

A large, faint watermark of the EPA logo is centered in the background. It features a stylized flower with three leaves and a circular head, surrounded by the text "UNITED STATES ENVIRONMENTAL PROTECTION AGENCY".

# Network Design

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Air Quality Analysis Office  
EPA Region 9

2019 ARB PQAQ Training Workshop  
June 4, 2019

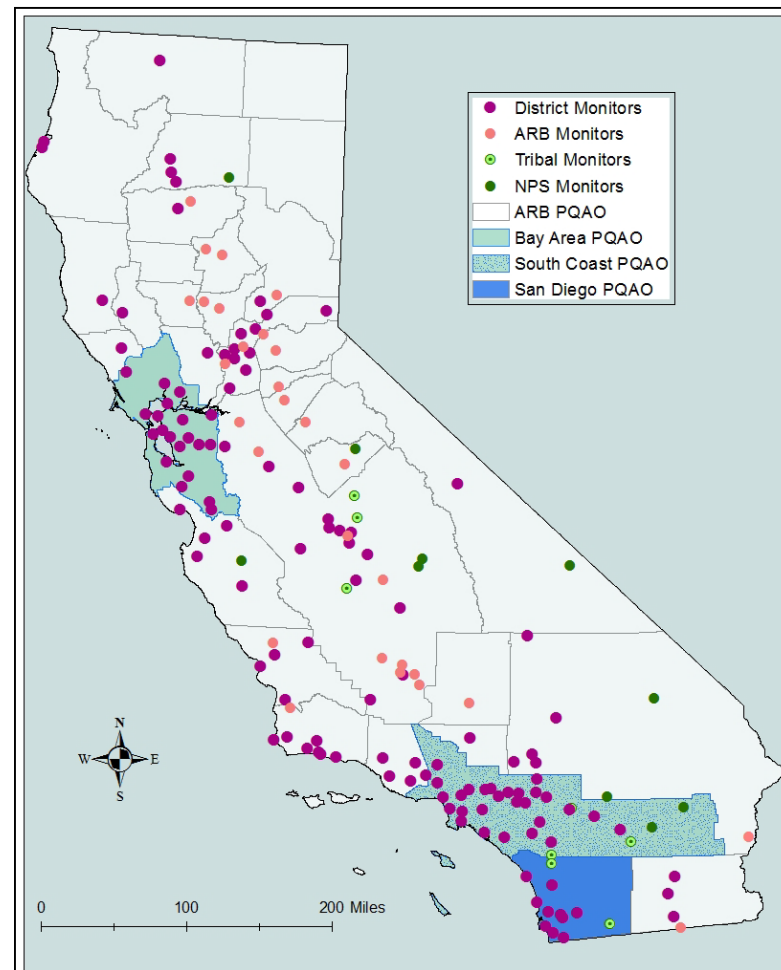
A photograph of the Colosseum in Rome, Italy, taken during sunset. The sun is low on the left side of the frame, creating a bright lens flare and casting long shadows. The sky is a mix of blue and orange, with wispy clouds. The Colosseum's iconic tiered arches are clearly visible, and the foreground shows a paved walkway and some greenery.

