



San Diego County Air Pollution Control District

MONITORING AND TECHNICAL SERVICES DIVISION Annual Air Quality Monitoring Network Report 2021

POSTED FOR PUBLIC VIEWING: MAY 17, 2022
SUBMITTED FOR EPA REVIEW: JUNE 30, 2022



Authors:

David Medina, PhD
Senior Chemist, Ambient Air Quality Section
Adam Canter
Senior Meteorologist, Meteorology and Modeling Section
Melin Lu
Associate Chemist, Ambient Air Quality Section
David Sodeman, PhD
Chief, Monitoring and Technical Services

Monitoring and Technical Services Division 10124 Old Grove Road, San Diego, CA 92131



(left intentionally blank)



Table of Contents

CHAPTER 1: INTRODUCTION - ANNUAL NETWORK REPORT REQUIREMENTS	1-1
Section 1.1 Federal Citation	1-1
Section 1.2 Purpose, Scope, and Organization of Annual Network Report.....	1-2
Section 1.3 Public Comments Information	1-2
Section 1.3.1 District Contact Information.....	1-2
Section 1.3.2 Additional Air Pollution Information.....	1-3
Section 1.4 Description of Monitoring.....	1-3
Section 1.4.1 Network Design Theory	1-3
Section 1.5 San Diego Air Basin Description	1-4
Section 1.5.1 San Diego Topography.....	1-4
Section 1.5.2 San Diego Climate.....	1-4
Section 1.5.3 Population.....	1-5
CHAPTER 2: OVERVIEW OF THE AIR QUALITY MONITORING NETWORK	2-1
Section 2.1 Executive Summary of the Air Quality Monitoring Network.....	2-1
Section 2.1.1 Overview of the Pollutant Monitoring Network	2-2
Section 2.1.2 Overview of the Gaseous Pollutant Monitoring Network.....	2-7
Section 2.1.3 Overview of the Pb-TSP Sampling Network	2-8
Section 2.1.4 Overview of the PM _{2.5} Sampling Network.....	2-9
Section 2.1.5 Overview of the PM ₁₀ Sampling Network	2-10
Section 2.1.6 Overview of the PAMS Network	2-10
Section 2.2 Summary of the Minimum Monitoring Requirements for the SDAB	2-11
Section 2.3 Summary of Minimum Monitoring Requirements (Data)	2-12
Section 2.3.1 Suitability for Comparison to the NAAQS (Data)-Criteria Pollutants.....	2-13
Section 2.3.2 Quality Control/Quality Assurance (Data)-Criteria Pollutants	2-13
Section 2.3.3 Reporting/Certifying (Data)-Criteria Pollutants.....	2-13
Section 2.3.4 Unsuitability for Comparison to the NAAQS (Data)-non-Criteria Pollutants & Other	2-13
Section 2.3.5 Quality Control/Quality Assurance (Data)-non-Criteria Pollutants & Others	2-13
Section 2.3.6 Reporting/Certifying (Data)-non-Criteria Pollutants & Others.....	2-13
Section 2.4 Recent Planned and Unplanned Changes to the Network.....	2-14
Section 2.4.1 Station Changes (Relocations, Shutdowns, and Additions)	2-14
Section 2.4.1.1 Relocations.....	2-14
Section 2.4.1.2 Station Shutdowns (Temporary or Permanent):	2-14
Section 2.4.1.3 Station Additions	2-15
Section 2.4.2 Monitor/Sampler/Equipment Replacements, Shutdowns, and Additions	2-15
Section 2.4.2.1 Replacements	2-15
Section 2.4.2.2 Shutdowns.....	2-15
Section 2.4.2.3 Additions.....	2-15
Section 2.4.2.4 Other	2-16
Section 2.5 List of Public Comments to this Report and the District Response(s).....	2-16
CHAPTER 3: OZONE (O₃).....	3-1
Section 3.1 Ozone Introduction.....	3-1
Section 3.2 Ozone Minimum Monitoring Requirements	3-3



Section 3.2.1 Ozone Minimum Monitoring Requirements-Design Value Criteria (8-Hr).....	3-3
Section 3.2.2 Ozone Minimum Monitoring Requirements-Maximum Concentration Site Design Value.....	3-4
Section 3.2.3 Ozone Minimum Monitoring Requirements-Ozone Season	3-4
Section 3.2.4 Ozone Minimum Monitoring Requirements-NCORE & PAMS	3-5
Section 3.2.5 Ozone Minimum Monitoring Requirements-Summary	3-5
Section 3.3 Ozone Suitability for Comparison to the NAAQS	3-5
Section 3.4 Ozone Concentrations for San Diego.....	3-6
Section 3.4.1 Ozone Concentrations for San Diego-for the Last 20 Years	3-6
Section 3.4.2 Ozone Concentrations for San Diego-by Site for the Year	3-7
Section 3.4.3 Ozone Concentrations for San Diego-by Site for Design Value.....	3-8
CHAPTER 4: NITROGEN DIOXIDE (NO₂) AND REACTIVE OXIDES OF NITROGEN (NO_y)	4-1
Section 4.1 Nitrogen Dioxide and Reactive Oxides of Nitrogen Introduction	4-1
Section 4.2 Nitrogen Dioxide Minimum Monitoring Requirements	4-3
Section 4.2.1 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road.....	4-3
Section 4.2.1.1 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (first site)...	4-3
Section 4.2.1.2 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (second site)	4-3
Section 4.2.1.3 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (summary).	4-7
Section 4.2.2 Nitrogen Dioxide Minimum Monitoring Requirements-Area-wide	4-7
Section 4.2.3 Nitrogen Dioxide Minimum Monitoring Requirements-Regional Administrator	4-8
Section 4.2.4 Minimum Monitoring Requirements for true-NO ₂ , PAMS	4-8
Section 4.2.5 Reactive Oxides of Nitrogen Minimum Monitoring Requirements for NCORE & PAMS	4-9
Section 4.2.6 NO ₂ , true-NO ₂ , & NO _y Minimum Monitoring Requirements-Summary.....	4-9
Section 4.3 Nitrogen Dioxide Suitability for Comparison to the NAAQS	4-10
Section 4.4 Nitrogen Dioxide Concentrations for San Diego	4-10
Section 4.4.1 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years	4-10
Section 4.4.2 Nitrogen Dioxide Concentrations for San Diego-by Site for the Year	4-11
Section 4.4.3 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value	4-12
CHAPTER 5: CARBON MONOXIDE (CO)	5-1
Section 5.1 Carbon Monoxide Introduction	5-1
Section 5.2 Carbon Monoxide Minimum Monitoring Requirements	5-3
Section 5.2.1 Carbon Monoxide Minimum Monitoring Requirements-Near-road.....	5-3
Section 5.2.2 Carbon Monoxide Minimum Monitoring Requirements-Regional Administrator	5-3
Section 5.2.3 Carbon Monoxide Minimum Monitoring Requirements-NCORE	5-4
Section 5.2.4 Carbon Monoxide Minimum Monitoring Requirements-State (SIP).....	5-4
Section 5.2.5 Carbon Monoxide Minimum Monitoring Requirements-Summary.....	5-5
Section 5.3 Carbon Monoxide Suitability for Comparison to the NAAQS	5-5
Section 5.4 Carbon Monoxide Concentrations for San Diego	5-5
Section 5.4.1 Carbon Monoxide Concentrations for San Diego-for the Last 20 years	5-5
Section 5.4.2 Carbon Monoxide Concentrations for San Diego-by Site for the Year	5-6
CHAPTER 6: SULFUR DIOXIDE (SO₂)	6-1
Section 6.1 Sulfur Dioxide Introduction	6-1
Section 6.2 Sulfur Dioxide Minimum Monitoring Requirements.....	6-3
Section 6.2.1 Sulfur Dioxide Minimum Monitoring Requirements-NCORE.....	6-3



Section 6.2.2 Sulfur Dioxide Minimum Monitoring Requirements-Ambient	6-3
Section 6.2.3 Sulfur Dioxide Minimum Monitoring Requirements-Summary	6-4
Section 6.3 Sulfur Dioxide Suitability for Comparison to the NAAQS	6-5
Section 6.4 Sulfur Dioxide Concentrations for San Diego	6-5
Section 6.4.1 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years	6-5
Section 6.4.2 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value.....	6-6
CHAPTER 7: LEAD (PB)	7-1
Section 7.1 Lead Introduction	7-1
Section 7.2 Lead Minimum Monitoring Requirements	7-3
Section 7.2.1 Lead Minimum Monitoring Requirements-Source (non-Airport) & Source (Airport)..	7-3
Section 7.2.2 Lead Minimum Monitoring Requirements-Special Study (Airport).....	7-4
Section 7.2.3 Lead Minimum Monitoring Requirements-Regional Administrator	7-5
Section 7.2.4 Lead Minimum Monitoring Requirements-QA Collocation & Filter Submittal to EPA	7-5
Section 7.2.5 Lead Minimum Monitoring Requirements-Summary	7-6
Section 7.3 Lead Suitability for Comparison to the NAAQS	7-6
Section 7.3.1 Lead Suitability for Comparison to the NAAQS – Operating Frequency.....	7-6
Section 7.4 Lead Concentrations for San Diego	7-7
Section 7.4.1 Lead Concentrations for San Diego-for the Last 20 Years	7-7
Section 7.4.2 Lead Concentrations for San Diego-by Site for the Year.....	7-8
CHAPTER 8: PARTICULATE MATTER 2.5 μM (PM_{2.5})	8-1
Section 8.1 PM _{2.5} Introduction	8-1
Section 8.2 PM _{2.5} Manual Minimum Monitoring Requirements	8-4
Section 8.2.1 PM _{2.5} Manual Minimum Monitoring Requirements-Design Criteria (24-Hr. & Annual	8-4
Average)	8-4
Section 8.2.2 PM _{2.5} Manual Minimum Monitoring Requirements-State (SIP).....	8-5
Section 8.2.3 PM _{2.5} Manual Minimum Monitoring Requirements-Site of Expected Maximum	8-6
Concentration (24-Hr & Annual Average).....	8-6
Section 8.2.4 PM _{2.5} Manual Minimum Monitoring Requirements-Near-road.....	8-6
Section 8.2.5 PM _{2.5} Manual Minimum Monitoring Requirements-Site of Poor Air Quality.....	8-7
Section 8.2.6 PM _{2.5} Manual Minimum Monitoring Requirements-NCORE	8-7
Section 8.2.7 PM _{2.5} Manual Minimum Monitoring Requirements- QA Collocation.....	8-8
Section 8.2.8 PM _{2.5} Manual Minimum Monitoring Requirements-Summary	8-8
Section 8.3 PM _{2.5} Continuous Minimum Monitoring Requirements	8-9
Section 8.3.1 PM _{2.5} Continuous Minimum Monitoring Requirements-Ambient.....	8-9
Section 8.3.2 PM _{2.5} Continuous Minimum Monitoring Requirements-Collocation with Manual .	8-10
Section 8.3.3 PM _{2.5} Continuous Minimum Monitoring Requirements-NCORE	8-10
Section 8.3.4 PM _{2.5} Continuous Minimum Monitoring Requirements-Collocation	8-11
Section 8.3.4.1 PM _{2.5} Continuous Minimum Monitoring Requirements- Collocation with Manual	8-11
Continuous	8-11
Section 8.3.4.2 PM _{2.5} Continuous Minimum Monitoring Requirements- QA Collocation with	8-11
Continuous	8-11
Section 8.3.5 PM _{2.5} Continuous Minimum Monitoring Requirements-Summary	8-11
Section 8.4 PM _{2.5} Speciation Minimum Monitoring Requirements.....	8-12
Section 8.4.1 PM _{2.5} Speciation Minimum Monitoring Requirements-Ambient	8-12



Section 8.4.2 PM _{2.5} Speciation Minimum Monitoring Requirements-NCORE.....	8-12
Section 8.4.3 PM _{2.5} Speciation Minimum Monitoring Requirements-Summary.....	8-12
Section 8.5 PM _{2.5} Suitability for Comparison to the NAAQS	8-13
Section 8.5.1 PM _{2.5} Manual Suitability for Comparison to the NAAQS	8-13
Section 8.5.2 PM _{2.5} Continuous Unsuitability for Comparison to the NAAQS.....	8-13
Section 8.5.3 PM _{2.5} Speciation Unsuitability for Comparison to the NAAQS	8-13
Section 8.6 PM _{2.5} Manual Operating Schedule.....	8-14
Section 8.7 PM _{2.5} Manual Concentrations for San Diego.....	8-16
Section 8.7.1 PM _{2.5} Manual Concentrations for San Diego-for the Last 20 Years	8-16
Section 8.7.2 PM _{2.5} Manual Concentrations for San Diego-by Site for the Year	8-17
Section 8.7.3 PM _{2.5} Manual Concentrations for San Diego-by Site for the Design Value (24-Hr).....	8-18
Section 8.7.4 PM _{2.5} Manual Concentrations for San Diego-by Site for the Design Value (Annual Average)	8-19
Section 8.8 PM _{2.5} Continuous Concentrations for San Diego.....	8-20
Section 8.8.1 PM _{2.5} Continuous Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average)	8-20
Section 8.8.2 PM _{2.5} Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average)	8-21
CHAPTER 9: PARTICULATE MATTER 10 μM (PM₁₀).....	9-1
Section 9.1 PM ₁₀ Introduction.....	9-1
Section 9.2 PM ₁₀ Minimum Monitoring Requirements	9-3
Section 9.2.1 PM ₁₀ Minimum Monitoring Requirements-Ambient.....	9-3
Section 9.2.2 PM ₁₀ Minimum Monitoring Requirements-NCORE	9-4
Section 9.2.3 PM ₁₀ Manual Minimum Monitoring Requirements-QA Collocation	9-4
Section 9.2.4 PM ₁₀ Minimum Monitoring Requirements-Summary	9-4
Section 9.3 PM ₁₀ Suitability for Comparison to the NAAQS.....	9-5
Section 9.3.1 PM ₁₀ Suitability for Comparison to the NAAQS - Equipment & Siting	9-5
Section 9.3.2 PM ₁₀ Suitability for Comparison to the NAAQS - Sampling Frequency	9-5
Section 9.4 PM ₁₀ Concentrations for San Diego.....	9-6
Section 9.4.1 PM ₁₀ Concentrations for San Diego-for the Last 20 Years.....	9-6
Section 9.4.2 PM ₁₀ Concentrations for San Diego - by Site at Standard Conditions (STD) for the Year (24-Hr & Annual Average).....	9-7
Section 9.4.3 PM ₁₀ Concentrations for San Diego - by Site at Local Conditions (LC) for the Year.....	9-7
CHAPTER 10: NATIONAL CORE (NCORE)	10-1
Section 10.1 NCore Introduction	10-1
Section 10.1.1 NCore Minimum Monitoring Requirements.....	10-2
Section 10.1.2 PM ₁₀ Minimum Monitoring Requirements-Ambient.....	10-2
Section 10.2 NCore Suitability for Comparison to the NAAQS.....	10-3
Section 10.3 NCore Concentrations	10-4
CHAPTER 11: PHOTOCHEMICAL ASSESSMENT MONITORING STATIONS (PAMS)	11-1
Section 11.1 PAMS Introduction	11-1
Section 11.2 PAMS Minimum Monitoring Requirements.....	11-3
Section 11.2.1 PAMS Minimum Monitoring Requirements-Equipment.....	11-3
Section 11.2.2 PAMS Minimum Monitoring Requirements-Sampling Season.....	11-4
Section 11.3 PAMS Sampling Frequency & Equipment	11-4



APPENDICES

APPENDIX A: SITE DESCRIPTION INTRODUCTION A-1
APPENDIX B: ALPINE STATION DESCRIPTION..... B-1
APPENDIX C: CAMP PENDLETON STATION DESCRIPTION..... C-1
APPENDIX D: CHULA VISTA STATION DESCRIPTION..... D-1
APPENDIX E: DONOVAN STATION DESCRIPTION E-1
APPENDIX F: KEARNY VILLA ROAD STATION DESCRIPTION.....F-1
APPENDIX G: LEXINGTON ELEMENTARY SCHOOL STATION DESCRIPTION G-1
APPENDIX H: RANCHO CARMEL DRIVE STATION DESCRIPTIONH-1
APPENDIX I: MCCLEAN - PALOMAR AIRPORT STATION DESCRIPTION..... I-1
APPENDIX J: SHERMAN ELEMENTARY SCHOOL STATION DESCRIPTION J-1



List of Tables

Table 2-1 List of Network Sites.....	2-2
Table 2-2 Air Monitoring Sites with Associated Monitors/Samplers & Sample Frequency	2-4
Table 2-3 Gaseous Pollutants Monitoring Network	2-7
Table 2-4 Lead Sampling Network.....	2-8
Table 2-5 PM _{2.5} Sampling Network	2-9
Table 2-6 PM ₁₀ Sampling Network	2-10
Table 2-7 PAMS Sampling Network*	2-10
Table 2-8 Summary of Minimum Monitoring Requirements.....	2-12
Table 3-1 Ozone State and Federal Standards for the Year.....	3-1
Table 3-2 Ozone Monitoring Network	3-2
Table 3-3 Ozone Minimum Monitoring Requirements-Design Value Criteria (8-Hr).....	3-3
Table 3-4 Ozone Minimum Monitoring Requirements-Maximum Concentration Site Design Value ...	3-4
Table 3-5 Ozone Minimum Monitoring Requirements-Ozone Sampling Season.....	3-4
Table 3-6 Ozone Minimum Monitoring Requirements-PAMS	3-5
Table 3-7 Ozone Minimum Monitoring Requirements-Summary	3-5
Table 3-8 Ozone Suitability for Comparison to the NAAQS- Sampling Equipment.....	3-6
Table 3-9 Ozone Concentrations for San Diego-for the Last 20 Years, 2001-2021.....	3-6
Table 3-10 Ozone Concentrations for San Diego-by Site for the Year, 2021	3-7
Table 3-11 Ozone Concentrations for San Diego-by Site for Design Value, 2019-2021.....	3-8
Table 4-1 Nitrogen Dioxide State and National Standards for the Year*	4-1
Table 4-2 Nitrogen Dioxide & Reactive Oxides of Nitrogen Monitoring Network.....	4-2
Table 4-3 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road	4-3
Table 4-4 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (second site) Matrix.....	4-4
Table 4-5 Common Air Pollution Related Health Issues in the South Region of San Diego.....	4-6
Table 4-6 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (summary)	4-7
Table 4-7 Nitrogen Dioxide Minimum Monitoring Requirements-Area-wide	4-7
Table 4-8 Nitrogen Dioxide Minimum Monitoring Requirements-Regional Administrator	4-8
Table 4-9 Minimum Monitoring Requirements for true-NO ₂ , PAMS	4-8
Table 4-10 Reactive Oxides of Nitrogen Minimum Monitoring Requirements-PAMS & NCore.....	4-9
Table 4-11 NO ₂ , true-NO ₂ , & NO _y Minimum Monitoring Requirements-Summary.....	4-9
Table 4-12 Nitrogen Dioxide & Reactive Oxides of Nitrogen Sampling Equipment	4-10
Table 4-13 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years, 2001-2021	4-10
Table 4-14 Nitrogen Dioxide Concentrations for San Diego- by Site for the Year, 2021	4-11
Table 4-15 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value, 2019-2021	4-12
Table 5-1 Carbon Monoxide State and National Standards for the Year	5-1
Table 5-2 Carbon Monoxide Monitoring Network.....	5-2
Table 5-3 Carbon Monoxide Minimum Monitoring Requirements-Near-road.....	5-3
Table 5-4 Carbon Monoxide Minimum Monitoring Requirements-Regional Administrator	5-4
Table 5-5 Carbon Monoxide Minimum Monitoring Requirements-NCore	5-4
Table 5-6 Carbon Monoxide Minimum Monitoring Requirements-State (SIP).....	5-4
Table 5-7 Carbon Monoxide Minimum Monitoring Requirements-Summary.....	5-5
Table 5-8 Carbon Monoxide Suitability for Comparison to the NAAQS-Sampling Equipment.....	5-5



