Draft 2021 CARB Annual Network Plan

Public Workshop
June 16, 2021

Overview

- Types of monitoring networks in California
- Regulatory Monitoring Network
- Annual Network Plan and requirements

  The CARB Annual Network Plan (ANP) covers the criteria pollutant monitoring networks of 25 districts within the CARB Primary Quality Assurance Organization (PQAO)

Logistics

- Draft 2021 ANP and presentation available on-line

  Annual Monitoring Network Report | California Air Resources Board

- *Please submit your official comments by 6/25/2021 at 5:00 PM*

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- Problems during presentation

  Email Jenette Kwong at jenette.kwong@arb.ca.gov

Types of Monitoring Networks in California

- **Regulatory (criteria pollutants)**
  - Ground-level ozone (O_3)
  - Carbon monoxide (CO)
  - Nitrogen dioxide (NO_2)
  - Particulate matter ($PM_{2.5}$ and PM_{10})
  - Sulfur dioxide (SO_2)
  - Lead (Pb)
- Toxic air contaminants
- Greenhouse gas emissions (e.g., CO_2, CH_4, and N_2O)
- Community-scale

Regulatory Monitoring Network

Regulatory Monitoring Network

- Criteria pollutant monitoring
- Over 250 sites in California
- Operated by CARB, Districts, Tribes, and Federal Agencies
- Monitors audited by MLD on annual or semi-annual basis
- Network Plans submitted on an annual basis to EPA
- Network Assessments submitted on a 5-year basis to EPA

Regulatory Monitoring Objectives

40 CFR 58, Appendix D

- Support compliance with state and federal standards
- Provide air quality data to the general public
- Support air quality research

Regulatory Monitoring Stations

- Types of monitoring stations
  - ✓ State and Local Air Monitoring Station (SLAMS)
  - ✓ National Core Network (NCore)
  - ✓ Photochemical Assessment Monitoring Station (PAMS)
  - ✓ PM Chemical Speciation Network(CSN)
  - ✓ Special Purpose Monitor (SPM)
  - ✓ Interagency Monitoring of Protected Visual Environments (IMPROVE)
  - ✓ Clean Air Status and Trends Network (CASTNET)
- Types of regulatory monitors
  - ✓ Federal Reference Method (FRM)
  - ✓ Federal Equivalent Method (FEM)

Appendix C to Part 58—Ambient Air Quality Monitoring Methodology
National Air Quality Monitoring Program Fact Sheets:
www3.epa.gov/ttnamti1/files/ambient/pm25/qa/vol2appa.doc

Annual Monitoring Network Plan

Annual Monitoring Network Plan (ANP)

- Annual network plan
- Content of CARB annual network plan
- Federal minimum monitoring requirements
- Detailed site information
- Ozone and $PM_{2.5}$ waiver requests

