

PM2.5 Trends in the South Coast Air Basin and Design Values

Item #2

AQMP Advisory Group

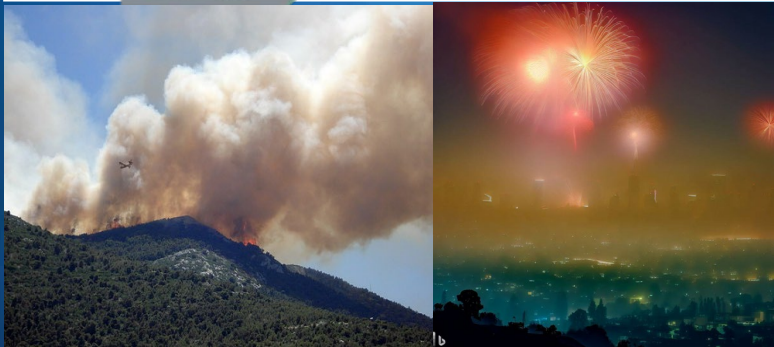
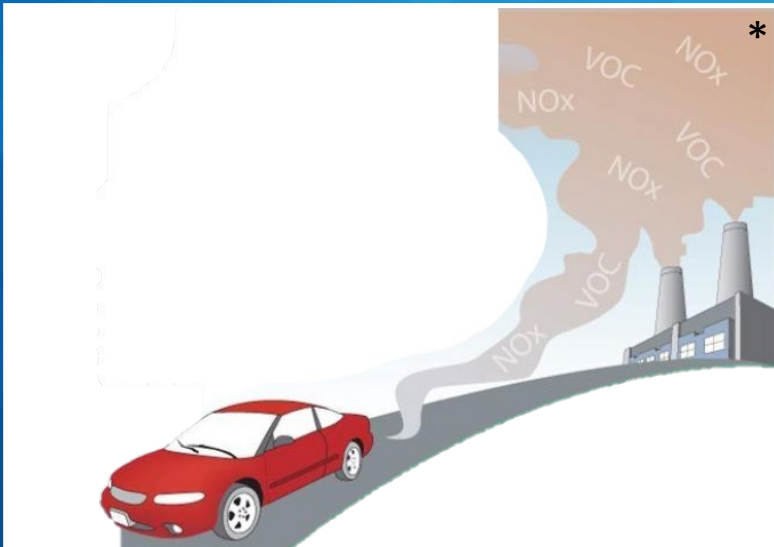
May 25, 2023

Outline

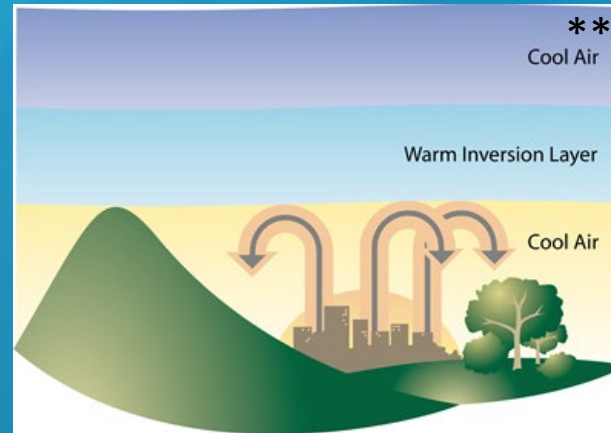
- Factors influencing PM2.5 Levels
- PM2.5 Design Values and Exceptional Events
- Design Value Trends
- Discussion of 2022 PM2.5 Levels

Factors Influencing PM2.5 Levels

Emissions



Mixing and Ventilation



Fog and Humidity



Sunlight



Storms



*Adapted from epa.gov

**<https://sparetheairofs.weebly.com/inversions.html>

PM2.5 Design Values and Attainment

Annual Standard

Year 1				Year 2				Year 3			
1	2	3	4	1	2	3	4	1	2	3	4
Annual average				Annual average				Annual average			
Average = Design value											

Attainment: Design value must be less than or equal to **12 $\mu\text{g}/\text{m}^3$** standard

24-Hour Standard

Year 1	Year 2	Year 3
98 th percentile of 24-hr conc.	98 th percentile of 24-hr conc.	98 th percentile of 24-hr conc.
Average = Design value		

Attainment: Design value must be less than or equal to **35 $\mu\text{g}/\text{m}^3$** standard

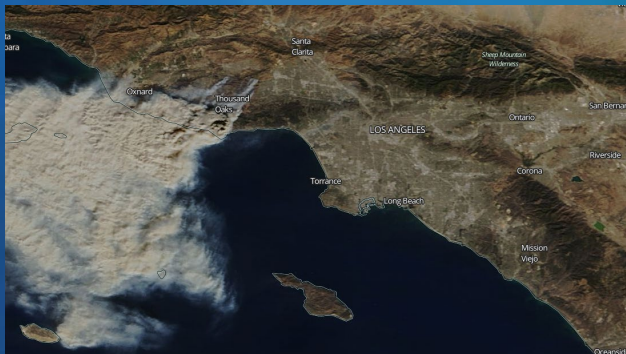
PM2.5 Exceptional Events

Control measures are developed to meet air quality standards, but not all air quality events are controllable.

Exceptional events are removed from design value calculation if:

1. Event clearly caused the exceedance
2. Event is not reasonably controllable or preventable
3. It is a natural event or an event caused by human activity that is unlikely to recur at a particular location

Wildfires

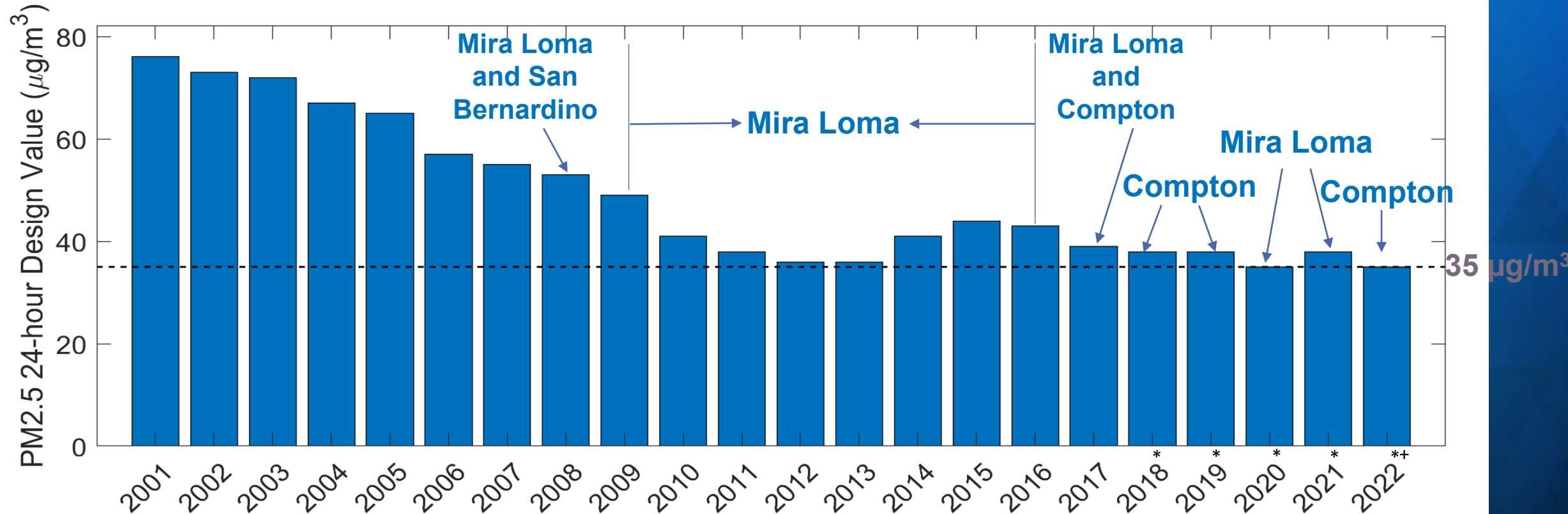


NASA Worldview MODIS/Terra Satellite

Fireworks (cultural events)



