2022 Annual Network Plan

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On the Cover: The newly built shelter for Folsom Air Monitoring Station being hoisted into place on 9/24/2019

Contents

List of Abbreviations and Acronyms

Abbreviation	Definition
µg/m3	Microgram per cubic meter
AAC Lab	Atmospheric Analysis and Consulting, Inc.
AADT	Annual average daily traffic
AGL	Above ground level
ANP	Annual Network Plan
AQI	Air Quality Index
AQS	Air Quality System
ARM	Approved regional monitor
BAM	Beta attenuation monitor
CAP III	California Alternative Plan III
CARB	California Air Resources Board
CBSA	Core-based Statistical Area
CFR	Code of Federal Regulation
CO	Carbon monoxide
CSN	Chemical Speciation Network
District	Sacramento Metropolitan Air Quality Management District
DV	Design Value
EMP	Enhanced Monitoring Plan
ERG	Eastern Research Group, Inc.
FEM	Federal equivalent method
FR	Federal Register
FRM	Federal reference method
m	Meter(s)
MSA	Metropolitan Statistical Area
NAAQS	National Ambient Air Quality Standards
NCore	National Core Multiple-pollutant Monitoring Stations
NEI	National Emission Inventory
NMHC	Non-methane hydrocarbon
NO_2	Nitrogen dioxide
NOX	Oxides of nitrogen
NOY	Reactive Oxides of Nitrogen
O_3	Ozone
PAMS	Photochemical Assessment Monitoring Station
Pb	Lead
PM	Particulate matter
PM_{10}	Particulate matter, 10 micrometers or smaller
$PM_{2.5}$	Particulate matter, 2.5 micrometers or smaller
PM_{COARSE}	Particulate matter, between 10 and 2.5 micrometers
ppb	Parts per billion
ppm	Parts per million
PQAO	Primary quality assurance organization
PWEI	Population weighted emission index
QA	Quality assurance
QC	Quality control

RASS	Radio acoustic sounding system
RTI	Research Triangle Institute
RWP	Radar wind profiler
Sac Metro Air District	Sacramento Metropolitan Air Quality Management District
SACDOT	Sacramento County Department of Transportation
SASS	Speciated air sampling system
SCC	Sacramento City Code
SIP	State Implementation Plan
SLAMS	State and local air monitoring stations
SO_2	Sulfur dioxide
SPM	Special purpose monitor
STN	Speciation Trends Network
TAPI	Teledyne Advanced Pollution Instrumentation
TEI	Thermo Environmental Instruments
U.S. EPA	United States Environmental Protection Agency
VOC	Volatile organic compound
VSCC	Very sharp cut cyclone

Section 1 Introduction

State and local agencies that conduct ambient air monitoring for regulatory purposes are required by Title 40, Code of Federal Regulations (40 CFR), Section 58.10 to submit an Annual Network Plan (ANP) to the United States Environmental Protection Agency (U.S. EPA) no later than July 1st of each year. The report must contain specific monitoring network information and must be presented for a 30-day public review period prior to submittal to the U.S. EPA. This ANP covers the time period: January 1, 2021 – December 31, 2021. It focuses on the monitors that operate within Sacramento County, which is a part of Sacramento-Arden Arcade-Roseville Metropolitan Statistical Area (Sacramento MSA).

The primary purpose of this ANP is to document the existing Sacramento County air monitoring network and to discuss proposed changes in the ambient air monitoring network that may occur within 18 months following the submittal of this report. The plan includes information on monitors that are a part of State and Local Air Monitoring Stations (SLAMS) network, National Core Multi-Pollutant Monitoring Stations (NCore), Chemical Speciation Network (CSN), Speciation Trends Network (STN), Special Purpose Monitor (SPM) sites, and Photochemical Assessment Monitoring Station (PAMS) network. The plan states whether each monitor in the ambient air monitoring network meets the requirements of 40 CFR Part 58, including Appendix A, C, D, and E, where applicable. 40 CFR Part 58, Appendix B, does not apply to the District's monitoring network because the District does not operate any air monitors regulated by Appendix B, which pertains only to Prevention of Significant Deterioration monitors. This report includes Federal Reference Method (FRM) and Federal Equivalent Method (FEM).

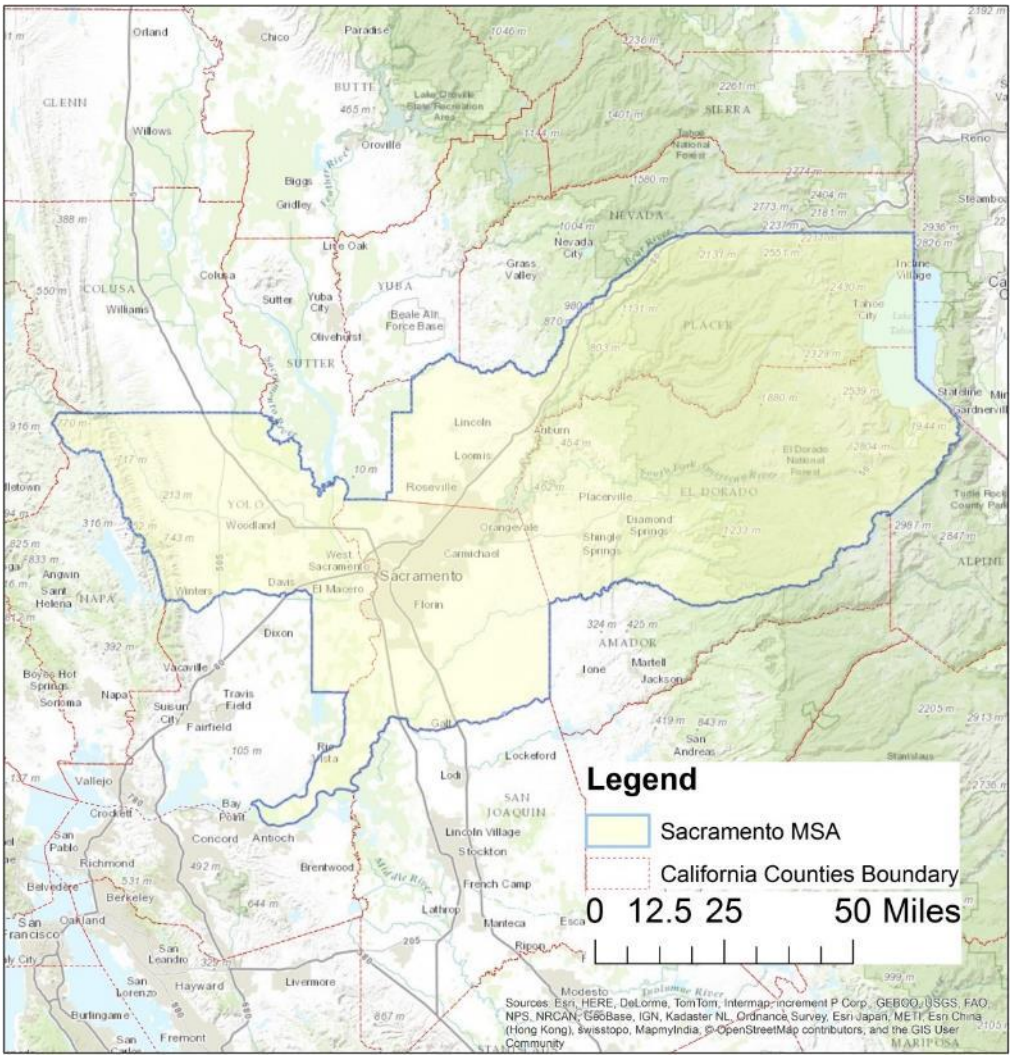
This report is not an extensive analysis of the design of the local air monitoring network. The extensive analysis of the air monitoring network is provided in a network assessment report, which is required every five years. The network assessment report analyzes and determines if the air monitoring network meets the monitoring objectives as defined in 40 CFR Part 58, Appendix D. It also provides recommendations to determine "whether new sites are needed, whether existing sites are no longer needed and can be terminated, and whether new technologies are appropriate for incorporation into the ambient air monitoring network" (40 CFR Section 58.10). The most recent five-year network assessment report (5YNA), 2015 Air Monitoring Network Assessment, was completed and submitted to U.S. EPA Region 9 on April 22, 2016. The report is available on the District's website at http://www.airquality.org/Air-Quality-Health/Air-Monitoring. The District is currently drafting the next Air Monitoring Network Assessment. The report will be posted on the District's website once completed.

Any shared monitoring responsibilities between the District and neighboring monitoring organizations in the Sacramento MSA are discussed in Section 3, Minimum Monitoring Requirements. For details on monitors in neighboring counties within the Sacramento MSA, please refer to the latest Annual Monitoring Network Plan published by California Air Resources Board (CARB).

Section 2 Network Operations

Sac Metro Air District is the local air quality regulatory and monitoring organization with jurisdiction in Sacramento County, California. Sacramento County is located in the middle of California's Central Valley and is a part of the Sacramento-Arden Arcade-Roseville Metropolitan Statistical Area. Sacramento MSA also includes Placer, El Dorado and Yolo Counties. Sacramento MSA has an estimated population of 2.4 million, including 1.59 million in Sacramento County[1]. Figure 2-1 shows a map of Sacramento MSA.

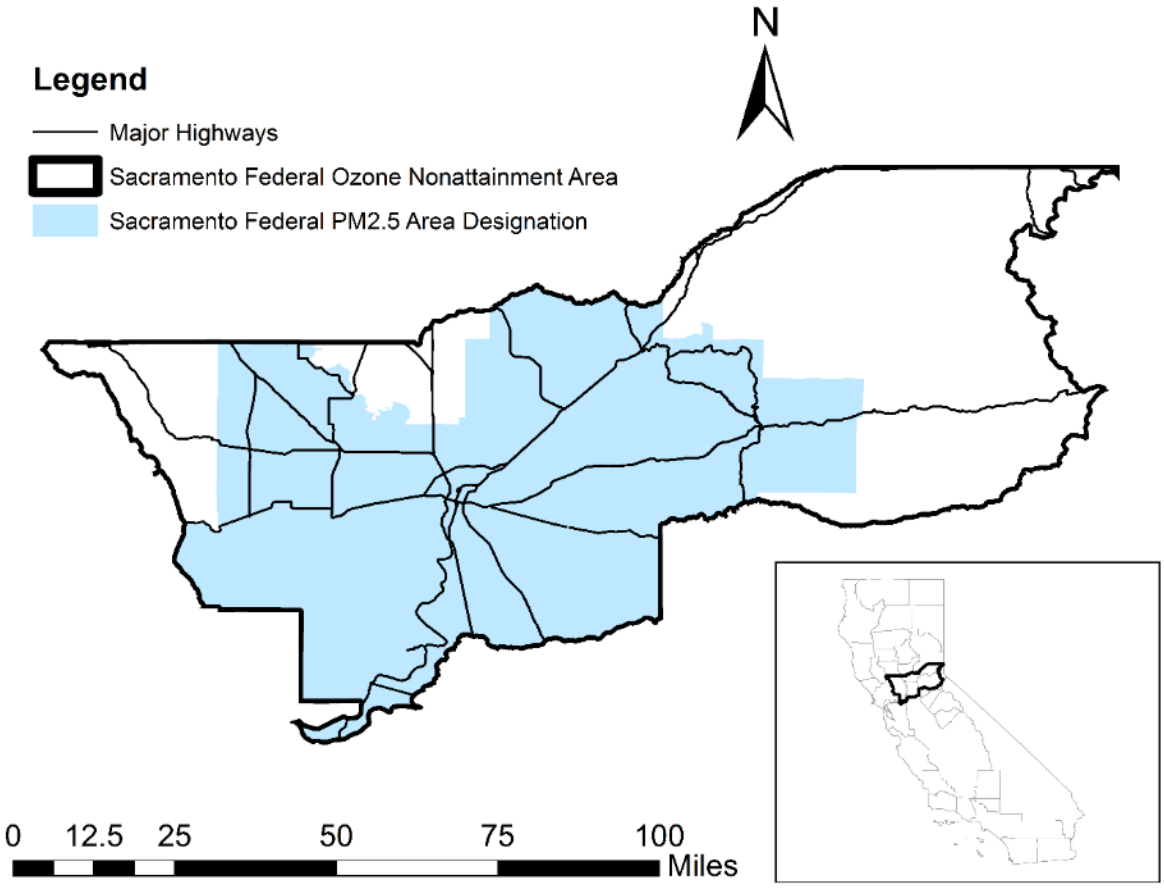
Figure 2-1 Counties within Sacramento-Arden Arcade-Roseville, California, MSA



[1] United States Census Bureau, QuickFacts, 2020 Population Estimates (accessed 22 Mar 2022)

A portion of the Sacramento MSA is a nonattainment area for the federal 2015 8-hr ozone (O_3) standard and is referred to as the Sacramento Federal Ozone Nonattainment Area[2]. This area includes all of Sacramento and Yolo Counties and portions of Placer, El Dorado, Solano, and Sutter Counties. The Sacramento region was also designated as nonattainment for the 2006 24-hour particulate matter with size of 2.5 microns or smaller ($PM_{2.5}$) standard (Figure 2-2). The region met the 2006 24-hour $PM_{2.5}$ standard in 2015 (82 FR 21711) and will continue to reduce $PM_{2.5}$ levels through various programs and strategies. Sacramento County has met the particulate matter with size of 10 microns or smaller (PM_{10}) air quality standard since 2002[3]. Sacramento County is designated as attainment for the most recent federal health standards for carbon monoxide (CO), nitrogen dioxide (NO_2), and sulfur dioxide (SO_2). U.S. EPA has designated Sacramento County as unclassifiable/attainment for the 2008 federal lead (Pb) standard[4].

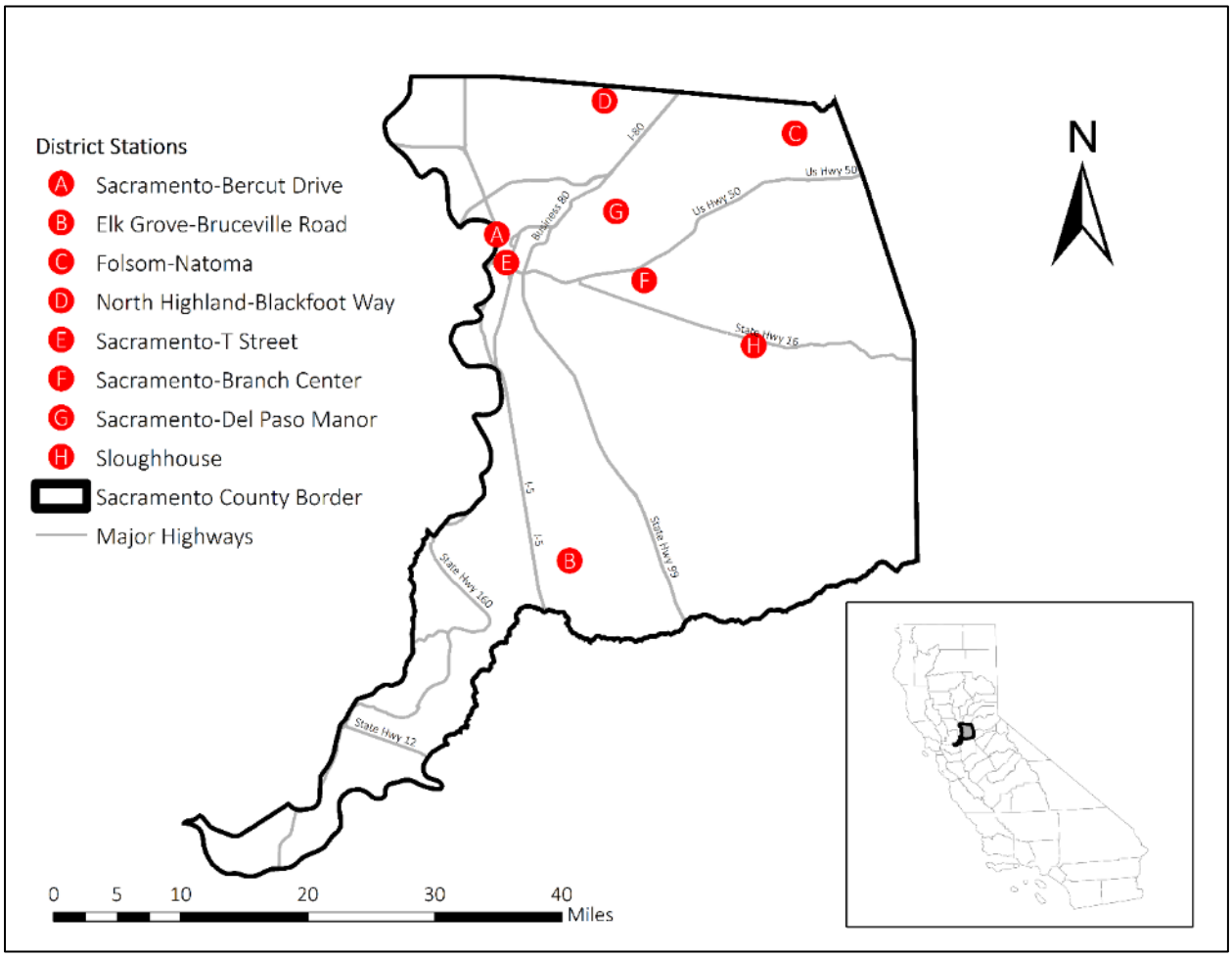
Figure 2-2 Sacramento Federal O_3 and $PM_{2.5}$ Nonattainment Area



