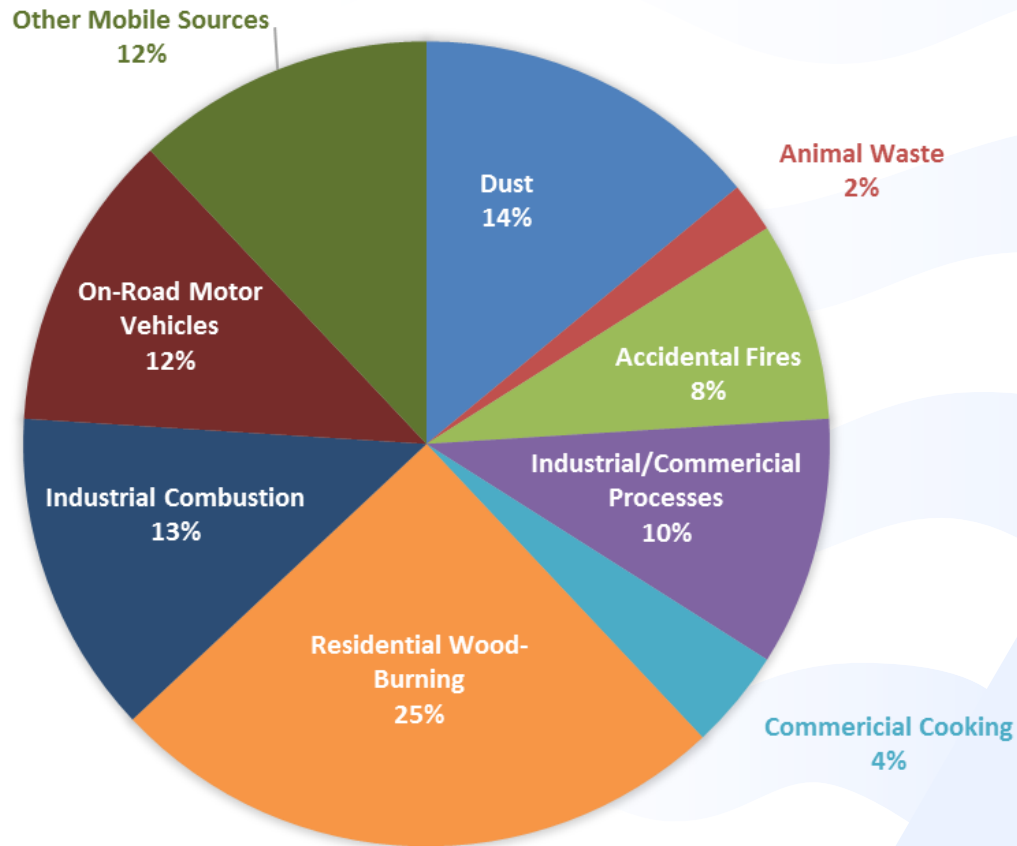
2017 Clean Air Plan Figure 2-7: Direct PM<sub>10</sub> Emissions by Source, Annual Average, 2015 (109 tons/day)





# Sources of PM<sub>2.5</sub>

2017 Clean Air Plan Figure 2-6: Direct PM<sub>2.5</sub> Emissions by Source, Annual Average, 2015 (47 tons/day)





# Targeted Sources

## Source Categories

Road Dust – 6 subcategories

Construction Dust – 5 subcategories

Industrial Combustion

- Petroleum Refinery Combustion

Industrial/Commercial Processes

- Petroleum Refinery Processing
- Chemical Manufacturing
- Food & Agricultural Processes
- Wood Products
- Asphalt
- Concrete
- Glass
- Stone, Sand & Gravel
- Landfills & Waste Management
- Other

PM<sub>10</sub>

28.1 tpd

11.5

5.2

2.5

0.3

0.4

0.4

0.1

0.2

1.1

0.7

0.4

1.9

0.8

PM<sub>2.5</sub>

4.0 tpd

1.1

5.1

2.5

0.2

0.4

0.3

0.1

0.2

0.8

0.7

0.1

0.5

0.5





# Control Methods

## Combustion:

- Natural Gas
  - Burner design
  - Good Combustion Practices
- Refinery Gas, Landfill Gas, Digester Gas – more variable
  - Burner design focused on NO<sub>x</sub>
  - Good Combustion Practices
  - Flue gas oxidation?
- Burner design and Good Combustion Practices currently in place
- Reduce combustion through efficiency





# Control Methods

## Industrial / Commercial Processes:

- Dust control required where solids and solids handling are exposed to wind
- Truck traffic is often the largest source of dust emissions
- When solids handling and processing are contained and vented through a stack
  - Wet mechanical scrubbers and/or cyclones: 50 – 70% effective
  - Baghouses, or Electrostatic precipitators: 90+% effective

## Road Dust:

- Mud and other solids on roads are entrained into the air by traffic



The background of the slide features a photograph of the Golden Gate Bridge in San Francisco, California. The bridge's iconic orange-red towers and suspension cables are visible against a clear blue sky. In the foreground, the water of the bay is visible, and a small building is situated on the left side of the frame.