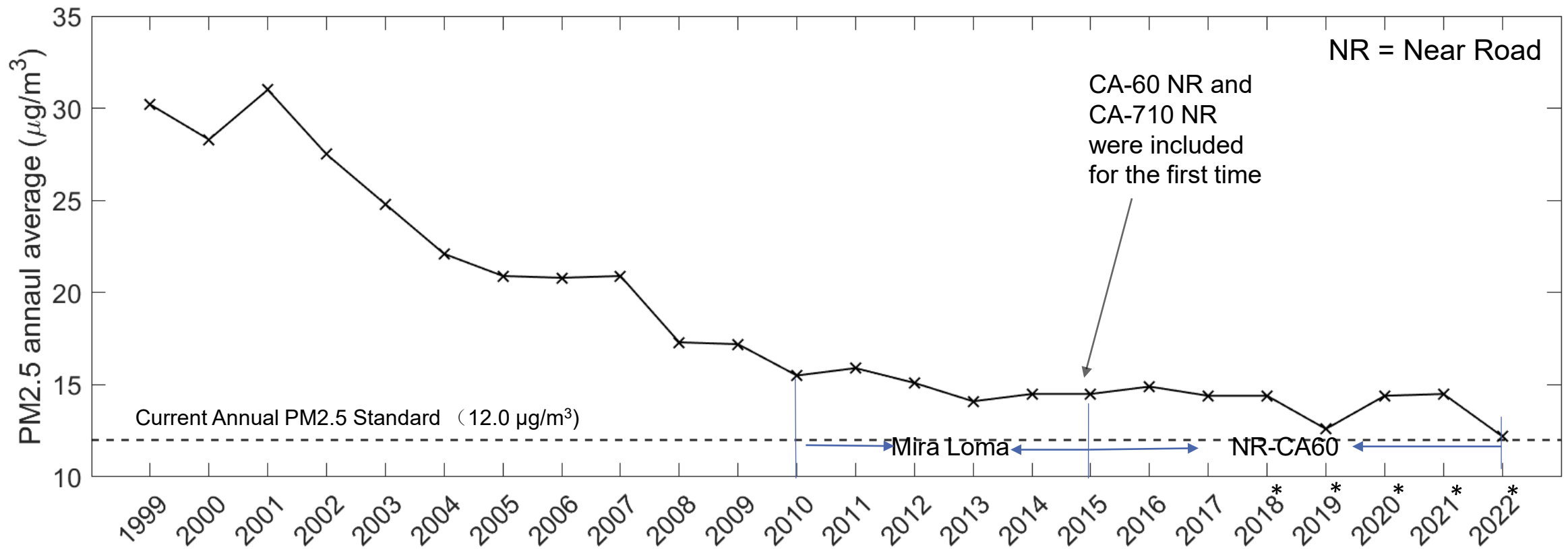
Basin PM2.5 24-hour Design Value Trend



*Data likely to be approved as exceptional events by U.S. EPA were removed.

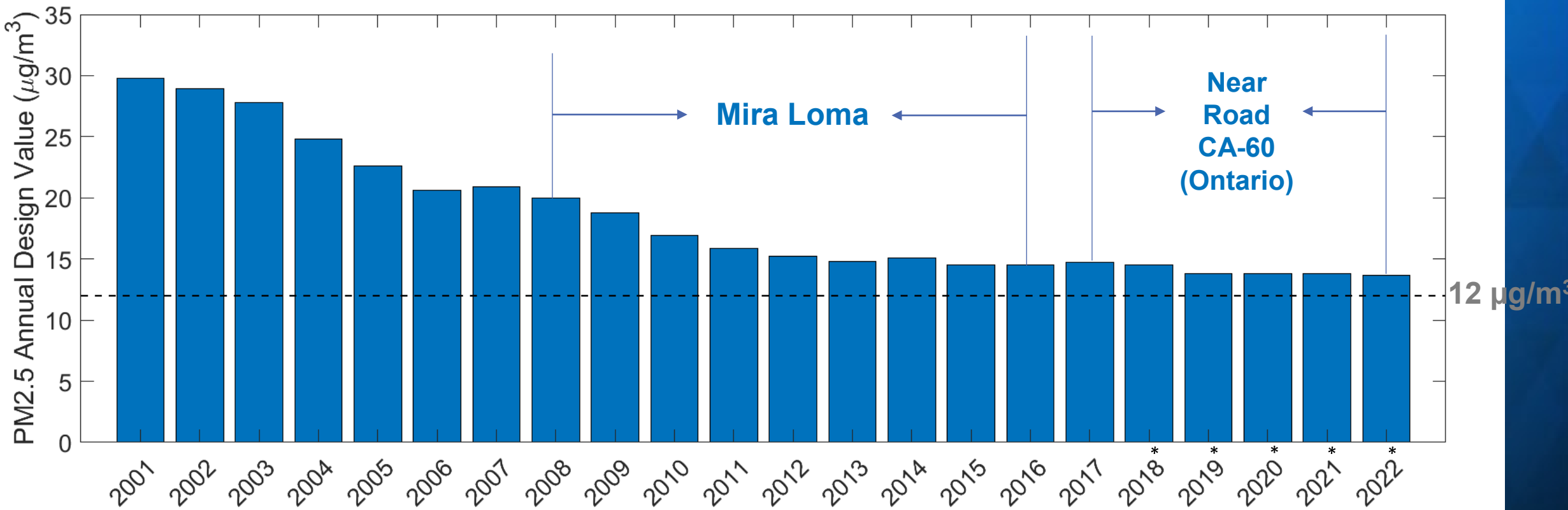
+Subject to EPA approval of a waiver to only consider more-accurate filter-based measurements at Compton by excluding measurements from a continuous instrument that doesn't meet performance goals. In the unlikely event that EPA does not approve the waiver, the 2022 value is 37 µg/m³.

PM2.5 Single-Year Annual Average Levels at the Highest Site



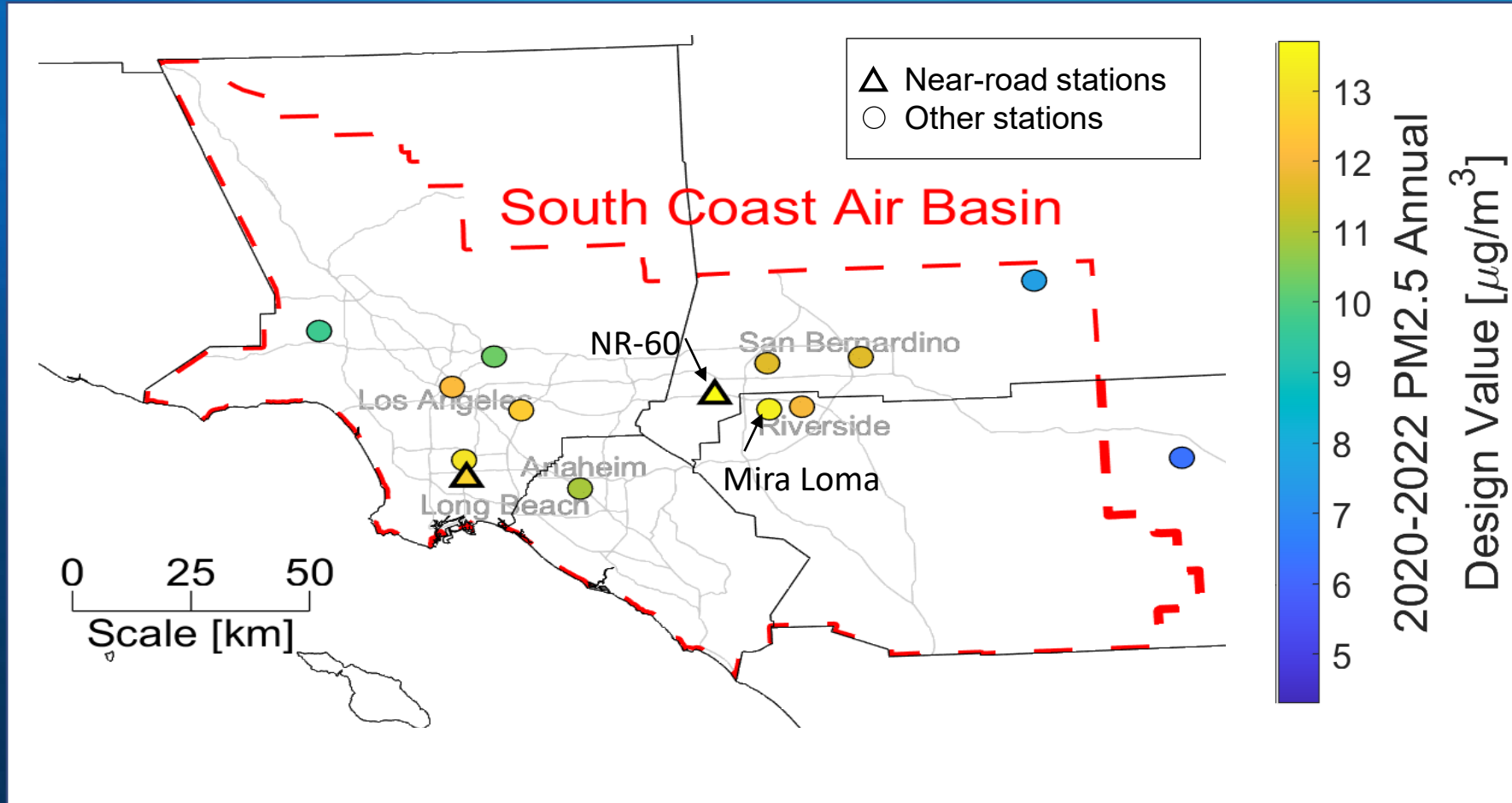
* Data likely to be approved as exceptional events by U.S. EPA removed from analysis