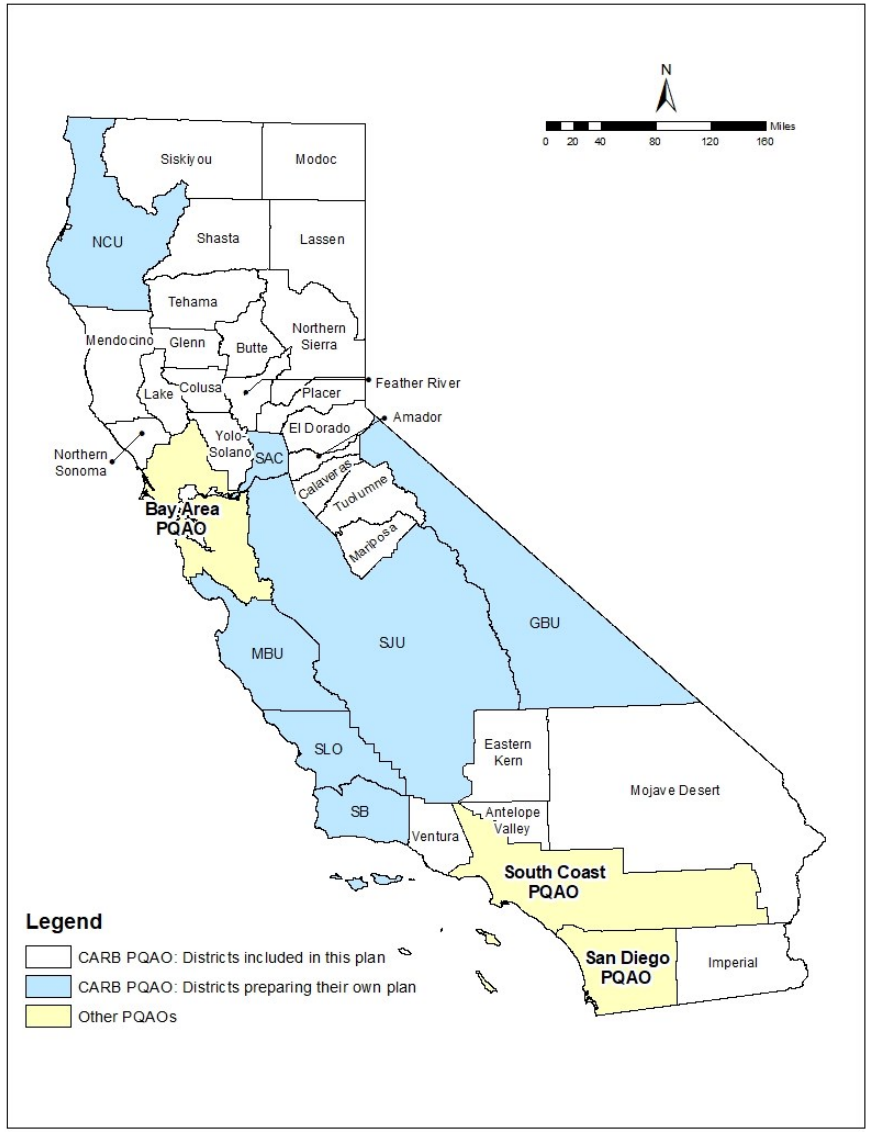
Annual Network Plan Requirements

- Required under federal regulations – submitted to the U.S. EPA by July 1st of each year
- 40 CFR 58.10: Annual Monitoring Network Plan and periodic network assessment

  "The plan shall include a statement of whether the operation of each monitor meets the requirements of appendices A, D, and E of this part, where applicable."

- 40 CFR 58, Appendix A: audits; collocation
- 40 CFR 58, Appendix D: Network Design Criteria
- 40 CFR 58, Appendix E: Probe and Monitor Path Siting Criteria
- It is more of a documentation tool than a planning tool.

Areas Covered in the CARB ANP



- CARB PQAO
  - ✓ 25 Districts Included in the CARB ANP

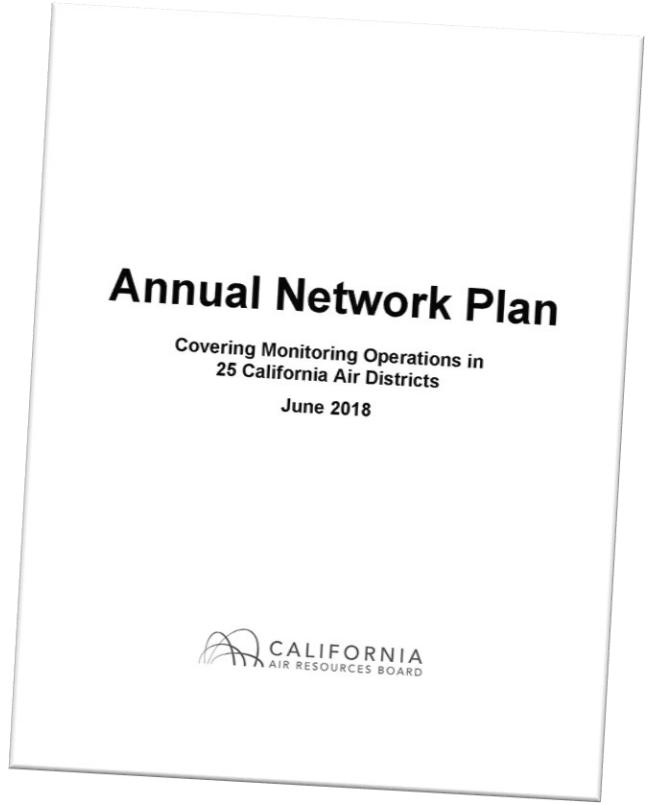
    Amador County, Antelope Valley, Butte County, Calaveras County, Colusa County, Eastern Kern, El Dorado County, Feather River, Glenn County, Imperial County, Lake County, Lassen County, Mariposa County, Mendocino County, Modoc County, Mojave Desert, Northern Sierra, Northern Sonoma County, Placer County, Shasta County, Siskiyou County, Tehama County, Tuolumne County, Ventura County, Yolo-Solano
  - ✓ 7 Districts Drafting Their Own ANP