**Rome  
(and your monitoring  
network)  
Wasn't Built in a Day**

# Talk Outline



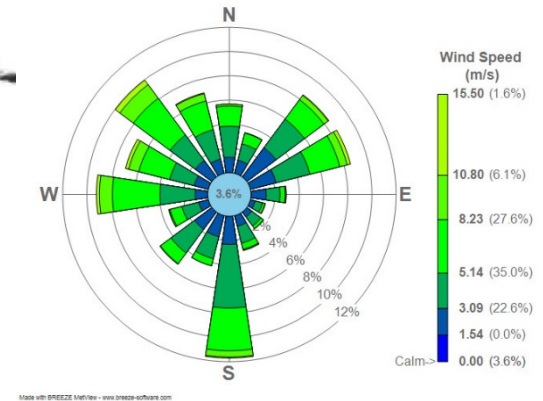
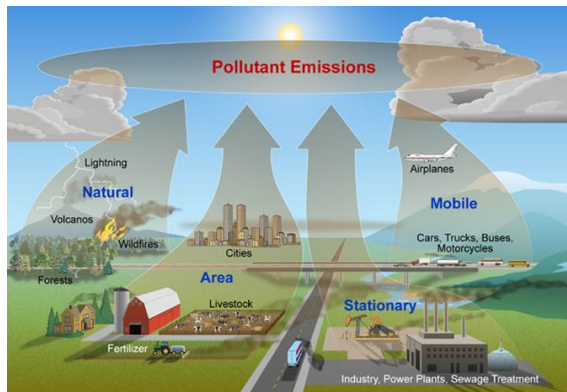
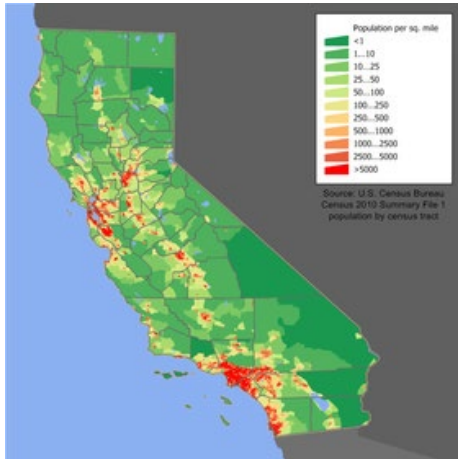
- Balancing Resources/Priorities
- Annual Network Plans and Network Assessments
- Minimum Monitoring Requirements
- Making Network Changes and Considerations
- Sensors/Non-regulatory Monitoring



Sources: EPA (2016), TANA (2006).