# Control Methods

## Bulk Materials & Construction Dust:

- Wind Erosion
  - Wind screens ~70% effective for stockpiles, conveyors, and disturbed surfaces
  - Wind screens not effective at construction sites
  - Water is frequently used to reduce dust
- Truck traffic is a significant source of dust on unpaved roads within facilities
  - Water is used to reduce dust (water mist is usually more efficient than water spray)
- Trackout & Carryout Control
  - Trackout = mud and dirt on vehicles deposited on roads leaving the facility
  - Carryout = spills and dust from vehicles onto roads



# Draft Structure for Regulation 6

- Recommend new umbrella regulation – Regulation 6
  - to provide common and consistent definitions and test methods that apply to all current and future PM rules.
- Amendments to Regulation 6, Rule 1: General Requirements
  - Including Bulk Material Storage and Handling
- New Regulation 6, Rule 6: Prohibition of Trackout
- Anticipate other source specific rules going forward





# Regulation 6, Rule 1: General Requirements

**Rule 6-1 is currently a Total Suspended Particulates (TSP) rule (includes  $PM_{10}$  and  $PM_{2.5}$ )**

## **Proposed changes to Rule 6-1**

- Tighten general particulate matter emissions limits
  - concentration and mass limits to match the most stringent requirements in California
  - translation of TSP to  $PM_{10}$  and/or  $PM_{2.5}$  requirements is challenging - depends on the specific solids
- Specify test methods for determining compliance
- Require periodic compliance testing
- Future rulemaking will need to be source-specific



# Bulk Material Handling

## Include Bulk Material Handling in Rule 6-1

- Addresses fugitive dust from all bulk materials, including petroleum coke and coal.
- Best Available Control Technology: cover transportation vehicles, and enclosures around handling, loading, and unloading – ducted to a baghouse.
- Requirements
  - No visible fugitive dust beyond property line
  - No significant visible emissions within the facility
  - Wind screens and water-mist systems for existing facilities
- Monitoring
  - For visible fugitive dust beyond property line twice daily
  - All sources at least once daily
- Expect emission reductions of 0.37 tpd  $PM_{10}$ , 0.03 tpd  $PM_{2.5}$



# Examples of Bulk Material Dust



Quarry



Petroleum Coke

December 18, 2017

Slide 19



# Bulk Material Dust Controls

Wind Screens



Mist Systems





# Prohibition of Trackout

## New Regulation 6, Rule 6: Prohibition of Trackout

- Currently required by many city / county ordinances, Storm Water Pollution Prevention Plans and California Motor Vehicle Code, but enforcement seems variable
- Road dust from trackout has high PM<sub>2.5</sub> content
- Staff observed that more than 50% of construction sites had trackout issues.
- Requirements
  - No “significant” visible roadway material on adjacent paved roadway
    - Significant = more than cumulative 25 linear feet, or 25 square feet
    - Cleanup required within 4 hours
    - No more than 1 quart of trackout can remain at end of work day
  - Prevent dust during cleanup
  - Monitor twice daily
- Expect emission reductions of 1.23 tpd PM<sub>10</sub>, 0.18 tpd PM<sub>2.5</sub>



# Examples of Road Dust - Trackout



From trucks



Soil Erosion





# Examples of Trackout Controls

Grizzlies



Truck wash system





# Rule Making Schedule

## Workshops:

- Eight workshops in late January / early February
  - Cupertino
  - San Rafael
  - Walnut Creek
  - San Jose
  - San Francisco
  - Yountville
  - Dublin
  - Oakland
- Comments received in March

## Public Hearing:

- Incorporate changes in April - September
- CEQA and Socio-economic analyses by November
- Public Hearing in February 2018







# Next Steps for PM

- Reduce refinery Fluidized Catalytic Cracking Unit PM<sub>2.5</sub> emissions
  - Possible amendments to Rule 6-5
- Continue working with the Office of Environmental Health Hazard Assessment (OEHHA) on risk characterization of PM
- Consider developing PM risk-based rule analogous to Rule 11-18
- Possible future source-specific regulations based on AB 617 BARCT, or risk-based rulemaking in highly impacted communities
  - Coke and coal handling facilities?
- Consider changes to permitting rules to address localized health impacts of PM