[2] https://www.epa.gov/sites/production/files/2018-04/documents/placeholder.pdf
[3] The 2018 Camp Fire and numerous wildfires in 2020 and 2021 caused PM_{10} exceedances, the District is submitting to U.S. EPA an exceptional event demonstration to exclude the data from air quality standard comparison
[4] https://www.epa.gov/lead-designations/lead-designations-final-nonattainment-designations-rounds-1-and-2; 70 FR 72097

Sac Metro Air District operates seven air monitoring sites within Sacramento County. CARB operates the eighth site at the Sacramento-T Street location. Figure 2-3 provides the location of air monitoring sites in Sacramento County. Sac Metro Air District monitors all criteria air pollutants[6], except lead, which was discontinued in 2020 with U.S. EPA approval. The District also monitors for non-criteria air pollutants and meteorological parameters. Table 2-1 through Table 2-3 list the criteria pollutants, non-criteria pollutants and meteorological parameters measured at each station located in Sacramento County. Each monitoring instrument is categorized by a monitor type: SLAMS or SPM. A SLAMS monitor may be further sub-divided into one or more network affiliations (e.g. PAMS, NCore, near-road, CSN STN). Unless otherwise noted, all monitors listed in Table 2-1 through Table 2-3 are SLAMS monitor type. Each of the tables are color coded to identify network affiliations, if any.

Figure 2-3 Air Monitoring Sites in Sacramento County



[6] O_3, CO, NO_2, SO_2, $PM_{2.5}$, PM_{10}

Table 2-1 Criteria Pollutants Measured by Stations

Station Name	O_3	CO	NO_2	SO_2	Pb	PM_{10} (Hourly)	PM_{10} (24-hr)	$PM_{2.5}$ (Hourly)	$PM_{2.5}$ (24-hr)
Sacramento-Bercut Dr.		✓	✓						✓
Sacramento-Branch Center #2							✓		
Elk Grove-Bruceville	✓		✓					✓	
Sacramento-Del Paso Manor	✓	✓	✓	✓			✓	✓	✓
Folsom-Natoma St.	✓		✓					✓	
North Highlands-Blackfoot Way	✓		✓				✓		
Sloughhouse	✓							✓	
Sacramento-T Street	✓		✓			✓		✓	✓

Note: All monitors are part of the SLAMS federal air quality surveillance network unless noted otherwise

Special purpose monitor ([SPM] not part of SLAMS)

No affiliation or not applicable

Near Road

Photochemical Assessment Monitoring Station (PAMS)

National Core Multi-pollutant Monitoring Stations (NCORE)

Multiple affiliation types (Includes SLAMS, PAMS & NCORE)

Table 2-2 Non-Criteria Pollutants Measured by Stations

Station Name	Reactive Nitrogen Compound (NO_Y)	Non-methane hydrocarbon (NMHC)	Volatile Organic Compound (VOC)	Carbonyl	$PM_{10-2.5}$	Speciated $PM_{2.5}$	Black Carbon (BC)
Sacramento-Bercut Dr.							✓
Sacramento-Branch Center #2							
Elk Grove-Bruceville		✓(A)	✓(B)				
Sacramento-Del Paso Manor	✓	✓(A)	✓	✓	✓	✓	✓
Folsom-Natoma St.	✓(B)	✓(A)	✓(B)				
North Highlands-Blackfoot Way							
Sloughhouse							
Sacramento-T Street						✓	

Note: All monitors are part of the SLAMS federal air quality surveillance network unless noted otherwise

(A) These monitors are on a temporary shutdown due to instrument malfunction and are being replaced

(B) These monitors have pending discontinuation, see Section 4 for proposed changes to the air monitoring network

Special purpose monitor ([SPM] not part of SLAMS)

No affiliation or not applicable

Near Road

Photochemical Assessment Monitoring Station (PAMS)

National Core Multi-pollutant Monitoring Stations (NCORE)

Carbon Speciation Network (CSN)

Multiple affiliation types (Includes SLAMS, NCORE and CSN)

Table 2-3 Meteorology Measured by Stations

Station Name	Outdoor Tempera-ture	Relative Humidity	Solar Radiation	Ultraviolet Radiation	Barometric Pressure	Precipita-tion	Wind Di-rection & Speed	Ceilometer
Sacramento-Bercut Dr.	✓						✓	
Sacramento-Branch Center #2								
Elk Grove-Bruceville	✓	✓	✓	✓	✓	✓	✓	✓
Sacramento-Del Paso Manor	✓	✓	✓				✓	
Folsom-Natoma St.	✓	✓	✓				✓	
North Highlands-Blackfoot Way								
Sloughhouse							✓(A)	
Sacramento-T Street	✓(A)	✓(A)					✓(A)	

Note: All monitors are part of the SLAMS federal air quality surveillance network unless noted otherwise

(A) "Other" monitor type (not part of SLAMS)

No affiliation or not applicable

Near Road

Photochemical Assessment Monitoring Station (PAMS)

National Core Multi-Pollutant Monitoring Stations (NCORE)

Multiple affiliation types (includes SLAMS, PAMS and NCORE)

The primary focus of the current ambient air monitoring network is the data collection of criteria pollutants. The data collected from the air monitoring stations supports State Implementation Plan (SIP) development, attainment/nonattainment decisions, public notification, and air quality modeling and research efforts. The network is designed to meet three basic monitoring objectives as required by 40 CFR Part 58, Appendix D: (1) provide air pollution data to the general public in a timely manner; (2) support compliance with ambient quality standards and emissions strategy development; and (3) support air pollution research studies. An overview of monitoring objectives is in Table 2-4.

Table 2-4 Monitoring Objectives of Criteria Pollutants

Station Name	O_3	CO	NO_2	SO_2	Pb	PM_{10} (Hourly)	PM_{10} (24-hr)	$PM_{2.5}$ (Hourly)	$PM_{2.5}$ (24-hr)
Sacramento-Bercut Dr.		N,P,R	N,P,R						N,P,R
Sacramento-Branch Center #2							N,P		
Elk Grove-Bruceville	N,P		N,P					P	
Sacramento-Del Paso Manor	N,P,R	N,P,R	N,P,R	N,P,R			N,P,R[(A)]	P,R	N,P,R
Folsom-Natoma St.	N,P		N,P					N,P,R	
North Highlands-Blackfoot Way	N,R		N,R				N,P		
Sloughhouse	N,P							N,P,R	
Sacramento-T Street	N,P		N,P			N,P		N,P	N,P

[(A)] There are three PM_{10} monitors at Sacramento-Del Paso Manor; the primary monitor for NAAQS comparison and its collocated (audit) monitor with parameter code 88102 have objectives of N and P; the last PM_{10} monitor with parameter code 85101, used in the calculation of Particulate Matter with size between 10 and 2.5 micrometers (PMCoarse), has objectives of P and R.

Monitoring objective abbreviation:
N – National Ambient Air Quality Standards (NAAQS) Comparison
P – Public Info
R – Research

There are different types of monitoring sites to support these monitoring objectives. Examples of these are: sites that are located in highest pollutant concentration area, sites that are located in areas of high population density to monitor for population exposure, sites that determine general background concentration levels, etc. A list of different types of monitoring sites is listed in 40 CFR Part 58, Appendix D. In addition, a spatial scale of representative is assigned to the air monitors to identify “the link between general monitoring objectives, sites types and the physical location of a particular monitor” (40 CFR Part 58, Appendix D). Table 2-5 summarize the site type and spatial scale. Description and further explanation on site type and spatial scale can be found in 40 CFR Part 58, Appendix D.

For in-depth details on individual monitors, see Appendix A, which documents the monitor type, affiliation, monitoring objectives, type of site, and spatial scale by each monitor. It also provides a statement of purpose and pollutant specific information, such as whether a $PM_{2.5}$ monitor is suitable for comparison to the national ambient air quality standard, 1-point quality control (QC) check frequency and distance to other PM monitors. All monitors operated in the District’s ambient air monitoring network meet the requirements of 40 CFR Part 58, including Appendices A, C, D, and E.

Table 2-5 Type of Site and Spatial Scale

Site	Pollutant	Site Type	Spatial Scale
			Micro / Neighbor-hood / Urban / Not Applicable
Sacramento-Bercut Dr.	CO	Source Oriented	
	NO_2	Source Oriented	
	$PM_{2.5}$	Source Oriented	
	BC	Source Oriented	
Sacramento-Branch Center #2	PM_{10}	Highest Concentration	
Elk Grove-Bruceville	O_3	Upwind/Background	
	NO_2	Upwind/Background	
	$PM_{2.5}$	General/Background	
Sacramento-Del Paso Manor	O_3	Population Exposure	
	CO	Population Exposure	
	NO_2	Population Exposure	
	SO_2	Population Exposure	
	Pb	(Monitor discontinued in May 2020)	
	PM_{10}	Population Exposure	
	$PM_{2.5}$	Population Exposure, Highest Concentration	
	BC	Population Exposure	
Folsom-Natoma St.	O_3	Maximum Ozone, Population Exposure	
	NO_2	Highest Concentration	
	$PM_{2.5}$	Population Exposure	
North Highlands-Blackfoot Way	O_3	Population Exposure	
	CO	(Monitor discontinued in May 2020)	
	NO_2	Population Exposure	
	PM_{10}	Population Exposure	
Sloughhouse	O_3	Maximum Ozone	
	$PM_{2.5}$	Upwind/background	
Sacramento-T Street	O_3	Upwind/background	
	NO_2	Population Exposure	
	PM_{10}	Population Exposure	
	$PM_{2.5}$	Population Exposure	

Section 3 Minimum Monitoring Requirements

Section 3.1 General

The minimum number of monitoring sites required for each pollutant is based on one or more applicable factors, as described in 40 CFR Part 58, Appendix D. Examples of these factors include: MSA population, core-based statistical area (CBSA) population, pollutant design value, pollutant maximum concentration, attainment status, annual average daily traffic (AADT), SIP, maintenance plan, population weighted emission index (PWEI), and U.S. EPA's national emission inventory (NEI) data.

Sacramento MSA meets or exceeds minimum monitoring requirement for all criteria pollutants – O_3, $PM_{2.5}$ (manual and continuous methods), PM_{10}, NO_2, SO_2, CO, and Pb. Details of the monitors representing Sacramento MSA (or CBSA, ID#40900) are provided in Tables 3-1 and 3-2. As mentioned in Section 2, Sacramento MSA has 2.4 million residents and covers all El Dorado, Placer, Sacramento, and Yolo Counties.

Sac Metro Air District has an agreement with CARB to share specific portions of the monitoring responsibility in the Sacramento MSA. A copy of this agreement is available upon request. Placer County Air Pollution Control District, the air quality agency for Placer County, and Yolo-Solano Air Quality Management District, the air quality agency for Yolo County, also operate air monitoring stations within the Sacramento MSA. 0 lists the number of monitors operated by CARB and different air districts in Sacramento MSA.

Table 3-1 2021 Sacramento MSA Design Value and SLAMS Monitoring Site Requirement

Pollutant and Type (if applicable)		Sites Required[A]	Sites in Sacramento MSA	Additional sites needed	Notes[B]
O_3		2	15	0	• 0.082 ppm at Auburn (06-061-0003) with wildfire impact[C]
CO	Near-road	1	1	1	• Sacramento-Bercut Dr. satisfies part of the near-road monitoring requirement • Sacramento-Del Paso satisfies the NCore and CO Maintenance Plan requirements
	Non-near-road	1	1	0	
NO_2	Near-road	1	1	1	• Highest AADT: 249,000 (U.S. Highway 50 east of 15/16th Street)[D] • Sacramento-Del Paso Manor serves as both PAMS and area-wide monitor
	Area-wide	1	6	0	
SO_2		1	1	0	• Total SO_2: 940 tons[E] • Population Weighted Emission Index: 2,256 million persons-tons per year[F] • Sacramento-Del Paso Manor satisfies NCore requirement
$PM_{2.5}$	FRM/FEM	3	8	0	• 24-hr standard: 55 µg/m3 at Auburn (06-061-0003) with wildfire impact [C] • Annual Standard: 11.5 µg/m3 at Sacramento-Bercut (06-067-0015) with wildfire impact [C]
	Continuous	2	10	0	
PM_{10}		2-4[G]	8	0	• Estimated number of exceedance: 3.8 days at West Sacramento (06-113-2001) with wildfire impact [C]
$PM_{10-2.5}$		1	1	0	• Required at the Sacramento-Del Paso Manor as an NCORE requirement
Pb	NCORE	0	0	0	• Monitor discontinued in May 2020
	Source oriented	0	0	0	• No non-airport source greater than 0.5 tons per year or airport source greater than 1.0 tons per year[E]

Source: U.S. EPA Air Quality System (AQS) Raw Data Report (AMP 350) and Design Value Report (AMP 480), accessed on 23 May 2022

Units abbreviation: ppm – part per million; µg/m^3 – microgram per cubic meter

[A] For site requirement information, see 40 CFR Part 58, Appendix D

[B] Design values are included for O_3, $PM_{2.5}$, PM_{10} because it helps to determine the number of sites required

[C] The design values shown in this table include wildfire smoke impact in 2020 and 2021; the District will address these impacts under the Exceptional Event Rule (81 FR 68216) as necessary

[D] California Department of Transportation, 2020 Traffic Volumes, accessed 22 Mar 2022

[E] 2017 National Emission Inventory (updated April 2020), accessed 19 May 2020

[F] Per 40 CFR Part 58, Appendix D, $PWEI = \frac{Total\ SO_2 \times MSA\ population}{1{,}000{,}000}$

[G] According to 40 CFR Part 58, Appendix D, PM_{10} monitoring requirement for the Sacramento MSA is listed to be six to ten monitors instead of two to four. This requirement is based on the highest ambient PM_{10} concentrations in the Sacramento MSA, which exceeded 120% of the NAAQS. Because the highest 2021 ambient concentrations in Sacramento were impacted by wildfire smoke, the District believes its long-standing requirement of two to four monitors is still relevant and meets the needs of its communities. (Two to four monitors are appropriate for areas with a peak concentration less than 80% of NAAQS.) The air districts in Sacramento MSA or CARB currently operate eight PM_{10} monitors in the MSA. The District looks forward to working with U.S EPA, CARB and other local air districts to ensure current and future monitoring level continue to protect health and safety.

Section 3.2 Photochemical Assessment Monitoring Station

The District operated the legacy PAMS network from the late 1900s through 2020. Elk Grove-Bruceville, Sacramento-Del Paso Manor, and Folsom-Natoma St. were the type I, II, III PAMS sites, respectively. The 2015 review of National Ambient Air Quality Standards for Ozone (80 FR 65292) consolidated the PAMS sites to one central location. However, it also required each State to draft an Enhanced Monitoring Plan (EMP) for areas with moderate or higher ozone nonattainment. Since the Sacramento ozone federal nonattainment area is classified as "moderate,"[7] it is required to have enhanced ozone monitoring activities. The District, CARB, and neighboring air districts worked together to determine the appropriate monitoring plan. Details are provided in Enhanced Monitoring Plan portion of the 2020 Monitoring Network Assessment drafted by CARB.