Table 5-9 Carbon Monoxide Concentrations for San Diego-for the Last 20 Years, 2001-2021	5-5
Table 5-10 Carbon Monoxide Concentrations for San Diego-by Site for the Year, 2021	5-6
Table 6-1 Sulfur Dioxide State and National Standards for the Year.....	6-1
Table 6-2 Sulfur Dioxide Monitoring Network	6-2
Table 6-3 Sulfur Dioxide Minimum Monitoring Requirements-NCORE.....	6-3
Table 6-4 Sulfur Dioxide Minimum Monitoring Requirements - EPA NEI SO ₂	6-4
Table 6-5 Sulfur Dioxide Minimum Monitoring Requirements-Ambient	6-4
Table 6-6 Sulfur Dioxide Minimum Monitoring Requirements-Summary	6-4
Table 6-7 Sulfur Dioxide Suitability for Comparison to the NAAQS-Sampling Equipment	6-5
Table 6-8 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years, 2001-2021	6-5
Table 6-9 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value, 2019-2021	6-6
Table 7-1 Lead State and National Standards for the Year	7-1
Table 7-2 Lead Sampling Network (regulatory collection and analysis)	7-2
Table 7-3 Lead Minimum Monitoring Requirements-Source (non-Airport) based on the NEI.....	7-3
Table 7-4 Lead Minimum Monitoring Requirements-Source (Airport) based on the NEI	7-3
Table 7-5 Lead Minimum Monitoring Requirements - Airport (Special Study) Results	7-4
Table 7-6 Lead Minimum Monitoring Requirements-Regional Administrator	7-5
Table 7-7 Lead Minimum Monitoring Requirements-QA Collocation & Filter Submittal to EPA.....	7-5
Table 7-8 Lead Minimum Monitoring Requirements-Summary	7-6
Table 7-9 Lead Suitability for Comparison to the NAAQS-Sampling Equipment	7-6
Table 7-10 Lead Suitability for Comparison to the NAAQS-Sampling Equipment	7-7
Table 7-11 Lead Concentrations for San Diego-for the Last 20 Years, 2001-2021	7-7
Table 7-12 Lead Concentrations for San Diego-by Site for the Year.....	7-8
Table 8-1 PM _{2.5} State and National Standards for the Year.....	8-1
Table 8-2 PM _{2.5} Sampling Network	8-2
Table 8-3 PM _{2.5} Manual Minimum Monitoring Requirements-Design Criteria (Annual Average).....	8-4
Table 8-4 PM _{2.5} Manual Minimum Monitoring Requirements-Design Criteria (24-Hr).....	8-5
Table 8-5 PM _{2.5} Manual Minimum Monitoring Requirements-Ambient	8-5
Table 8-6 PM _{2.5} Manual Minimum Monitoring Requirements- State (SIP).....	8-5
Table 8-7 PM _{2.5} Manual Minimum Monitoring Requirements-Site of Expected Maximum Concentration (Annual Average) & 24-Hr	8-6
Table 8-8 PM _{2.5} Manual Minimum Monitoring Requirements-Near-road	8-7
Table 8-9 PM _{2.5} Manual Minimum Monitoring Requirements-Site of Poor Air Quality.....	8-7
Table 8-10 PM _{2.5} Manual Minimum Monitoring Requirements-NCORE.....	8-8
Table 8-11 PM _{2.5} Manual Minimum Monitoring Requirements- QA Collocation.....	8-8
Table 8-12 PM _{2.5} Manual Minimum Monitoring Requirements-Summary	8-9
Table 8-13 PM _{2.5} Continuous Minimum Monitoring Requirements-Ambient	8-9
Table 8-14 PM _{2.5} Continuous Minimum Monitoring Requirements-Collocation with Manual	8-10
Table 8-15 PM _{2.5} Continuous Minimum Monitoring Requirements-NCORE	8-10
Table 8-16 PM _{2.5} Continuous Minimum Monitoring Requirements-Collocation	8-11
Table 8-17 PM _{2.5} Continuous Minimum Monitoring Requirements-Summary	8-11
Table 8-18 PM _{2.5} Speciation Minimum Monitoring Requirements-Ambient.....	8-12
Table 8-19 PM _{2.5} Speciation Minimum Monitoring Requirements-NCORE	8-12
Table 8-20 PM _{2.5} Speciation Minimum Monitoring Requirements-Summary	8-13
Table 8-21 PM _{2.5} Manual Suitability for Comparison to the NAAQS – Sampling Equipment.....	8-13
Table 8-22 PM _{2.5} Continuous Unsuitability for Comparison to the NAAQS – Sampling Equipment..	8-13



Table 8-23 PM _{2.5} Speciation Unsuitability for Comparison to the NAAQS – Sampling Equipment....	8-14
Table 8-24 PM _{2.5} Operating Schedule-for All PM _{2.5} Instruments	8-15
Table 8-25 PM _{2.5} Manual Operating Schedule-for Manual Samplers Collocated with Continuous Samplers (DV-24-hr)	8-15
Table 8-26 PM _{2.5} Manual Operating Schedule-NCORE	8-15
Table 8-27 PM _{2.5} Speciation Operating Schedule-NCORE	8-16
Table 8-28 PM _{2.5} Manual Concentrations for San Diego-for the Last 20 Years (24-Hr), 2001-2021 ...	8-16
Table 8-29 PM _{2.5} Manual Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average), 2021.....	8-17
Table 8-30 PM _{2.5} Manual Concentrations for San Diego-by Site for the Design Value (24-Hr), 2019-2021.....	8-18
Table 8-31 PM _{2.5} Manual Concentrations for San Diego-by Site for the Design Value (Annual Average), 2019-2021	8-19
Table 8-32 PM _{2.5} Continuous Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average), 2021	8-20
Table 8-33 PM _{2.5} Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average), 2019-2021.....	8-21
Table 9-1 PM ₁₀ State and National Standards for the Year	9-1
Table 9-2 PM ₁₀ Sampling Network	9-2
Table 9-3 PM ₁₀ Minimum Monitoring Requirement-Design Criteria for the Year, 2021 (24-Hr)	9-3
Table 9-4 PM ₁₀ Minimum Monitoring Requirements-Ambient.....	9-3
Table 9-5 PM ₁₀ Minimum Monitoring Requirements-NCORE	9-4
Table 9-6 PM ₁₀ Manual Minimum Monitoring Requirements-Collocation	9-4
Table 9-7 PM ₁₀ Minimum Monitoring Requirements-Summary	9-5
Table 9-8 PM ₁₀ Suitability for Comparison to the NAAQS, Equipment & Siting.....	9-5
Table 9-9 PM ₁₀ Suitability for Comparison to the NAAQS - Sampling Frequency.....	9-6
Table 9-10 PM ₁₀ Concentrations for San Diego - for the Last 20 Years, 2001-2021.....	9-6
Table 9-11 PM ₁₀ Concentrations for San Diego-by Site at Standard Conditions (STD) for the Year, 2021	9-7
Table 9-12 PM ₁₀ Concentrations for San Diego - by Site at Local Conditions (LC) for the Year, 2021	9-8
Table 10-1 NCore Minimum Monitoring Requirements-Equipment & Summary	10-2
Table 10-2 NCore Suitability for Comparison to the NAAQS-Frequency & Equipment.....	10-3
Table 10-3 NCore Concentrations for PM _{10-2.5} (PMcoarse)	10-4
Table 10-4 NCore Concentrations for CO-TLE	10-4
Table 10-5 NCore Concentrations for SO ₂ -TLE	10-4
Table 10-6 NCore Concentrations for NO _y -NO	10-4
Table 10-7 NCore Concentrations for NO ₂	10-4
Table 11-1 PAMS Sampling Network.....	11-2
Table 11-2 PAMS Minimum Sampling Requirements-Equipment & Summary	11-4
Table 11-3 PAMS Minimum Monitoring Requirements-Minimum Sampling Season.....	11-4
Table 11-4 PAMS Sampling Equipment	11-5
Table 11-5 PAMS VOC Parameter Codes.....	11-6
Table 11-6 PAMS Carbonyls Parameter Codes.....	11-6
Table A-1 Relationship between Site Types and Scales or Representativeness.....	A-1
Table A-2 Summary of Definitions in the Site Description Template	A-2
Table A-3 Summary of Probe Monitoring Paths	A-3



Table B-1 General Site Information	B-1
Table B-2 Alpine - Gaseous Pollutants Monitor Designations + Other	B-2
Table B-3 Alpine - Particulate Pollutants Monitor Designations	B-3
Table B-4 Alpine - Meteorology Equipment Designations + Other.....	B-4
Table B-5 Alpine - Distance the Equipment are from Influences	B-5
Table C-1 General Site Information	C-1
Table C-2 Camp Pendleton - Gaseous Pollutants Monitor Designations + Other.....	C-2
Table C-3 Camp Pendleton - Particulate Pollutants Monitor Designations	C-3
Table C-4 Camp Pendleton - Meteorological Equipment Designations + Other	C-4
Table C-5 Camp Pendleton - Distance the Equipment are from Influences.....	C-5
Table D-1 General Site Information	D-1
Table D-2 Chula Vista - Gaseous Pollutants Monitor Designations + Other	D-2
Table D-3 Chula Vista - Particulate Pollutants Monitor Designations.....	D-3
Table D-4 Chula Vista - Other Pollutants Monitor Designations.....	D-4
Table D-5 Chula Vista - Meteorological Equipment Designations + Other.....	D-5
Table D-6 Chula Vista - Distance the Equipment are from Influences	D-6
Table E-1 General Site Information.....	E-1
Table E-2 Donovan - Gaseous Pollutants Monitor Designations + Other.....	E-2
Table E-3 Donovan - Particulate Pollutants Monitor Designations.....	E-3
Table E-4 Donovan - Other Pollutants Monitor Designations.....	E-4
Table E-5 Donovan – Other Additional Pollutants Monitor Designations.....	E-5
Table E-6 Donovan - Meteorological Equipment Monitor Designations + Other	E-6
Table E-7 Donovan - Distance the Equipment are from Influences	E-7
Table F-1 General Site Information.....	F-1
Table F-2 Kearny Villa Road - Gaseous Pollutants Monitor Designations + Other	F-2
Table F-3 Kearny Villa Road - Particulate Pollutants Monitor Designations	F-3
Table F-4 Kearny Villa Road - Meteorological Equipment Designations + Other	F-4
Table F-5 Kearny Villa Road - Meteorological Equipment (Additional) Designations.....	F-5
Table F-6 Kearny Villa Road - Distance the Equipment are from Influences.....	F-6
Table G-1 General Site Information	G-1
Table G-2 Lexington Elementary School - Gaseous Pollutants Monitor Designations + Other	G-2
Table G-3 Lexington Elementary School - Particulate Pollutants Monitor Designations.....	G-3
Table G-4 Lexington Elementary School - Other Pollutants Monitor Designations.....	G-4
Table G-5 Lexington Elementary School - Other Pollutants Monitor (Additional) Designations	G-5
Table G-6 Lexington Elementary School - Meteorological Equipment Monitor Designations + Other	G-6
Table G-7 Lexington Elementary School - Meteorological Equipment (Additional) Designations	G-7
Table G-8 Lexington Elementary School - Distance the Equipment are from Influences	G-8
Table H-1 General Site Information	H-1
Table H-2 Rancho Carmel Drive - Gaseous Pollutants Monitor Designations + Other	H-2
Table H-3 Rancho Carmel Drive - Particulate Pollutants Monitor Designations.....	H-3
Table H-4 Rancho Carmel Drive - Meteorological Equipment Designations + Other.....	H-4
Table H-5 Rancho Carmel Drive - Distance the Equipment are from Influences	H-5
Table I-1 General Site Information.....	I-1
Table I-2 Palomar Airport – Particulate Pollutants Monitor Designations.....	I-2
Table I-3 Palomar Airport - Distance the Equipment are from Influences.....	I-3
Table J-1 General Site Information.....	J-1



Table J-2 Sherman Elementary School - Gaseous Pollutants Monitor Designations + Other..... J-2
Table J-3 Sherman Elementary School - Particulate Pollutants Monitor Designations J-3
Table J-4 Sherman Elementary School - Other Pollutants Monitor Designations J-4
Table J-5 Sherman Elementary School - Meteorological Equipment Designations + Other J-5
Table J-6 Sherman Elementary School - Distance the Equipment are from Influences..... J-6



List of Figures

Figure 2.1 San Diego APCD Air Quality Monitoring Network	2-3
Figure 3.1 Ozone Network Map	3-1
Figure 3.2 Ozone Concentrations for San Diego-for the Last 20 Years Graph.....	3-6
Figure 3.3 Ozone Concentrations for San Diego-by Site for the Year Graph	3-7
Figure 3.4 Ozone Concentrations for San Diego-by Site for Design Value Graph.....	3-8
Figure 4.1 Nitrogen Dioxide & NO _y Network Map	4-1
Figure 4.2 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years Graph	4-11
Figure 4.3 Nitrogen Dioxide Concentrations for San Diego-by Site for the Year Graph	4-12
Figure 4.4 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value Graph	4-13
Figure 5.1 Carbon Monoxide Network Map.....	5-1
Figure 5.2 Carbon Monoxide Concentrations for San Diego-for the Last 20 Years Graph	5-6
Figure 5.3 Carbon Monoxide Concentrations for San Diego-by Site for the Year Graph	5-7
Figure 6.1 Sulfur Dioxide Network Map.....	6-1
Figure 6.2 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years Graph	6-5
Figure 6.3 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value Graph.....	6-6
Figure 7.1 Lead Network Map.....	7-1
Figure 7.2 Lead Concentrations for San Diego-for the Last 20 Years	7-7
Figure 7.3 Lead Concentrations for San Diego-by Site for the Year Graph.....	7-8
Figure 8.1 PM _{2.5} Network Map.....	8-1
Figure 8.2 PM _{2.5} Manual Concentrations for San Diego-for the Last 20 Years (24-Hr) Graph	8-16
Figure 8.3 PM _{2.5} Manual Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average) Graph.....	8-17
Figure 8.4 PM _{2.5} Manual Concentrations for San Diego-by Site for the Design Value (24-Hr) Graph.....	8-18
Figure 8.5 PM _{2.5} Manual Concentrations for San Diego-by Site for the Design Value (Annual Average) Graph.....	8-19
Figure 8.6 PM _{2.5} Continuous Yearly 24-Hr & Annual Average Measurements by Site Graph	8-20
Figure 8.7 PM _{2.5} Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average) Graph	8-21
Figure 9.1 PM ₁₀ Overall Map	9-1
Figure 9.2 PM ₁₀ Concentrations for San Diego-for the Last 20 Years Graph.....	9-6
Figure 9.3 PM ₁₀ Concentrations for San Diego - by Site at Standard Conditions (STD) for the Year ...	9-7
Figure 9.4 PM ₁₀ Concentrations for San Diego - by Site at Local Conditions (LC) for the Year Graph (24-Hr & Annual Average).....	9-8
Figure 10.1 NCore Network Map	10-1
Figure 11.1 PAMS (Carbonyls and VOCs) Network Map	11-1
Figure A.1 Distance of PM samplers to nearest traffic lane	A-4
Figure B.1 Alpine – Picture of the Location of the Station	B-1
Figure B.2 Alpine – Pictures (Directional) from the Rooftop	B-6
Figure C.1 Camp Pendleton – Picture of the Location of the Station.....	C-1
Figure C.2 Camp Pendleton – Pictures (Directional) from the Rooftop.....	C-6
Figure D.1 Chula Vista – Pictures of the Location of the Station	D-1
Figure D.2 Chula Vista – Pictures (Directional) from the Ground.....	D-7
Figure E.1 Donovan – Picture of the Location	E-1



Figure E.2 Donovan – Pictures (Directional) from the Rooftop.....E-8
Figure F.1 Kearny Villa Road – Picture of the Location..... F-1
Figure F.2 Kearny Villa Road – Pictures (Directional) from the Rooftop F-7
Figure G.1 Lexington Elementary School – Picture of the Location G-1
Figure G.2 Lexington Elementary School – Pictures (Directional) from the Rooftop..... G-9
Figure H.1 Rancho Carmel Drive - Picture of the Location of the Station H-1
Figure H.2 Rancho Carmel Drive– Pictures (Directional) from the Ground* H-6
Figure H.3 Rancho Carmel Drive– Gas Inlet..... H-7
Figure I.1 Palomar Airport – Picture of the Location.....I-1
Figure I.2 Palomar Airport – Pictures (Directional) from the Ground*I-4
Figure J.1 Sherman Elementary School – Picture of the Location J-1
Figure J.2 Sherman Elementary – Pictures (Directional) form the rooftop..... J-7



Chapter 1: Introduction - Annual Network Report Requirements

Section 1.1 Federal Citation

In 2007, the U.S. Environmental Protection Agency (EPA) finalized amendments to the ambient air monitoring regulations. These amendments: revised the technical requirements for certain types of sites, programs, and analyzers; added pollutants and programs; and, specified sampling frequencies. Monitoring agencies are required to submit annual monitoring network reports, conduct network assessments every five years, perform quality assurance activities, and, in certain instances, establish new monitoring programs. The regulations from Title 40, Part 58, Section 10(a) of the Code of Federal Regulations (40 CFR 58.10, (a)(1)) state that:

The State, or where applicable local, agency shall adopt and submit to the Regional Administrator an annual monitoring network plan which shall provide for the establishment and maintenance of an air quality surveillance system that consists of a network of [State or Local Air Monitoring Stations] SLAMS monitoring stations including [Federal Reference Method]FRM, [Federal Equivalence Method]FEM, and [Approved Regional Method] ARM monitors that are part of SLAMS, [National Core] NCore stations, [Speciation Trends Network] STN stations, State speciation stations, [Special Purpose Monitor] SPM stations, and/or, in serious, severe and extreme ozone nonattainment areas, PAMS stations, and SPM monitoring stations. The plan shall include a statement of purposes for each monitor and evidence that siting and operation of each monitor meets the requirements of appendices A, C, D, and E of this part, where applicable. The annual monitoring network plan must be made available for public inspection for at least 30 days prior to submission to EPA.

This document is prepared and submitted as part of these requirements. It describes the network of ambient air quality monitors, samplers, and analyzers operated by San Diego County Air Pollution Control District (District) staff in fulfillment of EPA regulations governing network compliance that are updated every July 1. This Annual Network Report (ANR) serves to evaluate whether the current monitoring strategies are meeting the requirements of the District, to determine compliance with all current Federal, and State regulations as it pertains to the ambient Air Quality Network (AAQN). It also serves to identify and report needs for additions, relocations, or terminations of monitoring sites or instrumentation to continue to meet federal requirements.

The Ambient Air Quality Monitoring Network measures air pollutants on a regional level. The District also has a Community Air Protection Program (CAPP) that is devoted to Environmental Justice and the monitoring of toxic air contaminants at a microscale and localized level. The District has a separate network of air monitoring sites within Environmental Justice communities to measure pollutants that are of interest to the community. Although the CAPP has a separate network of monitoring sites for Environmental Justice communities, there is some overlap with the Ambient Air Quality Monitoring Network. The District's Ambient Air Quality Monitoring Network sites at Sherman Elementary School (SES) and at the Otay Mesa-Donovan State Prison (DVN) fall within the Portside Environmental Justice Community and the International Border Community, respectively.

In addition, as part of the AB-423 legislation, the District will be preparing a separate Comprehensive Monitoring Plan this summer/fall. The Comprehensive Monitoring Plan will document the decision process and tools the District utilizes when determining placement of a new monitoring location (regional or community-based) and the pollutants to measure at that location.



Section 1.2 Purpose, Scope, and Organization of Annual Network Report

In San Diego County, there are several locations where the ambient air quality is routinely measured for air pollutants. These sites are operated by the District. The measured data provide the public with information on the status of the air quality and the progress being made to improve air quality. The data can be used by health researchers, business interests, environmental groups, and others.

This report describes the network of ambient air quality monitors within the San Diego Air Basin (SDAB) and meets the requirements for an Annual Network Report as listed in Title 40 of the Code of Federal Regulations (CFR), Part 58.10. The 40 CFR 58.10 require that the report be submitted to the EPA, including any public comments, by July 1, of each year.

As required by the CFR, this report includes equipment which have federal reference methods (FRM) or federal equivalent methods (FEM) designations. While the CFR also requires reporting of approved regional methods (ARM), no ARMs are in operation in San Diego County at this time. Air monitoring samplers and analyzers are designated as FRM and FEM. Only air pollution concentrations measured by FRM and FEM monitors and samplers are compared against the National Ambient Air Quality Standards (NAAQS) for the criteria pollutants (listed in Section 1.4) set by the EPA so that EPA will determine the attainment status. There are also no Special Purpose Monitors (SPM) in the Network at this time. This report also includes information regarding non-regulatory and non-criteria pollutant monitoring.