    Great Basin, Monterey Bay, North Coast, Sacramento, San Joaquin Valley, San Luis Obispo County, Santa Barbara
- 3 Other PQAOs

  Bay Area, South Coast, San Diego

What is in the CARB ANP?

- Federal requirements
  - Minimum monitoring requirements
  - Quality assurance requirements
  - Particulate Matter collocation requirements
- Site information
  - Detailed information on each monitor
  - Recently implemented and proposed changes
  - Supporting documents
- Ozone and $PM_{2.5}$ waiver requests
- Public Comments and CARB Responses



Federal Minimum Monitoring Requirements

- Each pollutant requires a minimum number of monitors based upon certain criteria

Pollutant	Minimum Monitor Criteria
Ozone, PM_{10} and $PM_{2.5}$	MSA Population, Design Value Concentration
NO_2	MSA Population
Near Road NO_2	MSA Population, Annual Average Daily Traffic
SO_2	MSA Population, SO_2 Emissions (tons/year)
Pb	Pb Emissions (NEI)

Federal Minimum Monitoring Requirements: Example: Ozone Minimum Monitoring Requirements

Metropolitan Statistical Area population	3-year design value concentrations ≥85% of any Ozone NAAQS	3-year design value concentrations <85% of any Ozone NAAQS
>10 million	4	2
4 – 10 million	3	1
350,000 – <4 million	2	1
50,000 – <350,000	1	0

- MSA: Sacramento-Roseville-Arden Arcade
- Population: 2,149,127
- Design Value: 0.081 ppm
- Design Value = 116 percent of 0.070 ppm NAAQS

HOW MANY MONITORS ARE REQUIRED?

2

Federal Minimum Monitoring Requirements: Example: $PM_{2.5}$ Minimum Monitoring Requirements

Population	DV exceeds ≥ 85% of any NAAQS	DV exceeds < 85% of any NAAQS
> 1 million	3 sites	2 sites
500,000 – 1 million	2 sites	1 sites
50,000 – <500,000	1 sites	0 sites

- MSA: Bakersfield
- Population: 839,361
- Design Value: 64 µg/m³ (24-hour) and 17.6 µg/m³ (Annual)
- Design Value = 183% (24-hour) and 147% (Annual)

HOW MANY MONITORS ARE REQUIRED?

2

Minimum Monitoring Requirements

- Need more than minimum monitoring requirements?

  - ✓ State and Federal planning
  - ✓ Community needs
  - ✓ Emergency monitoring
  - ✓ Other Federal requirements
    - Highest concentration site
    - Background site
    - Transport site

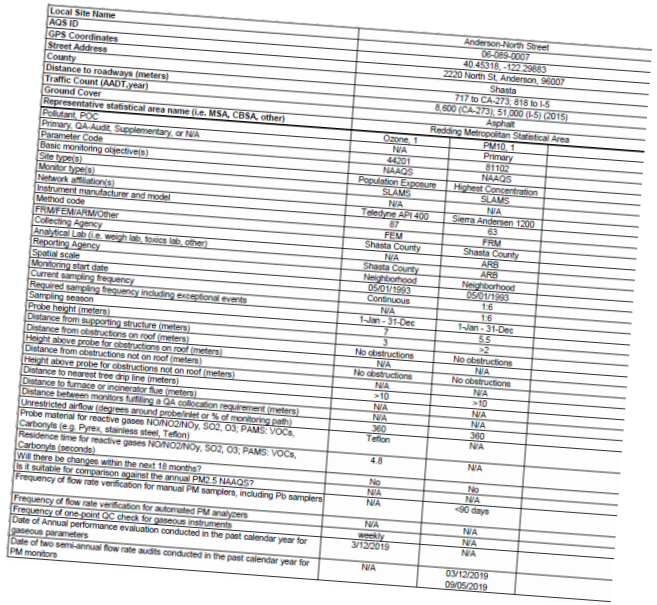
Exceptional Events and PM_{10} Minimum monitoring Requirement