For the purpose of aligning to the new PAMS requirements, Sacramento-Del Paso Manor will be the core PAMS station. Elk Grove-Bruceville Rd. and Folsom-Natoma St. will both serves as enhanced ozone monitoring sites. Table 3-2 lists the instruments the District plans to operate at each PAMS and enhanced monitoring site. Changes needed to realign the PAMS network are as followed:

- The District will request approval from U.S. EPA to discontinue unneeded PAMS parameters that are identified in CARB's Enhanced Monitoring Plan (namely, speciated volatile organic compound [VOC] at Elk Grove-Bruceville Rd. and Folsom-Natoma St. and the reactive oxides of nitrogen at Folsom-Natoma St.).
- To accommodate the large automatic gas chromatography and its support equipment, the District will have to rebuild the PAMS station at Sacramento-Del Paso Manor. Construction work is scheduled to start in 2022 and completed prior to the 2023 PAMS season.
- The District will be submitting a waiver to operate some of the required meteorological instruments (ultraviolet radiation, precipitation, and barometric pressure) at Elk-Bruceville Rd. instead of Sacramento-Del Paso Manor.

Table 3-2 Enhanced PAMS Monitoring

Site Name	O_3	NO_2	VOC	Carbonyl	NMHC(C)	Meteorology	Ceilometer
Elk Grove-Bruceville Rd.	✓	✓	✗(A)		✓(D)	✓(F)	✓
Sacramento-Del Paso Manor	✓	✓	✓(B)	✓	✓(E)	✓(G)	
Folsom-Natoma St.	✓	✓	✗(A)		✓(D)	✓(H)	

(A) VOC at Elk Grove-Bruceville and Folsom-Natoma St. are no longer needed under the enhanced PAMS monitoring plan and will be discontinued
(B) An automatic gas chromatography analyzer (Auto GC) will replace the existing canister sampling system as required under the new PAMS requirements
(C) Non-methane hydrocarbon, a precursor for O_3
(D) The NMHC analyzers at Elk-Grove Bruceville and Folsom Natoma St. are on a temporary shutdown due to instrument malfunction and will be replaced
(E) The NMHC analyzer at Sacramento-Del Paso Manor will be permanently discontinued when the Auto GC enters service and detects NMHC
(F) Surface meteorology at Elk Grove-Bruceville includes: temperature, relative humidity, wind direction and speed, solar radiation, ultraviolet radiation, precipitation, and barometric pressure
(G) Surface meteorology at Sacramento-Del Paso Manor includes: temperature, relative humidity, wind direction and speed, and solar radiation
(H) Surface meteorology at Folsom-Natoma St. includes: temperature, relative humidity, wind direction and speed, and solar radiation

[7] https://www.epa.gov/sites/production/files/2018-04/documents/placeholder.pdf

Section 3.3 Operating Schedule

All instruments operated by the District meet the operating schedule requirements as specified in 40 CFR Section 58.12. All continuous monitors report hourly data and monitor air pollutants year-round, unless otherwise specified in Appendix A. Non-continuous monitors are operated by following the sampling schedule in Table 3-3 and are operated year-round, except: VOC and carbonyl samplers related to PAMS that are operated from July through September.

Table 3-3 Sampling Schedule for PM, Pb, and VOC monitors in Sacramento

Site	Pollutant[A]	Sampling Schedule: Epi-sodic / 1 in 6 days / 1 in 3 days / Daily / Hourly	Note
Sacramento-Bercut Dr	$PM_{2.5}$		A continuous sampler replaced the 24-hr sampler in Dec 2020
Sacramento-Branch Center #2	PM_{10}		Max. 24-hr concentration: 57 µg/m3; ratio to standard: 0.38
Elk Grove-Bruceville	$PM_{2.5}$		Non-FRM/FEM
	VOC		July through September
Sacramento-Del Paso Manor	Pb	(monitor discontinued in May 2020)	
	PM_{10}		Max. 24-hr concentration: 63 µg/m3; ratio to standard: 0.42
	$PM_{10-2.5}$		
	$PM_{2.5}$		In January through March 2021, a continuous FEM monitor operated as the primary $PM_{2.5}$ monitor in lieu of the 24-hr FRM monitor due to the CARB laboratory's COVID-19 related closure
Folsom-Natoma St.	$PM_{2.5}$		
	VOC		July through September
North Highlands - Blackfoot Way	PM_{10}		Max. 24-hr concentration: 54 µg/m3; ratio to standard: 0.36
Sloughhouse	$PM_{2.5}$		
Sacramento-T Street	PM_{10}		
	$PM_{2.5}$		Special Purpose Monitor

Source: Design values from U.S. EPA Air Quality System Design Value Report (AMP 480), accessed on 15 Apr 2020

[A] Operating schedule requirements can be found in 40 CFR Section 58.12

Section 4 Recent and Proposed Modifications to the Network

This section discusses recent and proposed modifications to the Sacramento County air monitoring network. It includes modifications that occurred within the 2021 calendar year and may occur within the next 18 months following this annual network plan submittal. Unless specifically noted below, Sac Metro Air District is not formally requesting approval for modification through this network plan from CARB or U.S EPA. Prior to a network modification, the District will work with the CARB to submit to U.S. EPA the required documentation for official review and approval of proposed system modifications. Sac Metro Air District is a part of the CARB's primary quality assurance organization and works with CARB to ensure air monitoring requirements are met.

Section 4.1 Sacramento-Bercut Dr.

1. Due to the COVID-19 pandemic in December 2020, the $PM_{2.5}$ 24-hr FRM sampler was temporarily suspended because the $PM_{2.5}$ mass analysis laboratory weighing the 24-hr sampling filter had shut down. It was replaced with a continuous $PM_{2.5}$ FEM sampler. The District is making the replacement permanent and will work with U.S. EPA and CARB to discontinue the $PM_{2.5}$ 24-hr FRM sampler.

Section 4.2 Sacramento-Branch Center #2

(No change is anticipated.)

Section 4.3 Elk Grove-Bruceville Rd.

1. As noted in the PAMS Enhanced Monitoring Plan[8], the District will discontinue the speciated VOC episodic measurements at this site. A discontinuation request will be sent to U.S. EPA.
2. The District upgraded the old $PM_{2.5}$ beta attenuation monitor (BAM) monitor with a new one on May 18, 2021. The parameter code for $PM_{2.5}$ will remain unchanged as the new monitor operates as a non-FEM monitor.
3. The District is considering adding a PM_{10} monitor at this site to provide more localized information in the growing southern portion of Sacramento County.

Section 4.4 Sacramento-Del Paso Manor

1. Sacramento-Del Paso Manor was established in the 1970s with a small number of monitoring equipment. The number of equipment has steadily increased due to PAMS and NCore requirements, and the station cannot accommodate any more equipment. Renovation and site expansion are expected to begin in late 2022 and will allow the station to accommodate additional equipment required by PAMS in 40 CFR Part 58, Appendix D. After the station expansion project is completed, the District will replace the existing PAMS VOC canister sampling with a continuous auto gas chromatography (Auto-GC) instrument.
2. The District is evaluating replacing the PM_{10} filter based method to a PM_{10} continuous monitoring at this site. PM_{10} continuous monitoring provides real-time air quality information to the public.
3. Due to the same COVID-19 pandemic situation as noted above under changes to Sacramento-Bercut Dr., a continuous $PM_{2.5}$ FEM sampler was operated in lieu of the 24-hr $PM_{2.5}$ FRM 24-hr sampler. The District will continue to operate a PM2.5 FEM sampler concurrently to the $PM_{2.5}$ FRM sampler. The $PM_{2.5}$ FRM sampler will remain the primary $PM_{2.5}$ sampler.

[8] Provided in California Air Resources Board's 2020 Monitoring Network Assessment

Section 4.5 Folsom-Natoma St.

1. As noted in the PAMS Enhanced Monitoring Plan[9], the District will discontinue the speciated VOC episodic measurements at this site. A discontinuation request will be sent to U.S. EPA.

Section 4.6 North Highlands-Blackfoot Way

1. In late July 2022, the District was given a notice to vacate the area promptly and remove the air monitoring station from the premise. The District notified the U.S. EPA the discontinuation of all monitors at this location. The last day of monitoring operation was July 31, 2022. The District will work with U.S. EPA and CARB to evaluate whether a relocation site is needed.

Section 4.7 Sloughhouse-Sloughhouse Rd.

(No change is anticipated.)

Section 4.8 Near-road site #2

1. 40 CFR Part 58 requires state or local air monitoring organization to operate a second near-road monitoring site if any traffic count in the metropolitan area surpasses 250,000 in annual average daily traffic. As noted in the 2016 Annual Network Plan, Sacramento MSA surpassed the threshold on U.S. Highway 50 east of 15th/16th Street. However, the traffic volume dipped below 250,000 in the latest 2020 traffic count. The District is working with U.S. EPA and CARB to determine the appropriate timing, location, and funding for a second near-road monitoring site.

[9] Provided in California Air Resources Board's 2020 Monitoring Network Assessment

Section 5 Quality Assurance and Other Monitoring Requirements for the PQAO

40 CFR Part 58, Appendix A, requires monitoring activities to satisfy quality assurance criteria. Most of these activities are required and met on a primary quality assurance organization (PQAO) level. Sac Metro Air District is a part of the CARB's PQAO and works with the PQAO to meet the quality assurance requirements. Currently, there are collocated $PM_{2.5}$ FRM and PM_{10} FRM monitors at Sacramento-Del Paso Manor. There is a collocated $PM_{2.5}$ FEM monitor at Folsom-Natoma St. For the aforementioned collocated monitors, the primary monitor and audit monitor use the same U.S. EPA FRM/FEM method designation.

After receiving an approval from U.S. EPA in April 2020, the District has discontinued the Pb monitor at Del Paso Manor in May 2020. Thus, collocation for lead will not be conducted at this location.

40 CFR Part 58, Appendix D, 4.7.3, requires "each State shall install and operate at least one $PM_{2.5}$ site to monitor for regional background and at least one $PM_{2.5}$ site to monitor regional transport." In CARB's 2018 Annual Monitoring Network Report, it identified Point Reyes National Seashore and San Rafael Wilderness sites as the state's regional background sites and Vallejo as the regional transport site for $PM_{2.5}$. Please refer to the CARB's 2018 Annual Monitoring Network Report for updates or more information.

Section 6 Process to Review Changes to $PM_{2.5}$ Monitoring Network

40 CFR Section 58.10(c) requires this annual network plan to "provide for the review of changes to a $PM_{2.5}$ monitoring network that impact the location of a violating $PM_{2.5}$ monitor." There is no current plan to relocate or discontinue any $PM_{2.5}$ monitor suitable for NAAQS comparison. Any changes to the $PM_{2.5}$ monitoring network with impact to the location of a violating $PM_{2.5}$ monitor will be documented in this section of future annual network plans.

Appendix A Detailed Site and Monitor Information

Detailed site information covered in this appendix reflects air monitoring operation from January 1, 2021-December 31, 2021.

Appendix A.1 Sacramento-Bercut Dr.

This is an approved near-road monitoring site. Located one mile from Downtown Sacramento, this site is expected to measure the highest NO_2 concentration due to the emissions from mobile sources on Interstate 5, which is about 20 meters (m) from the site. The site started operation on October 13, 2015.

Table A-1 Sacramento-Bercut Dr. Metadata

Site Name	Sacramento-Bercut Dr.
AQS Site Number	06-067-0015
Geographic Coordinates	38.593328°N, 121.503728°W
Location	On the downwind side of Interstate 5, one mile north-northwest of Downtown Sacramento
Address	100 Bercut Dr., Sacramento, CA 95811
County	Sacramento
Metropolitan Statistical Area	Sacramento-Arden Arcade-Roseville
Distance from Roadway	Interstate 5: 20 m Bercut Dr.: 5 m
Annual Average Daily Traffic (Vehicles/Day)	Interstate 5: 202,000 (California Department of Transportation, 2019) Bercut Dr. at Bannon St.: 3,575 (City of Sacramento, 2019)
Ground Cover	Pavement, with vegetation

Figure A-1 Sacramento-Bercut Dr. Site Photo

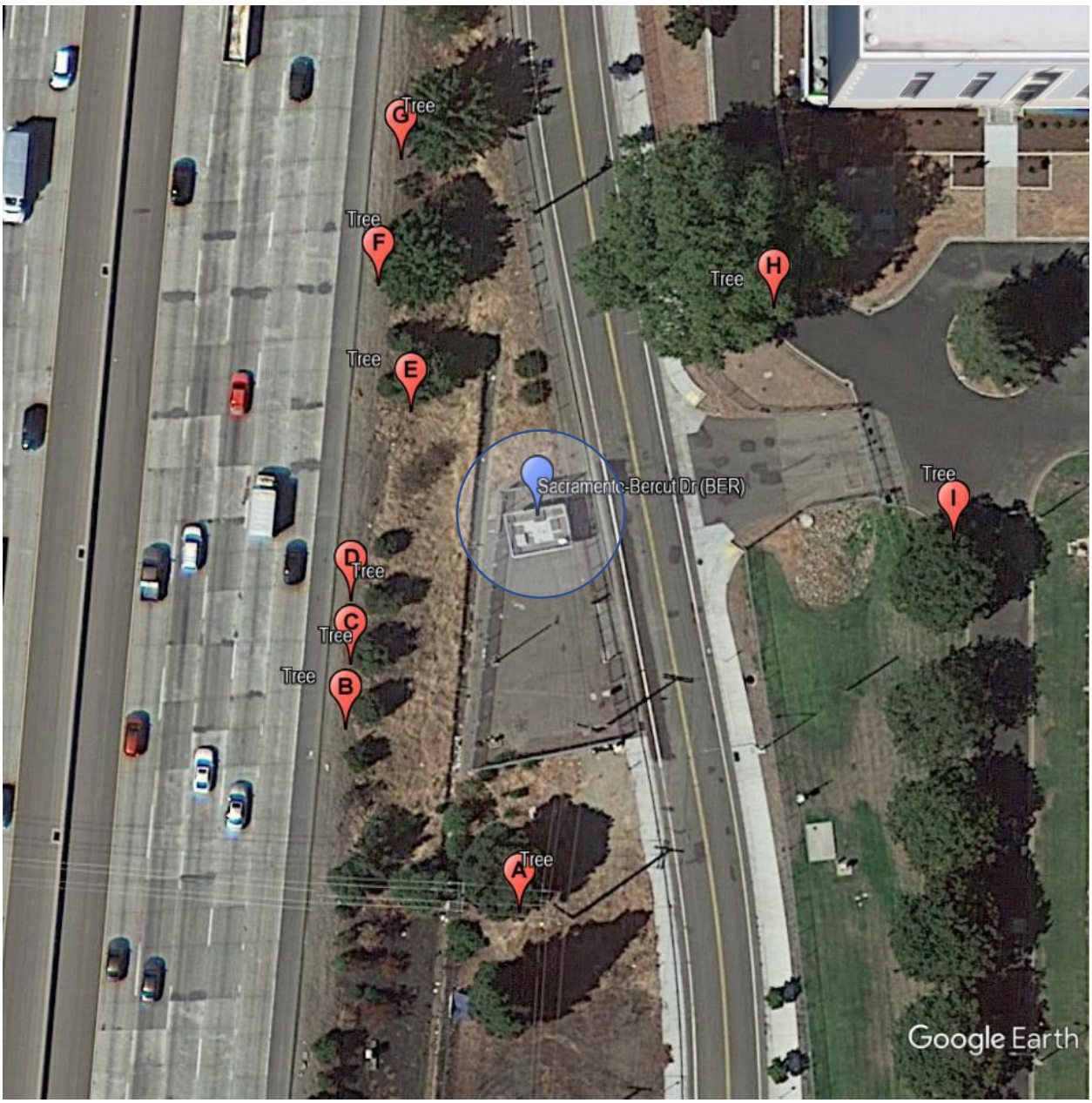
Figure A-2 Panoramic Photo Looking North from Sacramento-Bercut Dr.

Figure A-3 Panoramic Photo Looking East from Sacramento-Bercut Dr.

Figure A-4 Panoramic Photo Looking South from Sacramento-Bercut Dr.

Figure A-5 Panoramic Photo Looking West from Sacramento-Bercut Dr.

Figure A-6 Google Earth Satellite Image of Sacramento-Bercut Dr.