CA Ozone Network

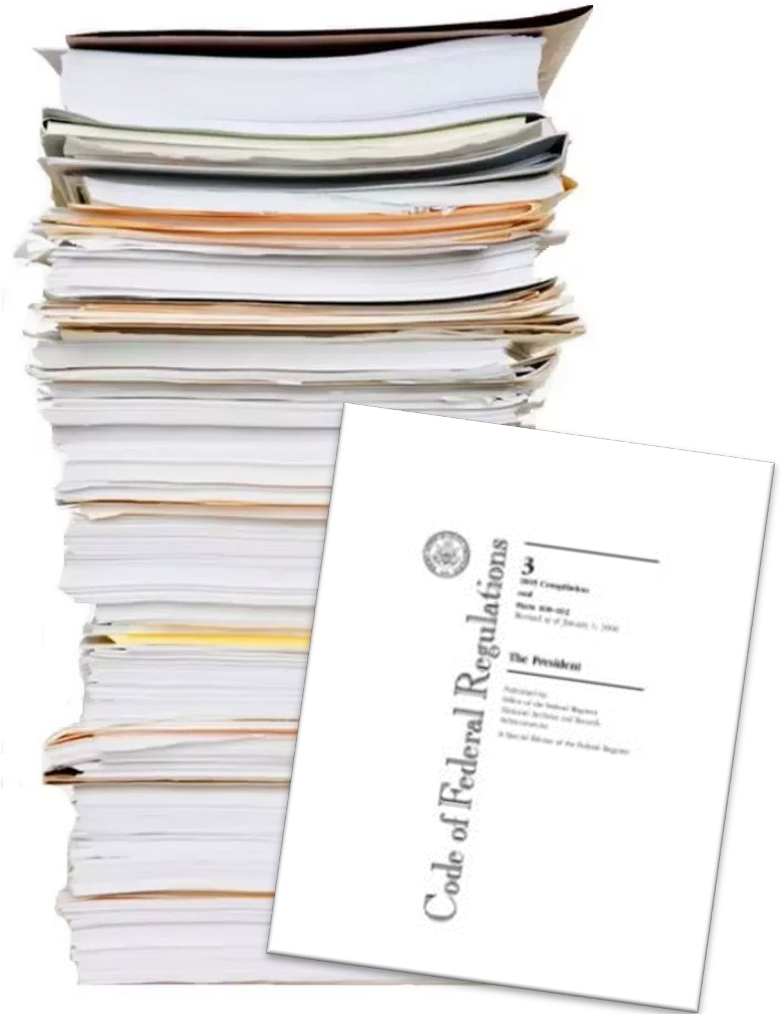
# Balancing Resources and Priorities



# Federal Monitoring Requirements



- 40 CFR part 58: Ambient Air Quality Surveillance
- 40 CFR part 58, Appendix D: Network Design Criteria
- 40 CFR part 58, Appendix E: Probe and Monitor Path Siting
- **40 CFR 58.10: Annual Monitoring Network Plans and Network Assessments**

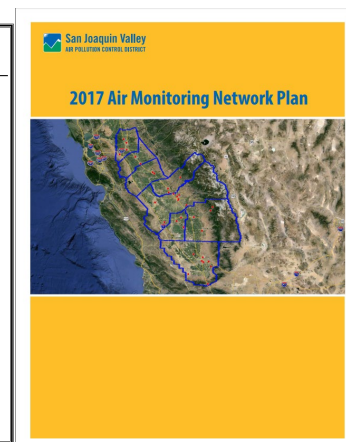
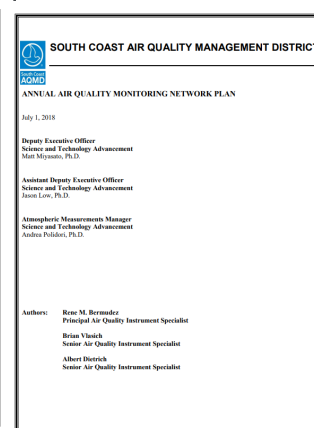
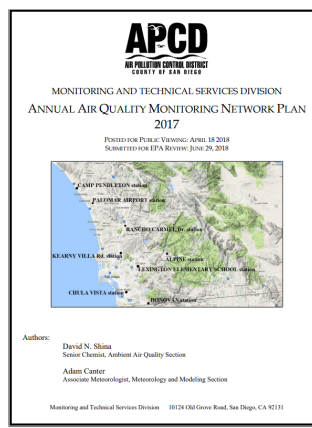
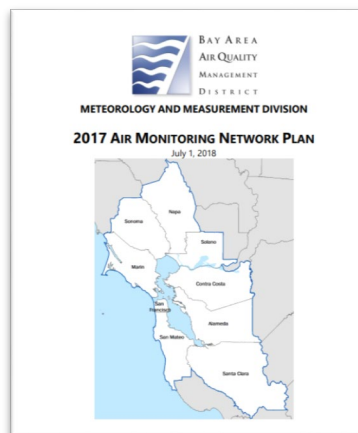
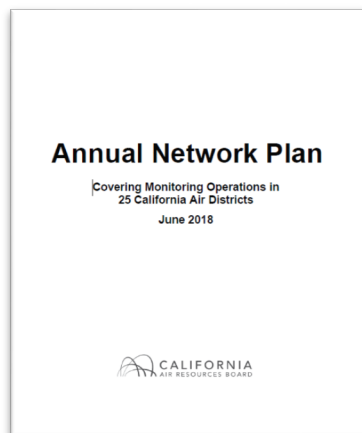


# Annual Network Plans (ANPs)



- Due July 1<sup>st</sup> each year
- Requires coordination and communication between monitoring agencies, EPA, and the public
- ANP's typically include site lists, photographs, satellite maps, EPA approval letters, details about network changes, public and EPA comments, and data analyses
- EPA posts all the final plans here:

<https://www.epa.gov/amtic/state-and-local-monitoring-plans>



# EPA R9 ANP Review



- Minimum CFR network requirements
- System Modifications: Monitor/Site Shutdowns, New sites, Relocations
- Sampling frequency changes
- Continuous PM<sub>2.5</sub> FEM monitors are reporting as NAAQS compliant
- SO<sub>2</sub> Data Requirements Rule
- 40 NO<sub>2</sub> monitors - susceptible and vulnerable (S/V) populations
- Resource saving opportunities or additional monitoring needs