Section 1.3 Public Comments Information

Pursuant to Federal regulations, the draft report will be available for a minimum of 30 days for public inspection period. Notice of availability of the report was posted on the District's website (www.sdapcd.org). Comments regarding this report and the District response(s) before submittal to EPA will be listed in the Chapter 2 Overview of the Air Quality Monitoring Network (Section 2.5). Any comments regarding this report and answered by the District after submittal to the EPA, will be forwarded to EPA Region 9 headquarters.

Please submit any comments in writing to David Medina, Senior Chemist, Ambient Air Quality Section, david.medina@sdapcd.org, or mail/deliver to District headquarters at David Medina c/o San Diego County Air Pollution Control District, 10124 Old Grove Road, San Diego, CA, 92131.

Note: The Ambient Air Quality Air Pollution Monitoring Network measures air pollutants on a regional level. The District also has a Community Air Protection Program (CAPP) that is devoted to Environmental Justice and the monitoring of toxic air contaminants at a microscale and localized level.

Section 1.3.1 District Contact Information

For information regarding this report, air monitoring stations, laboratory operations, field and laboratory equipment, quality control and quality assurance procedures of the field and laboratory equipment, or general oversight of the monitoring program contact: David Medina, Senior Chemist, Ambient Air Quality Section, david.medina@sdapcd.org (858) 586-2780.

For information about daily field operations regarding the equipment at the stations, contact: Victor Padilla, Supervisor of Technicians, Electronic Technicians Section, victor.padilla@sdapcd.org, (858) 586-2785.

For information regarding ambient air quality data, meteorological data, episode modeling, air quality forecasting, and smoke management plans contact: Adam Canter, Senior Meteorologist, adam.canter@sdapcd.org, (858) 586-2771.



Section 1.3.2 Additional Air Pollution Information

Additional information regarding San Diego's ambient air quality monitoring network, including pollutant data summaries for the various monitors in the network, are available from a variety of sources. This section lists a number of additional sources for related information.

Similar information is available on EPA and CARB websites, but the links to these locations change frequently. Key words to search at their website are: National Ambient Air Quality Standards, Fine Particle (PM_{2.5}) Designations, The Plain English Guide to the Clean Air Act, About Air Toxics, Health and Ecological Effects, Air Trends, PAMS Information, Green House Gases, Stratospheric Ozone, as well as the names of the chapters of this document, etc.

Likewise, the CARB's Monitoring and Laboratory Division (MLD) maintains web pages with information about all the existing monitoring sites that routinely monitor and submit air quality data in California. These web pages also include detailed local maps showing the location of the sites. This information can be found at <http://www.arb.ca.gov/aaqm/mldaqsb/amn.htm>. A more general MLD web page that provides links to other aspects of ambient monitoring is located at <http://www.arb.ca.gov/aaqm/aaqm.htm>.

CARB's annual network report contains listings of all the monitoring sites in the State, along with the years for which the data are available for each monitor/sampler in California. Summaries of the official air quality data from sites around the State can be found at: <http://www.arb.ca.gov/adam/welcome.html>. Pollution data is available on the District's website (<http://www.sdapcd.org/>). Other helpful websites to visit are: <http://airnow.gov/>, and at https://aqs.epa.gov/aqsweb/documents/data_mart_welcome.html.

Section 1.4 Description of Monitoring

The EPA has set National Ambient Air Quality Standards (NAAQS) for six common air pollutants, which are called criteria pollutants. These pollutants are known to cause health effects and harm the environment. It is the role of the San Diego County APCD to measure for these criteria pollutants. In addition, the EPA requires that the San Diego County APCD operates additional monitoring programs. This document details the current monitoring network in the SDAB for the criteria pollutants, monitoring programs, and site detail the District must report, and they are below:

Monitoring Programs

- National Core (NCore)
- Speciation Trends Network (STN)
- Chemical Speciation Network (CSN)
- Special Purpose Monitoring (SPM)
- Near-road
- Border 2020
- Photochemical Assessment Monitoring Stations (PAMS)

Criteria Pollutants

- Ozone (O₃)
- Nitrogen Dioxide (NO₂)
- Carbon Monoxide (CO)
- Sulfur Dioxide (SO₂)
- Lead (Pb)
- Particulate Matter (PM)

Site Information

- Site Location
- Site Type
- Site Objective
- Spatial Scale
- Sampling Schedule
- Equipment
- Sampling Method
- Monitoring Objective

Section 1.4.1 Network Design Theory

Ambient air monitoring networks (Network) are designed to fulfill several criteria. A general summary of the criteria are below.

Network Design Objectives

1. Provide data to the public in a timely manner.



2. Support compliance with NAAQS and emissions strategy development.
3. Support air pollution research studies.

Logistical

1. Minimal interference and perturbation of wind flow by obstacles.
2. Proximity to headquarters.
3. Availability of power and communications.
4. Cost of site lease, relocation, or new deployment, site improvements, e.g. fence, road, etc.
5. Safety, security, and accessibility.
6. Flat, level footprint for shelter, platforms, and concrete pad.
7. Gravel or paved road access.

Other

1. Funding.
2. Staffing.
3. Drive time from location to location (congestion patterns).
4. Longevity of the site location.
5. Buildup of the area surrounding the location.
6. Proximity to other monitors.
7. Homogeneity in space and with respect to speciation.
8. Devoid of source influences (point sources, mobile sources, etc.).

Section 1.5 San Diego Air Basin Description

San Diego County lies in the southwest corner of California, has an area of 4,526 square miles, and encompasses the San Diego Air Basin (SDAB) and includes part of the Salton Sea Air Basin. Most of the County's population and pollutant emissions are concentrated in the western portion of the County in the SDAB, which extends to the mountains in the near east. The topography in the SDAB, along with local meteorology, influences the pollutants in the basin. San Diego County also shares an international border with Mexico. The neighboring city of Tijuana forms a binational airshed with San Diego. The Air Pollution Control District has air monitoring stations set-up throughout the SDAB to monitor for these pollutants.

Section 1.5.1 San Diego Topography

The topography of San Diego County is highly varied, being comprised of coastal plains and lagoons, flatlands and mesas, broad valleys, canyons, foothills, mountains, and deserts. Generally, building structures are on the flatlands, mesas, and valleys, while the canyons and foothills tend to be sparsely developed. This segmentation is what has carved the region into a conglomeration of separate cities that led to low density housing and an automobile-centric environment.

The topography of San Diego County is quite diverse. To the west of San Diego are the beaches and the Pacific Ocean, to the south is Tijuana, Mexico and the Baja California Peninsula, to the near east are the mountains, to the far east is the desert (the Salton Sea Air Basin), and to the north is the South Coast Air Basin (the greater Los Angeles-Riverside-San Bernardino area/Air Basin).

Section 1.5.2 San Diego Climate

The climate is classified as Mediterranean, but it is diverse because of the topography. The climate is dominated by the Pacific High-pressure system that results in mild, dry summers and mild, wet winters. San Diego experiences over 150 days above 70°F and 8" to 12" of rainfall annually (mostly, November - March). El Niño and La Niña patterns have large effects on the annual rainfall received in San Diego.



An El Niño is a warming of the surface waters of the eastern Pacific Ocean. It is a climate pattern that occurs across the tropical Pacific Ocean that is associated with drastic weather occurrences, including enhanced rainfall in Southern California. La Niña is a term for cooler than normal sea surface temperatures across the Eastern Pacific Ocean. San Diego receives less than normal rainfall during La Niña years.

The Pacific High-pressure system drives the prevailing winds in the SDAB. The winds tend to blow onshore in the daytime and offshore at night. In the summer, an inversion layer is created over the coastal areas and increases the O₃ levels. In the winter, San Diego often experiences a shallow inversion layer which tends to increase carbon monoxide and PM_{2.5} concentration levels due to the increased use of residential wood burning.

In the fall months, the SDAB is often impacted by Santa Ana winds. These winds are the result of a high-pressure system over the Nevada-Utah region that overcomes the westerly wind pattern and forces hot, dry winds from the east to the Pacific Ocean. These winds are powerful and incessant. They blow the air basin's pollutants out to sea. However, a weak Santa Ana can transport air pollution from the South Coast Air Basin and greatly increase the San Diego O₃ concentrations. A strong Santa Ana also primes the vegetation for firestorm conditions.

Section 1.5.3 Population

According to the official 2020 U.S. census the population for San Diego County is 3.3 million. The County population has been increasing by a growth rate of 0.46% annually.



(left intentionally blank)



Chapter 2: Overview of the Air Quality Monitoring Network

Section 2.1 Executive Summary of the Air Quality Monitoring Network

The District operated nine (9) monitoring sites in 2021 that collected criteria pollutant data (Figure 2.1). The District's monitoring network has been designed to provide criteria pollutant monitoring coverage to the majority of the inhabited regions of the County (Table 2-1 & Table 2-2).

Since the San Diego County Air Pollution Control District was established by the County Board of Supervisors in 1955, occasional air monitoring has been performed in remote portions of the County, including the mountain and desert areas. Historical measurements have shown relatively low levels of air pollution in these areas. Population and growth in these areas have remained low enough that routine air sampling has not been necessary. Measurements have shown that harmful air contaminants are found in areas where population is dense, traffic patterns are heavy, and industrial sources are concentrated. As pollutants are carried inland by prevailing winds, they are frequently trapped against the mountain slopes by a temperature inversion layer, generally occurring between 1500 and 2500 feet above sea level. Therefore, our air monitoring stations are found between the coast and the mountain foothills up to approximately 2000 feet. The monitoring network needs to be large enough to cover the diverse range of topography, meteorology, emissions, and air quality in San Diego, while adequately representing the large population centers. This monitoring network plays a critical role in assessing San Diego County's clean air progress and in determining pollutant exposures throughout the County.

Ambient concentration data are collected for a wide variety of pollutants in the SDAB. These pollutants are: ozone (O₃), fine particulate matter 2.5 micrometers and less in diameter (PM_{2.5}), particulate matter 10 micrometers and less in diameter (PM₁₀), nitrogen dioxide (NO₂), carbon monoxide (CO), sulfur dioxide (SO₂), and lead (Pb). The District also measures additional compounds, including reactive oxides of Nitrogen (NO_y), and PAMS parameters [carbonyls, and Volatile Organic Compounds (VOCs)]. Monitoring for meteorological parameters is also conducted at most monitoring locations. Data for all of the pollutants are needed to better understand the nature of the ambient air quality in San Diego County, as well as to inform the public regarding the quality of the air they breathe. Not all pollutants are monitored at all sites, but most sites monitor for multiple pollutants. A particular site's location and monitoring purpose determine the actual pollutants measured at that site.

A fundamental purpose of air monitoring is to distinguish between areas where pollutant levels exceed the ambient air quality standards and areas where those standards are not exceeded. Health-based ambient air quality standards are set at levels that preclude adverse impacts to human health (allowing for a margin of safety). The District develops strategies and regulations to achieve the emission reductions necessary to meet all health-based standards. Data from the ambient monitoring network are then used to indicate the success of the regulations and control strategies in terms of the rate of progress towards attaining the standards or to demonstrate that standards have been attained and maintained. Thus, there is an established feedback loop between the emission reduction programs and the ambient monitoring programs. Over the years, Federal, State, and District regulatory/strategic measures have proven to be extremely successful at reducing levels of harmful air contaminants. Monitors once placed throughout the County to document the frequent and regular exceedance of ozone, nitrogen dioxide, carbon monoxide, and particulate matter standards now document the continued downward concentration trends of these pollutants.



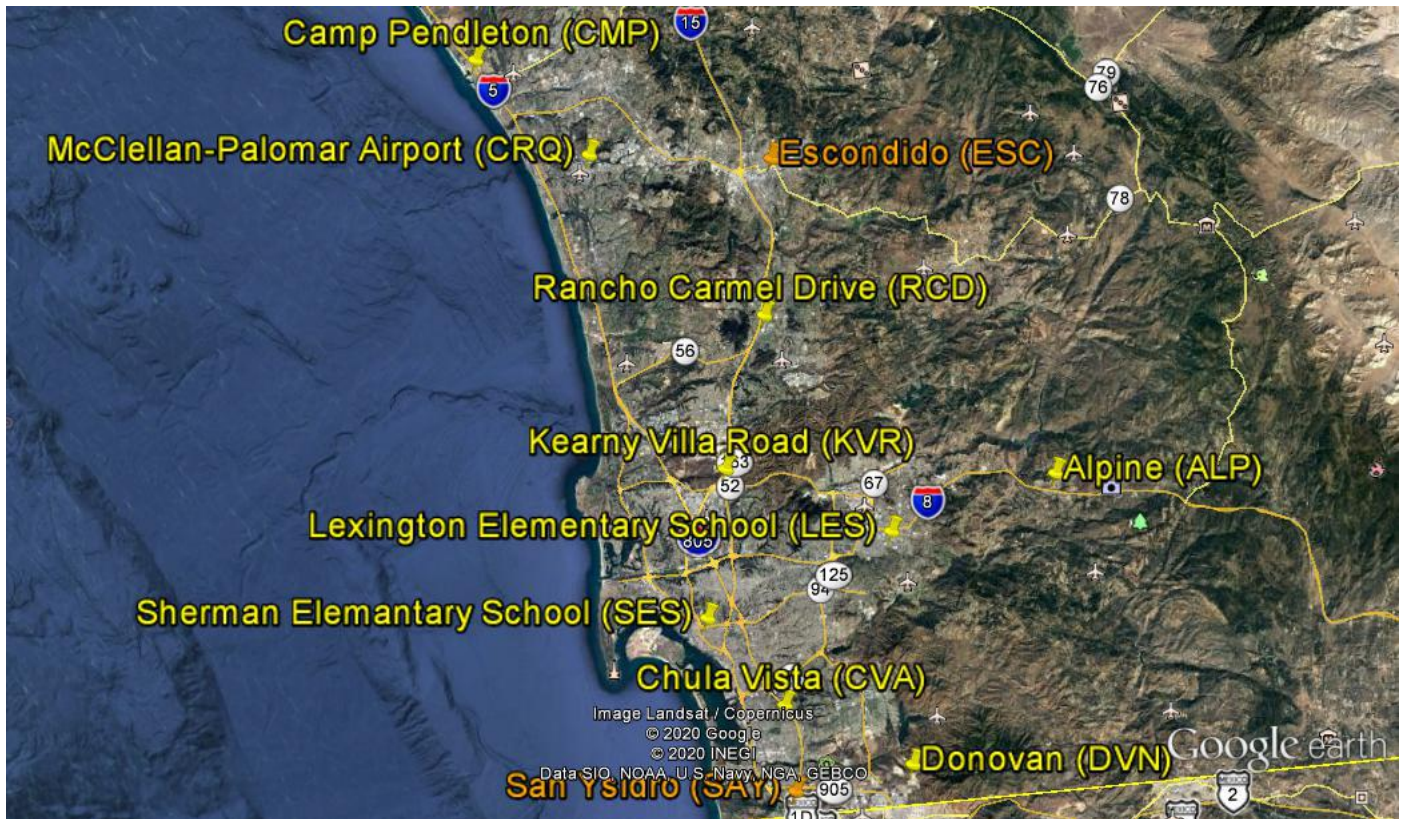
Section 2.1.1 Overview of the Pollutant Monitoring Network

This section lists all the monitoring locations in the SDAB undertaken by the District for this report year. Table 2-1 below is a list of the District’s stations and their locations. Figure 2.1 shows where these monitoring locations are on a map of the County. Table 2-2 lists all the samplers, analyzers, and other instrumentation at these monitoring sites.

Table 2-1 List of Network Sites

Station Name	Station Abbreviation	Address	Latitude/ Longitude	AQS ID
Alpine-Padre Dam	ALP	2300 W. Victoria Dr.	32.842312° -116.768277°	06-073-1006
Camp Pendleton	CMP	21441 W. B St.	33.217020° -117.396179°	06-073-1008
Chula Vista	CVA	84 E. J St.	32.631243° -117.059086°	06-073-0001
Otay Mesa - Donovan	DVN	480 Alta Rd.	32.578162° -116.921388°	06-073-1014
*Escondido	ESC	600 E. Valley Pkwy.	33.127765° -117.075093°	06-073-1002
Kearny Villa Rd.	KVR	6125A Kearny Villa Rd.	32.845713° -117.123979°	06-073-1016
Lexington Elementary School	LES	533 B. First St.	32.789569° -116.944308°	06-073-1022
McClellan-Palomar Airport	CRQ	2192 Palomar Airport Rd.	33.130898° -117.272392°	06-073-1023
Rancho Carmel Dr. (1 st Near-road Site)	RCD	11403 Rancho Carmel Dr.	32.985428° -117.082213°	06-073-1017
*San Ysidro (2 nd Near-road Site)	SAY	198 W. San Ysidro Blvd.	32.552809° -117.047328°	06-073-1025
Sherman Elementary School	SES	450B 24 th St.	32.710177° -117.142665°	06-073-1026

*Orange= Still in the permitting process with the City of Escondido and San Diego, respectively.



*Orange= Under construction

Figure 2.1 San Diego APCD Air Quality Monitoring Network



Table 2-2 Air Monitoring Sites with Associated Monitors/Samplers & Sample Frequency

		ALP Alpine	CMP Camp Pendleton	CVA Chula Vista	DVN Donovan	LES Lexington Elementary School	KVR Kearny Villa Rd.	CRQ Palomar Airport	RCD Rancho Carmel Dr.	SES Sherman Elementary School
AMBIENT	O ₃	7/24	7/24	7/24	7/24	7/24	7/24			7/24
	NO ₂	7/24	7/24	7/24	7/24	7/24	7/24		7/24	7/24
	CO								7/24	
NCORE	NO _y -TLE					7/24				
	CO-TLE					7/24				
	SO ₂ -TLE					7/24				
LEAD (Airports) (Hi-Vol)							1:6			
PM ₁₀ (Manual)			1:6	1:6	1:6					
PM _{10,2.5} (Manual)						1:3				
PML _{2.5} CSN FRM n-FEM	(non-FEM Continuous)	7/24	7/24		7/24	7/24				7/24
	(Manual)			1:3		1:1	1:3		1:3	1:3
	(Speciation)					1:3				
	Channel 1 (Metals)					1:3				
STN	Channel 2 (Inorganic Ions)					1:3				
	Channel 3 (Wood Smoke)									
PAMS	(VOCs)					7/24				
	(Carbonyls)					1:3				
TOXICS CA-TAC (CARB) (APCD)	(VOCs)			1:6		1:6				
	(Total Metals & Cr ⁺⁶)			1:12		1:12				
	(Aldehydes/ Carbonyls)			1:6		1:6				
	(VOCs)				1:6					1:6
	(Total Metals)				1:6	1:6				1:6
	(Aldehydes/ Carbonyls)				1:6					1:6
METEROLOGICAL PARAMETERS & Others	Wind Speed	7/24	7/24	7/24	7/24	7/24	7/24			7/24
	Wind Direction	7/24	7/24	7/24	7/24	7/24	7/24			7/24
	External Temperature	7/24	7/24	7/24	7/24	7/24	7/24		7/24	7/24
	% Relative Humidity	7/24				7/24	7/24			
	Internal Temperature	7/24	7/24	7/24	7/24	7/24	7/24		7/24	7/24
	Barometric Pressure					7/24	7/24			
	Solar Radiation					7/24	7/24			
	Ultraviolet Radiation					7/24				
	Precipitation					7/24				



- **Yellowed** areas indicate a collocation of samplers to satisfy Federal QA requirements for PM_{2.5} FRM monitors, PM₁₀, and TSP samplers with a sampling frequency of 1:6. Lexington Elementary School monitors for NO₂ by a chemiluminescent analyzer and collocated true-NO₂ analyzer.
- The official PAMS season is from June to the end of August. VOCs are sampled and analyzed on an hourly basis (7/24). For PAMS Carbonyls there are three 8-hour samples collected every three days (1:3) with one collocated 8-hour sample collected every 6 days (1:6).
- All sample times are set to Pacific Standard Time.
- The District operates, calibrates, and audits all instruments listed in Table 2-2, except for the CARB's Xontech 924's at the Chula Vista and El Cajon stations (operation only).
- Not all collected samples are analyzed by District personnel. Some samples are sent to the EPA or CARB laboratories for subsequent analysis. They are noted in Table 2-5 as EPA or CARB.
- CA TAC stands for the California Toxics Air Contaminant Monitoring network.