Source: Google Earth, imagery date 8/17/2018

The circle in Figure A-6 indicates there are no trees within a 10 m radius, which satisfy the siting criterion that requires drip lines of trees to be at least 10 m away from probes and inlets (40 CFR Part 58, Appendix E). Also, heights of potential flow obstacles were calculated on-site with trigonometry on 4/13/2022 and are provided in Table A-2 thru Table A-4. With the exception of tree “H,” each inlet and sampler have 360° of unrestricted airflow. Discussion for tree “H” is noted under Table A-4.

Table A-2 Distance between Object and Probe or Inlet at Sacramento-Bercut Dr.

	Gaseous Probe	Black Carbon Inlet	$PM_{2.5}$ Inlet (24-hr FRM)	$PM_{2.5}$ Inlet (Continuous)
Object A (Tree)	34.1	35.1	33.1	33.1
Object B (Tree)	Tree removed			
Object C (Tree)	Tree removed			
Object D (Tree)	Tree removed			
Object E (Tree)	Tree removed			
Object F (Tree)	27.0	23.0	26.0	27.0
Object G (Tree)	26.2	26.2	26.3	30.2
Object H (Tree)	27.9	27.0	29.4	27.0
Object I (Tree)	44.3	44.3	42.3	40.2

All units are in meter

Table A-3 Object Protrusion Above Probe or Inlet at Sacramento-Bercut Dr.

	Gaseous Probe	Black Carbon Inlet	$PM_{2.5}$ Inlet (24-hr FRM)	$PM_{2.5}$ Inlet (Continuous)
Object A (Tree)	7.7	8.1	7.2	7.1
Object B (Tree)	Tree removed			
Object C (Tree)	Tree removed			
Object D (Tree)	Tree removed			
Object E (Tree)	Tree removed			
Object F (Tree)	0.8	0.8	0.4	0.4
Object G (Tree)	6.3	6.5	5.6	6.4
Object H (Tree)	19.3	18.9	18.6	18.3
Object I (Tree)	7.6	7.8	7.0	7.2

All units are in meter

Table A-4 Distance vs. Protrusion Ratio at Sacramento-Bercut Dr.

	Gaseous Probe	Black Carbon Inlet	$PM_{2.5}$ Inlet (24-hr FRM)	$PM_{2.5}$ Inlet (Continuous)
Object A (Tree)	4.4	4.3	4.6	4.7
Object B (Tree)	Tree removed			
Object C (Tree)	Tree removed			
Object D (Tree)	Tree removed			
Object E (Tree)	Tree removed			
Object F (Tree)	33.7	28.7	65.0	67.5
Object G (Tree)	4.2	4.0	4.7	4.7
Object H (Tree)[(A)]	1.4	1.4	1.6	1.5
Object I (Tree)	5.8	5.7	6.0	5.6

Must be greater than or equal to 2 to meet U.S. EPA siting criteria

[(A)] Tree H is an old growth heritage tree, as defined by Chapter 12.64 of Sacramento City Code (SCC). It is protected by SCC from removal or significant pruning. Since the tree is directly downwind of the emission source, it has limited scavenging effect and does not interfere with the emission source being monitored. Before the air monitoring site was established, U.S. EPA staff had approved for this tree to remain in place per email correspondence with Elfego Felix, U.S. EPA Region 9, on August 6, 2013.

Site	Sacramento-Bercut Dr	Sacramento-Bercut Dr
Start Date	10/13/2015	10/13/2015
Collecting Agency	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District
Pollutant	NO_2	CO
Parameter Code	42602	42101
Parameter Occurrence	1	1
Manufacturer/Model	TAPI200UP	TAPI 300U
Sampling Method	Instrumental	Instrumental
Method Code	200	593
Analysis Method	Photolytic-Chemiluminescence	Gas Filter Correlation
FRM/FEM/ARM/Other	FEM	FRM
Monitoring Objective	NAAQS comparison, public info, research	NAAQS comparison, public info, research
Statement of Purpose	Monitors near road emission at region's highest fleet equivalent AADT roadway	Monitors near road emission at region's highest fleet equivalent AADT roadway
Monitor Type	SLAMS	SLAMS
Affiliation	Near Road	Near Road
Site Type	Source Oriented	Source Oriented
Spatial Scale	Micro	Micro
Sampling Frequency	Continuous	Continuous
Sampling Season	Year Round	Year Round
Distance from Supporting Structure or Roof	1.8	1.8
Distance from flow obstructions on roof (m)	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	34.8	34.8
Distance from nearest tree drip line (m)	12	12
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	4.6 m (lo vol)	4.6 m (lo vol)
Unrestricted airflow (deg)	336	336
Probe height (m, agl)	4.6	4.6
Probe material	Teflon	Teflon
Residence time (seconds)	17.9	18.6
Changes in next 18 months?	No	No
Frequency of 1-pt QC Check	Every other day	Every other day
Last Performance Evaluation	4/8/19[(A)]	8/2/21

[(A)] This monitor was not functioning properly during the attempted audit on 8/2/21; and due to the COVID-19 pandemic, it was not audited in 2020

Site	Sacramento-Bercut Dr		
Start Date	10/30/2015	11/1/2016	12/30/2020
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	CARB	Sac Metro Air District
Reporting Agency	Sac Metro Air District	CARB	Sac Metro Air District
Pollutant	Black Carbon	PM2.5	PM2.5
Parameter Code	84313	88101	88101
Parameter Occurrence	1	1	3
Manufacturer/Model	Magee Scientific	R & P 2025	Met One 1020
Sampling Method	Aethalometer	Low volume with VSCC	Very sharp cut cyclone
Method Code	894	145	170
Analysis Method	Optical Absorption	Gravimetric	Beta Attenuation
FRM/FEM/ARM/Other	Other	FRM	FEM
Monitoring Objective	Public info, research	NAAQS comparison, public info, research	NAAQS comparison, public info, research
Statement of Purpose	Determines component of PM emission	Monitors near road emission	Monitors near road emission
Monitor Type	SLAMS	SLAMS	SLAMS
Affiliation	Near Road	Near Road	Near Road
Site Type	Source Oriented	Source Oriented	Source Oriented
Spatial Scale	Not applicable	Micro	Micro
Sampling Frequency	Continuous	1 in 3 days	Continuous
Sampling Season	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	1.6	2.2	2.0
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	34.8	34.8	34.8
Distance from nearest tree drip line (m)	13	16	13
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	No other PM monitor[(A)]	No other PM monitor[(A)]
Unrestricted airflow (deg)	336	336	336
Probe height (m, agl)	4.6	5.0	4.8
Probe material	Aluminum	Aluminum	Aluminum
Residence time (seconds)	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	Yes	No
Frequency of flow rate verification	Monthly	Monthly	Bi-monthly
Last Performance Evaluation	Not applicable	7/19/20, 10/19/20	3/1/21, 8/2/21

[(A)] Did not operate concurrently with the other PM monitor

Site	Sacramento-Bercut Dr.		
Start Date	10/30/2015	10/30/2015	10/30/2015
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	Outdoor Temperature	Wind Direction	Wind Speed
Parameter Code	62101	61104	61103
Parameter Occurrence	1	1	1
Manufacturer/Model	Climatronics 100093	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental
Method Code	042	020	020
Analysis Method	Machine Average	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other
Monitoring Objective	Public info, research	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor Type	Other	Other	Other
Affiliation	Near Road	Near Road	Near Road
Site Type	Not applicable	Not applicable	Not applicable
Spatial Scale	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous
Sampling Season	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	Not applicable	Not applicable	Not applicable
Distance from flow obstructions not on roof (m)	Not applicable	Not applicable	Not applicable
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	336	336	336
Probe height (m, agl)	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No
Frequency of 1-pt QC Check	Not applicable	Not applicable	Not applicable
Last Performance Evaluation	8/2/21	8/2/21	8/2/21

Appendix A.2 Sacramento-Branch Center #2

Sacramento-Branch Center #2 is a PM_{10} monitoring site. This site was established in 2006 to replace the former Sacramento-Branch Center site, which was approximately one-quarter mile to the north. The site was moved because nearby trees at the previous location obstructed the airflow, and the former monitoring site did not meet siting requirements.

The objective of this site is to measure the representative PM_{10} concentration, as documented in the original site initiation reports filed in the late 1980s.

Table A-5 Sacramento-Branch Center #2 Metadata

Site Name	Sacramento-Branch Center #2
AQS Site Number	06-067-0284
Geographic Coordinates	38.551290°N, 121.336590°W
Location	Rooftop of building in the middle of County Maintenance Yard, located 10 miles east-southeast of downtown Sacramento.
Address	3847 Branch Center Road, Sacramento, CA 95827
County	Sacramento
Metropolitan Statistical Area	Sacramento--Arden-Arcade--Roseville, CA
Distance from Roadway	62 m
Annual Average Daily Traffic (Vehicles/Day)	Bradshaw Rd South of Old Placerville Rd.: 42,381 (SACDOT, 7/13/2017)
Ground Cover	Paved

Figure A-7 Sacramento-Branch Center #2 Site Photo

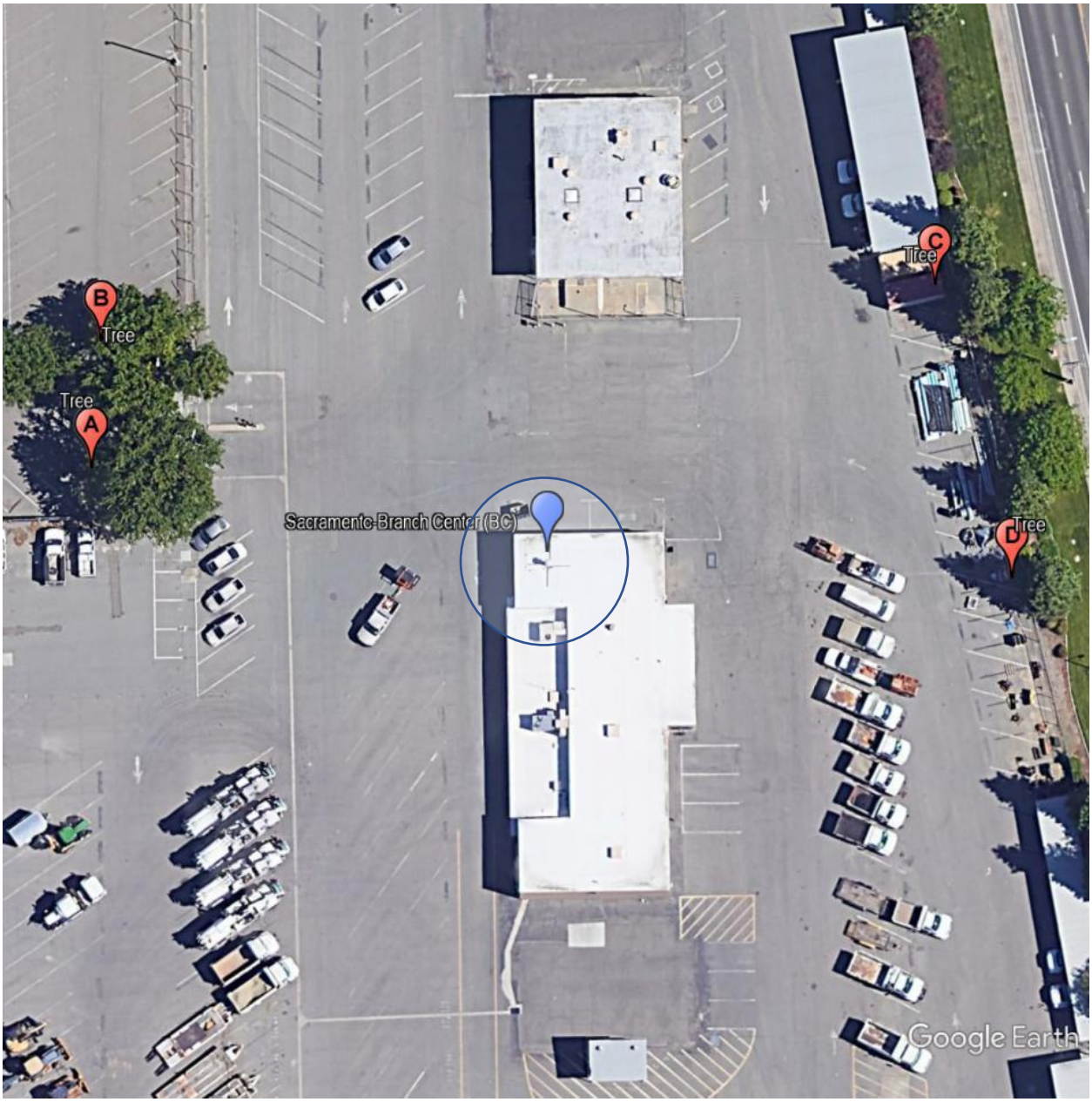
Figure A-8 Panoramic Photo Looking North from Sacramento-Branch Center #2

Figure A-9 Panoramic Photo Looking East from Sacramento-Branch Center #2

Figure A-10 Panoramic Photo Looking South from Sacramento-Branch Center #2

Figure A-11 Panoramic Photo Looking West from Sacramento-Branch Center #2

Figure A-12 Google Earth satellite image of Sacramento-Branch Center #2



Source: Google Earth, imagery date: 9/13/2019

The circle in Figure A-12 indicates no trees exist within a 10 m radius, which satisfy a siting criterion that requires drip lines of trees to be at least 10 m away from probes and inlets (40 CFR Part 58, Appendix E). Also, heights of the trees were calculated on-site with trigonometry on 4/7/2022. Object C and D marks the tallest tree northeast and southeast of the station, respectively. Analyses in Table A-6 Distance between Object and Probe or Inlet at Sacramento-Branch Center #2 Table A-6 through Table A-8 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler have 360° of unrestricted airflow.

Table A-6 Distance between Object and Probe or Inlet at Sacramento-Branch Center #2

	PM_{10} Inlet
Object A (Tree)	40.5
Object B (Tree)	47.9
Object C (Tree)	53.8
Object D (Tree)	51.8

All units in meter

Table A-7 Object Protrusion Above Probe or Inlet at Sacramento- Branch Center #2

	PM_{10} Inlet
Object A (Tree)	6.0
Object B (Tree)	3.0
Object C (Tree)	15.0
Object D (Tree)	10.6

All units in meter

Table A-8 Distance vs. Protrusion Ratio at Sacramento- Branch Center #2

	PM_{10} Inlet
Object A (Tree)	6.7
Object B (Tree)	16.0
Object C (Tree)	3.6
Object D (Tree)	4.9

Must be greater than or equal to 2 to meet U.S. EPA siting criteria

Site	Sacramento-Branch Center
Start Date	4/1/2006
Collecting Agency	Sac Metro Air District
Analytical Lab	Sac Metro Air District
Reporting Agency	Sac Metro Air District
Pollutant	PM_{10}
Parameter Code	81102
Parameter Occurrence	1
Manufacturer/Model	Sierra Anderson 1200
Sampling Method	Hi Volume
Method Code	063
Analysis Method	Gravimetric
FRM/FEM/ARM/Other	FRM
Monitoring Objective	NAAQS comparison, public info
Statement of Purpose	Measures PM_{10} concentration
Monitor Type	SLAMS
Affiliation	None
Site Type	Highest concentration
Spatial Scale	Neighborhood
Sampling Frequency	1 in 6 days
Sampling Season	Year Round
Distance from Supporting Structure or Roof	2.0
Distance from flow obstructions on roof (m)	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction
Distance from nearest tree drip line (m)	37
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not collocated
Distance with nearest PM monitor (m)	No other PM monitor
Unrestricted airflow (deg)	360
Probe height (m, agl)	6.5
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Monthly
Last Performance Evaluation	3/2/21, 8/6/21

Appendix A.3 Elk Grove-Bruceville

Bruceville air monitoring site is located in a rural area 4 miles south of Elk Grove, CA, and 20 miles south of Downtown Sacramento. It was initiated in 1992 to replace the former Sacramento-Meadowview Road O_3 monitoring site.

This site is the upwind O_3 and ozone precursor monitoring site for the Sac Metro Air District's network. Under the legacy PAMS network, it was a Type I site. It is now one of the two additional PAMS enhanced monitoring sites. The District installed a ceilometer at Elk Grove-Bruceville (instead of the main PAMS site at Sacramento-Del Paso Manor) in January 2018 after receiving a waiver from U.S. EPA.