Basin PM2.5 Annual Average Design Value Trend



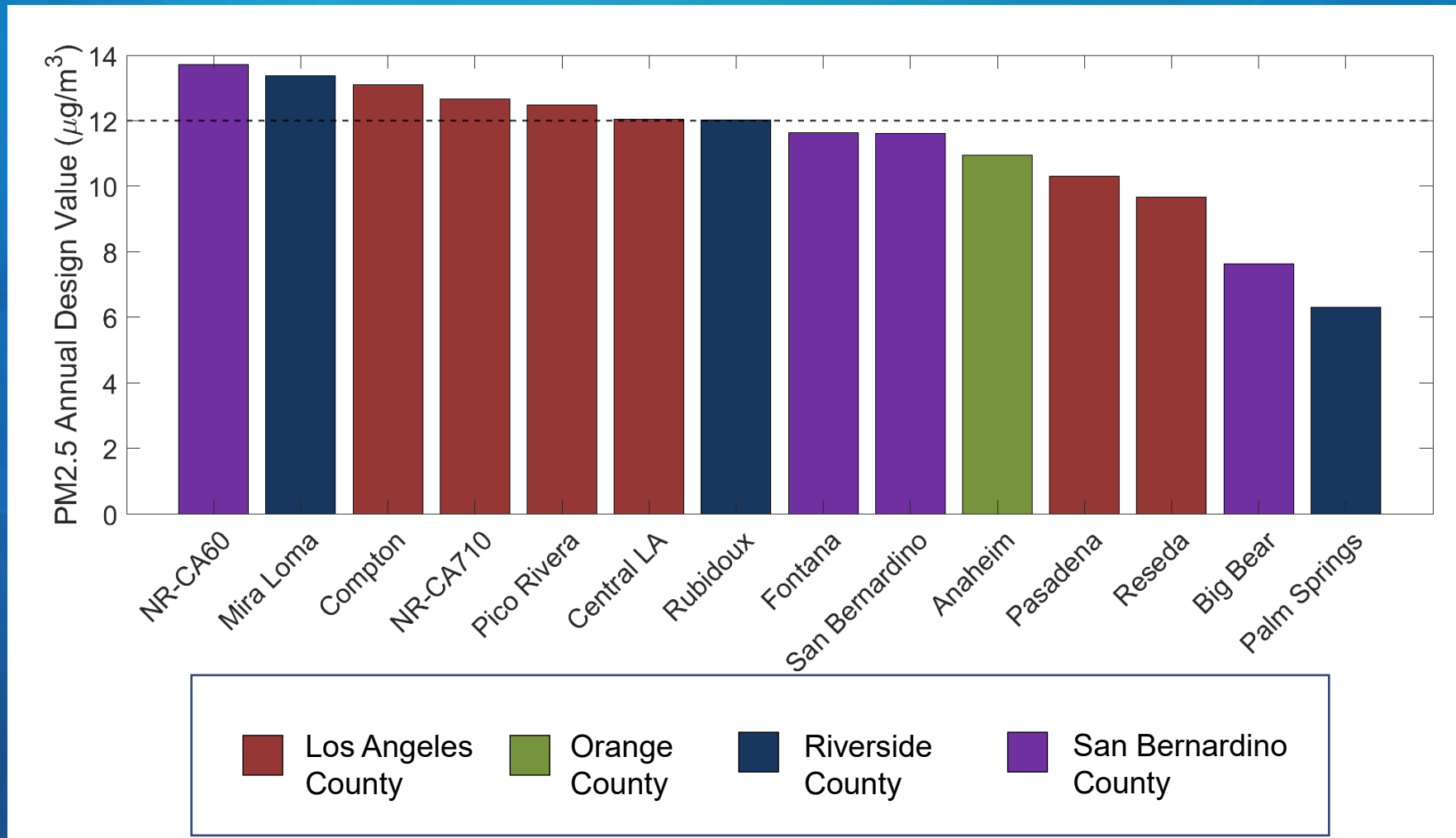
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Spatial Distribution of Annual Average PM_{2.5} Levels



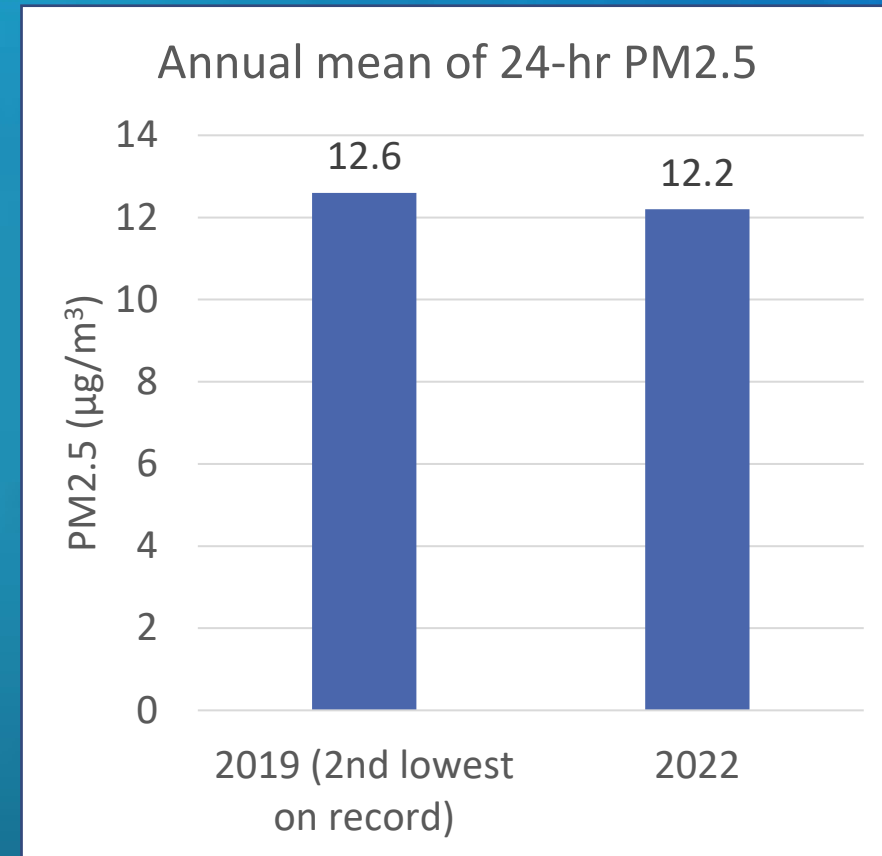
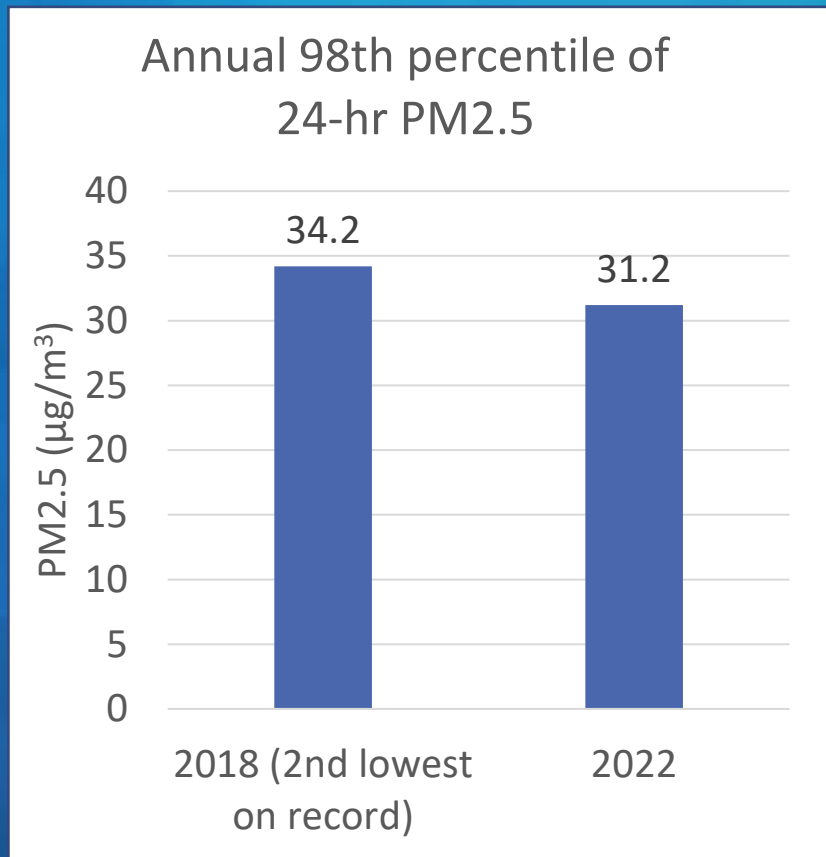
- Highest PM_{2.5} stations are located:
- Near freeways (CA-60 in Ontario and I-710 in Long Beach)
 - Riverside/San Bernardino region
 - Metropolitan LA County