Sampling frequencies are designated as follows:

7/24= a sampler that operates continually with no media changes needed (Please note that a filter tape roll is used on the non-FEM Continuous BAM sampler and changed as needed).

1:1= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs daily for a duration of 24 hours. The media are manually loaded, collected, and programmed to run on a weekly basis.

1:3= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs every three (3) days for a duration of 24 hours. The media are manually loaded, collected, and programmed in between sample days.

1:6= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs every six (6) days for a duration of 24 hours. The media are manually loaded, collected, and programmed on a weekly basis.

1:12= a sampler that requires a sample deposition media (filter, DNPH cartridge, or Summa canister); it runs every twelve (12) days for a duration of 24 hours. The media are manually loaded, collected, and programmed on a biweekly basis.



Tables 2-3 to 2-8 use the same Glossary (see below)

Glossary of Terms

Monitor Type

E= EPA
O= Other
SLAMS= State &Local monitoring stations
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type

HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
SQ= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GCFID continuous
CAPS= Cavity Attenuated Phase Shift

Monitor Designation

PRI= Primary
QAC= Collocated

Network Affiliation

BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale

MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other



Section 2.1.2 Overview of the Gaseous Pollutant Monitoring Network

Table 2-3 below is a summary of the criteria gaseous pollutants and NO_y monitoring network.

Table 2-3 Gaseous Pollutants Monitoring Network

Abbreviation	ALP	CMP	CVA	LES			KVR	DVN	RCD	SES		
Name	Alpine	Camp Pendleton	Chula Vista	Lexington Elementary School			Kearny Villa Rd.	Donovan	Rancho Carmel Dr.	Sherman Elementary School		
AQS ID	06-073-1006	06-073-1008	06-073-0001	06-073-1022			06-073-1016	06-073-1014	06-073-1017	06-073-1026		
O ₃	Monitor Type	SLAMS	SLAMS	SLAMS			SLAMS	SLAMS		SLAMS		
	Method	UV	UV	UV			UV	UV		UV		
	Affiliation	Not Applicable	Not Applicable	Not Applicable			PAMS, NCore	Not Applicable	Not Applicable	Not Applicable		
	Spatial Scale	US	NS	NS			NS	NS		NS		
	Site Type	HC	PE	PE			PE	PE		PE		
	Objective (Federal)	PI, NAAQS	PI, NAAQS	PI, NAAQS			PI, NAAQS	PI, NAAQS		PI, NAAQS		
	Equipment	Thermo 49i	Thermo 49i	Thermo 49i			Thermo 49i	Thermo 49i		Thermo 49i		
NO ₂ & NO _y	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	
	Method	CL	CL	CL	CL	CL	CAPS	CL	CL	CL	CAPS	
	Affiliation	Not Applicable	Not Applicable	Not Applicable	PAMS	PAMS, NCore	PAMS, NCore	Not Applicable	Not Applicable	NR	NA	NA
	Spatial Scale	US	NS	NS			NS	NS	NS	NS	NS	NS
	Site Type	PE	PE	PE			PE	PE	HC	PE	PE	PE
	Objective (Federal)	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, Research	PL, Research	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS
	Equipment	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i*	Thermo 42i-y	Research Teledyne T500U	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i	Teledyne T500U**
CO	Monitor Type			SLAMS					SLAMS			
	Method			IR					IR			
	Affiliation			NCore					Not Applicable			
	Spatial Scale			NS					NS			
	Site Type			PE					PE			
	Objective (Federal)			PI, NAAQS					PI, NAAQS			
	Equipment			Thermo 48i-TLE					Thermo 48i-TLE			
SO ₂	Monitor Type			SLAMS								
	Method			FL								
	Affiliation			NCore								
	Spatial Scale			NS								
	Site Type			PE								
	Objective (Federal)			PI, NAAQS								
	Equipment			Thermo 43i-TLE								

*Closed out 3/31/2021, **Start up 6/30/2021



Section 2.1.3 Overview of the Pb-TSP Sampling Network

Table 2-4 below is a summary of the lead particulates sampling network (regulatory method only).

Table 2-4 Lead Sampling Network

Abbreviation	CRQ		
Name	Palomar Airport		
AQS ID	06-073-1023		
Lead	Monitor Type	SLAMS	SLAMS
	Designation	O	QAC
	Method	HV	HV
	Affiliation	Not Applicable	Not Applicable
	Spatial Scale	MI	MI
	Site Type	SO	QA
	Objective (Federal)	NAAQS	NAAQS
	Analysis	APCD	APCD
	Frequency	1:6	1:6
	Equipment	Tisch TE-5170BLVFC+	Tisch TE-5170BLVFC+



Section 2.1.4 Overview of the PM_{2.5} Sampling Network

Table 2-5 below is a summary of the PM_{2.5} sampling network.

Table 2-5 PM_{2.5} Sampling Network

Site Abbreviation	ALP	CMP	CVA	LES		KVR		DVN	SES		RCD
Site Name	Alpine	Camp Pendleton	Chula Vista	Lexington Elementary School		Kearny Villa Rd.		Donovan	Sherman Elementary School		Rancho Carmel Dr.
AQS ID	06-073-1006	06-073-1008	06-073-0001	06-073-1022		06-073-1016		06-073-1014	06-073-1026		06-073-1017
PM _{2.5} (non-specified)	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
	Designation	O	O	PRI	O	PRI	PRI	QAC	O	O	PRI
	Method	CT (non-FEM)	CT (non-FEM)	SQ (FRM)	CT (non-FEM)	SQ (FRM)	SQ (FRM)	SQ (FRM)	CT (non-FEM)	CT (non-FEM)	SQ (FRM)
	Affiliation	N/A	N/A	N/A	NCORE	NCORE	N/A	N/A	N/A	N/A	N/A
	Spatial Scale	US	US	NS	US	NS	NS	NS	NS	NS	NS
	Site Type	PE	PE	PE	PE	HC	PE	PE	PE	PE	PE
	Objective (Federal)	PI, Research	PI, Research	NAAQS	PI, Research	NAAQS	NAAQS	NAAQS	PI, Research	PI, Research	NAAQS
	Analysis	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD
	Frequency	7/24	7/24	1:3	7/24	1:1	1:3	1:6	7/24	7/24	1:3
Equipment	Met One BAM-1020	Met One BAM-1020	Met One E-SEQ-FRM	Met One BAM-1020	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One BAM-1020	Met One BAM-1020	Met One E-SEQ-FRM	
PM _{2.5} (specified)	Monitor Type			SLAMS	SLAMS						
	Method			SP & SQ	SP & SQ						
	Affiliation			NCORE, CSN, STN	NCORE, CSN, STN						
	Spatial Scale			NS	NS						
	Site Type			PE	PE						
	Objective (Federal)			Research	Research						
	Analysis			EPA	EPA						
	Frequency			1:3	1:3						
Equipment			URG-3000N	Met One SuperSASS							



Section 2.1.5 Overview of the PM₁₀ Sampling Network

Table 2-6 below is a summary of the PM₁₀ sampling network.

Table 2-6 PM₁₀ Sampling Network

Abbreviation	CVA	DVN		LES
Name	Chula Vista	Donovan		Lexington Elementary School
AQS ID	06-073-0001	06-073-1014		06-073-1022
PM ₁₀	Monitor Type	SLAMS	SLAMS	SLAMS
	Designation	O	O	O
	Method	SQ	SQ	SQ
	Affiliation	Not Applicable	Not Applicable	NCORE
	Spatial Scale	NS	NS	NS
	Site Type	PE	HC	PE
	Objective (Federal)	NAAQS	NAAQS	NAAQS
	Frequency	1:6	1:6	1:6
	Equipment	Met One E-SEQ-FRM w/o VSCC	Met One E-SEQ-FRM w/o VSCC	Met One E-SEQ-FRM w/o VSCC

Section 2.1.6 Overview of the PAMS Network

Table 2-7 below is a summary of the Photochemical Assessment Monitoring Stations (PAMS) network.

Table 2-7 PAMS Sampling Network*

Abbreviation	LES			
Name	Lexington			
AQS ID	06-073-1022			
PAMS	Monitor Type	SLAMS	SLAMS	SLAMS
	Method	Auto	Cartridges	Cartridges
	Affiliation	PAMS	PAMS	PAMS
	Spatial Scale	NS	NS	NS
	Site Type	PE	PE	PE
	Objective (Federal)	Research	Research	Research
	Analysis By	APCD	APCD	APCD
	Frequency	24/7	1:3	1:6
	Equipment	Agilent GCFID / Markes	Atec 8000	Atec 8000

*Official EPA start date June 1, 2021



Section 2.2 Summary of the Minimum Monitoring Requirements for the SDAB

The EPA regulations specify the minimum number of sites at which State and Local air agencies must deploy monitors. The State and Local agencies generally find they need to deploy more monitors than are minimally required to fulfill State and Local purposes for monitoring. For example, often California air quality standards are more stringent than National standards, so many areas need more monitors than required by the EPA to show compliance with both State and National standards.

For pollutants monitoring, the minimum requirements for the number of monitors are in the 40 CFR 58, Appendix D “Network Design Criteria for Ambient Air Quality Monitoring”. Each pollutant or monitoring program has different requirements for determining the minimum number of monitors needed for a Metropolitan Statistical Area (MSA) and the requirements can change yearly. The County of San Diego encompasses the San Diego County air basin and part of the Salton Sea air basin, as outlined by the California Air Resources Board. Some pollutants have additional monitoring requirements associated with them, e.g. PM_{2.5} monitoring has requirements for continuous and sequential monitors. This section summarizes the minimum monitoring requirements from the criteria pollutant chapters in this report. For greater detail, refer to the specific pollutant’s chapter.

Note: when the number of monitors required is based on the MSA population, it is taken from the latest U.S. Census. In the non-Census years, the MSA population is extrapolated by the San Diego Association of Governments (SANDAG) and that number is used by the District.

The U.S. EPA regulations specify the minimum number of samplers and monitors (also referred to as analyzers) needed for ambient air monitoring, including those required for collocation. These numbers vary annually, by program, and by within each pollutant. Table 2-1 summarizes these totals listed in the subsequent chapters. Much of this equipment overlaps and can serve multiple functions and/or programs. For example, there are two different requirements for the NO_y analyzer: one for the PAMS program and one for the NCore program. These dual requirements are listed in Table 2-8, but the details allowing for one NO_y analyzer to be used for both programs are listed in the NO₂ chapter and this is true for the other parameters as well.



Table 2-8 Summary of Minimum Monitoring Requirements

Parameter	Requirements for Monitors/Samplers for CFR Programs	Number of Equipment Required	Number of Equipment Active	Number of Equipment Needed
O ₃	CFR EPA Table D-2 only=	2	7	0
	NCore & PAMS only=	1	1	0
NO ₂ , True- NO ₂ , NO _y	Near-road=	2	1	1
	Area-Wide=	1	1	0
	Regional Administrator=	1	1	0
	PAMS true-NO ₂ =	1	1	0
	NCore & PAMS NO _y =	1	1	0
CO	Near-road=	1	1	0
	Regional Administrator	0	0	0
	NCore=	1	1	0
	SIP=	1	1	0
SO ₂	PWEI=	1	1	0
	NCore=	1	1	0
Pb-TSP	Source (non-Airport)=	0	0	0
	Source (Airport)=	0	0	0
	Airport Study=	0	0	0
	Airport Study Exceedance=	1	1	0
	Regional Administrator=	0	0	0
PM _{2.5} Samplers	QA Collocation=	1	1	0
	CFR EPA Table D-2 only=	3	5	0
	California Particulate Matter Network (non-microscale)=	5	4	1
	DV Maximum Concentration, 24-Hr =	1	1	0
	DV Maximum Concentration, Annual Average=	1	1	0
	Expected Maximum Concentration, 24-Hr =	1	1	0
	Expected Maximum Concentration, Annual Average=	1	1	0
	Near-road=	1	0	0
	Poor Air Quality=	1	1	0
	NCore=	1	1	0
PM _{2.5} Continuous	QA Collocation=	1	1	0
	Minimum number required=	2	5	0
	Minimum number of PM _{2.5} continuous collocated with PM _{2.5} manual=	1	1	0
	NCore=	1	1	0
PM _{2.5} Speciation	QA collocation PM _{2.5} continuous with PM _{2.5} continuous=	0	0	0
	PM _{2.5} STN & CSN Speciation=	2	1	1
PM ₁₀ Samplers	NCore=	1	1	0
	CFR EPA Table D-2 only=	6-10	4	2
	QA collocation	1	1	0
NCore	PM _{2.5} -Continuous=	1	1	0
	PM _{2.5} -Manual (Integrated/filter-based)=	1	1	0
	PM _{2.5} -Speciated=	1	1	0
	PM _{10-2.5} =	1	1	0
	NCore & PAMS O ₃ =	1	1	0
	SO ₂ -TLE=	1	1	0
	CO-TLE=	1	1	0
	NCore & PAMS NO/NO _y =	1	1	0
	Wind speed/Wind direction=	1	1	0
	% Relative Humidity=	1	1	0
	Ambient temperature=	1	1	0
PAMS	Hourly averaged speciated volatile organic compounds (VOCs)=	1	1	0
	Three 8-hour averaged carbonyl samples per day on a 1 in 3 day schedule =	1	1	0
	NCore & PAMS O ₃ =	1	1	0
	NO=	1	1	0
	True-NO ₂ =	1	1	0
	NCore & PAMS NO _y	1	1	0
	NCore & PAMS Hourly averaged ambient temperature=	1	1	0
	NCore & PAMS Hourly vector-averaged wind direction=	1	1	0
	Hourly average atmospheric pressure=	1	1	0
	NCore & PAMS Hourly averaged relative humidity=	1	1	0
	Hourly precipitation=	1	1	0
		Hourly averaged mixing-height=		1
		Hourly averaged solar radiation=	1	0
		Hourly averaged ultraviolet radiation	1	0

Section 2.3 Summary of Minimum Monitoring Requirements (Data)

The EPA regulations specify, when applicable:



- how samplers, analyzers, and stations are positioned, to collect data that can be compared to the National standards (NAAQS),
- how the samplers and analyzers are checked using established EPA methodologies, and
- that this data can be legally certified.

Section 2.3.1 Suitability for Comparison to the NAAQS (Data)-Criteria Pollutants

The CFR requires that for O₃, NO₂, CO, SO₂, Pb-TSP, PM_{2.5}, PM₁₀ data to be used in regulatory determinations of compliance with the NAAQS, these instruments must be sited according to Federal Regulations (these requirements are listed in 1)a)i)(1)(a)(i)Appendix A:) and the sampling frequency must be in accordance with Federal regulations (sampling frequencies for each pollutant are in their respective chapters). All the District's instruments meet or exceed all minimum monitoring requirements for siting and sampling frequencies, and the data from them can be compared to the NAAQS and the data can be certified.

Section 2.3.2 Quality Control/Quality Assurance (Data)-Criteria Pollutants

All the District's O₃, NO₂, CO, SO₂, Pb-TSP, PM_{2.5} (manual), PM₁₀ (manual) samplers and analyzers were calibrated, flow checked, one-point checked, internally/District-audited, and externally-NPAP & NPEP audited according to EPA methodologies and the data can be certified.

Section 2.3.3 Reporting/Certifying (Data)-Criteria Pollutants

All the ambient data from the O₃, NO₂, CO, SO₂, Pb-TSP, PM_{2.5} (manual), PM₁₀ (manual) samplers and analyzers were reviewed for validity and the verified data were uploaded into EPA's AQS database quarterly.

All QA and QC reports regarding the O₃, NO₂, CO, SO₂, Pb-TSP, PM_{2.5} (manual), PM₁₀ (manual) instruments were reviewed for validity and the verified data were uploaded into EPA's AQS database quarterly.

All reviewed and verified ambient data and all reviewed and verified QA/QC reports regarding the O₃, NO₂, CO, SO₂, Pb-TSP, PM_{2.5} (manual), PM₁₀ (manual) instruments, were certified in a letter to the EPA Region 9 Authorities by May 1.

Section 2.3.4 Unsuitability for Comparison to the NAAQS (Data)-non-Criteria Pollutants & Other

The District analyzes for other pollutants: PM_{2.5} (continuous) in non-FEM mode, PAMS-VOCs, PAMS-Carbonyls, Toxics-VOCs, Toxics-Carbonyls, and Toxics-Metals. These instruments have no NAAQS to compare. All these instruments meet or exceed all minimum monitoring requirements for siting and sampling frequencies.

Section 2.3.5 Quality Control/Quality Assurance (Data)-non-Criteria Pollutants & Others

All QA/QC functions on the District's PM_{2.5} (continuous) in non-FEM mode, PAMS-VOC, PAMS-Carbonyls, Toxics-VOC, Toxics-Carbonyls, and Toxics-Metals instruments met or exceeded EPA requirements.

Section 2.3.6 Reporting/Certifying (Data)-non-Criteria Pollutants & Others

All the data from the PM_{2.5} (continuous), PAMS-VOC, PAMS-Carbonyls, Toxics-VOCs, Toxics-Carbonyls, and Toxics-Metals instruments were reviewed for validity and the verified data were uploaded into EPA's AQS. The verified data were uploaded to the EPA's AQS database. This data is non-certifiable and is not included in the annual Data Certification Report.



Section 2.4 Recent Planned and Unplanned Changes to the Network

The EPA Region 9 governing authority approves the District's distribution of monitors and the location of the collocated sites for compliance with Federal regulations. Any station or equipment changes will be undertaken in partnership and advisement with the EPA (and CARB, when applicable). Before any SLAMS monitor is decommissioned, the District will follow the procedures listed in 40 CFR Part 58.14, "System Modifications" and any proposed changes to the air monitoring network will be documented in the Annual Network Report. The District will provide a minimum 30-day period for public review, prior to any change, when possible. If a station or analyzer is to relocate, parallel sampling will be undertaken, when possible.

Changes to the monitoring network may occur outside the Annual Network Report approval and the planning process, due to unforeseen circumstances such as eviction, safety concerns, etc. Any changes due to circumstances beyond the District's control will be communicated in writing to the EPA Regional Authority and identified in the subsequent Annual Network Report.

Note: all listed timelines for construction activities are an estimate, as all construction activities require city permitting, construction work goes out to the competitive bid process, and these are handled by the County Department of General Services and the District has no control over these timelines.

Section 2.4.1 Station Changes (Relocations, Shutdowns, and Additions)

The section discusses all the station changes in the network (planned and unplanned).

Section 2.4.1.1 Relocations

- **Escondido** - Operational timeline - TBD.

The District is working to satisfy the City of Escondido permitting requirements needed to set up and operate an air monitoring station. These requirements must be approved by the City before the District can proceed with the construction of a sampling deck and the deployment of air monitoring samplers.

- **San Ysidro (SAY) PM_{2.5}** - Operational timeline - 2023

Construction to install Shelter to be performed in 2022. Once completed, it will serve multiple capacities/programs:

- EPA Border 2025 program (PM_{2.5} continuous and Black Carbon continuous analyzers).
- EPA NO₂ Near-road program for the location of the 2nd required site (true-NO₂ analyzer)
- Community Air Monitoring (State AB 617) (exact parameters unknown)

- **Camp Pendleton** - Operational timeline unknown

This station needs to be relocated (EPA R9 2017 TSA recommendation) elsewhere in the north coastal region. Data is often affected by emissions from the upwind motor pool. A weak node in the power grid, causes frequent power outages which have cascading ramifications: loss of data; equipment repairs; additional field QA/QC; etc. The District has significant site/base access complications. Once a new location is identified, the District will submit a 58.14 request to EPA to the EPA R9 Authorities for approval. The District has no plans of relocating Camp Pendleton in calendar year 2022.

Section 2.4.1.2 Station Shutdowns (Temporary or Permanent):

- **Chula Vista Temporary Shutdown** –Temporary Shutdown timeline - TBD

The entire site will need to be demolished and rebuilt. The District does not plan on discontinuing monitoring at the station in calendar year 2022. The District will seek formal approval with EPA R9 Authorities before any action is taken.