Site Name	Elk Grove-Bruceville
AQS Site Number	06-067-0011
Geographic Coordinates	38.302560°N, 121.420830°W
Location	Rural area located 4 miles south of Elk Grove, CA.
Address	12490 Bruceville Rd, Elk Grove, CA 95758
County	Sacramento
Metropolitan Statistical Area	Sacramento--Arden-Arcade--Roseville, CA
Distance from Roadway	76 m
Annual Average Daily Traffic (Vehicles/Day)	Bruceville Rd south of Lambert Rd.: 2,340 (SACDOT, 9/21/2017)
Ground Cover	Vegetated

Figure A-13 Elk Grove-Bruceville Site Photo

Figure A-14 Panoramic Photo Looking North from Elk Grove-Bruceville

Figure A-15 Panoramic Photo Looking East from Elk Grove-Bruceville

Figure A-16 Panoramic Photo Looking South from Elk Grove-Bruceville

Figure A-17 Panoramic Photo Looking West from Elk Grove-Bruceville

Figure A-18 Google Earth satellite image of Elk Grove-Bruceville

Source: Google Earth, imagery date: 9/13/2019

The circle in Figure A-18 indicates no trees exist within a 10 m radius, which satisfy the siting criterion that requires drip lines of trees to be at least 10 m away from probes and inlets (40 CFR Part 58, Appendix E). Also, heights of the trees were calculated on-site with trigonometry on 3/31/2022. Analyses in Table A-9 through Table A-11 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler have 360° of unrestricted airflow.

Table A-9 Distance between Object and Probe or Inlet at Elk Grove-Bruceville

	Gaseous Probe	VOC Probe	$PM_{2.5}$ Inlet
Object A (Tree)	24.0	24.0	24.0
Object B (Tree)	39.9	39.9	39.9
Object C (Tree)	48.8	48.8	48.8
Object D (Building)	37.9	37.9	37.9

All units are in meter

Table A-10 Object Protrusion Above Probe or Inlet at Elk Grove-Bruceville

	Gaseous Probe	VOC Probe	$PM_{2.5}$ Inlet
Object A (Tree)	0.4	-0.1	-0.5
Object B (Tree)	2.5	2.0	1.6
Object C (Tree)	4.6	4.2	3.8
Object D (Building)	-1.6	-2.1	-2.5

All units are in meter; a negative value indicates that the inlet or probe is taller than the object; thus, airflow is not obstructed no matter the distance

Table A-11 Distance vs. Protrusion Ratio at Elk Grove-Bruceville

	Gaseous Probe	VOC Probe	$PM_{2.5}$ Inlet
Object A (Tree)	60.0	N/A	N/A
Object B (Tree)	16.0	20.0	25.0
Object C (Tree)	10.6	11.6	12.8
Object D (Building)	N/A	N/A	N/A

Must be greater than or equal to 2 to meet U.S. EPA siting criteria; N/A indicates that the inlet or probe is taller than the object and airflow is not obstructed

Site	Elk Grove-Bruceville			
Start Date	7/1/1992	7/1/1992	7/1/1996	6/1/1994
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	AAC Lab
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	O_3	NO_2	Total NMHC	Speciated VOC
Parameter Code	44201	42602	43102	43102
Parameter Occurrence	1	1	1	2
Manufacturer/Model	TAPI 400E	TAPI200UP	TEI 55C	Xontech 910A/912
Sampling Method	Instrumental	Instrumental	Instrumental	6L Pressurized Canister
Method Code	087	200	164	177
Analysis Method	Ultraviolet Absorption	Photolytic-Chemiluminescenc	Flame Ionization Detector	Dual Flame Ionization Detector
FRM/FEM/ARM/Other	FEM	FEM	Other	Other
Monitoring Objective	NAAQS comparison, public info	NAAQS comparison, public info	Public info, research	Research
Statement of Purpose	Measures background O_3 concentration at upwind site	Measures background ozone precursor concentration	Measures background ozone precursor concentration	Measures background ozone precursor concentration
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	PAMS	PAMS	PAMS	PAMS
Site Type	Upwind/Background	Upwind/Background	Upwind/Background	Upwind/Background
Spatial Scale	Urban	Urban	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Episodic Sampling
Sampling Season	Year Round	Year Round	Year Round	July thru Sept.
Distance from Supporting Structure or Roof	1.2	1.2	1.2	1.7
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	22	22	22	22
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.1 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol)
Unrestricted airflow (deg)	360	360	360	360
Probe height (m, agl)	4.5	4.5	4.5	4.9
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	Stainless Steel
Residence time (seconds)	18.1	16.9	16.9	2.0
Changes in next 18 months?	No	No	No	Yes
Frequency of 1-pt QC Check	Every other day	Every other day	Every other day	Pre- and post-seasonally check
Last Performance Evaluation	8/3/21	8/3/21	Temporary shutdown[A]	Not applicable

[A] U.S. EPA Region 9 approved the temporary shut down on 12/1/17

Site	Elk Grove-Bruceville
Start Date	1/30/2003
Collecting Agency	Sac Metro Air District
Analytical Lab	Sac Metro Air District
Reporting Agency	Sac Metro Air District
Pollutant	$PM_{2.5}$
Parameter Code	88501
Parameter Occurrence	3
Manufacturer/Model	Met One 1020 BAM
Sampling Method	Very sharp cut cyclone
Method Code	731
Analysis Method	Beta Attenuation
FRM/FEM/ARM/Other	Other
Monitoring Objective	Public info [(A)]
Statement of Purpose	Measures background concentration and transport of $PM_{2.5}$ from San Joaquin Valley for $PM_{2.5}$ forecasting
Monitor Type	SPM
Affiliation	None
Site Type	General/Background
Spatial Scale	Urban
Sampling Frequency	Continuous
Sampling Season	Year Round
Distance from Supporting Structure or Roof	2.1
Distance from flow obstructions on roof (m)	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction
Distance from nearest tree drip line (m)	21.0
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not collocated
Distance with nearest PM monitor (m)	Not applicable
Unrestricted airflow (deg)	360
Probe height (m, agl)	5.4
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Bi-monthly
Last Performance Evaluation	3/1/21, 8/3/21

[(A)] This $PM_{2.5}$ monitor is operating as a non-FEM sampler

Site	Elk Grove-Bruceville			
Start Date	8/1/1996	8/1/1996	7/1/1997	8/1/1997
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	Outdoor Temperature	Relative Humidity	Barometric Pressure	Precipitation
Parameter Code	62101	62201	64101	65102
Parameter Occurrence	1	1	1	1
Manufacturer/Model	Met One 060A-2	Met One 083E-0-6	Met One 092	Met One 370C
Sampling Method	Instrumental	Instrumental	Instrumental	Bucket
Method Code	042	012	011	011
Analysis Method	Machine Average	Hygroscopic Plastic Film	Aneroid	Continuous or Incremental
FRM/FEM/ARM/Other	Other	Other	Other	Other
Monitoring Objective	Public info	Public info	Public info	Public info
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor Type	Other	Other	Other	Other
Affiliation	PAMS	PAMS	PAMS	PAMS
Site Type	Not applicable	Not applicable	Not applicable	Not applicable
Spatial Scale	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous
Sampling Season	Year Round	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360
Probe height (m, agl)	10.0	10.0	10.0	2.3
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of 1-pt QC Check	N/A	N/A	N/A	N/A
Last Performance Evaluation	8/3/21	Not applicable	8/3/21	Not applicable

Site	Elk Grove-Bruceville			
Start Date	8/1/1996	8/1/1997	8/1/1996	8/1/1996
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	Solar Radiation	UV Radiation	Wind Direction	Wind Speed
Parameter Code	63301	63302	61104	61103
Parameter Occurrence	1	1	1	1
Manufacturer/Model	Campbell Scientific CMP-6	Kipp & Zonen CUV-5	Climatronics100076S	Climatronics100075S
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	011	011	020	020
Analysis Method	Pyranometer	UV Radiometer (Photometer)	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other	Other
Monitoring Objective	Public info	Public info	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor Type	Other	Other	Other	Other
Affiliation	PAMS	PAMS	PAMS	PAMS
Site Type	Not applicable	Not applicable	Not applicable	Not applicable
Spatial Scale	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous
Sampling Season	Year Round	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360
Probe height (m, agl)	10.0	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of 1-pt QC Check	N/A	N/A	N/A	N/A
Last Performance Evaluation	Not applicable	Not applicable	8/3/21	8/3/21

Site	Elk Grove-Bruceville	Elk Grove-Bruceville
Start Date	1/17/2018	6/1/1996
Collecting Agency	Sac Metro Air District	Sac Metro Air District
Analytical Lab	N/A	N/A
Reporting Agency	N/A	N/A
Pollutant	Mixing Height	Upper Level Wind and Virtual Temperature
Parameter Code	Not applicable	Not applicable
Parameter Occurrence	Not applicable	Not applicable
Manufacturer/Model	Vaisala Ceilometer CL51	Radian LAP-3000 with RASS option
Sampling Method	Not applicable	Not applicable
Method Code	Not applicable	Not applicable
Analysis Method	Light Detection and Ranging	915 MHz Radar Wind Profiler, with RASS
FRM/FEM/ARM/Other	Other	Other
Monitoring Objective	Public info, research	Public info, research
Statement of Purpose	Measures representative upper level meteorology	Measures representative upper level meteorology
Monitor Type	Other	Other
Affiliation	PAMS	PAMS
Site Type	Not applicable	Not applicable
Spatial Scale	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous
Sampling Season	Year Round	Year Round
Distance from Supporting Structure or Roof	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction
Distance from nearest tree drip line (m)	> 20 m	> 20 m
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360
Probe height (m, agl)	Not applicable	Not applicable
Probe material	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable
Changes in next 18 months?	No	No
Frequency of 1-pt QC Check	N/A	N/A
Last Performance Evaluation	N/A	Malfunctioned[(A)]

[(A)] According to the PAMS Network Operations report submitted to U.S. EPA on 9/15/17 and internal District QC document, the radar wind profiler malfunctioned starting 10/25/16; the ceilometer is replacing the radar wind profiler as the new PAMS requirement

Appendix A.4 Sacramento-Del Paso Manor

This air monitoring site was initiated in 1979 and eventually became the largest air monitoring site in the Sacramento Valley Air Basin. This site is also one of the largest in Northern California, in terms of number of parameters measured. In October 2009, U.S. EPA Region 9 approved Sacramento-Del Paso Manor as an NCore site. This is one of six NCore sites operating in California. Also, Sacramento-Del Paso Manor is a design value site for $PM_{2.5}$, which means that this site has the highest $PM_{2.5}$ design value in the $PM_{2.5}$ non-attainment area.

Located just downwind of Downtown Sacramento, Sacramento-Del Paso Manor was a PAMS Type II primary site under the legacy PAMS network. It is now one of the 43 national PAMS site required under the 2015 revision to the O_3 standard.

Speciation monitors at this site are part of the Chemical Speciation Network and Speciated Trends Network. A URG3000N sampler was installed in April 2009. The Met One Spiral Aerosol Speciation Sampler has been in service for many years.

Table A-12 Sacramento-Del Paso Manor Metadata

Site Name	Sacramento-Del Paso Manor
AQS Site Number	06-067-0006
Geographic Coordinates	38.613740°N, 121.368040°W
Location	Neighborhood park located 7 miles east-northeast of downtown Sacramento.
Address	2701 Avalon Drive, Sacramento, CA 95821
County	Sacramento
Metropolitan Statistical Area	Sacramento--Arden-Arcade--Roseville, CA
Distance from Roadway	56 m
Annual Average Daily Traffic (Vehicles/Day)	Avalon Dr. south of Annette St.: 1,000 (estimated, two-lanes suburban local residential road)
Ground Cover	Vegetated

Figure A-19 Sacramento-Del Paso Manor Site Photo

Figure A-20 Panoramic Photo Looking North from Sacramento-Del Paso Manor

Figure A-21 Panoramic Photo Looking East from Sacramento-Del Paso Manor

Figure A-22 Panoramic Photo Looking South from Sacramento-Del Paso Manor

Figure A-23 Panoramic Photo Looking West from Sacramento-Del Paso Manor

Figure A-24 Google Earth Satellite Image of Sacramento-Del Paso Manor

Source: Google Earth, imagery date: 6/4/21

The circle in Figure A-24 indicates no trees exist within a 10 m radius, which satisfy the siting criterion that requires drip lines of trees to be at least 10 m away from probes and inlets (40 CFR Part 58, Appendix E). Also, heights of the trees were calculated on-site with trigonometry on 4/8/2022. Analyses in Table A-13 through Table A-18 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler have 360° of unrestricted airflow.

Table A-13 Distance between Object and Probe or Inlet at Sacramento-Del Paso Manor

	Gaseous Probe	NO_Y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	28.0	25.0	25.0	25.0	27.0	30.0
Object B (Tree)	39.8	35.9	35.9	37.9	39.8	41.8
Object C (Tree)	29.3	26.3	26.3	29.3	28.4	31.3
Object D (Building)	16.0	15.0	15.0	20.0	17.0	19.0
Object E (Tree)	39.9	40.9	40.9	42.1	40.9	40.9
Object F (Building)	34.0	37.0	37.0	37.0	36.0	33.0

All units are in meter

Table A-14 Distance between Object and Probe or Inlet at Sacramento-Del Paso Manor

	$PM_{2.5}$ Inlet (Primary)	$PM_{2.5}$ Inlet (Collocated)	$PM_{10-2.5}$ Inlet	$PM_{2.5}$ Inlet (Continuous)	$PM_{2.5}$ Speciation	Carbon Speciation
Object A (Tree)	31.0	30.0	28.0	28.0	27.0	30.0
Object B (Tree)	41.8	41.8	39.8	39.8	40.8	41.8
Object C (Tree)	29.3	30.3	28.4	30.3	31.4	31.4
Object D Building)	15.0	17.0	15.0	18.0	20.0	19.0
Object E (Tree)	37.8	39.9	37.8	40.9	42.1	40.9
Object F (Building)	32.0	32.0	34.0	33.0	35.0	31.0

All units are in meter

Table A-15 Object Protrusion Above Probe or Inlet at Sacramento-Del Paso Manor

	Gaseous Probe	NO_Y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	-0.4	-8.4	-0.4	-0.5	-0.3	-0.6
Object B (Tree)	3.1	-5.3	2.7	2.9	3.2	3.1
Object C (Tree)	5.8	-2.3	5.7	5.8	5.7	6.1
Object D (Building)	-0.4	-8.4	-0.4	-0.4	-0.3	-0.6
Object E (Tree)	8.8	1.1	9.1	8.6	9.2	8.9
Object F (Building)	0.8	-7.1	0.9	0.9	1.0	1.1

All units are in meter; a negative value indicates that the inlet or probe is taller than the object; thus, airflow is not obstructed no matter the distance

Table A-16 Object Protrusion Above Probe or Inlet at Sacramento-Del Paso Manor

	$PM_{2.5}$ Inlet (Primary)	$PM_{2.5}$ Inlet (Collocated)	$PM_{10-2.5}$ Inlet	$PM_{2.5}$ Inlet (Continuous)	$PM_{2.5}$ Speciation	Carbon Speciation
Object A (Tree)	-0.5	-0.5	-0.5	-0.4	-0.5	-0.5
Object B (Tree)	3.2	3.2	3.0	3.1	3.1	3.2
Object C (Tree)	5.7	6.0	5.5	6.1	5.6	5.6
Object D (Building)	-0.5	-0.5	-0.5	-0.4	-0.5	-0.5
Object E (Tree)	8.9	8.7	8.9	9.1	8.5	9.0
Object F (Building)	1.2	1.2	1.3	1.3	1.3	1.1

All units are in meters; a negative value indicates that the inlet or probe is taller than the object; thus, airflow is not obstructed no matter the distance

Table A-17 Distance vs. Protrusion Ratio at Sacramento-Del Paso Manor

	Gaseous Probe	NO_Y Probe	PM_{10} Inlet (Primary)	PM_{10} Inlet (Collocated)	Black Carbon Inlet	VOC Inlet
Object A (Tree)	N/A	N/A	N/A	N/A	N/A	N/A
Object B (Tree)	12.9	N/A	13.3	13.1	12.5	13.5
Object C (Tree)	5.1	N/A	4.6	5.1	5.0	5.1
Object D (Building)	N/A	N/A	N/A	N/A	N/A	N/A
Object E (Tree)	4.5	37.2	4.5	4.9	4.4	4.6
Object F (Building)	42.5	N/A	41.1	41.1	36.0	30.0