2020-2022 PM2.5 Annual Design Value by Station*



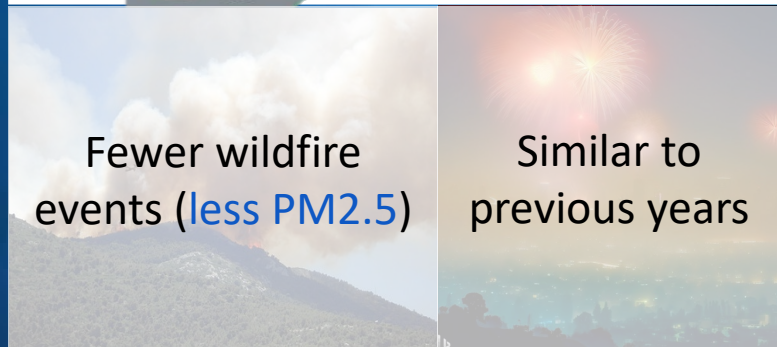
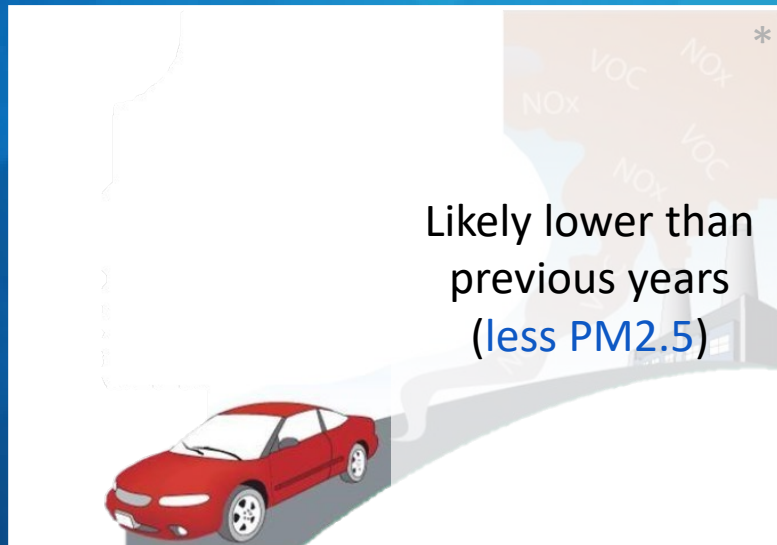
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2022 has the Lowest PM2.5 Levels on Record