**C. ANNUAL MONITORING NETWORK PLAN CHECKLIST**  
(Updated June 28, 2018)

Year: \_\_\_\_\_  
Agency: \_\_\_\_\_

40 CFR 58.10(a)(1) requires that each Annual Network Plan (ANP) shall provide for the documentation of the establishment and maintenance of an air quality surveillance system that consists of a network of SLAMS monitoring stations that can include FRM, FEM, and ARM monitors that are part of SLAMS, NCore, CSN, PAMS, and SPM stations.

40 CFR 58.10(a)(1) further directs that, "The plan shall include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D, and E of this part, where applicable. The Regional Administrator may require additional information in support of this statement." On this basis, review of the ANPs is based on the requirements listed in 58.10 along with those in Appendices A, C, D, and E.

EPA Region 9 will not take action to approve or disapprove any item for which Part 58 grants approval authority to the Administrator rather than the Regional Administrators, but we will do a check to see if the required information is included and correct. The items requiring approval by the Administrator are: NCore, and Speciation (STN/CSN).

Please note that this checklist summarizes many of the requirements of 40 CFR Part 58, but does not substitute for those requirements, nor do its contents provide a binding determination of compliance with those requirements. The checklist is subject to revision in the future and we welcome comments on its contents and structure.

Key:

White	meets the requirement
Yellow	requirement is not met, or information is insufficient to make a determination. Action requested in next year's plan or outside the ANP process (items listed in Enclosure A).
Green	item requires attention in order to improve next year's plan (items listed in Enclosure B).

# ANPs vs Network Assessments



Element	Annual Network Plan	Network Assessment
<b>Frequency</b>	Annually	5-years (2015, 2020)
<b>EPA Approval &amp; Public Comment Requirement</b>	Yes (for changes)	Network assessment submitted as part of ANP by following year (e.g., 2021)
<b>Specified Content Requirements</b>	Extensive	Minimal (new technologies, susceptible communities, etc.)
<b>Applicability period</b>	Relatively short - 18 months (see 58.10(b)(5))	Long – expected to be very forward looking



# Minimum Monitoring Requirements



## Example: PM<sub>10</sub> Minimum Monitoring Requirements

Metropolitan Statistical Area Population	High Concentration (exceeds NAAQS by ≥20%)	Medium Concentration (≥80% of NAAQS)	Low Concentration (<80% of NAAQS)
>1 million	6-10 sites	4-8 sites	2-4 sites
500,000 - 1 million	4-8 sites	2-4 sites	1-2 sites
250,000 –	3-4 sites	1-2 sites	0-1 sites
		0-1 sites	0 sites

MSA: Sacramento-Roseville-Arden Arcade

Population: 2,324, 884

High Concentration: 149 (µg/m<sup>3</sup>)

- ≥80% of NAAQS



4-8

# Minimum Monitoring Requirements



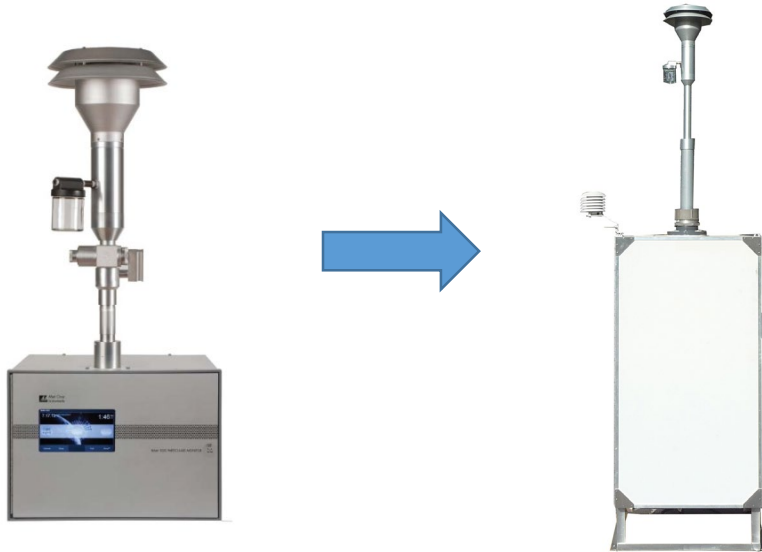
## Why Go Beyond Min Mon Requirements?