Must be greater than or equal to 2 to meet U.S. EPA siting criteria; N/A indicates inlet or probe is taller than the object and airflow is not obstructed

Table A-18 Distance vs. Protrusion Ratio at Sacramento-Del Paso Manor

	$PM_{2.5}$ Inlet (Primary)	$PM_{2.5}$ Inlet (Collocated)	$PM_{10\text{-}2.5}$ Inlet	$PM_{2.5}$ Inlet (Continuous)	$PM_{2.5}$ Speciation	Carbon Speciation
Object A (Tree)	N/A	N/A	N/A	N/A	N/A	N/A
Object B (Tree)	13.1	13.1	13.3	12.9	13.2	13.1
Object C (Tree)	5.1	5.1	5.2	5.0	5.6	5.6
Object D (Building)	N/A	N/A	N/A	N/A	N/A	N/A
Object E (Tree)	4.3	4.6	4.3	4.5	4.9	4.5
Object F (Building)	26.6	26.6	26.1	25.3	26.9	28.1

Must be greater than or equal to 2 to meet U.S. EPA siting criteria; N/A indicates inlet or probe is taller than the object and airflow is not obstructed

Site	Sacramento-Del Paso Manor			
Start Date	1/1/1981	1/1/1981	1/1/1980	1/1/1983
Collecting Agency	Sac Metro Air	Sac Metro Air	Sac Metro Air	Sac Metro Air
Analytical Lab	Sac Metro Air	Sac Metro Air	Sac Metro Air	Sac Metro Air
Reporting Agency	Sac Metro Air	Sac Metro Air	Sac Metro Air	Sac Metro Air
Pollutant	O_3	CO	NO_2	NOY
Parameter Code	44201	42101	42602	42600
Parameter Occurrence	1	1	1	1
Manufacturer/Model	TAPI 400E	TAPI 300EU	TAPI200UP	TEI 42I-Y
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	087	593	200	574
Analysis Method	Ultraviolet Absorption	Gas Filter Correlation	Photolytic-Chemiluminescence	Chemiluminescence
FRM/FEM/ARM/Other	FEM	FRM	FEM	Other
Monitoring Objective	NAAQS comparison, public info, research	NAAQS comparison, public info, research	NAAQS comparison, public info, research	Public info, research
Statement of Purpose	Measures elevated summer O_3 levels near the downwind edge of the central business district	Measures representative wintertime CO concentration in populated area	Measures O_3 precursor emission near downwind edge of central business district	Measures representative concentration in populated area
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	NCORE, PAMS	NCORE	NCORE, PAMS	NCORE
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous
Sampling Season	Year Round	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	2.0	2.0	2.0	Not applicable
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	28	28	28	26
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.1 m (lo vol)	1.1 m (lo vol)	1.1 m (lo vol)	Not applicable
Unrestricted airflow (deg)	360	360	360	360
Probe height (m, agl)	5.3	5.3	5.3	10.0
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	FEP Teflon
Residence time (seconds)	15.2	13.4	15.0	4.0
Changes in next 18 months?	No	No	No	No
Frequency of 1-pt QC Check	Every fourth day	Every fourth day	Every fourth day	Every fourth day
Last Performance Evaluation	8/5/21	2/11/19[(A)]	8/5/21	Not applicable

[(A)] This monitor was not functioning properly during the attempted audit on 8/2/21; and due to the COVID-19 pandemic, it was not audited in 2020; otherwise, this monitor passes all other QA and QC requirements

Site	Sacramento-Del Paso Manor			
Start Date	1/1/1980	8/1/1994	9/22/2000	1/1/2001
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	AAC Lab	AAC Lab
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	SO_2	Total NMHC	Speciated VOC	Carbonyl
Parameter Code	42401	43102	43102	Multiple
Parameter Occurrence	1, 2[(A)]	2	1	1
Manufacturer/Model	TAPI 100EU	TEI 55C	Xontech 910A/912	Xontech 925
Sampling Method	Instrumental	Instrumental	6L Pressurized Canister	DNPH Silica gel
Method Code	600	164	123	202
Analysis Method	Ultraviolet Fluorescence	Flame Ionization Detector	Dual Flame Ionization Detector	(multiple)
FRM/FEM/ARM/Other	FEM	Other	Other	Other
Monitoring Objective	NAAQS comparison, public info, research	Public info, research	Research	Research
Statement of Purpose	Measures representative concentration in populated area	Measures O_3 precursor emission near downwind edge of central business district	Measures O_3 precursor emission near downwind edge of central business district	Measures O_3 precursor emission near downwind edge of central business district
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	NCORE	PAMS	PAMS	PAMS
Site Type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Spatial Scale	Urban	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	1 in 3 days	1 in 3 days
Sampling Season	Year Round	Year Round	July thru Sep	July thru Sep
Distance from Supporting Structure or Roof	2.0	2.0	2.2	2.2
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	28	28	30	30
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.1 m (lo vol)	1.1 m (lo vol)	1.0 m (lo vol)	1.0 m (lo vol)
Unrestricted airflow (deg)	360	360	360	360
Probe height (m, agl)	5.3	5.3	5.5	5.5
Probe material	FEP Teflon	FEP Teflon	Stainless Steel	Stainless Steel
Residence time (seconds)	14.7	17.0	3.0	3.0
Changes in next 18 months?	No	No	Yes	No
Frequency of 1-pt QC Check	Every fourth day	Every fourth day	Pre- and post-seasonally check	Pre- and post-seasonally check
Last Performance Evaluation	8/4/21	Temporary shutdown[(B)]	Not applicable	Not applicable

[(A)] Hourly average is reported under parameter occurrence code 1, and the 5-minute data (from the same monitor and required by 40 CFR Section 58.12(g) are reported under parameter occurrence code 2

[(B)] U.S. EPA Region 9 approved the temporary shut down on 12/1/17

Site	Sacramento-Del Paso Manor			
Start Date	1/1/1998	1/1/1986	1/1/1986	12/21/2020
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	Black Carbon	PM_{10} (Primary monitor)	PM_{10} (Audit monitor)	PM2.5
Parameter Code	84313	81102	81102	88101
Parameter Occurrence	1	1	2	3
Manufacturer/Model	Magee Scientific	Sierra Anderson	Sierra Anderson	Met One BAM1020
Sampling Method	Aethalometer	Hi Volume	Hi Volume	Very sharp cut cyclone
Method Code	894	063	063	170
Analysis Method	Optical Absorption	Gravimetric	Gravimetric	Beta Attenuation
FRM/FEM/ARM/Other	Other	FRM	FRM	FEM
Monitoring Objective	Research	NAAQS comparison, public info, research	NAAQS comparison	NAAQS comparison, public info, research
Statement of Purpose	Originally installed for CRPAQS study in 1999[(A)]	Measures wintertime elevated PM level from motor vehicles and residential wood combustion	Collocated for QA purpose and provides substitute data if necessary	Measures wintertime elevated PM level from motor vehicles and residential wood combustion
Monitor Type	SPM	SLAMS	SLAMS	SLAMS
Affiliation	None	None	None	NCORE
Site Type	Population Exposure	Population Exposure	Population Exposure	Highest concentration, population exposure
Spatial Scale	Not applicable	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	Continuous	1 in 6 days	1 in 6 days	Continuous
Sampling Season	Year Round	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	1.9	2.0	2.0	2.0
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	28	26	28	29
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	2.2 m	2.2 m	Not applicable
Distance with nearest PM monitor (m)	1.8 m (lo vol)	2.1 m (lo vol)	2.2 m (hi vol)	1.4 (lo vol)
Unrestricted airflow (deg)	360	360	360	336
Probe height (m, agl)	5.2	5.3	5.3	
Probe material	Aluminum	Not applicable	Not applicable	Aluminum
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	Yes	Yes	No
Frequency of flow rate verification	Monthly	Monthly	Monthly	Bi-monthly
Last Performance Evaluation	Not applicable	3/4/21, 8/5/21	3/4/21, 8/5/21	3/4/21, 8/5/21

[(A)] California Regional Particulate Air Quality Study

Site	Sacramento-Del Paso Manor			
Start Date	1/1/1999	2/1/1999	5/1/2000	2/1/2000
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	CARB	CARB	N/A	RTI
Reporting Agency	CARB	CARB	CARB	RTI
Pollutant	$PM_{2.5}$ (Primary monitor)	$PM_{2.5}$ (Audit monitor)	$PM_{2.5}$	$PM_{2.5}$ Mass Speciated
Parameter Code	88101	88101	88502	88502
Parameter Occurrence	1	2	3	5
Manufacturer/Model	R & P 2025	R & P 2025	Met One 1020	Met One SASS
Sampling Method	Very sharp cut cyclone	Very sharp cut cyclone	Very sharp cut cyclone	Sharp cut cyclone
Method Code	145	145	731	810
Analysis Method	Gravimetric	Gravimetric	Beta Attenuation	Gravimetric
FRM/FEM/ARM/Other	FRM	FRM	Other	Other
Monitoring Objective	NAAQS Comparison, research, public info	NAAQS Comparison	Public info, research[A]	Research
Statement of Purpose	Measures wintertime elevated PM level from motor vehicles and residential wood combustion	Collocated for QA purpose and provides substitute data if necessary	Provides real time PM Measurement from motor vehicles and residential wood combustion	Provides speciation data on urban PM emission
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	NCORE	NCORE	NCORE	CSN STN,
Site Type	Highest concentration, population exposure	Highest concentration, population exposure	Highest concentration, population exposure	Highest concentration, population exposure
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	Daily	1 in 12 days	Continuous	1 in 3 days
Sampling Season	Year Round	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	2.1	2.1	2.0	2.0
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	29	30	29	29
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	1.6 m	1.6 m	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.5 m (lo vol)	1.6 m (lo vol)	1.4 (lo vol)	2.2 m (hi vol)
Unrestricted airflow (deg)	360	360	360	360
Probe height (m, agl)	5.4	5.4	5.3	5.3
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	Yes	No
Frequency of flow rate verification	Monthly	Monthly	Bi-monthly	Monthly
Last Performance Evaluation	8/5/21	8/5/21	7/6/20, 10/14/20[B]	9/19/19

[A] This $PM_{2.5}$ monitor is not comparable to NAAQS because it is not an FRM or FEM sampler

[B] Due to the COVID-19 pandemic, this sampler was not audited in 2020 and has been replaced with an PM2.5 FEM sampler on 12/21/20

Site	Sacramento-Del Paso Manor	
Start Date	4/1/2009	4/1/2012
Collecting Agency	Sac Metro Air District	Sac Metro Air District
Analytical Lab	RTI	CARB
Reporting Agency	RTI	CARB
Pollutant	OC & EC	PM10
Parameter Code	(multiple)[A]	85101
Parameter Occurrence	5	7
Manufacturer/Model	URG 3000N	R & P 2025
Sampling Method	Quartz filter and cyclone inlet	Very sharp cut cyclone
Method Code	842, 826	127
Analysis Method	(multiple)	Gravimetric
FRM/FEM/ARM/Other	Other	FRM
Monitoring Objective	Research	Public info, research
Statement of Purpose	Provides speciation data on urban PM emission	Measures PM mass to provide $PM_{10-2.5}$ data
Monitor Type	SLAMS	Other
Affiliation	CSN STN, NCORE	None
Site Type	Highest concentration	Population Exposure
Spatial Scale	Neighborhood	Neighborhood
Sampling Frequency	1 in 3 days	1 in 3 days
Sampling Season	Year Round	Year Round
Distance from Supporting Structure or Roof	2.1	2.1
Distance from flow obstructions on roof (m)	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction
Distance from nearest tree drip line (m)	31	28
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.7 m (lo vol)	1.9 m (lo vol)
Unrestricted airflow (deg)	360	360
Probe height (m, agl)	5.4	5.4
Probe material	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable
Changes in next 18 months?	No	No
Frequency of flow rate verification	Monthly	Monthly
Last Performance Evaluation	Not Applicable	8/5/21

[A] 88355, 88357, 88370, 88374, 88375, 88376, 88377, 88378, 88380, 88383, 88384, 88385, 88388

Site	Sacramento-Del Paso Manor				
Start Date	8/1/1994	8/1/1994	9/1/1994	8/1/1994	8/1/1994
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	Outdoor Temperature	Relative Humidity	Solar Radiation	Wind Direction	Wind Speed
Parameter Code	62101	62201	63301	61104	61103
Parameter Occurrence	1	1	1	1	1
Manufacturer/Model	Climatronics 100093	Climatronics 101669	Climatronics 100848	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	042	012	011	020	020
Analysis Method	Machine Average	Hygroscopic Plastic Film	Pyranometer	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Monitoring Objective	Public info, research	Public info, research	Public info	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor Type	SLAMS	SLAMS	Other	Other	Other
Affiliation	NCORE, PAMS				
Site Type	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Spatial Scale	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling Season	Year Round	Year Round	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	No supporting structure	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360	360
Probe height (m, agl)	10.0	10.0	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No	No
Frequency of 1-pt QC Check	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Last Performance Evaluation	8/5/21	Not applicable	Not applicable	8/5/21	8/5/21

Appendix A.5 Folsom-Natoma St.

This site has been in operation since 1996. This site replaced the former Folsom-Leidesdorff Street site. Approximately 20 miles northeast of Downtown Sacramento, Folsom-Natoma St. site is the maximum summertime O_3 monitoring site within Sacramento County, for days with prevailing afternoon southwesterly winds. This was a PAMS Type III site under the legacy PAMS network. It is now one of the two additional PAMS enhanced monitoring sites.

From mid-2019 through most of 2020, this air monitoring station was demolished and re-constructed to replace the 20-30 years old wooden shelter. The new shelter now sits in the footprint of the old shelter.

Table A-19 Folsom-Natoma St. Metadata

Site Name	Folsom-Natoma Street
AQS Site Number	06-067-0012
Geographic Coordinates	38.683304°N, 121.164457°W
Location	Folsom City Hall (parking lot), located 20 miles east-northeast of downtown Sacramento.
Address	50 Natoma Street, Folsom, CA 95630
County	Sacramento
Metropolitan Statistical Area	Sacramento--Arden-Arcade--Roseville, CA
Distance from Roadway	206 m
Annual Average Daily Traffic (Vehicles/Day)	Natoma St. at Coloma St (intersection total): 14,628 (City of Folsom, 2017)
Ground Cover	Vegetated

Figure A-25 Folsom-Natoma St. Site Photo

Figure A-26 Panoramic Photo Looking North from Folsom-Natoma St.

Figure A-27 Panoramic Photo Looking East from Folsom-Natoma St.

Figure A-28 Panoramic Photo Looking South from Folsom-Natoma St.

Figure A-29 Panoramic Photo Looking West from Folsom-Natoma St.

Figure A-30 Google Earth Satellite Image of Folsom-Natoma St.

Source: Google Earth, imagery date: 6/4/2021

The circle over Folsom-Natoma St. in Figure A-30 indicates no trees exist within a 10 m radius, which satisfy the siting criterion that requires drip lines of trees to be at least 10 m away from probes and inlets (40 CFR Part 58, Appendix E). A site survey was conducted on 4/13/2022 to identify flow obstacle. Results are provided in provided in Table A-20 through Table A-22.

Table A-20 Distance between Object and Probe or Inlet at Folsom-Natoma St.

	Gaseous Probe	$PM_{2.5}$ Inlet (Primary)	$PM_{2.5}$ Inlet (Collocated)
Object A (Tower) [(A)]	N/A	N/A	N/A
Object B (Building)	10.8	9.7	6.9
Object C (Building)	8.7	7.7	9.7
Object D (Building)	4.5	4.4	9.7
Object E (Building)	9.9	8.9	5.6
Object F (Tree)	9.9	18.9	16.8
Object G (Tree)	32.9	30.9	30.9
Object H (Tree)	25.8	25.8	27.8
Object I (Tree)	Tree removed		
Object J (Tree)	24.9	25.9	23.9

All units are in meter

[(A)] This is an open lattice style communication tower, airflow is not obstructed by this structure

Table A-21 Object Protrusion Above Probe or Inlet at Folsom-Natoma St.