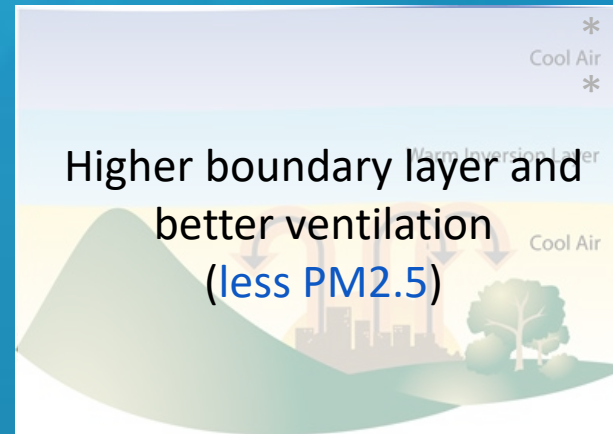


Factors Influencing PM2.5 Levels in 2022

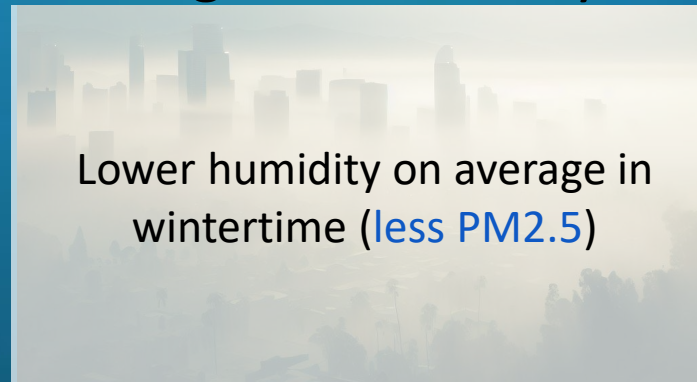
Emissions



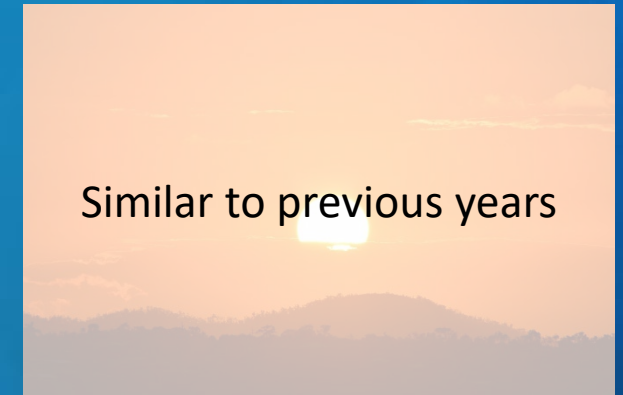
Mixing and Ventilation



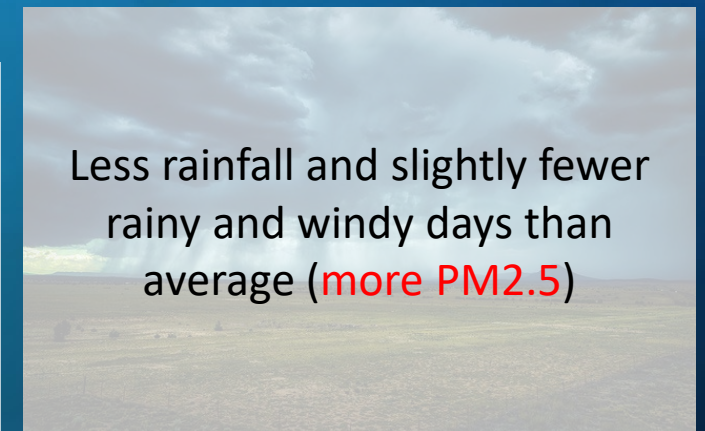
Fog and Humidity



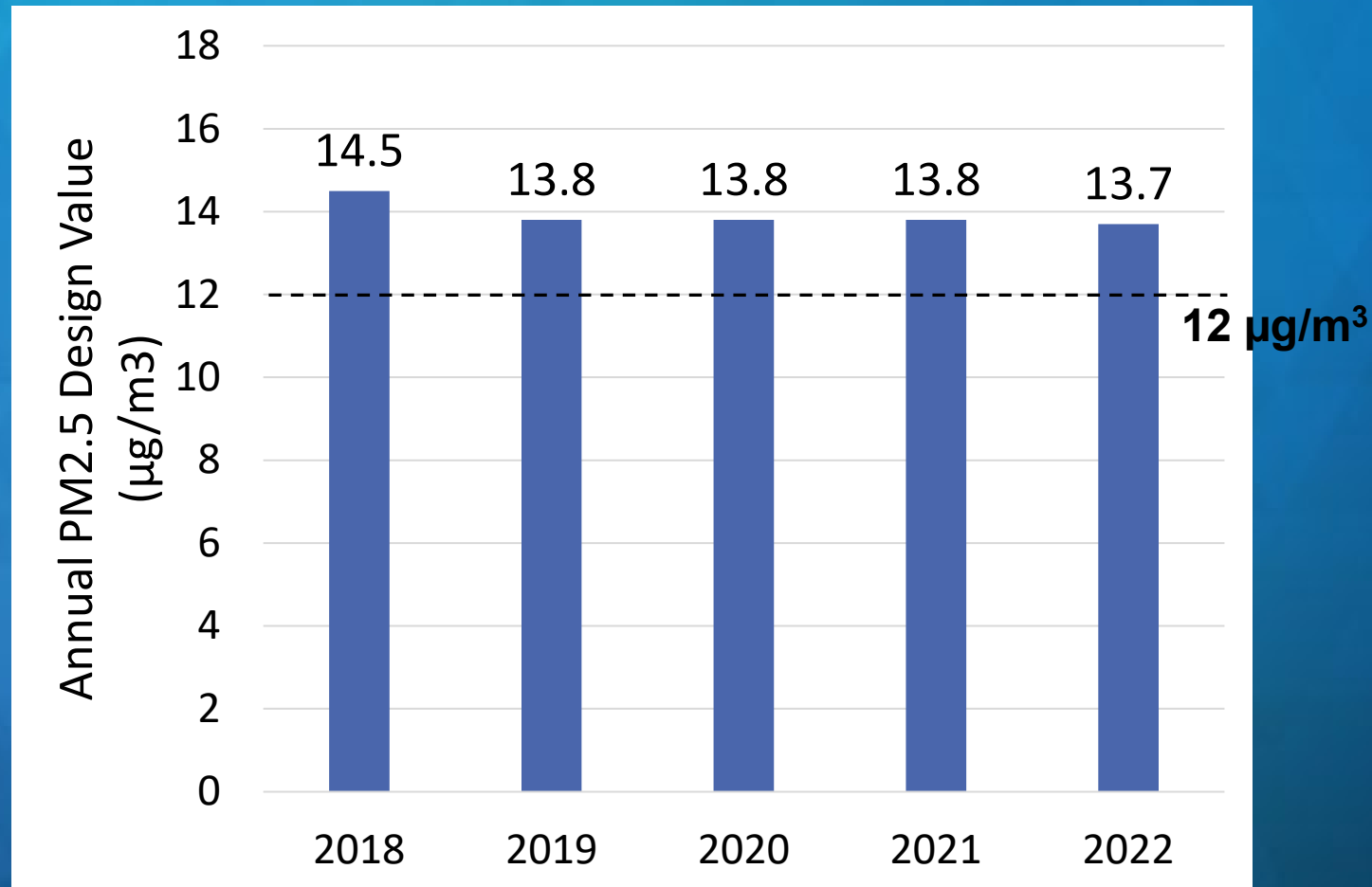
Sunlight



Storms



Approximately 2 $\mu\text{g}/\text{m}^3$ Reduction in Annual PM2.5 Design Value is Needed to Attain the Standard



Data likely to be approved as exceptional events by U.S. EPA were removed.

Summary

- 2022 was the cleanest year on record for both annual and 24-hour levels. Favorable meteorology and emission reductions contributed to the low PM2.5 levels in 2022
- South Coast Air Basin meets the 24-hour PM2.5 standard based on data collected in 2020-2022*.
- Additional emission reductions will be needed to attain the annual PM2.5 standard
- The Coachella Valley continues to be well below the annual and 24-hour PM2.5 standards

* Subject to EPA concurrence of exceptional event demonstrations and approval of a waiver to exclude continuous PM2.5 measurements at Compton that do not meet performance guidelines.

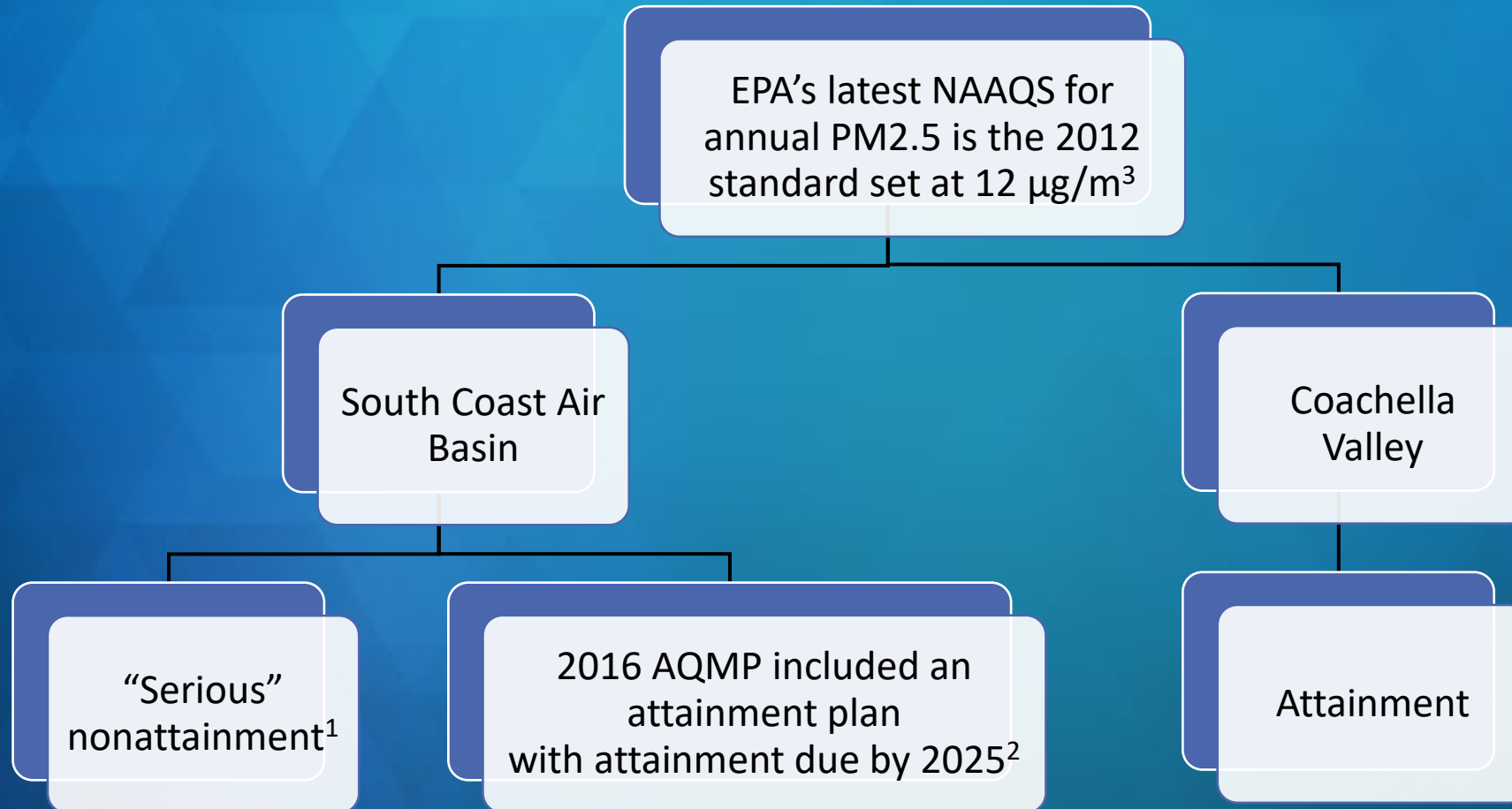
SIP Revision to Attain the 2012 Annual PM2.5 National Ambient Air Quality Standard in the South Coast Air Basin