Section 2.4.1.3 Station Additions

- **Near the Otay Mesa Point-of-Entry (POE) - Operational timeline - TBD**
The EPA Border 2025 Authorities have requested that PM_{2.5}-continuous and Black Carbon-continuous analyzers be located near the Otay Mesa POE. The District has received landlord approval to deploy a sampling platform at the State of California Highway Patrol Truck Safety Inspection facility along east Via de la Amistad. As with the San Ysidro site, this location will serve multiple purposes:
 - EPA Border 2025 program (PM_{2.5} continuous and Black Carbon continuous analyzers).
 - Ambient pollutants (exact parameters unknown)
 - Community Air Monitoring (State AB 617) program (exact parameters unknown)

Section 2.4.2 Monitor/Sampler/Equipment Replacements, Shutdowns, and Additions

The section discusses the monitor/sampler changes in the network with respect to the pollutant or program.

Section 2.4.2.1 Replacements

- **Continuous Particulate Matter (PM) Analyzers - Operational timeline – January 2024.**
Continuous Federal Equivalence Method (FEM) Particulate Matter (PM) Analyzers (T640x) will be deployed throughout the Ambient Air Monitoring Network. These analyzers will measure PM_{2.5} and PM₁₀. The District was awarded grant funding in 2022, as part of the American Rescue Plan (ARP), to purchase FEM analyzers to provide continuous PM data. In 2019, the District recorded a maximum PM₁₀ concentration of 199 µg/m³. This has triggered the requirement for 6 to 10 monitors. The District currently has 4 PM₁₀ monitors. The addition of the T640x analyzers (to measure both PM_{2.5} & PM₁₀) will satisfy this requirement. The District is researching the PM_{1.0} reporting option on the analyzer as well.
- **NO/NO₂/NO_x (NO_x) to true-NO₂ – Operational timeline – January 2022**
All Thermo 42i NO₂ analyzers were replaced with Teledyne T500U true-NO₂ analyzers.

Note: A true-NO₂ analyzer was deployed at Lexington Elementary School in El Cajon for the PAMS and NCore requirement at the start of April 2021 (2nd Quarter).

Section 2.4.2.2 Shutdowns

- **Pb-TSP at McClellan Palomar Airport (CRQ) - Shutdown timeline is unknown (EPA dependent)**
All the measured concentrations at the Palomar Airport location are well below 50% of the NAAQS. In 2017 the District petitioned the EPA to decommission lead sampling at this airport. EPA is not approving the previously requested discontinuation of Pb monitoring at Palomar Airport, but EPA Region 9 will continue to work with EPA Headquarters to determine discontinuation eligibility.

Section 2.4.2.3 Additions

- **Ozone Field Transfer Standards - Operational timeline - TBD.**
The District will add a second ozone analyzer to every station that measures for ozone. It will serve as an ozone transfer standard, so the ozone nightly automated QC checks can be official/Level 3 at all ozone sampling locations.
- **PAMS Re-engineering – EPA implementation date June 2021.**
Based on 40 CFR part 58, Appendix D, State air monitoring agencies are required to begin taking PAMS measurements at their NCore location(s) by June 1, 2021. The equipment needed to measure



PAMS parameters were purchased by USEPA using a nationally negotiated contract and delivered to the monitoring agencies.

- **Ceilometer** – As part of the PAMS re-engineering program a ceilometer used to measure mixing height was deployed at the Lexington Elementary School station in August 2021.

Section 2.4.2.4 Other

- **Calibration & Audit Schedule** - Operational timeline TBD
The District is adding three more stations (Escondido, San Ysidro, Otay Mesa-CHP) in TBD and to balance the calibration and audit schedule, a complete reshuffling of the QA/QC dates will be undertaken.
- **Electronic Field Logbooks** - Operational timeline - TBD.
The District is in the process of converting to a cloud-based electronic logbook for field work.

Section 2.5 List of Public Comments to this Report and the District Response(s)

This section will address comments from the public regarding inquires to this report. Questions that were emailed to the District will be included below with a response. The Draft version of the 2021 Annual Network Report was posted on May 17, 2022. It was posted for 30 days to allow for public comment. The final draft of the 2021 Annual Network Report was submitted by July 1, 2022.

Q: Why has it taken 7 years or more to replace the station at Escondido? Why does the county need approval from the city of Escondido to locate a station on county property? Why was the district evicted?

A: In 2015 the District was evicted from the Escondido site. The County had plans to demolish the original County facilities and construct a new facility. The County agreed to dedicate a portion of the property (20 meters South East of the original siting) to the District to establish a new monitoring site. However, during the set-up of the new site location, the District encountered delays with the City of Escondido. The District was working with an architect to help meet the City requirements. Although the site is technically County property, the District still has to meet the City of Escondido requirements. While the architect was working with the City to meet these requirements, the District was informed that a new high density, affordable housing project was announced to be built on the County land adjacent to the monitoring station. The project would impact the air monitoring at the site. Therefore, the District has decided to find an alternative location in the Escondido area for the air monitoring station and meet the EPA siting requirements. Escondido is an important site for our regional Air Monitoring Network and provides valuable data for our inland North County. Finding an alternative site will allow the District to resume monitoring in the region.



Chapter 3: Ozone (O₃)

Section 3.1 Ozone Introduction

Ambient level Ozone was sampled on a continuous (7/24) basis at locations throughout the SDAB (**Figure 3.1**) and referenced to the ozone standard of the year (Table 3-1). The sampling equipment are listed in Table 3-2. Please note:

- In 2015, the District was evicted from our Escondido site (it was on the City of Escondido property) and relocated the station 20 meters southeast of the original location to be on San Diego County property and is currently under construction.

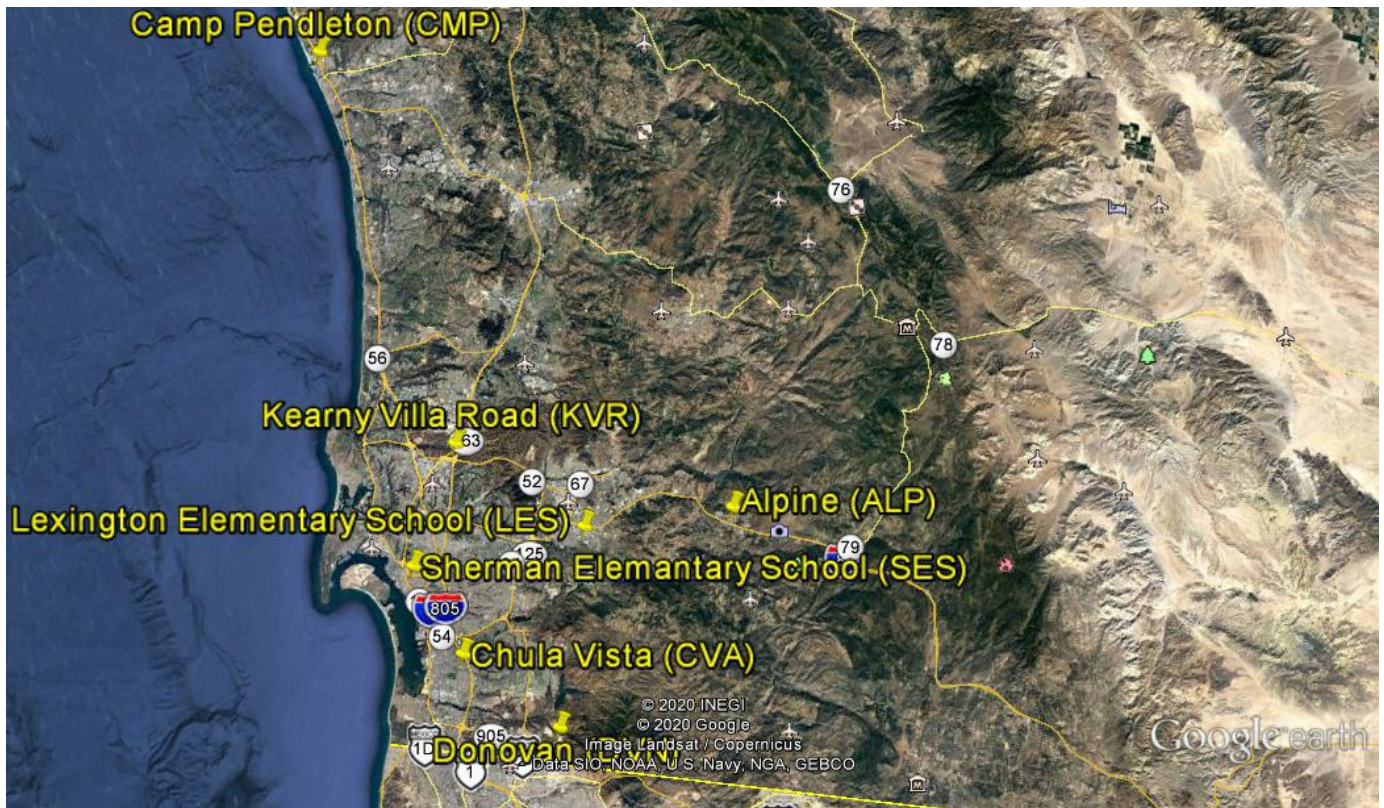


Figure 3.1 Ozone Network Map

Table 3-1 Ozone State and Federal Standards for the Year

Pollutant	Averaging Time	Ambient Air Quality Standards		
		California Standards	National Standards	
		Concentration	Primary	Secondary
Ozone (O ₃)	1 hour	0.09 ppm (180 µg/m ³)	Not Applicable	Not Applicable
	8 hour	0.07 ppm (137 µg/m ³)	0.07 ppm (137 µg/m ³)	0.07 ppm (137 µg/m ³)



Table 3-2 Ozone Monitoring Network

Abbreviation	ALP	CMP	CVA	LES	KVR	DVN	SES
Name	Alpine	Camp Pendleton	Chula Vista	Lexington Elementary School	Kearny Villa Rd.	Donovan	Sherman Elementary School
AQS ID	06-073-1006	06-073-1008	06-073-0001	06-073-1022	06-073-1016	06-073-1014	06-073-1026
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Method	UV	UV	UV	UV	UV	UV	UV
Affiliation	Not Applicable	Not Applicable	Not Applicable	PAMS, NCore	Not Applicable	Not Applicable	Not Applicable
Spatial Scale	US	NS	NS	NS	NS	NS	NS
Site Type	HC	PE	PE	PE	PE	PE	PE
Objective (Federal)	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS
Equipment	Thermo 49i	Thermo 49i	Thermo 49i	Thermo 49i	Thermo 49i	Thermo 49i	Thermo 49i

Glossary of Terms

Monitor Type

E= EPA
 O= Other
 SLAMS= State & Local monitoring station
 SPM= Special purpose monitor
 CATAC= California Toxics Monitoring

Site Type

HC= Highest concentration
 PE= Population exposure
 SO= Source oriented
 UPBD= Upwind background
 G/B= General/Background
 RT= Regional Transport
 WRI= Welfare related impacts
 QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
 CT= Low Volume, size selective inlet, continuous
 FL= Fluorescence
 HV= High volume
 IR= Nondispersive infrared
 SI= High volume, size selective inlet
 SP= Low volume, size selective inlet, speciated
 SQ= Low volume, size selective inlet, sequential
 UV= Ultraviolet absorption
 Canister= Evacuated stainless steel canisters
 Cartridges= Di-nitrophenylhydrazine cartridges
 FSL= Fused Silica Lined
 Filter= Quartz filters
 Auto= GCFID continuous

Monitor Designation

PRI= Primary
 QAC= Collocated

Network Affiliation

BG= Border Grant
 CSN STN= Trends Speciation
 CSN SU= Supplemental Speciation
 NATTS= National Air Toxics Trends Stations
 NCore= National Core Multi-pollutants
 NR= Near-road
 PAMS= Photochemical Assessment Monitoring

Spatial Scale

MI= Micro
 MS= Middle
 NS= Neighborhood

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
 Research= Research support
 PI= Public Information
 N/A= Not Applicable
 O= Other



Section 3.2 Ozone Minimum Monitoring Requirements

The District is federally mandated to monitor O₃ levels in accordance with the CFR. This section will state the different monitoring requirements for each program, e.g. ambient, PAMS, NCore, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other O₃ network requirements, e.g. ambient O₃ monitor can fulfill a PAMS O₃ monitor requirement.

The District meets or exceeds all minimum requirements for O₃ monitoring for all programs.

Section 3.2.1 Ozone Minimum Monitoring Requirements-Design Value Criteria (8-Hr)

The District is required to operate a minimum number of O₃ monitors irrespective of O₃ network affiliations. To ascertain the minimum number of monitors required, the Design Value (DV) must be calculated. The DV is derived by averaging the 4th highest for the last three years. Table 3-3 lists these DV requirements.

4.1(a) Ozone (O₃) Design Criteria¹

...local agencies must operate O₃ sites for various locations depending upon area size (in terms of population and geographic characteristics) and typical peak concentrations (expressed in percentages below, or near the O₃ NAAQS). Specific SLAMS O₃ site minimum requirements are included in Table D-2 of this appendix. The NCore sites are expected to complement the O₃ data collection that takes place at single-pollutant SLAMS sites, and both types of sites can be used to meet the network minimum requirements. The total number of O₃ sites needed to support the basic monitoring objectives of public data reporting, air quality mapping, compliance, and understanding O₃-related atmospheric processes will include more sites than these minimum numbers required in Table D-2 of this appendix....

Table D-2 of Appendix D to Part 58— SLAMS Minimum O₃ Monitoring Requirements

<i>MSA population</i>	<i>Most recent 3-year design value concentrations ≥85% of any O₃ NAAQS</i>	<i>Most recent 3-year design value concentrations <85% of any O₃ NAAQS</i>
<i>350,000 - < 4 million</i>	<i>2</i>	<i>1</i>

Table 3-3 Ozone Minimum Monitoring Requirements-Design Value Criteria (8-Hr)

What is the Maximum 8-Hr Design Value?	Is the Maximum 8-Hr Design Value ≥ 85% of the NAAQS?	Is the Maximum 8-Hr Design Value < 85% of the NAAQS?	Does the Maximum 8-Hr Design Value Meet the NAAQS?	MSA & County	Population Estimated from 2020 Census ²	Number of Monitors Required	Number of Monitors Active	Number of Monitors Needed
2019-2021 (ppm)	2019-2021 (yes/no)	2019-2021 (yes/no)	2019-2021 (yes/no)	(name)	(#)	(#)	(#)	(#)
0.078	yes	no	no	San Diego	3.3 Million	2	7	0

¹(2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.1 “Ozone (O₃) Design Criteria”, subsection 4.1(a), list the requirements needed to fulfill the Ozone (O₃) Design Criteria.

² Based on the official U.S Census statistics.



Section 3.2.2 Ozone Minimum Monitoring Requirements-Maximum Concentration Site Design Value

All Districts are required to categorize at least one monitor/sampling site in the air basin as an area of maximum concentration. A concentration is calculated for this site. The DV is derived by averaging the 4th highest for the last three years. Table 3-4 lists these maximum concentrations site requirements.

4.1(b) Ozone (O₃) Design Criteria³

Within an O₃ network, at least one O₃ site for each MSA, or CSA if multiple MSAs are involved, must be designed to record the maximum concentration for that particular metropolitan area...

Table 3-4 Ozone Minimum Monitoring Requirements-Maximum Concentration Site Design Value

Maximum 8-Hr Design Value Site 2019-2021 (name)	Maximum 8-Hr Design Value Concentration 2019-2021 (ppm)
Alpine (ALP) 06-073-1006	0.078

Section 3.2.3 Ozone Minimum Monitoring Requirements-Ozone Season

All Districts are required to sample for ozone during ozone season as defined by Table D-3. Table 3-5 lists the ozone sampling season for the SDAB.

4.1(i) Ozone (O₃) Design Criteria⁴

Ozone monitoring is required at SLAMS monitoring sites only during the seasons of the year that are conducive to O₃ formation (i.e., “ozone season”) as described below in Table D-3... Ozone monitors at NCore stations are required to be operated year-round (January to December).

Table D-3 to Appendix D of part 58. Ozone Monitoring Season by State

State	Begin Month	End Month
California	January	December

Table 3-5 Ozone Minimum Monitoring Requirements-Ozone Sampling Season

Required Ozone Sampling Season (range)	Active Ozone Sampling Season (range)	Does Active Ozone Sampling Season Meet Requirements? (yes/no)
January-December (annually)	January-December (annually)	yes

³(2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.1 “Ozone (O₃) Design Criteria”, subsection 4.1(b), list the requirements needed to fulfill the Ozone (O₃) Design Criteria.

⁴(2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.1 “Ozone (O₃) Design Criteria”, subsection 4.1(i), list the requirements needed to fulfill the Ozone (O₃) Design Criteria.



Section 3.2.4 Ozone Minimum Monitoring Requirements-NCORE & PAMS

The District is required to operate NCore and Photochemical Assessment Monitoring Stations (PAMS) sites. There are several associated requirements to operate these sites. One of the overlapping requirements is to operate O₃ monitors. Table 3-6 lists Ozone (O₃) Monitoring requirements.

NCore

3. Design Criteria for NCore Sites⁵

(b) The NCore sites must measure, at a minimum, PM_{2.5} particle mass using continuous and integrated/filter-based samplers, speciated PM_{2.5}, PM_{10-2.5} particle mass, O₃, SO₂, CO, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature.

PAMS

5 Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring⁶

(a) State and local monitoring agencies are required to collect and report PAMS measurements at each NCore Site...

(b)... PAMS measurements include: ... (3) Hourly averaged O₃;

Table 3-6 Ozone Minimum Monitoring Requirements-PAMS

Number of O ₃ Monitors Required at NCore & PAMS Sites (#)	Number of O ₃ Monitors Active at NCore & PAMS Sites (#)	Number of O ₃ Monitors Needed at PAMS & NCore Sites (#)	Location of O ₃ Monitors at NCore & PAMS Sites (name)
1	1	0	Lexington Elementary School (LES) 06-073-1022

Section 3.2.5 Ozone Minimum Monitoring Requirements-Summary

Table 3-7 summarizes all the O₃ minimum monitoring requirements from Sections 3.2.1 to 3.2.4.

Table 3-7 Ozone Minimum Monitoring Requirements-Summary

Requirements for O ₃ Monitors for CFR Programs (name)	Number of O ₃ Monitors Required (#)	Number of O ₃ Monitors Active (#)	Number of O ₃ Monitors Needed (#)
CFR EPA Table D-2 only=	2	7	0
NCore & PAMS only=	1	1	0

Section 3.3 Ozone Suitability for Comparison to the NAAQS

The CFR requires that for O₃ data to be used in regulatory determinations of compliance with the O₃ NAAQS, the O₃ monitors must be sited according to Federal Regulations⁷ and the sampling frequency

⁵ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 3(b), “Network Design for NCore Sites.

⁶ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 5(a)-(b)(3), “Network Design for Photochemical Assessment Monitoring Stations (PAMS)”, -subpart (3) “Ozone Monitoring Requirements”

⁷ (2021) 40 CFR Part 58, Appendix E, “Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring” and Table E-4.



must be in accordance with Federal Regulations.⁸ All District O₃ monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 3-8 summarizes these requirements.

Table 3-8 Ozone Suitability for Comparison to the NAAQS- Sampling Equipment

Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Sampling Frequency	Method ID	
Ozone	O ₃	44201	ppm	007	1-Hr	1	Thermo 49 series	Ultraviolet absorption	047	7/24	EQOA-0880-047

Section 3.4 Ozone Concentrations for San Diego

Over the last few years, the ozone concentration has been fluctuating. This section will illustrate the different metrics for comparison.

Section 3.4.1 Ozone Concentrations for San Diego-for the Last 20 Years

San Diego has realized a significant decrease in the 3-yr average of the exceedance days for ozone and has seen a sharp decrease in its 8-hour Design Value (3-year average of the 4th highest 8-hour concentration) since 1990 (Table 3-9 and Figure 3.2).

Note: “Days Above the National 8-Hr Standard” in Table 3-9 reflect the ozone standard for that year.