# Questions?





REGULATION 11, RULE 18,  
REDUCTION OF RISK FROM AIR TOXIC  
EMISSIONS AT EXISTING FACILITIES:  
**IMPLEMENTATION UPDATE**

**Carol Allen**  
Supervisor, Engineering Division

# OUTLINE

- **Rule 11-18 Background**
- **Implementation Preparation**
- **Health Risk Assessment Vendors**
- **Next Steps**

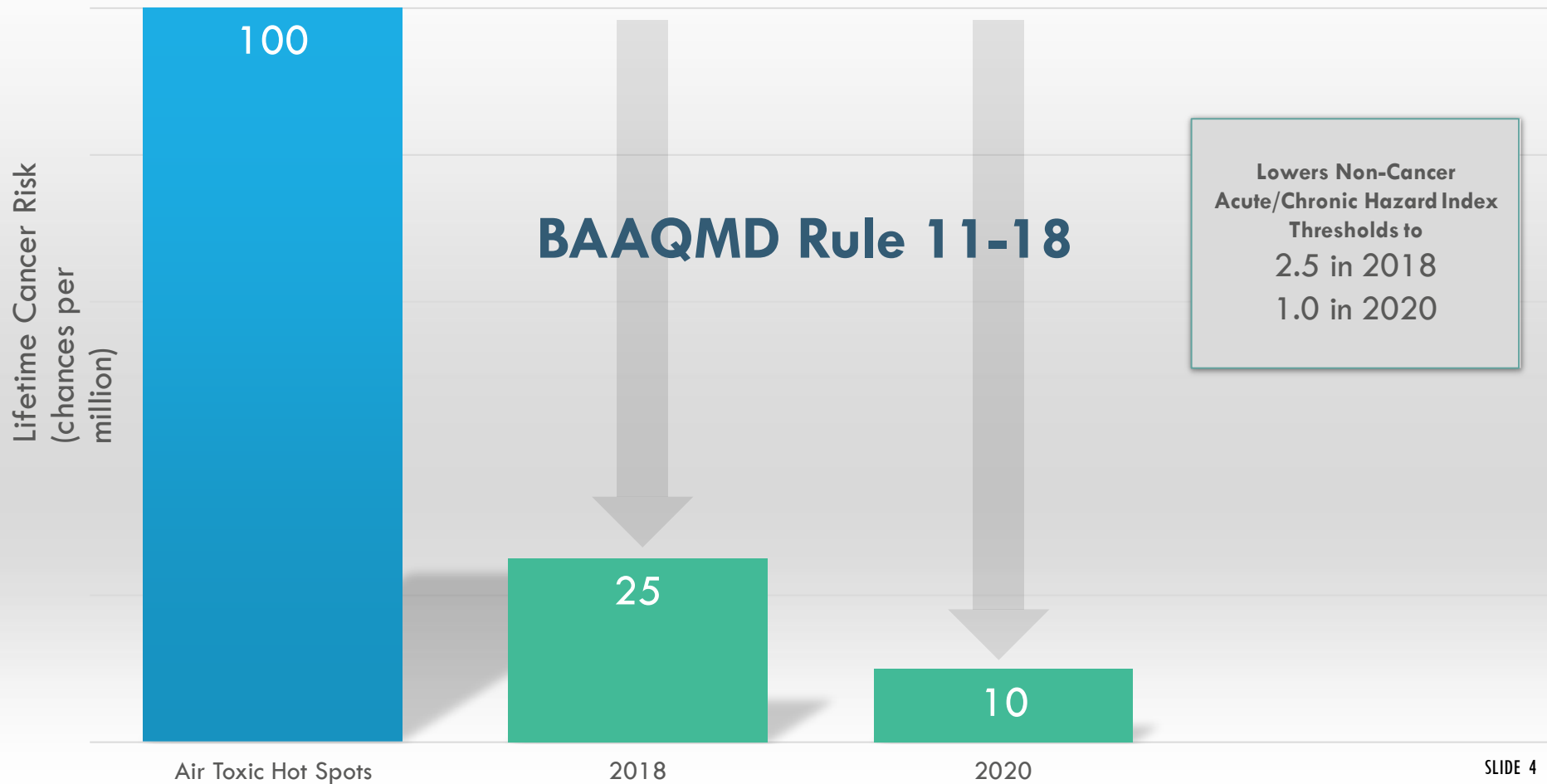
# REGULATION 11, RULE 18 OVERVIEW

- **Air District Identifies Affected Facilities**
  - Analyze Facility-Wide Health Impacts
  - Compare to Rule 11-18 Risk Action Thresholds
- **Facilities Above Risk Action Level Must:**
  - Develop a Risk Reduction Plan for Air District Approval
  - Execute Plan According to Plan Schedule
- **Facilities Achieve Compliance By Either:**
  - Reducing Health Impacts Below Final Risk Action Levels