- ✓ MSA: Oxnard-Thousand Oaks-Ventura
- ✓ County: Ventura
- ✓ Population:823,318

Year	Max Concentration (% of NAAQS)	Required Sites	Active Sites
2020	200 ug/m^3 (133%)	4-8	2

- Monitoring data generally cannot be excluded for monitoring requirements
- Footnotes indicating data might be impacted by Exceptional Event (wildfire activity)
- Air agencies may consult with their EPA Regional office regarding unique situation

Detailed Site Information



Local Site Name	Anderson-North Street		
AQS ID	06-089-0007		
GPS Coordinates	40.45318, -122.29883		
Street Address	2220 North St, Anderson, 96007		
County	Shasta		
Distance to roadways (meters)	717 to CA-273; 818 to I-5		
Traffic Count (AADT,year)	8,600 (CA-273); 51,000 (I-5) (2015)		
Ground Cover	Asphalt		
Representative statistical area name (i.e. MSA, CBSA, other)	Redding Metropolitan Statistical Area		
Primary, QA-Audit, Supplementary, or N/A	Ozone, 1	PM10, 1	
Parameter Code	N/A	Primary	
Basic monitoring objective(s)	44201	81102	
Site type(s)	NAAQS	NAAQS	
Monitor type(s)	Population Exposure	Highest Concentration	
Network affiliation(s)	SLAMS	SLAMS	
Instrument manufacturer and model	N/A	N/A	
Method code	Teledyne API 400	Sierra Andersen 1200	
FRM/FEM/ARM/Other	87	83	
Collecting Agency	FEM	FRM	
Analytical Lab (i.e. weigh lab, toxics lab, other)	Shasta County	Shasta County	
Reporting Agency	N/A	ARB	
Spatial scale	Shasta County	ARB	
Monitoring start date	Neighborhood	Neighborhood	
Current sampling frequency	06/01/1993	05/01/1993	
Required sampling frequency including exceptional events	Continuous	1.6	
Sampling season	N/A	1-Jan - 31-Dec	
Probe height (meters)	1-Jan - 31-Dec	1.6	
Distance from supporting structure (meters)	7	1-Jan - 31-Dec	
Distance from obstructions on roof (meters)	3	5.5	
Height above probe for obstructions on roof (meters)	No obstructions	2	
Distance from obstructions not on roof (meters)	N/A	No obstructions	
Height above probe for obstructions not on roof (meters)	No obstructions	N/A	
Distance to nearest tree drip line (meters)	N/A	No obstructions	
Distance to furnace or incinerator flue (meters)	>10	N/A	
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	>10	
Unrestricted airflow (degrees around probe/inlet or % of monitoring path)	N/A	N/A	
Probe material for reactive gases NO/NO2/NOy, SO2, O3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	360	N/A	
Residence time for reactive gases NO/NO2/NOy, SO2, O3; PAMS: VOCs, Carbonyls (seconds)	Teflon	360	
Will there be changes within the next 18 months?	4.8	N/A	
Is it suitable for comparison against the annual PM2.5 NAAQS?	No	No	
Frequency of flow rate verification for manual PM samplers, including Pb samplers	N/A	N/A	
Frequency of flow rate verification for automated PM analyzers	N/A	<90 days	
Frequency of one-point QC check for gaseous instruments	weekly	N/A	
Date of Annual performance evaluation conducted in the past calendar year for gaseous parameters	3/12/2019	N/A	
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors	N/A	03/12/2019 09/05/2019	