Item #3

AQMP Advisory Group

May 25, 2023

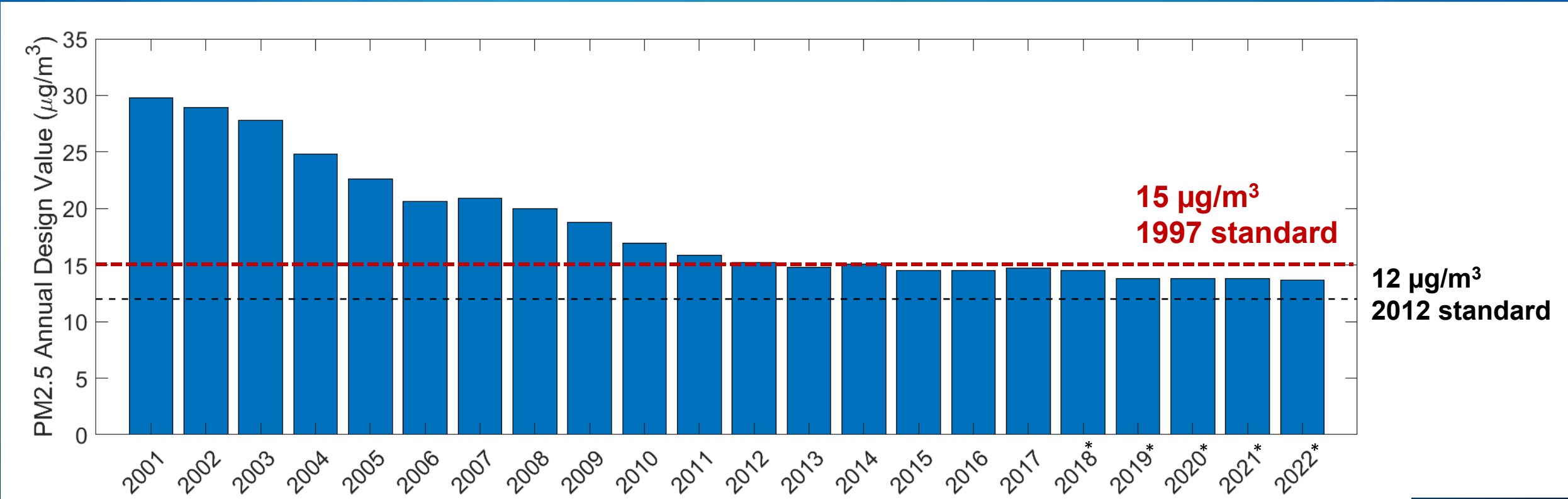
Annual PM2.5 Standard Background



¹ Reclassification from "moderate" to "serious" approved by U.S. EPA effective December 9, 2020 (85 FR 71264)

² U.S. EPA is considering a new standard in the range of 9-10 µg/m³. If a new standard goes into effect, an additional plan will be required.

Annual PM2.5 Trend in the South Coast Air Basin



*Data likely to be approved as exceptional events by U.S. EPA were removed.

PM2.5 Elements Included in the 2016 AQMP

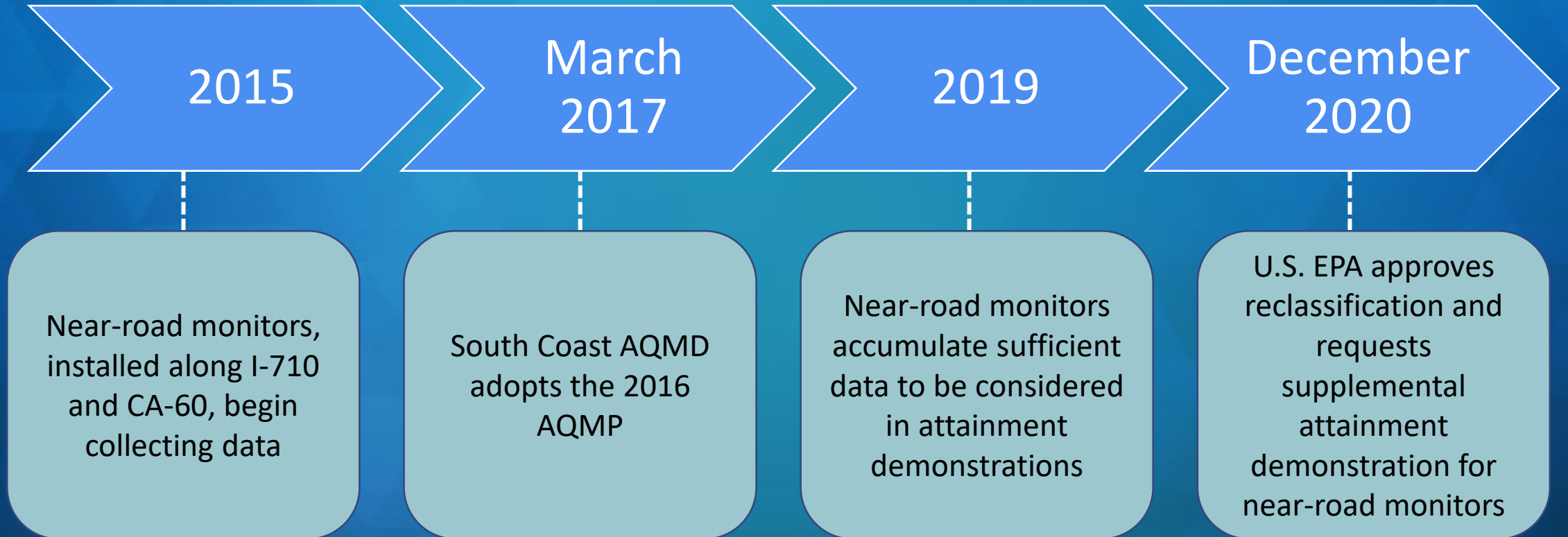
- Request to reclassify from “moderate” to “serious” nonattainment with attainment due in 2025
- Demonstrated attainment by 2025
- Control strategy relied primarily on NOx emission reductions to meet federal ozone standards by 2023 and 2031

2016 AQMP was submitted to EPA in April 2017,
but EPA did not act on the PM2.5 “serious” area plan for several years

2016 AQMP did not include an attainment demonstration for near-road monitors (not enough data collected at that time)

U.S. EPA recently asked for an updated attainment demonstration

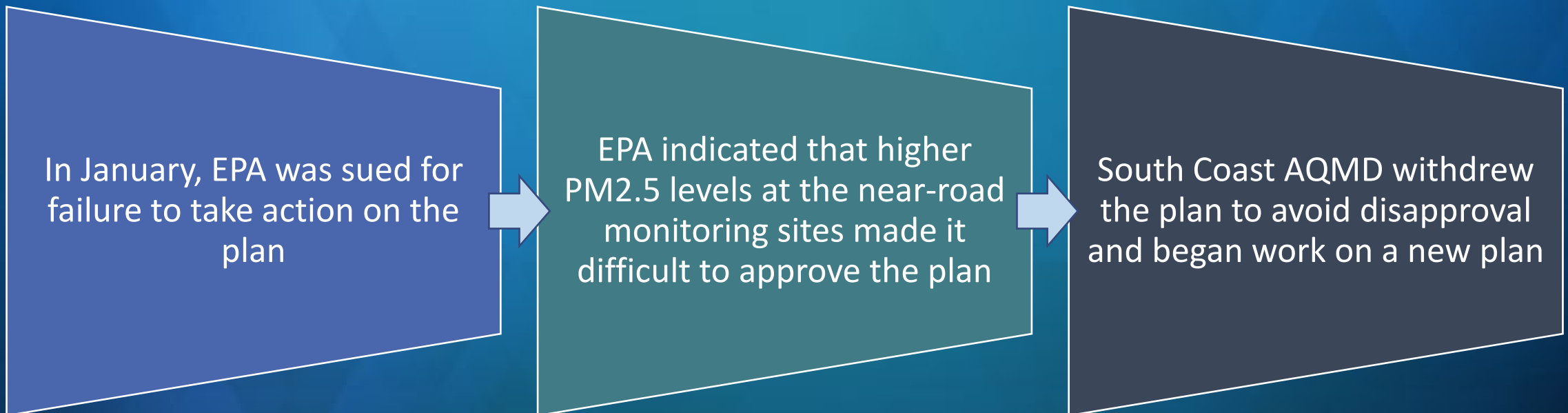
Near-Road Monitors



Based on 2019-2021 data, the CA-60 monitor has the highest PM_{2.5} level (14.2 $\mu\text{g}/\text{m}^3$) in the Basin