Table 3-9 Ozone Concentrations for San Diego-for the Last 20 Years, 2001-2021

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Design Value (ppm)	0.094	0.095	0.093	0.089	0.086	0.088	0.089	0.092	0.089	0.088	0.082	0.081	0.080	0.079	0.079	0.081	0.084	0.084	0.082	0.079	0.078
Maximum 8-Hr Concentration (ppm)	0.116	0.100	0.103	0.095	0.089	0.100	0.092	0.109	0.097	0.088	0.093	0.083	0.083	0.081	0.084	0.091	0.095	0.082	0.084	0.102	0.080
Days above the National 8-Hr Standard	43	31	38	23	24	38	27	35	24	14	10	10	7	12	13	13	54	23	19	33	16

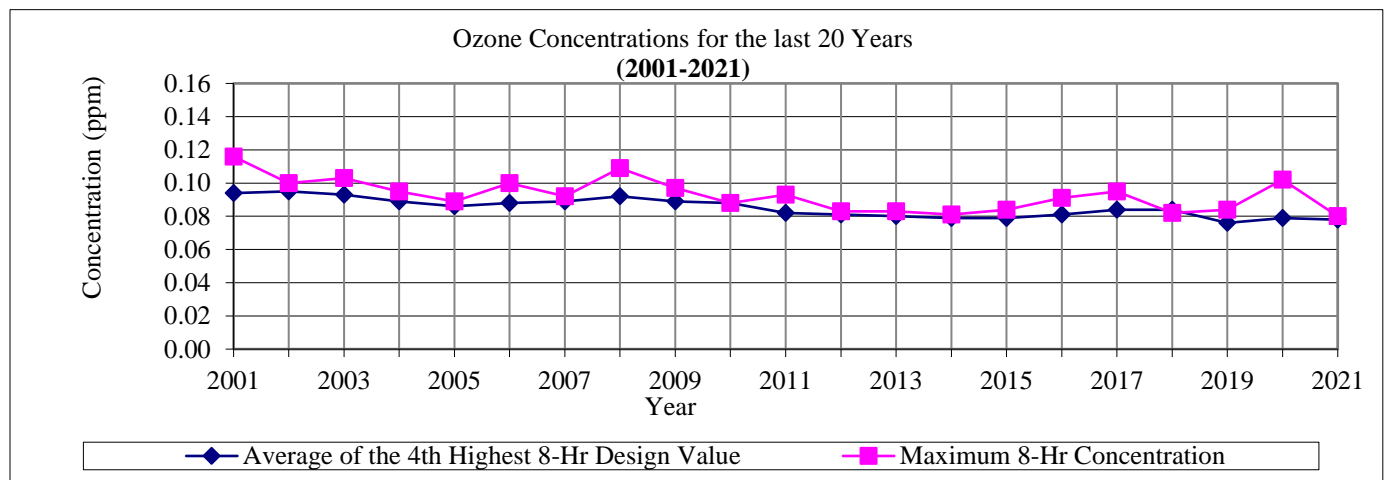


Figure 3.2 Ozone Concentrations for San Diego-for the Last 20 Years Graph

⁸ (2021) 40 CFR Part 58, Subpart B, Section 58.12, “Operating Schedules”.



Section 3.4.2 Ozone Concentrations for San Diego-by Site for the Year

Table 3-10 lists the maximum ozone measurements for every ozone monitoring location and Figure 3.3 show the values graphically with respect to the National Standard for the year.

FOR INFORMATIONAL PURPOSES ONLY

NAAQS comparison requires DV calculations. Annual values are not comparable to the NAAQS

Table 3-10 Ozone Concentrations for San Diego-by Site for the Year, 2021

No. (#)	Site (name)	Site Abbreviation (name)	Maximum 8-Hr Concentration (ppm)	Number of Days Above the National Standard (#)	Annual Average (ppm)
1	Camp Pendleton	CMP	0.059	0	0.040
2	Kearny Villa Rd.	KVR	0.071	1	0.044
3	Alpine	ALP	0.080	15	0.054
4	Lexington Elementary School	LES	0.076	3	0.046
5	Sherman Elementary School	SES	0.063	0	0.041
6	Chula Vista	CVA	0.066	0	0.042
7	Donovan	DVN	0.068	0	0.042

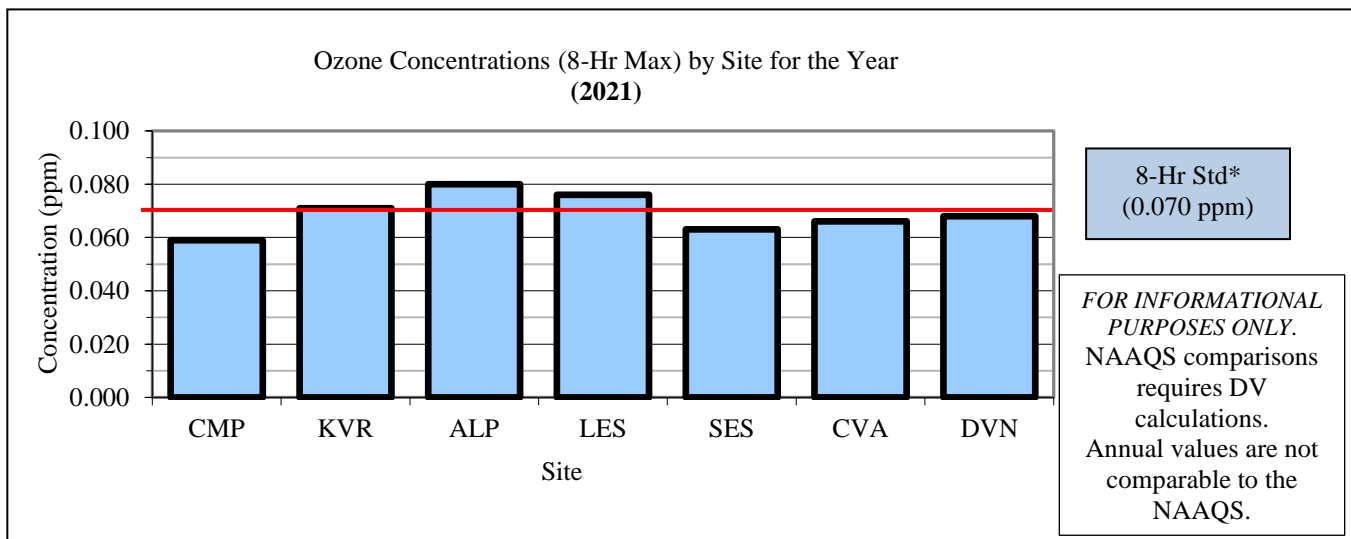


Figure 3.3 Ozone Concentrations for San Diego-by Site for the Year Graph



Section 3.4.3 Ozone Concentrations for San Diego-by Site for Design Value

Table 3-11 lists the maximum ozone measurements for every ozone monitoring location and Figure 3.4 shows the values graphically for the Design Value.

Table 3-11 Ozone Concentrations for San Diego-by Site for Design Value, 2019-2021

No. (#)	Site (name)	Site Abbreviation (name)	Concentration of 8-Hr Design Value (ppm)	Is the 8-Hr Design Value \geq 85% of the NAAQS? (yes/no)	Does the 8-Hr Design Value Meet the NAAQS? (yes/no)
1	Camp Pendleton	CMP	0.059	no	yes
2	Kearny Villa Rd.	KVR	0.070	yes	yes
3	Alpine	ALP	0.078	yes	no
4	Lexington Elementary School	LES	0.071	yes	no
5	Sherman Elementary School	SES	0.061*	yes	yes
6	Chula Vista	CVA	0.066	yes	yes
7	Donovan	DVN	0.066	yes	yes

*Not sampled for 3-yrs

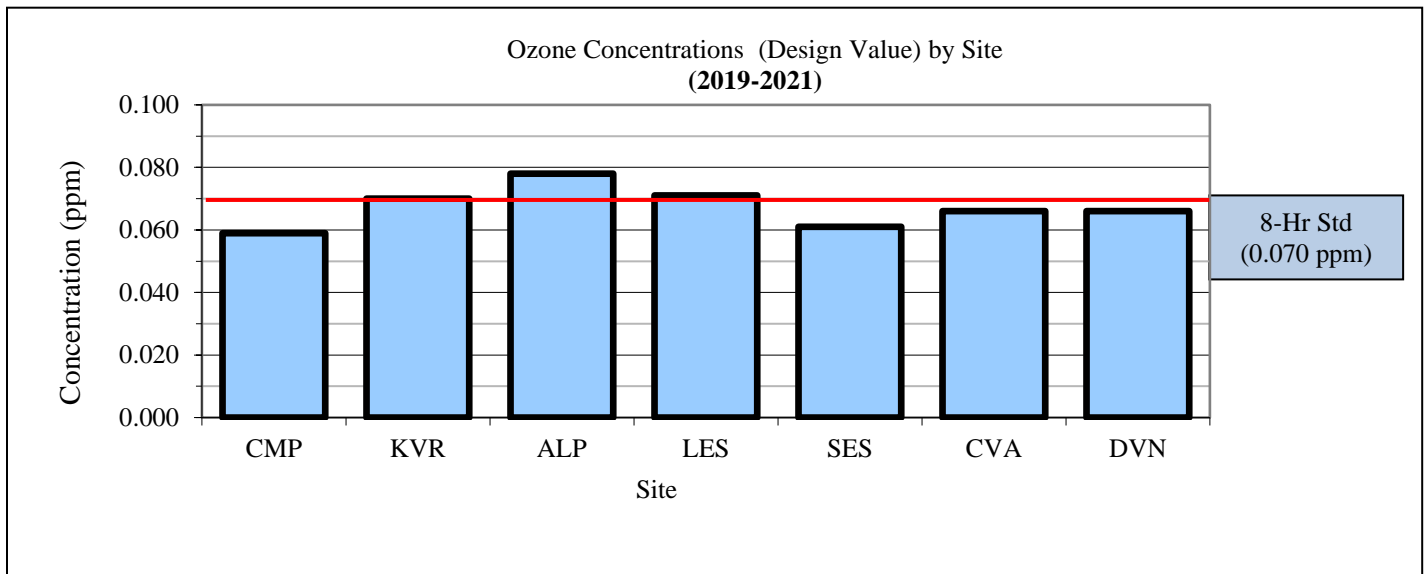


Figure 3.4 Ozone Concentrations for San Diego-by Site for Design Value Graph



Chapter 4: Nitrogen Dioxide (NO₂) and Reactive Oxides of Nitrogen (NO_y)

Section 4.1 Nitrogen Dioxide and Reactive Oxides of Nitrogen Introduction

Ambient level nitrogen dioxide was sampled on a continuous basis at locations throughout the SDAB (Figure 4.1) and referenced to the nitrogen dioxide standards of the year (Table 4-1). The sampling equipment are listed in Table 4-2. Please note:

- In 2015, the District was evicted from our Escondido site (it was on the City of Escondido property) and relocated the station 20 meters southeast of the original location to be on San Diego County property and is currently under construction.
- In September 2020, a true-NO₂ analyzer was deployed at Lexington Elementary School in El Cajon as part of the PAMS and NCore programs to replace the Thermo 42i NO_x analyzer, which was closed out in March 2021. A true-NO₂ analyzer was deployed at Sherman Elementary School in June 2021.

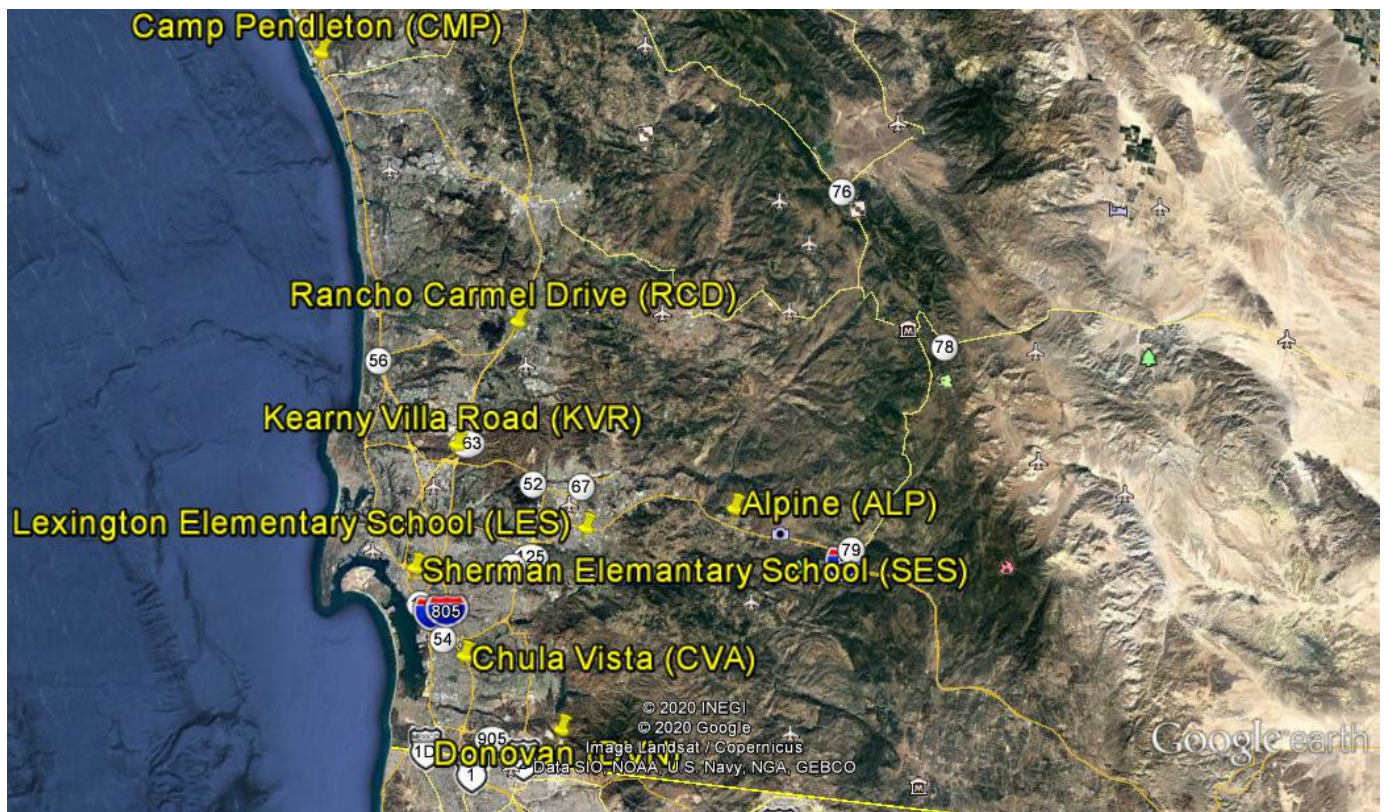


Figure 4.1 Nitrogen Dioxide & NO_y Network Map

Table 4-1 Nitrogen Dioxide State and National Standards for the Year*

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Nitrogen Dioxide (NO ₂)	1 hour	0.18 ppm (339 μg/m ³)	0.100 ppm (188 μg/m ³)	Not Applicable
	Annual Arithmetic Mean	0.030 ppm (57 μg/m ³)	0.053 ppm (137 μg/m ³)	0.053 ppm (137 μg/m ³)

*The NO_y analyzer is non-regulatory; therefore there are no NAAQS to compare. The NO_x and NO_y measurements are comparable in the SDAB.



Table 4-2 Nitrogen Dioxide & Reactive Oxides of Nitrogen Monitoring Network

Abbreviation	ALP	CMP	CVA	LES			KVR	DVN	RCD	SES	
Name	Alpine	Camp Pendleton	Chula Vista	Lexington Elementary School			Kearny Villa Rd.	Donovan	Rancho Carmel Dr.	Sherman Elementary School	
AQS ID	06-073-1006	06-073-1008	06-073-0001	06-073-1022			06-073-1016	06-073-1014	06-073-1017	06-073-1026	
Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Designation	PRI	PRI	PRI	PRI	Not Applicable	O	PRI	PRI	PRI	PRI	O
Method	CL	CL	CL	CL	CL	CAPS	CL	CL	CL	CL	CAPS
Affiliation	Not Applicable	Not Applicable	Not Applicable	PAMS	NCORE, PAMS	NCORE, PAMS	Not Applicable	SLAMS	NR	NR	NR
Spatial Scale	US	NS	NS	NS	NS	NS	NS	NS	MI	NS	NS
Site Type	PE	PE	PE	PE	PE	PE	PE	HC	SO	PE	PE
Objective (Federal)	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, Research	PL, Research	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS	PI, NAAQS
Equipment	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i-y	Teledyne T500U	Thermo 42i	Thermo 42i	Thermo 42i	Thermo 42i	Teledyne T500U

Glossary of Terms

Monitor Type

E= EPA
 O= Other
 SLAMS= State & Local monitoring station
 SPM= Special purpose monitor
 CATAC= California Toxics Monitoring

Site Type

HC= Highest concentration
 PE= Population exposure
 SO= Source oriented
 UPBD= Upwind background
 G/B= General/Background
 RT= Regional Transport
 WRI= Welfare related impacts
 QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
 CT= Low Volume, size selective inlet, continuous
 FL= Fluorescence
 HV= High volume
 IR= Nondispersive infrared
 SI= High volume, size selective inlet
 SP= Low volume, size selective inlet, speciated
 SQ= Low volume, size selective inlet, sequential
 UV= Ultraviolet absorption
 Canister= Evacuated stainless steel canisters
 Cartridges= Di-nitrophenylhydrazine cartridges
 FSL= Fused Silica Lined
 Filter= Quartz filters
 Auto= GCF ID continuous
 CAPS=Cavity Attenuated Phase Shift

Monitor Designation

PRI=Primary
 QAC=Collocated

Network Affiliation

BG= Border Grant
 CSN STN= Trends Speciation
 CSN SU= Supplemental Speciation
 NATTS= National Air Toxics Trends Stations
 NCORE= National Core Multi-pollutants
 NR= Near-road
 PAMS= Photochemical Assessment Monitoring

Spatial Scale

MI= Micro
 MS= Middle
 NS= Neighborhood

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
 Research= Research support
 PI= Public Information
 N/A= Not Applicable
 O= Other



Section 4.2 Nitrogen Dioxide Minimum Monitoring Requirements

The District is federally mandated to monitor NO₂ levels in accordance with the CFR. This section will state the different minimum monitoring requirements for each program, e.g. ambient, Near-road, PAMS, etc., that the District operates and the references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve to fulfill other NO₂ network requirements, e.g. ambient NO₂ monitor can fulfill a PAMS NO₂ monitor requirement.

The District meets or exceeds all minimum requirements for NO₂ monitoring for all programs except for the following:

- Establishment of the 2nd Near-road location (in process now)

Section 4.2.1 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road

To measure concentrations for some pollutants in communities located by roadways, the EPA instituted the Near-road monitoring program. Table 4-3 lists the Near-road monitors required for the SDAB.

4.3.2(a) Requirement for Near-road NO₂ Monitors⁹

Within the NO₂ network, there must be one microscale near-road NO₂ monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected maximum hourly concentrations sited near a major road with high AADT counts as specified in paragraph 4.3.2(a)(1) of this appendix. An additional near-road NO₂ monitoring station is required for any CBSA with a population of 2,500,000 persons or more, or in any CBSA with a population of 1,000,000 or more persons that has one or more roadway segments with 250,000 or greater AADT counts to monitor a second location of expected maximum hourly concentrations. CBSA populations shall be based on the latest available census figures.

Table 4-3 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road

MSA & County (name)	Population Estimated from 2020 Census ¹⁰ (#)	Number of NO ₂ Near-road Monitors Required (#)	Are Additional NO ₂ Near-road Monitors Required? (yes/no)	Number of Additional NO ₂ Near-road Monitors Required (#)	Number of NO ₂ Near-road Monitors Active (#)	Number of NO ₂ Near-road Monitors Needed (#)
San Diego	3.3 Million	2	YES	1	1	1

Section 4.2.1.1 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (first site)

The first Near-road site must be sited in the area of the highest traffic count, adjusted for High Density (FE=Fleet Equivalency) vehicles. The first NO₂ near-road location is on Rancho Carmel Drive (RCD).

Section 4.2.1.2 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (second site)

The criteria for the second Near-road location are more flexible than the criteria for the first site. The second site is not necessarily the next location according to FE ranking. The EPA prescribes that the second site be selected so that it is differentiated from the first by one or more factors affecting traffic emissions and/or pollution transport, i.e. fleet mix, terrain, geographic area, different roadway, public health, etc. The District has successfully located an area near the San Ysidro Point-of-Entry (POE) at Fire Station #29 (at Interstate-5 and Cottonwood Road), which is also in an EJ area. This site has been:

⁹ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.3 “Nitrogen Dioxide (NO₂) Design Criteria”, subpart 4.3.2 “Requirement for Near-road monitors”

¹⁰ Based on initial counts of official U.S Census statistics.