Detailed Site Information (Cont'd)

Pollutant, POC	Ozone, 1	PM10, 1
Primary, QA-Audit, Supplementary, or N/A	N/A	Primary
Parameter Code	44201	81102
Basic monitoring objective(s)	NAAQS	NAAQS
Site type(s)	Population Exposure	Highest Concentration
Monitor type(s)	SLAMS	SLAMS
Network affiliation(s)	N/A	N/A
Instrument manufacturer and model	Teledyne API 400	Sierra Andersen 1200
Method code	87	63
FRM/FEM/ARM/Other	FEM	FRM
Collecting Agency	Shasta County	Shasta County
Analytical Lab (i.e. weigh lab, toxics lab, other)	N/A	CARB
Reporting Agency	Shasta County	CARB
Spatial scale	Neighborhood	Neighborhood
Monitoring start date	05/01/1993	05/01/1993
Current sampling frequency	Continuous	1:6
Required sampling frequency including exceptional events	N/A	1:6
Sampling season	1-Jan - 31-Dec	1-Jan - 31-Dec

Detailed Site Information (Cont'd)

Pollutant, POC	Ozone, 1	PM10, 1
Probe height (meters)	7	5.5
Distance from supporting structure (meters)	3	>2
Distance from obstructions on roof (meters)	No obstructions	No obstructions
Height above probe for obstructions on roof (meters)	N/A	N/A
Distance from obstructions not on roof (meters)	No obstructions	No obstructions
Height above probe for obstructions not on roof (meters)	N/A	N/A
Distance to nearest tree drip line (meters)	>10	>10
Distance to furnace or incinerator flue (meters)	N/A	N/A
Distance between monitors fulfilling a QA collocation requirement (meters)	N/A	N/A
Unrestricted airflow (degrees around probe/inlet or % of monitoring path)	360	360
Probe material for reactive gases NO/NO2/NOy, SO2, O3; PAMS: VOCs, Carbonyls (e.g. Pyrex, stainless steel, Teflon)	Teflon	N/A
Residence time for reactive gases NO/NO2/NOy, SO2, O3; PAMS: VOCs, Carbonyls (seconds)	5.0	N/A
Will there be changes within the next 18 months?	No	No
Is it suitable for comparison against the annual PM2.5 NAAQS?	N/A	N/A
Frequency of flow rate verification for manual PM samplers, including Pb samplers	N/A	<90 days
Frequency of flow rate verification for automated PM analyzers	N/A	N/A
Frequency of one-point QC check for gaseous instruments	weekly	N/A
Date of Annual performance evaluation conducted in the past calendar year for gaseous parameters	3/13/2018	N/A
Date of two semi-annual flow rate audits conducted in the past calendar year for PM monitors	N/A	4/12/2018 9/25/2018