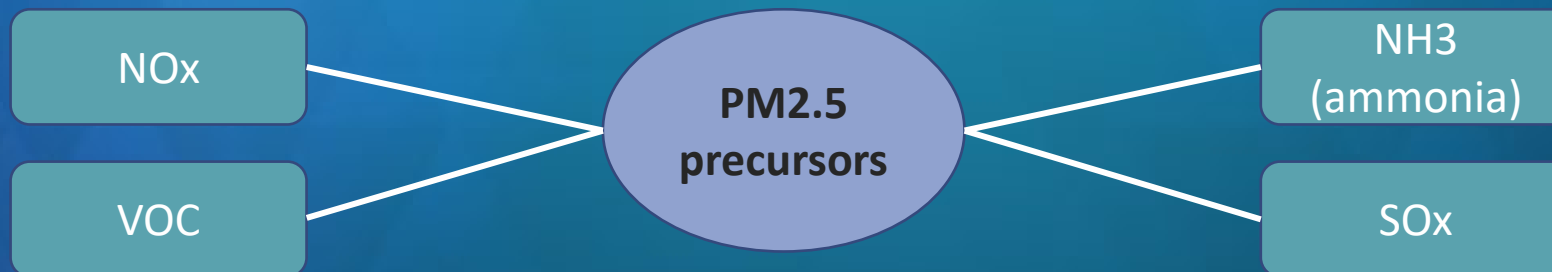
Need to Develop Revised PM2.5 Plan

- EPA's concerns with the 2016 AQMP
 - Requested supplemental attainment demonstration for near-road monitors
 - Concerned the wood burning curtailment program (Rule 445) may not satisfy Best Available Control Measures requirement



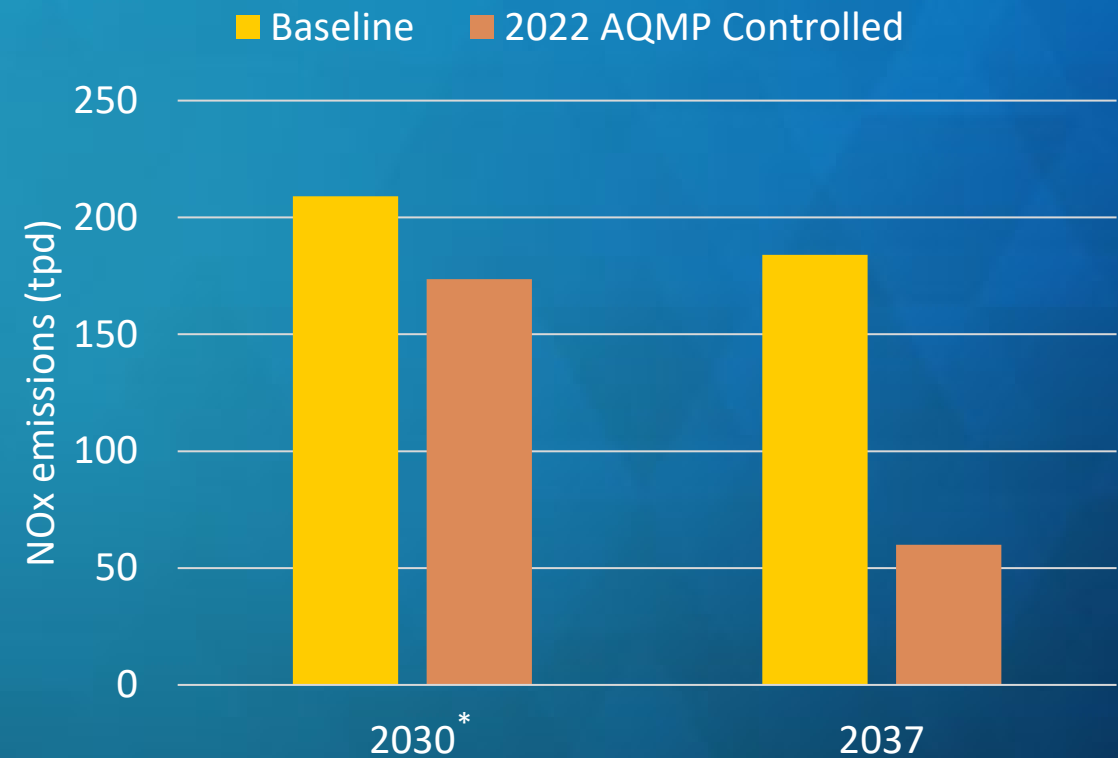
Revised Annual PM2.5 Plan

- The latest design value is $13.7 \mu\text{g}/\text{m}^3$ *, well above the $12 \mu\text{g}/\text{m}^3$ standard
- Attainment will require additional NOx emission reductions
 - Shortfall of emission reductions for attainment of the ozone standard by 2023
- This plan will include a request to extend the attainment date to 2030 consistent with CAA Section 188(e) to allow more time for implementation
- Ozone plans focused mainly on NOx controls, but PM2.5 plan must also focus on PM2.5 itself and its precursors



2022 AQMP NOx Control Strategy

- 2022 AQMP NOx control strategy is insufficient to attain the PM2.5 standard given the earlier attainment year (2030 vs. 2037)
 - Most reductions occur closer to 2037, the 2015 ozone standard attainment year
 - Even if black box measures could be considered, Basin would be far from meeting the $12 \mu\text{g}/\text{m}^3$ standard by 2030
- Additional reductions are necessary to attain the PM2.5 standard



* Preliminary estimates from the 2022 AQMP

Additional Reductions Are Needed for Attainment

Near Road station of which data became valid for attainment demonstration after the submission of the 2016 has the highest annual PM_{2.5} levels in the Basin

Some of the PM_{2.5} measures in the 2016 AQMP were considered as contingency measure for attainment and would be implemented if needed

Most of reductions committed in the 2022 AQMP will occur near 2037, not early enough to assist PM_{2.5} attainment in 2030

PM plan cannot use a black box measure – CAA 182(e)(5) provision to allow reliance on future cleaner technology

PM2.5 Plan Elements

Emissions Inventory*

Best Available Control Measures (BACM)/Most Stringent Measures (MSM)*

Requirements for Major Sources

Optional Precursor Demonstration

Attainment Demonstration

Reasonable Further Progress

Quantitative Milestones

Contingency Measures

* Due to EPA 18 months prior to the rest of the elements

Control Strategy Analyses

To be included in this Plan

Reasonably Available Control Measures (RACM)

- RACM required for “moderate” areas
- Less stringent criteria applied for assessing feasibility
- Implemented within 4 years of designation
- RACM was already implemented as part of 2016 AQMP