≥85% of 2017 ozone NAAQS*	Number of SLAMS required	SLAMS in MSA
Yes	2	2
Yes	2	2
Yes	1	1
Yes	1	2
Yes	2	6
Yes	1	1
Yes	2	3
Yes	2	7



- Planning Actions
- Community Needs
- Emergency Monitoring
- Other Fed Rqmts

# Network Changes

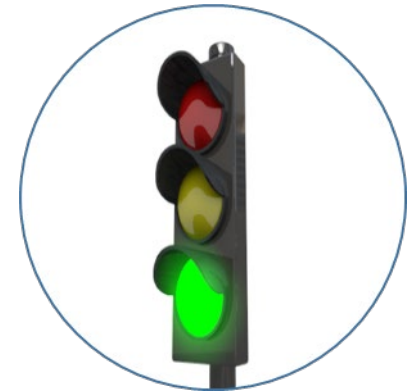


What needs to be considered before a change?

# Network Changes

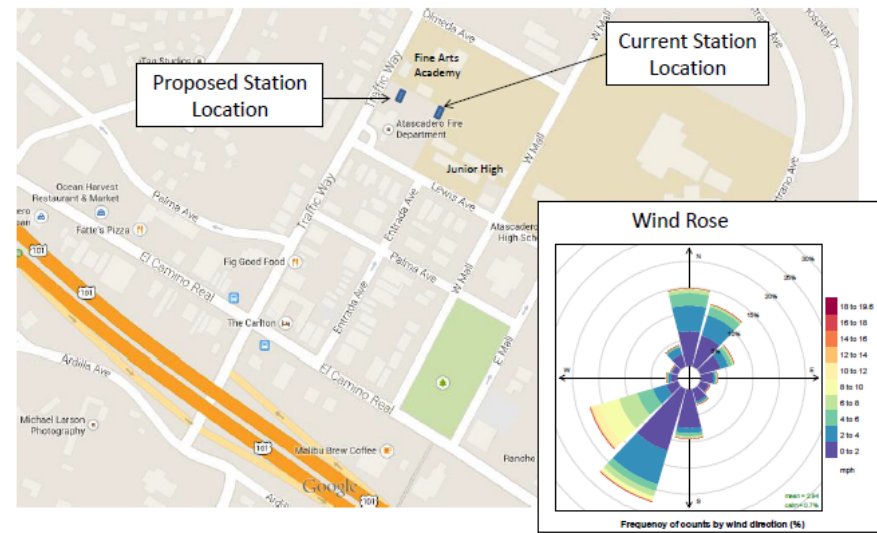


- Motivation
- Resources/Support Needed
- Data Considerations: use, submission, certification
- Minimum Monitoring Requirements
- Collocation requirements
- Training for new instrumentation
- EPA approval required
- CARB (AQPSD and MLD) notification and collaboration – PQAO Liaisons!



## Example: Shutdown or Relocation?

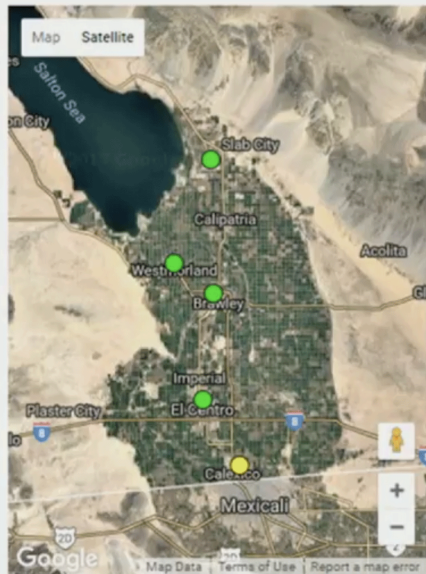
- Attainment or maintenance plan requirements?
- Probability of exceeding 80% of NAAQS in the next 3 years?
- Appendix D requirements?
- Max concentration site?
- Min. monitoring requirements?
- Collocation requirements?
- Attainment in the last 5 years?