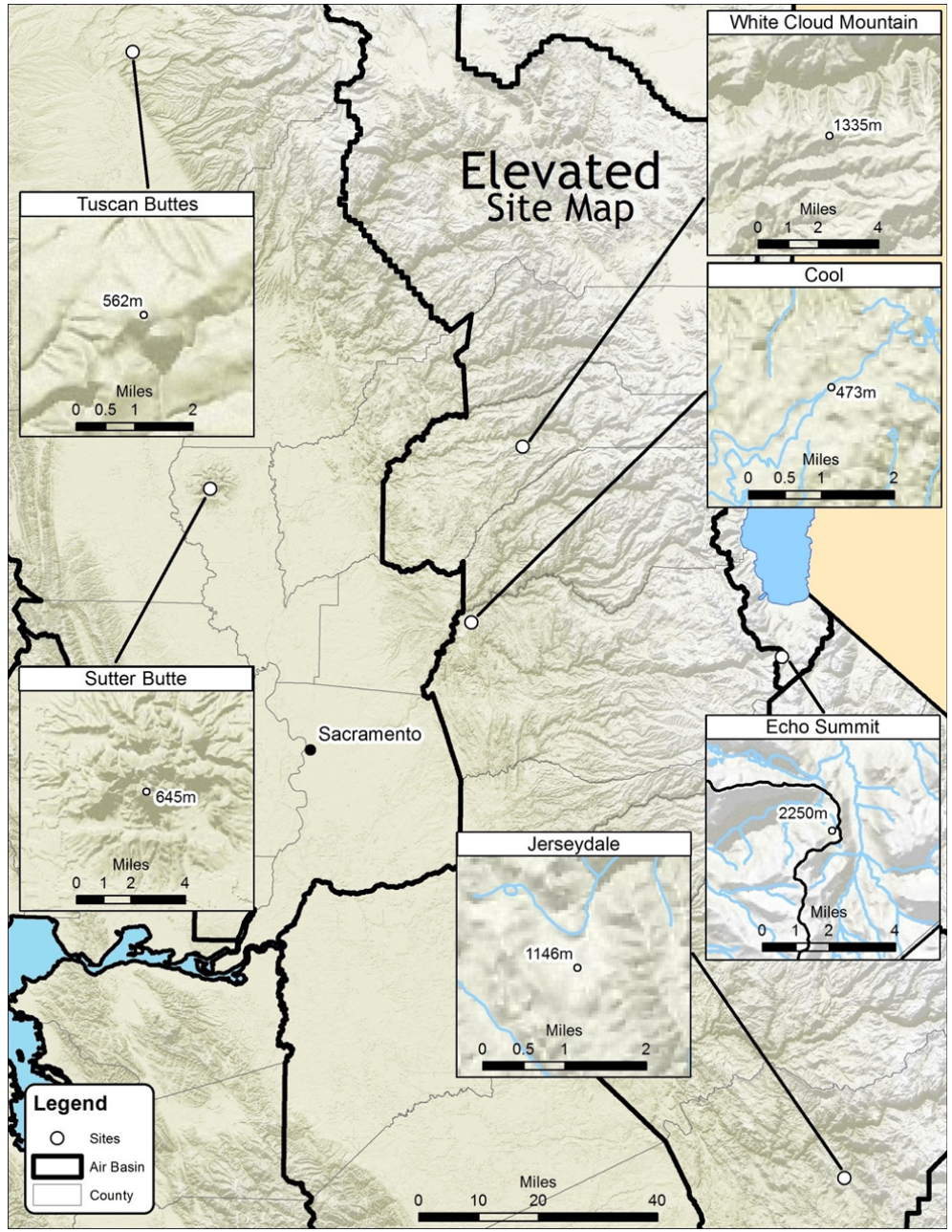
Proposed and Recently Implemented Monitoring Site Changes (examples)

District	Site (AQS ID)	Comment
Butte County APCD	Paradise-Theater (060072002)	CARB is planning to consolidate the two Paradise monitoring stations to a single new location due to the potential demolition of the Theater building. The new site will be located at 5913 Clark Road. Lease negotiations are underway.
	Paradise-Airport (060070007)	
Northern Sonoma County APCD	Healdsburg-Airport (060971003)	The ozone monitor was shut down in June 2020 and the shut-down was approved by U.S. EPA.
Yolo-Solano AQMD	Woodland (061131003)	District has switched the $PM_{2.5}$ FRM to $PM_{2.5}$ FEM on January 1, 2021; this change does not require EPA approval.

Ozone Seasonal Monitoring Waiver Request

- Six seasonal monitoring sites:

  Echo Summit, Cool, Jerseydale,
  White Cloud Mountain,
  Sutter Buttes, Tuscan Butte
- April – October
- Justification:
  - ✓ O_3 concentrations are significantly lower in the early spring and late fall months
  - ✓ Located in remote, mountainous area
  - ✓ Winter weather conditions



Waiver Request for1-in-6 Day PM2.5 Monitoring

- Manual PM2.5 monitors: 1-in-3 day schedule
- 1-in-6 day PM2.5 Sites

Site	County	Required Collocated Site
Lakeport	Lake	No
Woodland	Yolo	No

- Justification
  - ✓ concentrations have historically been below the PM2.5 NAAQS
  - ✓ not part of any PM2.5 nonattainment areas or given a Clean Data Determination effective August 14, 2013

Contact Information

Please submit any written comments by
6/25/2021 at 5:00 PM

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THANK YOU!