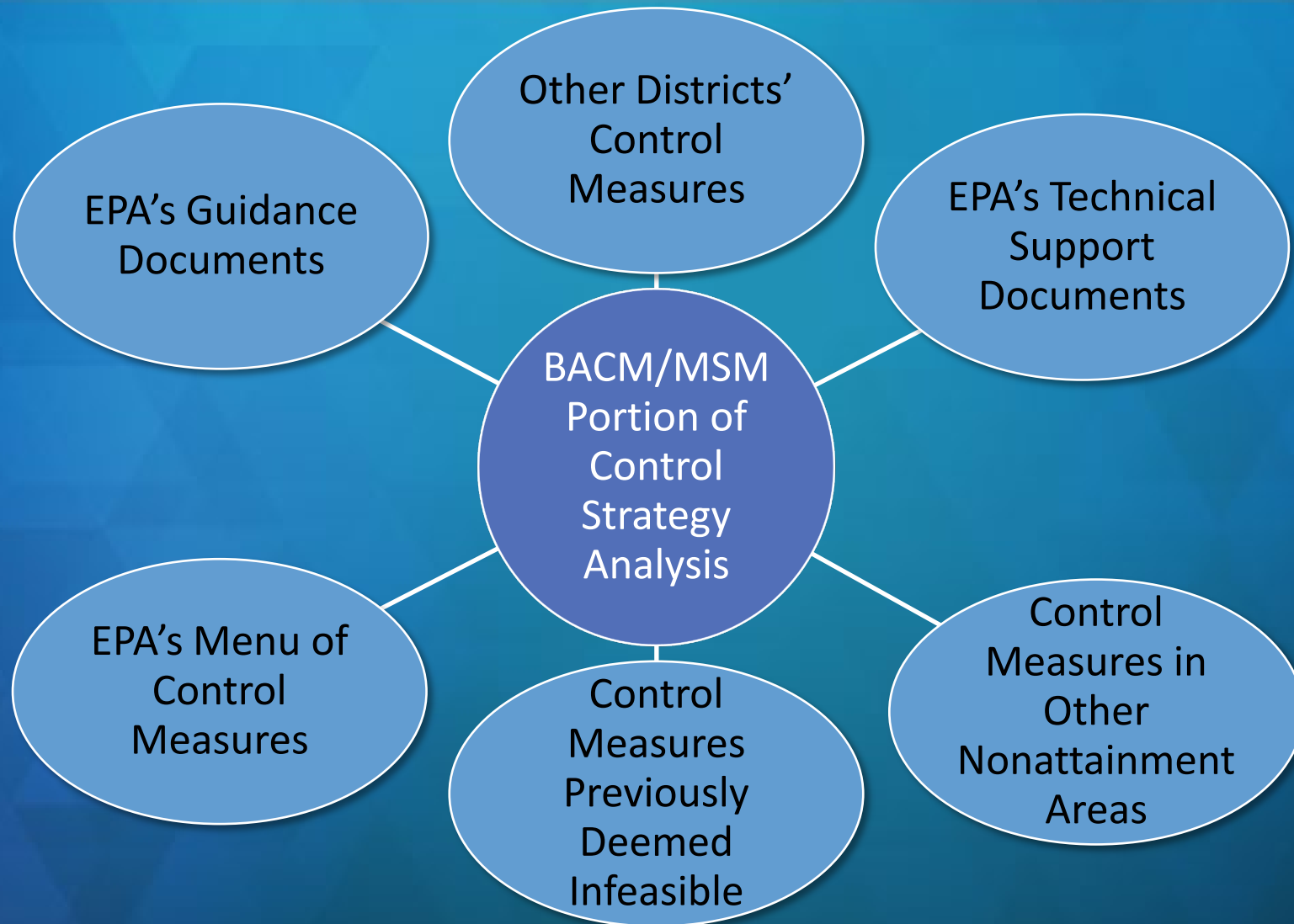
Best Available Control Measures (BACM)

- BACM required for “serious” areas
- More stringent criteria applied for assessing feasibility
- Implemented within 4 years of reclassification

Most Stringent Measures (MSM)

- MSM required for “serious” areas that request attainment date extension
- Most stringent criteria applied for assessing feasibility
- Implementation no later than 1 year prior to attainment date

Identification of BACM and MSM



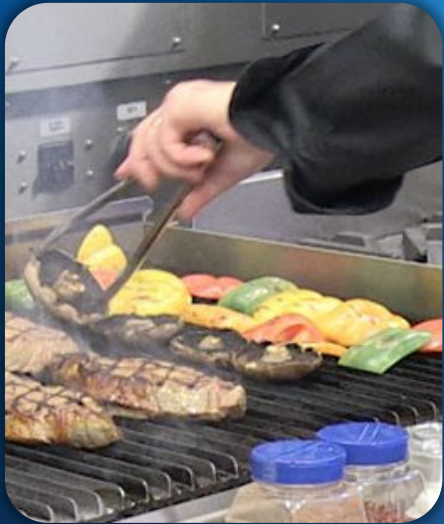
PM2.5 Control Measures in 2016 AQMP

- 2016 AQMP included 10 stationary source control measures, but only 3 had quantified reductions
 - Staff is re-assessing technical and economical feasibility of these measures in the new PM2.5 plan

2016 AQMP Control Measure	Title	Committed Adoption Year	Implementation Period	2025 Emission Reductions (tpd)
BCM-01	Further Emission Reductions from Commercial Cooking	2018	2025 as an attainment contingency measure	3.3 [PM2.5]
BCM-04	Emission Reductions from Manure Management Strategies	2019	2020	0.2 [NH3]
BCM-10	Emission Reductions from Greenwaste Composting	2019	2020	0.1 [NH3]

Additional Control Concepts Being Considered

- Controls must be implemented by 2030
 - Pursue co-benefits of the 2022 AQMP control strategy for ozone attainment and identify opportunities for accelerated implementation
 - Preliminary analysis indicates that controls on directly emitted PM_{2.5} and its precursors will be needed in addition to NO_x controls



EPA's Proposal to Strengthen PM Standard

- In January, U.S. EPA proposed to strengthen the annual PM_{2.5} standard from its current level of 12.0 $\mu\text{g}/\text{m}^3$ to within the range of 9.0 to 10.0 $\mu\text{g}/\text{m}^3$
 - If U.S. EPA adopts a new standard, South Coast AQMD will need to develop a new plan to achieve these lower levels within 18 months of designation
- Controls proposed in the current plan under development for the 12 $\mu\text{g}/\text{m}^3$ standard are expected to be challenging, but necessary
 - Reducing emissions to attain the 12 $\mu\text{g}/\text{m}^3$ standard will assist with attainment of the new standard
 - Significant additional reductions beyond those in this plan would be required to attain the new standard in the proposed range

SIP Development Public Process

Summer/Fall
2023

- AQMP & STMPR Advisory Group Meetings

Fall 2023

- Regional Workshops
- CEQA Scoping Meeting

Spring 2024

- Regional Public Hearings

Spring 2024

- Public Hearing for South Coast AQMD Board adoption

Summer 2024

- Public Hearing for CARB adoption and submittal to EPA

Summary

- Basin is currently in “serious” nonattainment of the 2012 annual PM2.5 standard
- South Coast AQMD withdrew the 2016 AQMP “serious” area plan to avoid disapproval by EPA and allow more time to meet the standard
- New plan will be comprehensive and include controls that go beyond the NOx control strategy in the 2022 AQMP to meet the standard by 2030
- The new plan, scheduled for Board consideration in Spring 2024, includes a robust public process to ensure stakeholder input is considered

AQMP Advisory Group Membership

Item #4

AQMP Advisory Group

May 25, 2023

Background

1997

2002

September
2019

September
2023

South Coast AQMD adopted charters for six Advisory Groups to provide advice and recommendations to the Board

South Coast AQMD adopted the Blue Ribbon Panel recommendations regarding the Advisory Council and Advisory Groups

South Coast AQMD appointed 2022 AQMP Advisory Group members for a 4 year term

AQMP Advisory Group membership expires and must be renewed subject to Board approval

AQMP Advisory Group Charter Overview

- The advisory group reviews the overall aspects of a draft air quality management plan and makes recommendations concerning emission inventories, modeling, control measures, and socioeconomic impacts
- Currently, there are 70 primary and 34 alternate members drawn from a cross-section of the community representing businesses, local governments, ethnic interests, environmental groups, and government agencies
 - Members appointed by the Governing Board
- Chair of the Board or designee serves as the chair of the advisory group
 - Deputy Executive Officer of Planning Divisions traditionally serves as chair of advisory group
- Reports to the Stationary Source Committee
- All Advisory Group meetings are open to the public and are subject to the Brown Act

Membership Roster

➤ South Coast AQMD will update the AQMP Advisory Group membership and seek renewal by September 2023 (*recommendations to August Stationary Source Committee*)

➤ South Coast AQMD is seeking input and suggestions from Advisory Group members

➤ Additions and changes to membership are subject to Board approval

Request Changes to Roster

Please address requests or other relevant information to:



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Please submit all requests no later than June 30, 2023