	Gaseous Probe	$PM_{2.5}$ Inlet (north)	$PM_{2.5}$ Inlet (south)
Object A (Tower)	N/A	N/A	N/A
Object B (Building)	-2.8	-2.9	-1.8
Object C (Building)	-2.7	-2.7	-2.7
Object D (Building)	-2.7	-2.8	-2.9
Object E (Building)	-2.1	-1.9	-2.6
Object F (Tree)	0.6	1.8	1.9
Object G (Tree)	1.8	1.7	1.7
Object H (Tree)	2.7	2.7	2.9
Object I (Tree)	Tree removed		
Object J (Tree)	1.3	1.3	1.2

All units are in meter

Table A-22 Distance vs. Protrusion Ratio at Folsom-Natoma St.

	Gaseous Probe	$PM_{2.5}$ Inlet (north)	$PM_{2.5}$ Inlet (south)
Object A (Tower)	N/A	N/A	N/A
Object B (Building)	N/A	N/A	N/A
Object C (Building)	N/A	N/A	N/A
Object D (Building)	N/A	N/A	N/A
Object E (Building)	N/A	N/A	N/A
Object F (Tree)	16.6	10.5	8.9
Object G (Tree)	18.3	18.2	18.2
Object H (Tree)	9.6	9.6	9.6
Object I (Tree)	Tree removed		
Object J (Tree)	19.2	20.0	20.0

Must be greater than or equal to 2 to meet U.S. EPA siting criteria; N/A indicates inlet or probe is taller than the object and airflow is not obstructed

Site	Folsom-Natoma St.				
Start Date	7/1/1996	7/1/1996	7/1/2011	7/1/1996	7/1/1996
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	AAC
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	O_3	NO_2	NOY	Total NMHC	Speciated VOC
Parameter Code	44201	42602	42600	43102	43102
Parameter Occurrence	1	1	1	1	2
Manufacturer/Model	TAPI 400E	TAPI200UP	TEI 42I-Y	TEI 55C	Xontech 910A/912
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental	6L Pressurized Canister
Method Code	087	200	674	164	123
Analysis Method	Ultraviolet Absorption	Photolytic-Chemiluminesc	Chemiluminesc ence	Flame Ionization	Dual Flame Ionization
FRM/FEM/ARM/Other	FEM	FEM	Other	Other	Other
Monitoring Objective	NAAQS comparison, public info	NAAQS comparison, public info	Public info, research	Public info, research	Research
Statement of Purpose	Measure highest summer O_3 level downwind of urban area	Measures concentration downwind of urban area	Measures representative concentration	Measures concentration downwind of urban area	Measures concentration downwind of urban area
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	PAMS	PAMS	PAMS	PAMS	PAMS
Site Type	Max O_3 Concentration, Population Exposure	Highest concentration	Population Exposure	Highest concentration	Highest concentration
Spatial Scale	Neighborhood	Neighborhood	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous	1 in 3 days
Sampling Season	Year Round	Year Round	Year Round	Year Round	July thru Sep
Distance from Supporting Structure or Roof	1.9	1.9	Not applicable	1.9	1.9
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	15.5	15.5	14.6	15.5	15.5
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	2.2 (lo vol)	2.2 (lo vol)	2.2 (lo vol)	2.2 (lo vol)	2.2 (lo vol)
Unrestricted airflow (deg)	360	360	360	360	360
Probe height (m, agl)	5.5	5.5	10.0	5.5	5.5
Probe material	FEP Teflon	FEP Teflon	FEP Teflon	FEP Teflon	Stainless Steel
Residence time (seconds)	13.9	12.7	9.0	13.7	3.0
Changes in next 18 months?	No	No	Yes	No	Yes
Frequency of 1-pt QC Check	Every other day	Every other day	Every other day	Every other day	Pre- and post-seasonally
Last Performance Evaluation	8/9/21	8/9/21	Not applicable	Temp. shutdown[(A)]	Not applicable

[(A)] U.S. EPA Region 9 approved the temporary shut down on 12/1/17

Site	Folsom-Natoma St.	
Start Date	4/1/2013	7/1/2015
Collecting Agency	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District
Pollutant	$PM_{2.5}$ (Primary monitor)	$PM_{2.5}$ (Audit monitor)
Parameter Code	88101	88101
Parameter Occurrence	3	4
Manufacturer/Model	Met One 1020 BAM	Met One 1020 BAM
Sampling Method	Very sharp cut cyclone	Very sharp cut cyclone
Method Code	170	170
Analysis Method	Beta Attenuation	Beta Attenuation
FRM/FEM/ARM/Other	FEM	FEM
Monitoring Objective	NAAQS comparison, public info, research	NAAQS comparison, public info, research
Statement of Purpose	Measures representative concentration	Collocated for QA purpose and provides substitute data if necessary
Monitor Type	SLAMS	SLAMS
Affiliation	None	None
Site Type	Population Exposure	Population Exposure
Spatial Scale	Neighborhood	Neighborhood
Sampling Frequency	Continuous	Continuous
Sampling Season	Year Round	Year Round
Distance from Supporting Structure or Roof	2.1	2.1
Distance from flow obstructions on roof (m)	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction
Distance from nearest tree drip line (m)	13.0	12.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	2.0	2.0
Distance with nearest PM monitor (m)	2.0 m (lo vol)	2.0 m (lo vol)
Unrestricted airflow (deg)	360	360
Probe height (m, agl)	5.7	5.7
Probe material	Aluminum	Aluminum
Residence time (seconds)	Not applicable	Not applicable
Changes in next 18 months?	No	No
Frequency of flow rate verification	Bi-monthly	Bi-monthly
Last Performance Evaluation	3/3/21, 8/9/21	3/3/21, 8/9/21

Site	Folsom-Natoma St.				
Start Date	7/1/1996	7/1/1996	7/1/1996	7/1/1996	7/1/1996
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	Outdoor Temperature	Relative Humidity	Solar Radiation	Wind Direction	Wind Speed
Parameter Code	62101	62201	63301	61104	61103
Parameter Occurrence	1	1	1	1	1
Manufacturer/Model	Climatronics 100093	Climatronics 101669	Climatronics 100848	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	042	012	011	020	020
Analysis Method	Machine Average	Hygroscopic Plastic Film	Pyranometer	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Monitoring Objective	Public info	Public info	Public info	Public info, research	Public info, research
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	PAMS	PAMS	PAMS	PAMS	PAMS
Site Type	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Spatial Scale	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling Season	Year Round	Year Round	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	No supporting structure	No supporting structure	No supporting structure	No supporting structure	No supporting structure
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360	360
Probe height (m, agl)	10.0	10.0	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No	No
Frequency of 1-pt QC Check	N/A	N/A	N/A	N/A	N/A
Last Performance Evaluation	8/9/21	Not applicable	Not applicable	8/9/21	8/9/21

Appendix A.6 North Highlands-Blackfoot

North Highlands-Blackfoot has been in operation since 1979. The objective of the original site was to collect data in support of a proposed power plant project at McClellan Air Force Base, which was located 3 miles southwest of the site. The proposed power plant project was canceled in the early 1980's; and the air force base was closed in 2001. This entire site was designated as SPM upon its establishment. During an annual review of network design in the mid-1990s, Sac Metro Air District needed additional SLAMS (which was known as National Air Monitoring Stations) sites for SO_2 and PM_{10} to meet minimum monitoring requirements. Thus, the designations of those monitors were changed to SLAMS. The SO_2 monitor, however, was terminated in late 2010. The CO monitor was terminated in May 2020.

Table A-23 North Highlands-Blackfoot

Site Name	North Highlands-Blackfoot
AQS Site Number	06-067-0002
Geographic Coordinates	38.71209°N, 121.38109°W
Location	Residential area located 11 miles north-northeast of downtown Sacramento.
Address	7823 Blackfoot Way, Antelope, CA 95843
County	Sacramento
Metropolitan Statistical Area	Sacramento--Arden-Arcade--Roseville, CA
Distance from Roadway	100 m
Annual Average Daily Traffic (Vehicles/Day)	Navaho Dr. east of Aztec Way: <100 (estimated, two-lanes suburban circular local residential road)
Ground Cover	Paved (to north), vegetated (to south)

Figure A-31 North Highlands Site Photo

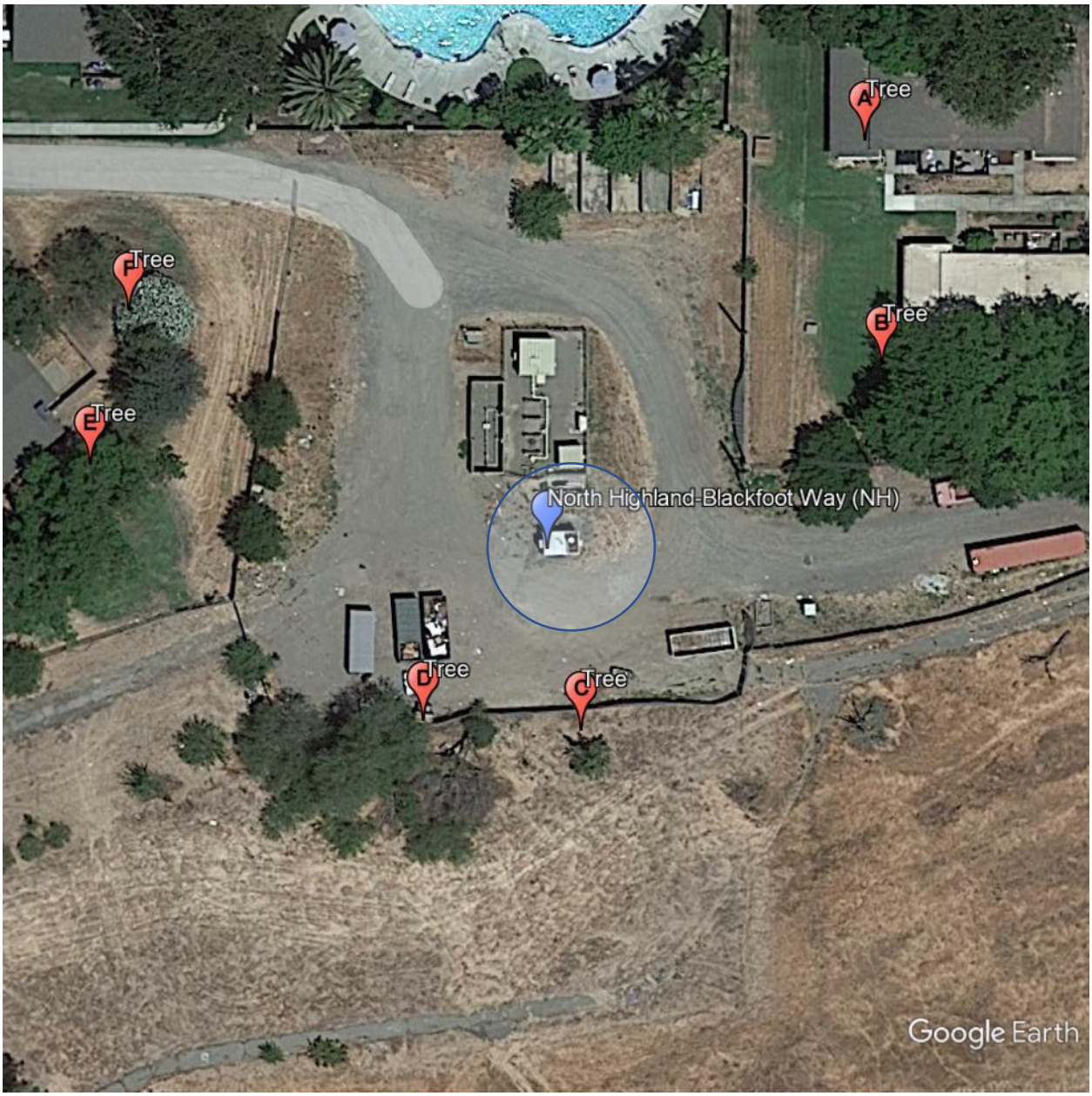
Figure A-32 Panoramic Photo Looking North from North Highlands-Blackfoot

Figure A-33 Panoramic Photo Looking East from North Highlands-Blackfoot

Figure A-34 Panoramic Photo Looking South from North Highlands-Blackfoot

Figure A-35 Panoramic Photo Looking West from North Highlands-Blackfoot

Figure A-36 Google Earth Satellite Image of North Highlands-Blackfoot



Source: Google Earth, imagery date: 9/13/19

The circle in Figure A-36 indicates no trees exist within a 10 m radius, which satisfy the siting criterion that requires drip lines of trees to be at least 10 m away from probes and inlets (40 CFR Part 58, Appendix E). Each of the markers identifies the tallest tree in its local cluster of vegetation. Also, height of the tree was calculated on-site with trigonometry on 4/8/2022. Analyses in Table A-24 through Table A-26 show objects identified above do not restrict air flow to the roof top inlets and samplers.

Table A-24 Distance between Object and Probe or Inlet at North Highlands-Blackfoot

	Gaseous Probe	PM_{10} Inlet
Object A (Tree)	Tree removed	
Object B (Tree)	39.9	41.1
Object C (Tree)	22.9	23.0
Object D (Tree)	29.8	30.8
Object E (Tree)	49.1	50.1
Object F (Tree)	45.3	46.3

All units are in meter

Table A-25 Object Protrusion Above Probe or Inlet at North Highlands-Blackfoot

	Gaseous Probe	PM_{10} Inlet
Object A (Tree)	Tree removed	
Object B (Tree)	8.9	8.3
Object C (Tree)	1.3	0.4
Object D (Tree)	8.3	8.4
Object E (Tree)	9.3	9.3
Object F (Tree)	7.7	7.8

All units are in meter

Table A-26 Distance vs. Protrusion Ratio at North Highlands-Blackfoot

	Gaseous Probe	PM_{10} Inlet
Object A (Tree)	Tree removed	
Object B (Tree)	4.5	4.9
Object C (Tree)	17.6	57.5
Object D (Tree)	3.6	3.7
Object E (Tree)	5.3	5.4
Object F (Tree)	5.9	5.9

Must be greater than or equal to 2 to meet U.S. EPA siting criteria

Site	North Highlands-Blackfoot	
Start Date	12/1/1979	12/1/1979
Collecting Agency	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District
Pollutant	O_3	NO_2
Parameter Code	44201	42602
Parameter Occurrence	1	1
Manufacturer/Model	TAPI 400E	TEI 42I
Sampling Method	Instrumental	Instrumental
Method Code	087	200
Analysis Method	Ultraviolet Absorption	Photolytic-Chemiluminescence
FRM/FEM/ARM/Other	FEM	FRM
Monitoring Objective	NAAQS comparison, research	NAAQS comparison, research
Statement of Purpose	Measures representative concentrations	Measures representative concentrations
Monitor Type	SPM	SPM
Affiliation	None	None
Site Type	Population Exposure	Population Exposure
Spatial Scale	Urban	Neighborhood
Sampling Frequency	Continuous	Continuous
Sampling Season	Year Round	Year Round
Distance from Supporting Structure or Roof	1.9	1.9
Distance from flow obstructions on roof (m)	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction
Distance from nearest tree drip line (m)	22	22
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.1 (hi vol)	1.1 (hi vol)
Unrestricted airflow (deg)	360	360
Probe height (m, agl)	5.0	5.0
Probe material	FEP Teflon	FEP Teflon
Residence time (seconds)	14.8	16.4
Changes in next 18 months?	Yes	Yes
Frequency of 1-pt QC Check	Every Other Day	Every Other Day
Last Performance Evaluation	8/4/21	4/28/2016[(A)]

[(A)] Analyzer malfunction since 1/10/17

Site	North Highlands-Blackfoot Way
Start Date	1/1/1989
Collecting Agency	Sac Metro Air District
Analytical Lab	Sac Metro Air District
Reporting Agency	Sac Metro Air District
Pollutant	PM_{10}
Parameter Code	81102
Parameter Occurrence	1
Manufacturer/Model	Sierra Anderson 1200
Sampling Method	Hi Volume
Method Code	063
Analysis Method	Gravimetric
FRM/FEM/ARM/Other	FRM
Monitoring Objective	NAAQS comparison, public info
Statement of Purpose	Measures representative concentrations
Monitor Type	SLAMS
Affiliation	None
Site Type	Population Exposure
Spatial Scale	Neighborhood
Sampling Frequency	1 in 6 days
Sampling Season	Year Round
Distance from Supporting Structure or Roof	2.0
Distance from flow obstructions on roof (m)	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction
Distance from nearest tree drip line (m)	22
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not collocated
Distance with nearest PM monitor (m)	Not applicable
Unrestricted airflow (deg)	360
Probe height (m, agl)	5.4
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	Yes
Frequency of flow rate verification	Monthly
Last Performance Evaluation	3/2/21, 8/4/21

Appendix A.7 Sloughhouse

Located in a rural area 16.5 miles southeast of Downtown Sacramento, Sloughhouse was established in 1997 as a seasonal (April-October) O_3 special purpose monitoring site to measure elevated afternoon O_3 concentrations, under northwesterly winds, in support of Sac Metro Air District's summer Spare the Air (O_3 episodic control measure) program. It was sited to cover "data gaps" in the O_3 monitoring network, which is used for forecasting summer AQI levels.