- Fully endorsed by Casa Familiar, a local environmental group.
- Endorsed by EPA-National Authorities.
- Verbally approved by EPA-National Authorities.
- Visited and verbally approved by EPA-Region 9 Authorities during the 2017 TSA.

Consequently, the District entered into an MOU with the City of San Diego Fire Department in 2019 and began the construction process in 2020 (operational timeline Early 2023). All Near-road candidate locations must be formally approved by EPA. This process requires filling out an EPA Near-road template. Table 4-4 is the formal application for the San Ysidro Near-road location.

Table 4-4 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (second site) Matrix

No.	Condition	Notes
1	Plan submitted by July 1, 2017	None
2	Submitted for public comment	Yes in the 2017, 2018, 2019, & 2020 Network Plans
3	Anticipated start-up	Early 2023
4	AQS #	06-073-1025
5	Address and coordinates	32.552833°, -117.047360° 198 W San Ysidro Blvd, San Diego, CA 92173 at Fire Station #29
6	Sampling & analysis method	NO ₂ (True-NO ₂)- Method 212 PM _{2.5} (continuous)- Method code 733 BC-1060 (continuous)- Method code 879
7	Sampling & analysis duration	NO ₂ (True-NO ₂)- year-long & 24/7 PM _{2.5} (continuous)- year-long & 24/7 BC-1060 (continuous)- year-long & 24/7
8	Any plans to remove or move the monitor within 18 months?	No
9	Monitoring objective & spatial scale	Public Information, NAAQS, Microscale for NO _x Public Information, Microscale for all else
10	CBSA	San Diego-Carlsbad-San Marcos
11	CBSA population & year	3.3 million (from 2010census)
12	Maximum AADT counts & year (2018)	FE AADT (estimated)= 90,002 AADT= 65,000 HDc (estimated)= 2,778 Ranking (County)= 231 (of 500 County-wide ranked segments) If you take out the road segments that cannot be used, because of their proximity to the 1st near road site and take out the road segments that cannot be used due to planned and current highway expansion (Interstate 5 between State Routes 56 and 78), the Ranking (County, adjusted)= 203 <i>FE AADT= (AADT - HDc) + (HDm x HDc)</i> <i>HDc= High density count (trucks)</i> <i>HDm= High density multiplier (10)</i>
13	Correct number of required NO _x (NO ₂) monitors?	Two NO ₂ (Teledyne T500U True-NO ₂) monitors based on population
14	Are all road segments ranked?	Yes, by FE & AADT
15	How is fleet mix considered?	A high volume of passenger vehicles with a number of buses and diesel delivery style vehicles queue at the border crossing.
16	How is roadway design considered?	Station will be about 2 meters lower than the target road segment



17	How is congestion considered (congestion rating)?	A/B at the road segment, but about 1.5 km south (downwind) at the San Ysidro POE, "F".
18	How is terrain considered?	Some hills about 0.5 km downwind of the site. Otherwise, flat terrain for several kilometers upwind of the location
19	How is meteorology considered?	The typical wind direction varies by the time of day with nighttime/early morning hours, the winds are generally light out of the northeast, due to drainage and land breezes. These northeast winds are a stronger in the fall and winter, than other months. By late morning/afternoon, the winds are usually from the west or southwest. Occasionally, the winds will blow from the northwest. This is the onshore sea breeze flow that develops in the coastal environment almost every day. The only time this wind pattern is interrupted is if there is a storm system or a Santa Ana occurs. When onshore winds are blowing, emissions from the I-5 will be measured here.
20	How is population exposure considered?	Residential community (see "Other" sections at the end of the table)
21	1st Near-road site?	Interstate-15 (I-15) at Rancho Carmel Dr. is on a hill overlooking I-15. This site is in the north mid-county along the busiest road segments in the air basin. Much of the multi-axle vehicles use this route to Los Angeles/Riverside/Inland Empire. 2 nd Near-road site in San Ysidro will be even with I-5, will be at the southernmost point of the air basin, and will have a higher mix of cars compared to trucks with much longer idle times.
22	Distance from the target road?	30 meters to road
23	Will the vertical inlet be within 2-7 meters?	Yes
24	Will the probe distance from supporting structures be a least 1 meter away vertically or horizontally?	Yes
25	Will the air flow between the probe and the outside nearest edge of the target road segment be unobstructed?	Yes

The San Ysidro POE is the busiest in the U.S. Vehicles emit air pollution when moving and at idle. Residents and a local environmental group, Casa Familiar, in the San Ysidro area have expressed concerns over the air quality impacts of the POE in their community along the freeways leading to and from the POE. Upon investigation using CalEnviroScreen, EJ Screen, NATA database, Customs data, and local health statistics, the San Ysidro area is greatly impacted by the POE. Air quality measurements in this area will help to determine if steps are needed to improve the air quality in these communities.

The San Ysidro POE averages about 2 million vehicles and 600,000 pedestrian crossings a month or approximately 70,000 vehicle and 20,000 pedestrian crossings a day. These are only the northbound (from Mexico to the United States) statistics, but a large percentage of the morning northbound crossings return southbound (from the United States to Mexico) in the evening. During peak commuting times, the POE has a long vehicle queue flowing from south to north in the morning and reversed in the evening. Wait times and queue length are day of the week and holiday dependent. Normally, the Mon-Fri traffic experiences wait time of about 60 minutes, weekend traffic wait/engine idle times of 90-120 minutes are common, and holidays longer yet. Air pollution control devices on engines at idle operate inefficiently, thus increasing microscale air pollution impacts in the areas adjacent to the POE.



Road segments near the San Ysidro POE have a lower traffic count when compared to elsewhere in the County. The District believes the actual traffic count is higher, because of the long queues of cars (up to 3+ kilometers long, depending on metrics above) in the POE lanes. These queues of idling vehicles are expected to increase the effective traffic count, but there is no mechanism to account for this phenomenon.

The San Ysidro community is part of the South Region, as defined by the County of San Diego Health and Human Services Agency (HHSA). According to the most recent San Diego County HHSA health data portal (2011-2017), the South Region is routinely in the higher percentiles for coronary heart disease, stroke, asthma, and COPD for indicators for poor health, as compared to the other regions in the county. Numerous publications and studies have linked these health issues to air pollution, specifically, particulate matter, ozone, nitrogen dioxide, and diesel exhaust. Table 4-5 lists these health indicators and compares the rates to the other regions in the county. For 2011-2017 the South Region was:

Table 4-5 Common Air Pollution Related Health Issues in the South Region of San Diego

Parameter	Rating
Coronary Heart Disease Related Deaths	2 nd
Coronary Heart Disease Related Hospitalizations	Alternates between 1 st and 2 nd
Coronary Heart Disease Related Emergency Room Visits	Alternates between 3 rd and 4 th
Stroke Related Deaths	5 th
Stroke Related Hospitalizations	2 nd
Stroke Related Emergency Room Visits	3 rd
Asthma Related Deaths	Insufficient data
Asthma Related Hospitalizations	3 rd
Asthma Related Emergency Room Visits	2 nd
COPD Related Deaths	5 th
COPD Related Hospitalizations	Alternates between 2 nd and 3 rd
COPD Related Emergency Room Visits	Alternates between 1 st and 2 nd

The EPA has several on-line science-based tools, CalEnviroScreen, EJScreen, National Ambient Air Toxics Assessment (NATA) database, etc., that identify pollution from multiple sources, the effects, and those communities most at risk. The community of San Ysidro has several of these elevated markers that indicate a higher vulnerability to air pollution. Compared to other areas, this location ranks in the higher percentile bracket for PM_{2.5}, Pesticide, and Toxic release emissions, as well as higher percentile for cardiovascular disease, linguistic isolation, poverty, and less than a high school education.

EPA, CARB, academia, and others have sponsored or participated in various special sampling projects along both sides of the San Ysidro-Otay Mesa border area. Findings have indicated that PM_{2.5} and toxic compounds are elevated and trend high with an increase in the border traffic/wait times and these data are not represented in current EPA pollution screening tools, e.g. EJScreen. District-run Toxics often record the highest concentrations in the SDAB. All these indicators, coupled with the fact that San Ysidro is home to the busiest POE in the United States, lead to a need for an air pollution monitoring presence in the community of San Ysidro.



Section 4.2.1.3 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (summary)

This section summarizes the Near-road information (Table 4-6)

Table 4-6 Nitrogen Dioxide Minimum Monitoring Requirements -Near-road (summary)

MSA (name)	County (name)	Population Estimated from 2020 Census (#)	MAX AADT (2020) (#)	Location of Near-road Sites (#)	Is Near-road Site Active? (yes/no)	Number of Near-road Site(s) Needed (#)
San Diego	San Diego	3.3 Million	332,356	Rancho Carmel Dr. (RCD) 06-073-1017	yes	0
			74,000	San Ysidro Blvd. (SAY)* 06-073-1025	NO	1

*Site is in the permitting phase; expected operational timeline is Early 2023.

Section 4.2.2 Nitrogen Dioxide Minimum Monitoring Requirements-Area-wide

The District is required to designate a monitor that routinely measures high concentrations of nitrogen dioxide. This monitor cannot be used for Regional Administrator needs. Table 4-7 lists the Area-wide NO₂ Monitoring requirements for the SDAB.

4.3.3(a) Requirement for Area-wide NO₂ Monitoring ¹¹

Within the NO₂ network, there must be one monitoring station in each CBSA with a population of 1,000,000 or more persons to monitor a location of expected highest NO₂ concentrations representing the neighborhood or larger spatial scales...

Table 4-7 Nitrogen Dioxide Minimum Monitoring Requirements-Area-wide

MSA & County (name)	Population Estimated from 2020 Census (#)	Number of Area-wide NO ₂ Monitors Required (#)	Number of Area-wide NO ₂ Monitors Active (#)	Number of Area-wide NO ₂ Monitors Needed (#)	Location of Area-wide Site (name)	Does Area-wide Site Meet NAAQS? (yes/no)
San Diego	3.3 Million	1	1	0	Donovan (DVN) 06-073-1014	yes

¹¹ (2021) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 4, "Pollutant-Specific Design Criteria for SLAMS Sites", part 4.3 "Nitrogen Dioxide (NO₂) Design Criteria", subpart 4.3.3 "Requirement for Area-wide Monitoring"



Section 4.2.3 Nitrogen Dioxide Minimum Monitoring Requirements-Regional Administrator

To obtain a pollutant profile in certain areas, often in or near Environmental Justice locations, the monitoring of NO₂ may be required by the EPA Regional Administrator. The Sherman station in Sherman Heights satisfies this requirement see Table 4-8 for this requirement.

4.3.4(a) Regional Administrator Required Monitoring¹²

The Regional Administrators... require a minimum of forty additional NO₂ monitoring stations nationwide in any area... with a primary focus on siting these monitors in locations to protect susceptible and vulnerable populations.

Table 4-8 Nitrogen Dioxide Minimum Monitoring Requirements-Regional Administrator

Number of Regional Administrator NO ₂ Monitors Required (#)	Number of Regional Administrator NO ₂ Monitors Active (#)	Number of Regional Administrator NO ₂ Monitors Needed (#)	Location of Regional Administrator Site (name)	Does Regional Administrator Site Meet NAAQS? (yes/no)
1	1	0	Sherman Elementary School (SES) 06-073-1026	Yes

Section 4.2.4 Minimum Monitoring Requirements for true-NO₂, PAMS

The District is required to operate PAMS sites. There are several associated requirements to operate a PAMS site (see the PAMS chapter for more detail). One of the requirements is to operate a NO₂ monitor. Table 4-9 lists the PAMS NO₂ Monitoring requirements for the SDAB.

5(a) Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring¹³

(a) State and local monitoring agencies are required to collect and report PAMS measurements at each NCore site required under paragraph 3(a) of this appendix located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures.

(b) PAMS measurements include...(4) Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO₂), and total reactive nitrogen (NO_y);

Table 4-9 Minimum Monitoring Requirements for true-NO₂, PAMS

PAMS Sites/Locations (name)	Number of true-NO ₂ Monitors Required at PAMS Sites (#)	Number of true-NO ₂ Monitors Active at PAMS Sites (#)	Number of true-NO ₂ Monitors Needed at PAMS Sites (#)
Lexington Elementary School (LES) 06-073-1022	1	1	0

¹² (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.3 “Nitrogen Dioxide (NO₂) Design Criteria”, subpart 4.3.4 “Requirement for Regional Administrator Monitoring”

¹³ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 5, “Network Design for Photochemical Assessment Monitoring Stations (PAMS)”, part (b) “PAMS measurements include”, -subpart (4) “Hourly averaged nitrogen dioxide”



Section 4.2.5 Reactive Oxides of Nitrogen Minimum Monitoring Requirements for NCore & PAMS

The District is federally mandated to monitor NO_y levels in accordance with the CFR. This section will state the different minimum monitoring requirements for each program, e.g. NCore, PAMS, etc. that the District operates and the references therein (Note: only the passages applicable/informative to the District are referenced). Table 4-11 summarizes these requirements.

NCore

3.1 Design Criteria for NCore Sites¹⁴

(b) The NCore sites must measure, at a minimum, PM_{2.5} particle mass using continuous and integrated/filter-based samplers, speciated PM_{2.5}, PM_{10-2.5} particle mass, O₃, SO₂, CO, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature.

PAMS

5 Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring¹⁵

(b) ... PAMS measurements include: ... (4) Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO₂), and total reactive nitrogen (NO_y);

Table 4-10 Reactive Oxides of Nitrogen Minimum Monitoring Requirements-PAMS & NCore

Number of NO _y Monitors Required at NCore & PAMS Sites (#)	Number of NO _y Monitors Active at NCore & PAMS Sites (#)	Number of NO _y Monitors Needed at PAMS & NCore Sites (#)	NCore & PAMS Sites (name)
1	1	0	Lexington Elementary School (LES) 06-073-1022

Section 4.2.6 NO₂, true-NO₂, & NO_y Minimum Monitoring Requirements-Summary

Table 4-11 summarizes all the NO₂ minimum monitoring requirements from Sections 4.2.1 to 4.2.5.

Table 4-11 NO₂, true-NO₂, & NO_y Minimum Monitoring Requirements-Summary

Requirements for NO ₂ Monitors for CFR Programs (name)	Number of Monitors Required (#)	Number of Monitors Active (#)	Number of Monitors Needed (#)
Near-road=	2	1	1*
Area-Wide=	1	1	0
Regional Administrator=	1	1	0
PAMS for true-NO ₂ =	1	1	0
NCore & PAMS NO _y =	1	1	0

*Under Construction

¹⁴ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 3(b), “Network Design for NCore Sites.

¹⁵ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 5(a)-(b)(3), “Network Design for Photochemical Assessment Monitoring Stations (PAMS)”, -subpart (4) “Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO₂), and total reactive nitrogen (NO_y)”



Section 4.3 Nitrogen Dioxide Suitability for Comparison to the NAAQS

The CFR requires that for NO₂ data to be used in regulatory determinations of compliance with the NO₂ NAAQS, the NO₂ monitors must be sited according to Federal Regulations¹⁶ and the sampling frequency must be in accordance with Federal regulations¹⁷. All District NO₂ monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 4-12 summarizes these requirements. There is no NAAQS for NO_y.

Table 4-12 Nitrogen Dioxide & Reactive Oxides of Nitrogen Sampling Equipment

	Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Amb	Oxides of Nitrogen	NO _x	42603	ppm	1-Hr	1	Thermo 42 series	Chemiluminescence	074	7/24	RFNA-1289-074
	Nitrogen dioxide	NO ₂	42602								
	Nitric oxide	NO	42601								
Amb	Nitrogen dioxide	NO ₂	42602	ppm	1-Hr	1	Teledyne T500U	Cavity Attenuated Phase Shift (CAPS)	212	7/24	EQNA-0514-212
NCore	Reactive Oxides of Nitrogen	NO _y	42600	ppb	1-Hr	1	Thermo 42i-NO _y	Chemiluminescence	574	7/24	Not Applicable
	Not Applicable	NO _y -NO	42612								
	Nitric oxide	NO	42601								

Section 4.4 Nitrogen Dioxide Concentrations for San Diego

Over the last few years, the maximum 1-hour nitrogen dioxide concentration levels have been fluctuating between 55-86 ppb. This section will illustrate the different metrics for comparison.

Section 4.4.1 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years

San Diego has measured a decrease in maximum NO₂ concentrations (Table 4-13) over the last twenty years. Over the last 14 years, the maximum 1-hour NO₂ concentrations have been below 0.10 ppm. Improved emission control technology on mobile sources and emissions should contribute to a decrease in NO₂ concentrations. Note: the “Days Above the National 1-Hr Standard.” row reflect the NO₂ standard for that year.

Table 4-13 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years, 2001-2021

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Maximum 1-Hr Concentration (ppm)	0.148	0.126	0.148	0.125	0.109	0.097	0.101	0.091	0.078	0.081	0.067	0.065	0.081	0.075	0.062	0.073	0.074	0.055	0.086	0.058	0.061
Maximum Annual Average (ppm)	0.022	0.022	0.021	0.023	0.024	0.024	0.022	0.019	0.017	0.015	0.014	0.013	0.014	0.013	0.016	0.017	0.016	0.014	0.014	0.013	0.013
Days above the National 1-Hr Standard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

¹⁶ (2021) 40 CFR Part 58, Appendix E, “Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring” and Table E-4.

¹⁷ (2021) 40 CFR Part 58, Subpart B, Section 58.12, “Operating Schedules”.

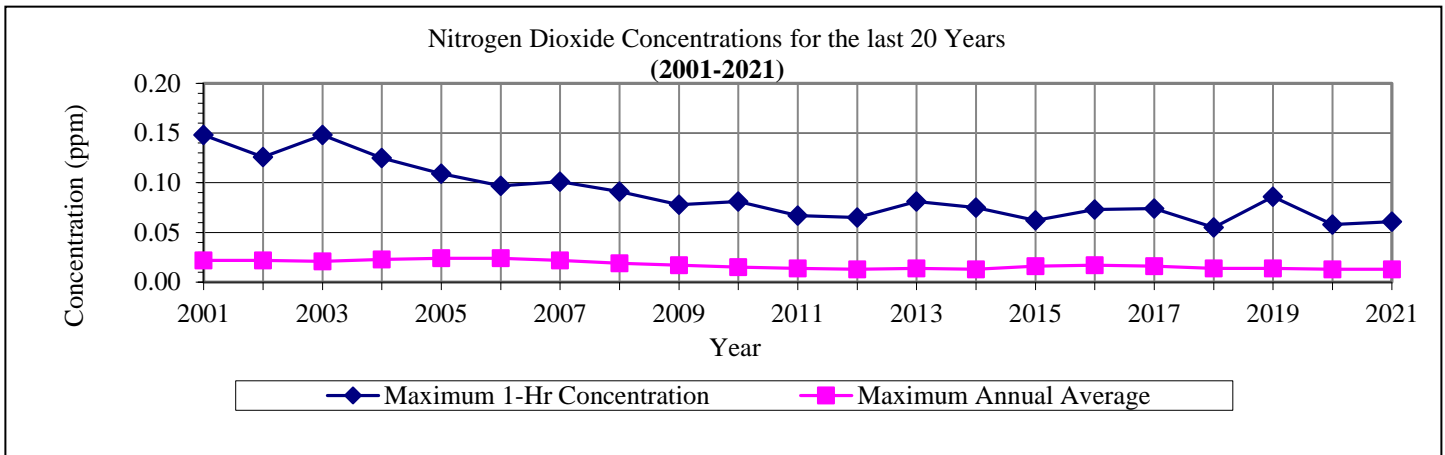


Figure 4.2 Nitrogen Dioxide Concentrations for San Diego-for the Last 20 Years Graph

Section 4.4.2 Nitrogen Dioxide Concentrations for San Diego-by Site for the Year

Table 4-14 lists the maximum nitrogen dioxide measurements and NO_y-NO for each nitrogen dioxide monitoring location and NCore, respectively; Figure 4.3 shows the values graphically with respect to the National Standard for the year.