# Non-Regulatory Monitoring



## Wildfire/Emergency Response Monitoring

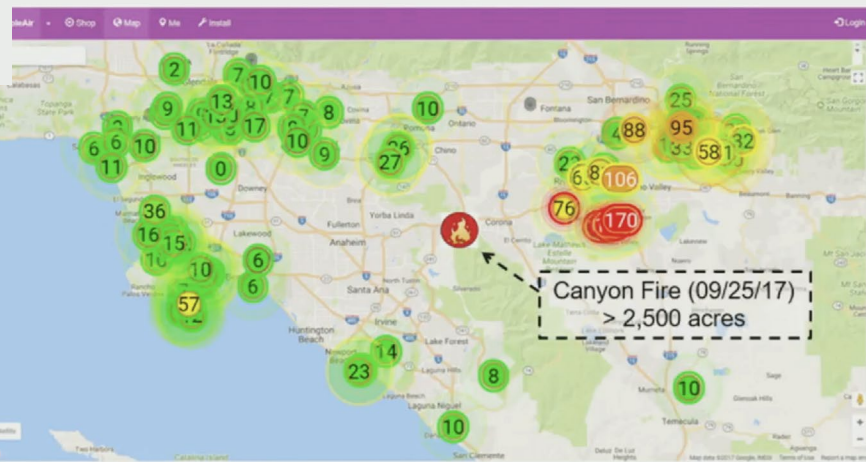


Regulatory monitors



IVAN AIR monitors

### AQ-SPEC – Current Activities PM Sensor Network (Wildfire Event)



Note: Values are reported as AQI units

## Community Monitoring

# EPA Sensors Guidance



- Regulatory-grade data is required for basis of NAAQS decisions
- Sensors not expected to be used for regulatory decisions
- Non-regulatory (i.e. secondary) data has been used to:
  - **Inform boundaries for nonattainment areas**
  - **Support additional monitoring in areas of concern**
  - **Provide supporting evidence for exceptional event demonstrations**
- Guidance being discussed to clarify appropriate uses of 2<sup>nd</sup>ary sensor data (EPA Performance Standard Workshops)



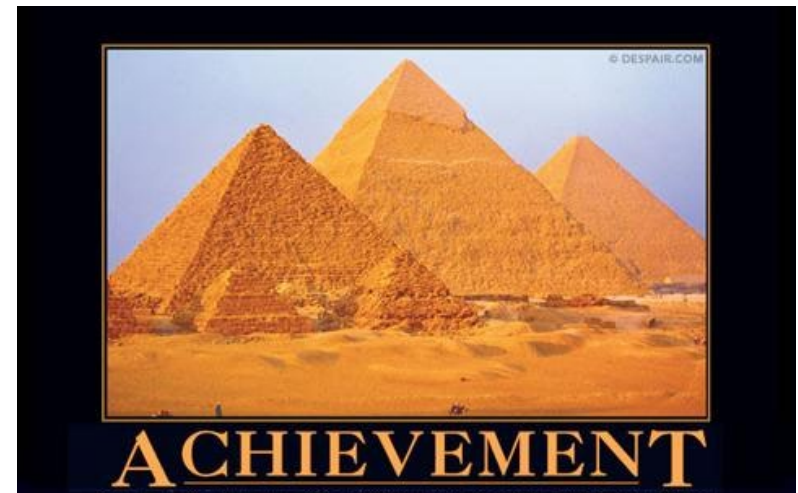
# Thanks!



## Breakout Session

### Network Design: Real World Exercises

Tuesday June 4, 1:30-2:10pm



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