OR

  - Installing Best Available Retrofit Control Technologies for Toxics (TBARCT) on All Significant Sources of Health Risk

# NEW RISK ACTION THRESHOLDS



# REGULATION 11, RULE 18: IMPLEMENTATION PREPARATION

- **Rule 11-18 Adopted November 15, 2017**
- **Identify Health Risk Assessment Vendors (2016 - 2017)**
  - Process
  - Review Criteria
  - Results
  - Conclusions
- **Next Steps (2017 – 2018)**

# RFQ - PROCESS

- **Request for Qualifications (RFQ) #2016-006**  
Health Risk Assessments and Related Activities  
for Toxic Risk Reduction Regulations
  - November 16, 2016 - Issued RFQ
  - November 23, 2016 – Questions Due
  - December 1, 2016 – Answers Posted to Web Site
  - December 8, 2016 – Proposals Due
  - January 23-26, 2017 – Panel Reviewed Proposals



# RFQ – REVIEW CRITERIA

Category	Description	Percent
Expertise	<ul style="list-style-type: none"> <li>• Number, complexity, and nature of HRA projects handled by the firm.</li> <li>• Selected firm’s staff ability, availability and facility for working with Air District staff</li> <li>• Quality and diversity of work product as demonstrated through submitted work samples.</li> <li>• Demonstrated knowledge of Air District activities and guidelines.</li> </ul>	40
Experience	<ul style="list-style-type: none"> <li>• Experience of firm and employees to be assigned to a District project in general, and, providing HRAs to governmental agencies.</li> </ul>	10
Approach	<ul style="list-style-type: none"> <li>• Approaches in methodology with respect to the anticipated scope of services that demonstrate maximum comprehension of and ability to provide such services.</li> </ul>	30
Cost	<ul style="list-style-type: none"> <li>• Proposed fee structure relating to services the firm(s) would provide.</li> </ul>	15
Other	<ul style="list-style-type: none"> <li>• Minority-owned, veteran-owned, women-owned, Certified Green, or local business designations.</li> </ul>	5

# RFQ - RESULTS

FIRM (by rank order)	Total (100 max)	Expertise (40 max)	Experience (10 max)	Approach (30 max)	Cost (15 max)	Other (5 max)
Environmental Audit, Inc.	88	37	9	27	12	3
Ramboll Environ, Inc.	86	38	9	28	9	2
Environmental Science Associates	86	36	9	27	10	3
Trinity Consultants	83	36	9	26	9	2
ICF Resources	78	35	6	26	8	3
MRS Environmental, Inc.	78	34	8	26	8	1
EnviroComp Consulting, Inc.	72	35	7	20	7	2
Yorke Engineering, LLC	65	25	6	23	8	3
Ashworth Leininger Group	61	31	8	19	3	1
Placeworks	53	23	6	22	1	1
ES Engineering	50	19	5	18	8	0
Alta Environmental	40	23	3	11	3	1

# RFQ - CONCLUSIONS

- Air District's Authorized Health Risk Assessment Vendors:
  - Environment Audit, Inc.
  - Ramboll Environ, Inc.
  - Environmental Science Associates
  - Trinity Consultants
  - ICF Resources
  - MRS Environmental, Inc.
- Executive Officer/APCO will negotiate terms and execute contracts with the above firms for Rule 11-18 related HRA services.
- Non-Title V facilities may either choose one of these firms to conduct their HRA or choose to have the Air District conduct the facility-wide HRA.

# Next Steps

## Refine Facility Lists

2017 Q4 – 2018 Q1

- **Select First 20 High Impact Facilities**
  - Most Recent Emissions Inventory
  - Updated Prioritization Scores
  - Verified Proximity Adjustment Factors
- **Notify Affected Facilities**

## Build Additional Infrastructure

2018 Q1 – 2018 Q2

- **Prepare Intake Tools and Data Reporting Formats**
- **Create General Modeling Protocol and Authorized Refinement Options**
- **Select Consultants and Execute Contracts**
- **Form Rule 11-18 Dispute Resolution Committee**

## Conduct HRAs

2018 Q2 – 2018 Q4

- **Review and Approve Site-Specific:**
  - Emission Inventories
  - Model Input Data
  - Modeling Protocol
- **Consultants Complete HRAs Under AD Supervision**
- **Public Comment on HRAs**
- **Publish HRA Results to Website**



# QUESTIONS