A tree 10 m southeast of the O_3 inlet was removed in May 2011 in order to comply with 40 CFR Part 58, Appendix E (Probe and Monitoring Path Siting Criteria). After the tree removal, the O_3 monitor was re-classified from SPM to SLAMS and began continuous monitoring year-round.

From November 2008 through February 2013, seasonal (November–February) $PM_{2.5}$ data was collected with a special purpose monitor (Met One Instruments e-BAM). In November 2013, a non-FEM $PM_{2.5}$ sampler installed to improve data quality. Sampling season was also increased to year-round. In June 2017, a FEM $PM_{2.5}$ sampler replaced the non-FEM sampler.

Table A-27 Sloughhouse Metadata

Site Name	Sloughhouse
AQS Site Number	06-067-5003
Geographic Coordinates	38.494475°N, W121.211131°
Location	Fire Station in rural area located 16.5 miles east-southeast of downtown Sacramento.
Address	7250 Sloughhouse Road, Sloughhouse, CA 95683
County	Sacramento
Metropolitan Statistical Area	Sacramento--Arden-Arcade--Roseville, CA
Distance from Roadway	27 m
Annual Average Daily Traffic (Vehicles/Day)	Sloughhouse Rd south of Jackson Rd: 1,000 (Estimated)
Ground Cover	Vegetated

Figure A-37 Sloughhouse Site Photo

Figure A-38 Panoramic Photo Looking North from Sloughhouse

Figure A-39 Panoramic Photo Looking East from Sloughhouse

Figure A-40 Panoramic Photo Looking South from Sloughhouse

Figure A-41 Panoramic Photo Looking West from Sloughhouse

Figure A-42 Google Earth Satellite Image of Sloughhouse

Source: Google Earth, imagery date: 9/13/19

The circle in Figure A-42 indicates no trees exist within a 10 m radius, which satisfy the siting criterion that requires drip lines of trees to be at least 10 m away from probes and inlets (40 CFR Part 58, Appendix E). Also, height of the tree and building was calculated on-site with trigonometry on 4/8/2022. Analyses in Table A-28 through Table A-30 show the objects identified above do not restrict air flow to the roof top inlets and samplers. Therefore, each inlet and sampler have 360° of unrestricted airflow.

Table A-28 Distance between Object and Probe or Inlet at Sloughhouse

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	51.4	53.6
Object B (Tree)	19.7	20.7
Object C (Building)	14.7	15.2
Object D (Tree)	25.9	24.9

All units are in meter

Table A-29 Object Protrusion Above Probe or Inlet at Sloughhouse

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	12.7	11.8
Object B (Tree)	7.1	6.9
Object C (Building)	-3.2	-3.8
Object D (Tree)	1.7	1.2

All units are in meter; a negative value indicates that the inlet or probe is taller than the object; thus, airflow is not obstructed no matter the distance

Table A-30 Distance vs. Protrusion Ratio at Sloughhouse

	Gaseous Probe	$PM_{2.5}$ Inlet
Object A (Tree)	4.0	4.5
Object B (Tree)	2.8	3.0
Object C (Building)	N/A	N/A
Object D (Tree)	15.3	20.8

Must be greater than or equal to 2 to meet U.S. EPA siting criteria; N/A indicates inlet or probe is taller than the object and airflow is not obstructed

Site	Sloughhouse-Sloughhouse Rd.		
Start Date	7/1/1997	7/1/1997	7/1/1997
Collecting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Analytical Lab	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Reporting Agency	Sac Metro Air District	Sac Metro Air District	Sac Metro Air District
Pollutant	O_3	Wind Direction	Wind Speed
Parameter Code	44201	61104	61103
Parameter Occurrence	1	1	1
Manufacturer/Model	TAPI 400E	Climatronics F-460	Climatronics F-460
Sampling Method	Instrumental	Instrumental	Instrumental
Method Code	087	020	020
Analysis Method	Ultraviolet Absorption	Vector Summation	Vector Summation
FRM/FEM/ARM/Other	FEM	Other	Other
Monitoring Objective	NAAQS comparison, public info	Public info	Public info
Statement of Purpose	Measures elevated O_3 concentration under northwesterly wind	Measures representative meteorology	Measures representative meteorology
Monitor Type	SLAMS	Other	Other
Affiliation	None	None	None
Site Type	Max O_3 concentration	Not applicable	Not applicable
Spatial Scale	Neighborhood	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous
Sampling Season	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	1.7	2.8	2.8
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	18.3	18.0	18.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.5 m (lo vol)	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360
Probe height (m, agl)	5.0	6.1	6.1
Probe material	FEP Teflon	Not applicable	Not applicable
Residence time (seconds)	3.9	Not applicable	Not applicable
Changes in next 18 months?	No	No	No
Frequency of 1-pt QC Check	Every other day	N/A	N/A
Last Performance Evaluation	8/6/21	4/10/19[(A)]	4/10/19[(A)]

[(A)] Auditors were unable to access these instruments during the 2021 audit; and due to the COVID-19 pandemic, it was not audited in 2020

Site	Sloughhouse-Sloughhouse Rd.
Start Date	5/1/2017
Collecting Agency	Sac Metro Air District
Analytical Lab	N/A
Reporting Agency	CARB
Pollutant	$PM_{2.5}$
Parameter Code	88101
Parameter Occurrence	3
Manufacturer/Model	Met One 1020 BAM
Sampling Method	Very sharp cut cyclone
Method Code	170
Analysis Method	Beta Attenuation
FRM/FEM/ARM/Other	FEM
Monitoring Objective	NAAQS comparison, public info, research
Statement of Purpose	Measures rural, background $PM_{2.5}$ concentration
Monitor Type	SLAMS
Affiliation	None
Site Type	Upwind/Background
Spatial Scale	Urban
Sampling Frequency	Continuous
Sampling Season	Year Round
Distance from Supporting Structure or Roof	2.2
Distance from flow obstructions on roof (m)	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction
Distance from nearest tree drip line (m)	17
Distance to furnace or incinerator flue (m)	No furnace/flue
Distance between collocated PM monitors (m)	Not collocated
Distance with nearest PM monitor (m)	Not applicable
Unrestricted airflow (deg)	360
Probe height (m, agl)	5.2
Probe material	Not applicable
Residence time (seconds)	Not applicable
Changes in next 18 months?	No
Frequency of flow rate verification	Bi-monthly
Last Performance Evaluation	3/1/21, 8/6/21

Appendix A.8 Sacramento-1309 T Street

The Sacramento-1309 T Street site is operated by the California Air Resources Board/Monitoring and Laboratory Division/Special Purpose Monitoring Section. This site has been operating since 1989.

Table A-31 Sacramento-T Street Metadata

Site Name	Sacramento-1309 T Street
AQS Site No.	06-067-0010
Geographic Coordinates	38.568440°N, 121.4931190°W
Location	Residential area located in downtown Sacramento
Address	1309 T Street, Sacramento, CA 95814
County	Sacramento
Representative Area (MSA)	Sacramento--Arden-Arcade--Roseville, CA
Distance from roadway	30 m
Annual Average Daily Traffic (Vehicles/Day)	T St. at 13th St.: 4,061 (City of Sacramento, 2019)
Ground Cover	Rooftop site (residential area is paved)

Site	Sacramento-1309 T St.	
Start Date	12/1/1998	4/28/2020
Collecting Agency	CARB	CARB
Analytical Lab	N/A	N/A
Reporting Agency	CARB	CARB
Pollutant	O3	NO2
Parameter Code	44201	42602
Parameter Occurrence	1	1
Manufacturer/Model	TAPI 400E	THERMO 42iQ
Sampling Method	Instrumental	Instrumental
Method Code	087	074
Analysis Method	Ultraviolet Absorption	Chemiluminescence
FRM/FEM/ARM/Other	FEM	FEM
Monitoring Objective	NAAQS comparison, public info	NAAQS comparison, public info
Statement of Purpose	Measures representative concentration in urban area	Measures representative concentration in urban area
Monitor Type	SLAMS	SLAMS
Affiliation	None	None
Site Type	Upwind/Background	Population Exposure
Spatial Scale	Urban	Neighborhood
Sampling Frequency	Continuous	Continuous
Sampling Season	Year Round	Year Round
Distance from Supporting Structure or Roof	3.0	3.0
Distance from flow obstructions on roof (m)	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction
Distance from nearest tree drip line (m)	50.0	50.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable
Distance with nearest PM monitor (m)	1.0 - 2.0 m	1.0 - 2.0 m
Unrestricted airflow (deg)	360	360
Probe height (m, agl)	11.7	11.7
Probe material	FEP Teflon	FEP Teflon
Residence time (seconds)	5.4	6.0
Changes in next 18 months?	No	No
Frequency of 1-pt QC Check	Daily	Daily
Last Performance Evaluation	8/10/21, 10/22/21	8/10/21

Site	Sacramento-1309 T Street			
Start Date	5/1/2013	1/14/2020	12/11/2020	4/1/2021
Collecting Agency	CARB	CARB	CARB	CARB
Analytical Lab	CARB	CARB	CARB	CARB
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	PM10	PM2.5 Mass	PM2.5	PM2.5
Parameter Code	81102	88502	88101	88101
Parameter Occurrence	4	5	3	2
Manufacturer/Model	Met One 4 Models	Met One 5	Met One 1020	THERMO 2000i
Sampling Method	Instrumental	Low volume with VSCC	Low volume with VSCC	Low volume with VSCC
Method Code	122	810	170	143
Analysis Method	Beta Attenuation	Gravimetric	Beta Attenuation	Gravimetric
FRM/FEM/ARM/Other	FEM	Other	FEM	FRM
Monitoring Objective	NAAQS comparison, public info	Research	NAAQS comparison, public info	NAAQS comparison, public info
Statement of Purpose	Measures representative concentration in urban area	Provide speciation data of urban emission	Measures representative concentration in urban area	Measures representative concentration in urban area
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS
Affiliation	None	None	None	None
Site Type	Population Exposure	Highest concentration	Population Exposure, highest concentration	Population exposure
Spatial Scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Sampling Frequency	Continuous	1 in 6 days	Continuous	1 in 12 days
Sampling Season	Year Round	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	2.0	2.0	2.0	2.0
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	50.0	50.0	50.0	50.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	1.0 - 2.0 m	1.0 - 2.0 m	1.0 - 2.0 m	1.0 - 2.0 m
Distance with nearest PM monitor (m)	1.0 - 2.0 m	1.0 - 2.0 m	1.0 - 2.0 m	1.0 - 2.0 m
Unrestricted airflow (deg)	360	360	360	360
Probe height (m, agl)	10.0	10.0	10.0	10.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	Yes
Frequency of flow rate verification	Bi-Monthly	Monthly	Bi-Monthly	Monthly
Last Performance Evaluation	2/25/21, 8/10/21	Not applicable	2/25/21, 8/10/21	None yet

Site	Sacramento-1309 T Street			
Start Date	7/1/2015	7/1/2015	2/1/1992	2/1/1992
Collecting Agency	CARB	CARB	CARB	CARB
Analytical Lab	N/A	N/A	N/A	N/A
Reporting Agency	CARB	CARB	CARB	CARB
Pollutant	Outdoor	Relative Humidity	Wind Direction	Wind Speed
Parameter Code	62101	62201	61104	61103
Parameter Occurrence	2	2	1	1
Manufacturer/Model	Vaisala OT/RH	Vaisala OT/RH	RM Young Model	RM Young Model
Sampling Method	Instrumental	Instrumental	Instrumental	Instrumental
Method Code	059	059	066	066
Analysis Method	Vaisala HMP155	Vaisala HMP155	Ultrasonic Anemometer	Ultrasonic Anemometer
FRM/FEM/ARM/Other	Other	Other	Other	Other
Monitoring Objective	Public info	Public info	Public info	Public info
Statement of Purpose	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology	Measures representative meteorology
Monitor Type	Other	Other	Other	Other
Affiliation	None	None	None	None
Site Type	Not applicable	Not applicable	Not applicable	Not applicable
Spatial Scale	Not applicable	Not applicable	Not applicable	Not applicable
Sampling Frequency	Continuous	Continuous	Continuous	Continuous
Sampling Season	Year Round	Year Round	Year Round	Year Round
Distance from Supporting Structure or Roof	9.0	9.0	9.0	9.0
Distance from flow obstructions on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from flow obstructions not on roof (m)	No obstruction	No obstruction	No obstruction	No obstruction
Distance from nearest tree drip line (m)	50.0	50.0	50.0	50.0
Distance to furnace or incinerator flue (m)	No furnace/flue	No furnace/flue	No furnace/flue	No furnace/flue
Distance between collocated PM monitors (m)	Not applicable	Not applicable	Not applicable	Not applicable
Distance with nearest PM monitor (m)	Not applicable	Not applicable	Not applicable	Not applicable
Unrestricted airflow (deg)	360	360	360	360
Probe height (m, agl)	15.0	15.0	15.0	15.0
Probe material	Not applicable	Not applicable	Not applicable	Not applicable
Residence time (seconds)	Not applicable	Not applicable	Not applicable	Not applicable
Changes in next 18 months?	No	No	No	No
Frequency of flow rate verification	N/A	N/A	N/A	N/A
Last Performance Evaluation	Not applicable	Not applicable	Not applicable	Not applicable

Appendix B Minimum Monitoring Requirement Assessment

Table B-1 Number of SLAMS Monitoring Site Within Sacramento MSA

Pollutant/Type (if applicable)		Required in MSA[A]	CARB[B]	EDCAQMD[C]	PCAPCD[D]	SMAQMD[E]	YSAQMD[F]	Total
O_3		2	6	0	4	4	1	15
CO		2	0	0	0	2	0	2
NO_2	Area-wide	1	3	0	0	3	0	6
	Near-road	1	0	0	0	1	0	1
SO_2		1	0	0	0	1	0	1
Pb	NCore	0	0	0	0	0	0	0
	Source Oriented	0	0	0	0	0	0	0
PM_{10}		2-4[G]	3	0	0	3	2	8
$PM_{2.5}$	FEM/FRM	3	2	0	1	4	1	8
	Continuous[H]	2	2	0	3	5	0	10
$PM_{10-2.5}$		1	0	0	0	1	0	1

Source: U.S. EPA Air Quality System Extract Site/Monitor Report (AMP 500), access on 23 May 2022

[A] Number of monitors required in Sacramento MSA

[B] CARB – California Air Resources Board

[C] EDCAQMD – El Dorado County Air Quality Management District

[D] PCAPCD – Placer County Air Pollution Control District

[E] SMAQMD – Sacramento Metropolitan Air Quality Management District

[F] YSAQMD – Yolo-Solano Air Quality Management District

[G] According to 40 CFR Part 58, Appendix D- PM_{10} monitoring requirement for the Sacramento MSA is listed to be six to ten PM_{10} monitors instead of two to four. This requirement is based on the highest ambient PM_{10} concentrations in the Sacramento MSA exceeding 120% of the PM10 NAAQS. Because the highest 2020 ambient concentrations in Sacramento were severely impacted by historical wildfire smoke blanketing most of California and the West Coast, the District believes its long-standing requirement of two to four monitors is still relevant and meets the needs of its communities. (Two to four monitors are appropriate for areas with a peak concentration less than 80% of NAAQS.) The air districts in Sacramento MSA or CARB currently operate eight PM_{10} monitors in the MSA. The District looks forward to working with U.S EPA, CARB and other local air districts to ensure current and future monitoring level continue to protect health and safety.

[H] Includes non-FRM/FEM continuous monitors