FOR INFORMATIONAL PURPOSES ONLY

NAAQS comparison requires DV calculations. Annual values are not comparable to the NAAQS

Table 4-14 Nitrogen Dioxide Concentrations for San Diego- by Site for the Year, 2021

No. (#)	Site (name)	Site Abbreviation	Maximum 1-Hr Concentration (ppm)	Number of Days Above the National Standard (#)	Annual Average (ppm)
1	Camp Pendleton	CMP	0.059	0	0.005
2	Rancho Carmel Dr.	RCD	0.054	0	0.013
3	Kearny Villa Rd.	KVR	0.049	0	0.006
4	Alpine	ALP	0.035	0	0.004
5	Lexington Elementary School	LES	0.038	0	0.006
6	Sherman Elementary School	SES	0.054	0	0.009
7	Chula Vista	CVA	0.046	0	0.007
8	Donovan	DVN	0.061	0	0.007

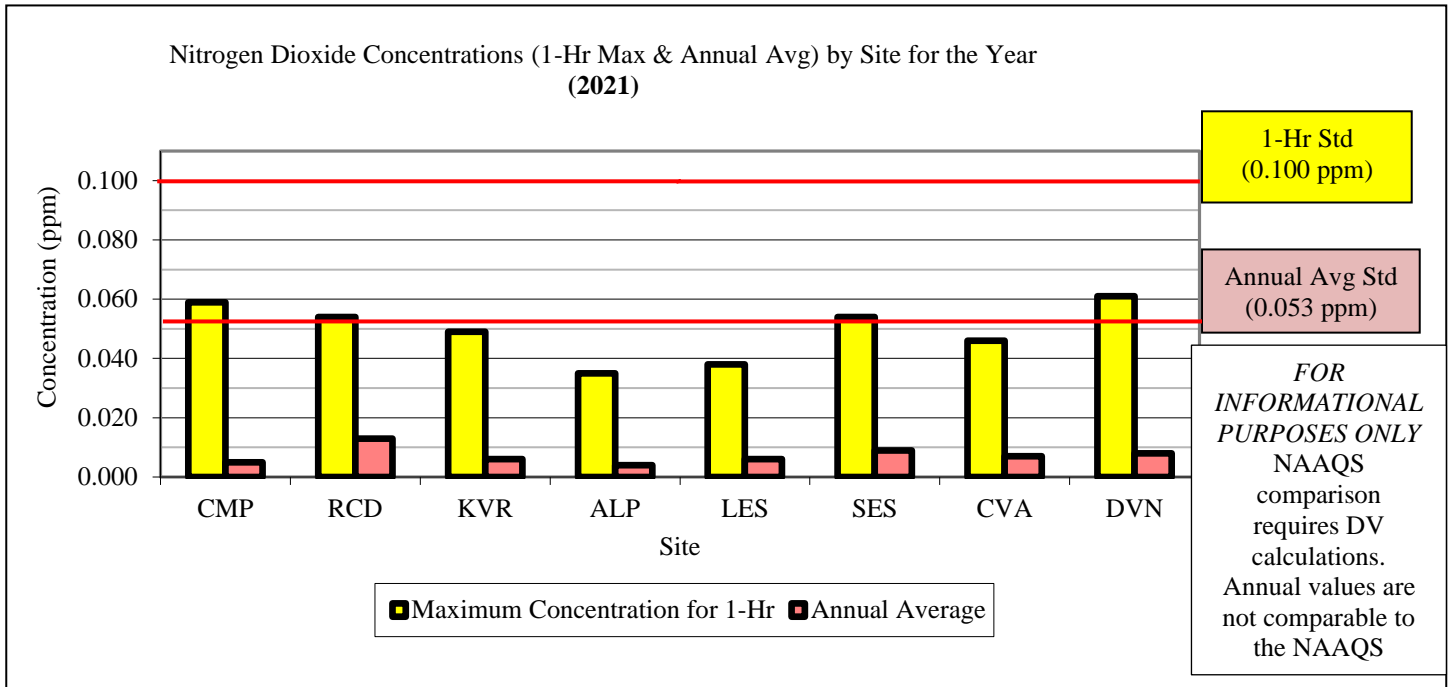


Figure 4.3 Nitrogen Dioxide Concentrations for San Diego-by Site for the Year Graph

Section 4.4.3 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value

Table 4-15 lists the maximum nitrogen dioxide measurements and NO_y-NO for each nitrogen dioxide monitoring location and NCore, respectively; **Figure 4.4** shows the values graphically with respect to the National Standard for the year.

Table 4-15 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value, 2019-2021

No. (#)	Site (name)	Site Abbreviation	Maximum Concentration 1-Hr DV (ppm)	Number of Days Above the National Standard (#)
1	Camp Pendleton	CMP	0.043	0
2	Rancho Carmel Dr.	RCD	0.047	0
3	Kearny Villa Rd.	KVR	0.037	0
4	Alpine	ALP	0.019	0
5	Lexington Elementary School	LES	0.035	0
6	Sherman Elementary School	SES	0.047*	0
7	Chula Vista	CVA	0.041	0
8	Donovan	DVN	0.050	0

*Not sampled for 3 years

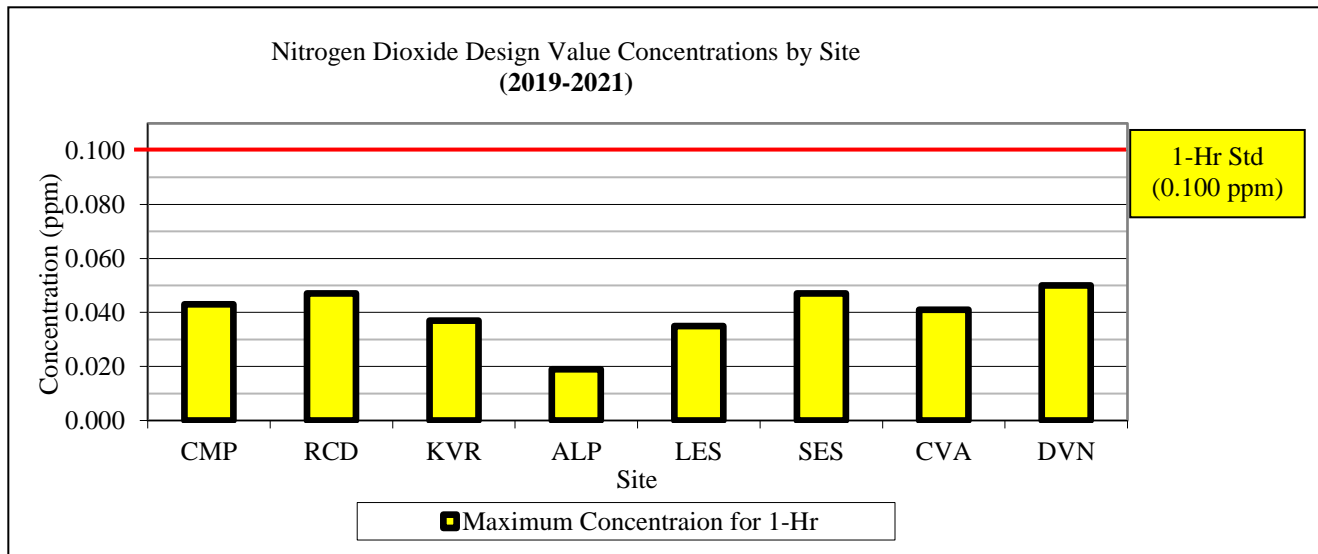


Figure 4.4 Nitrogen Dioxide Concentrations for San Diego-by Site for the Design Value Graph



Chapter 5: Carbon Monoxide (CO)

Section 5.1 Carbon Monoxide Introduction

Carbon monoxide (CO) was sampled on a continuous basis at two (2) locations in the SDAB (Figure 5.1 and Table 5-2) and referenced to the carbon monoxide standards of the year (Table 5-1). The sampling equipment are listed in Table 5-2. Trace level CO was sampled at the Lexington-NCore site. For NCore details, see Chapter 10:– NCore for a complete list of all the requirements.

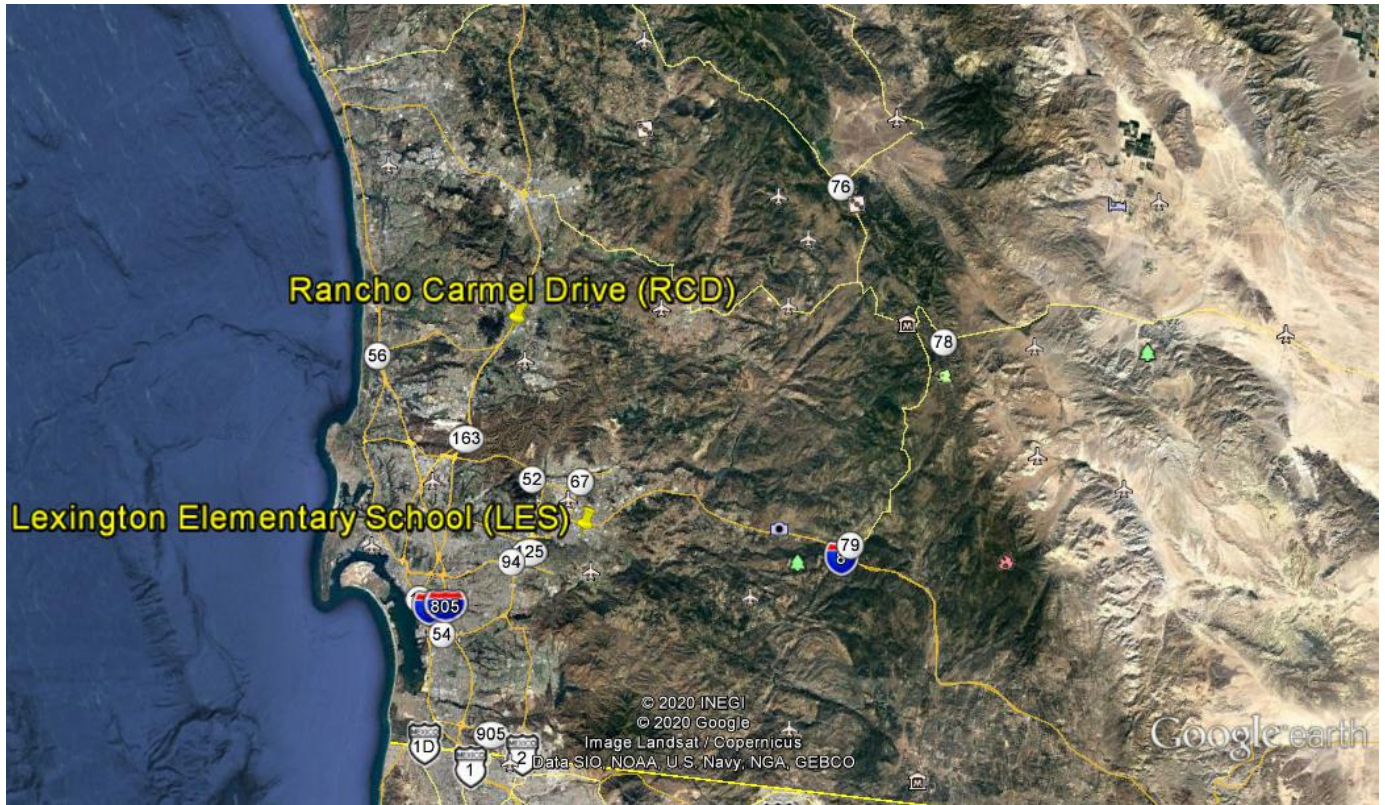


Figure 5.1 Carbon Monoxide Network Map

Table 5-1 Carbon Monoxide State and National Standards for the Year

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Carbon Monoxide (CO)	1 hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	Not Applicable
	8 hour	9 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	Not Applicable



Table 5-2 Carbon Monoxide Monitoring Network

Abbreviation	LES	RCD
Name	Lexington Elementary School	Rancho Carmel Dr.
AQS ID	06-073-1022	06-073-1017
Monitor Type	SLAMS	SLAMS
Method	IR	IR
Affiliation	NCORE, PAMS	NR
Spatial Scale	NS	MI
Site Type	PE	SO
Objective (Federal)	PI, NAAQS	PI, NAAQS
Equipment	Thermo 48i-TLE	Thermo 48i-TLE

Glossary of Terms

Monitor Type

E= EPA
 O= Other
 SLAMS= State & Local monitoring station
 SPM= Special purpose monitor
 CATAC= California Toxics Monitoring

Site Type

HC= Highest concentration
 PE= Population exposure
 SO= Source oriented
 UPBD= Upwind background
 G/B= General/Background
 RT= Regional Transport
 WRI= Welfare related impacts
 QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
 CT= Low Volume, size selective inlet, continuous
 FL= Fluorescence
 HV= High volume
 IR= Nondispersive infrared
 SI= High volume, size selective inlet
 SP= Low volume, size selective inlet, speciated
 SQ= Low volume, size selective inlet, sequential
 UV= Ultraviolet absorption
 Canister= Evacuated stainless steel canisters
 Cartridges= Di-nitrophenylhydrazine cartridges
 FSL= Fused Silica Lined
 Filter= Quartz filters
 Auto= GC/FID continuous

Monitor Designation

PRI= Primary
 QAC= Collocated

Network Affiliation

BG= Border Grant
 CSN STN= Trends Speciation
 CSN SU= Supplemental Speciation
 NATTS= National Air Toxics Trends Stations
 NCORE= National Core Multi-pollutants
 NR= Near-road
 PAMS= Photochemical Assessment Monitoring

Spatial Scale

MI= Micro
 MS= Middle
 NS= Neighborhood

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
 Research= Research support
 PI= Public Information
 N/A= Not Applicable
 O= Other



Section 5.2 Carbon Monoxide Minimum Monitoring Requirements

The District is federally mandated to monitor CO levels in accordance with the CFR. This section will state the different monitoring requirements for each program, e.g. ambient, PAMS, NCore, Near-road, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other CO network requirements, e.g. ambient CO monitor can fulfill a PAMS CO monitor requirement.

The District meets or exceeds all minimum requirements for CO monitoring for all programs.

Section 5.2.1 Carbon Monoxide Minimum Monitoring Requirements-Near-road

In an effort to measure concentrations for some pollutants in communities located by highly trafficked roadways, the EPA instituted the Near-road monitoring program. Table 5-3 lists the Near-road requirements.

4.2 Carbon Monoxide (CO) Design Criteria¹⁸

4.2.1 General Requirements (a) Except as provided in subsection (b), one CO monitor is required to operate collocated with one required near-road NO₂ monitor, as required in Section 4.3.2 of this part, in CBSAs having a population of 1,000,000 or more persons. If a CBSA has more than one required near-road NO₂ monitor, only one CO monitor is required to be collocated with a near-road NO₂ monitor within that CBSA.

Table 5-3 Carbon Monoxide Minimum Monitoring Requirements-Near-road

MSA & County	Population from 2020 Census ¹⁹	Are Near-road NO ₂ Monitors Required	Are Collocated CO Monitors Required	Number of Collocated CO Monitors Required	Number of Collocated CO Monitors Active	Number of Collocated CO Monitors Needed
(name)	(#)	(yes/no)	(yes/no)	(#)	(#)	(#)
San Diego	3.3 Million	Yes	Yes	1	1	0

Section 5.2.2 Carbon Monoxide Minimum Monitoring Requirements-Regional Administrator

Table 5-4 lists the Regional Administrator Designated CO Monitoring requirements for the SDAB.

4.2.2(a) Regional Administrator Required Monitoring²⁰

The Regional Administrators, in collaboration with states, may require additional CO monitors above the minimum number of monitors required in 4.2.1 of this part...

¹⁸ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.2 “Carbon Monoxide (CO) Design Criteria”, section 4.21, “General Requirements

¹⁹ Based on official U.S Census statistics.

²⁰ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.2.2 “Carbon Monoxide (CO) Design Criteria”, subpart (a), “Regional Administrator Required Monitoring”



Table 5-4 Carbon Monoxide Minimum Monitoring Requirements-Regional Administrator

Number of Regional Administrator sites Required* (#)	Number of Regional Administrator sites Active (#)	Number of Regional Administrator sites Needed (#)
0	0	0

* CO emissions in Barrio Logan were so far below the NAAQS that EPA approved the decommissioning of CO monitoring there.

Section 5.2.3 Carbon Monoxide Minimum Monitoring Requirements-NCore

The District is required to operate a CO monitor as part of the NCore multipollutant monitoring program. This program was designed to measure pollutants at lower levels, low ppb-ppt range. Table 5-5 lists the NCore CO requirements.

*3(b) Design Criteria for NCore Sites²¹
 The NCore sites must measure, at a minimum...CO...*

Table 5-5 Carbon Monoxide Minimum Monitoring Requirements-NCore

Number of CO Monitors Required at NCore Sites (#)	Number of CO Monitors Active at NCore Sites (#)	Number of CO Monitors Needed at NCore Sites (#)	NCore Sites/Location (name)
1	1	0	Lexington Elementary School (LES) 06-073-1022

Section 5.2.4 Carbon Monoxide Minimum Monitoring Requirements-State (SIP)

The District must operate one non-source monitor as part of the 2004 Revision to the California State Implementation Plan (SIP) for Carbon Monoxide²². Table 5-6 summarizes these requirements.

Table 5-6 Carbon Monoxide Minimum Monitoring Requirements-State (SIP)

Number of CO Monitors Required for the SIP (#)	Number of CO Monitors Active for the SIP (#)	Number of CO Monitors Needed for the SIP (#)	SIP Sites/Locations (name)
1	1	0	Lexington Elementary School (LES) 06-073-1022

²¹ (2021) 40 CFR Part 58, App. D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 3, “Design Criteria for NCore sites”, subpart (b)
²² http://www.arb.ca.gov/planning/sip/co/final_2004_co_plan_update.pdf



Section 5.2.5 Carbon Monoxide Minimum Monitoring Requirements-Summary

Table 5-7 summarizes all the CO minimum monitoring requirements.

Table 5-7 Carbon Monoxide Minimum Monitoring Requirements-Summary

Requirements for CO Monitors for CFR Programs (name)	Number of CO Monitors Required (#)	Number of CO Monitors Active (#)	Number of CO Monitors Needed (#)
Near-road=	1	1	0
Regional Administrator	0	0	0
NCore=	1	1	0
SIP=	1	1	0

Section 5.3 Carbon Monoxide Suitability for Comparison to the NAAQS

The CFR requires that for CO data to be used in regulatory determinations of compliance with the CO NAAQS, the CO monitors must be sited according to Federal Regulations²³ and the sampling frequency must be in accordance with Federal regulations²⁴. All District CO monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 5-8 summarizes these requirements.

Table 5-8 Carbon Monoxide Suitability for Comparison to the NAAQS-Sampling Equipment

	Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Amb	Carbon monoxide* CO	42101	ppm	007	1-Hr	1	Thermo 48i-TLE	Nondispersive infrared	554	7/24	RFCA-0981-554
NCore	Carbon monoxide Trace Level CO	42101	ppb	008	1-Hr	1	Thermo 48i-TLE	Nondispersive infrared	554	7/24	RFCA-0981-554

*Carbon monoxide analyzer operates in the 20 ppm range.

Section 5.4 Carbon Monoxide Concentrations for San Diego

This section will illustrate the different metrics for comparison for carbon monoxide concentration levels.

Section 5.4.1 Carbon Monoxide Concentrations for San Diego-for the Last 20 years

In San Diego, CO concentrations have decreased over the years (Table 5-9) and is shown graphically in Figure 5.2. The 2003 Wildfires caused the SDAB to exceed the standards for CO, but the exceedances are considered an exceptional event and do not have a lasting impact in the air basin. Even with the last two wildfires in 2003 and 2007, the County still qualifies for attainment status. Note: the “Days Above the National Standard” row in Table 5-9 reflect the carbon monoxide standards for that year.

Table 5-9 Carbon Monoxide Concentrations for San Diego-for the Last 20 Years, 2001-2021

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Maximum 1-Hr Concentration (ppm)	8.5	8.5	12.7	6.9	7.9	10.8	8.7	5.6	4.6	3.9	3.5	4.4	3.2	3.8	3.1	2.2	2.0	1.9	4.1	3.3	3.0
Maximum 8-Hr Concentration (ppm)	5.1	4.7	10.6	4.1	4.7	3.6	5.2	3.5	3.4	2.5	2.4	3.8	2.6	3.0	2.0	1.7	1.5	1.4	2.5	1.7	1.8
Days above the National Standard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

²³ (2021) 40 CFR Part 58, Appendix E, “Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring” and Table E-4.

²⁴ (2021) 40 CFR Part 58, Subpart B, Section 58.12, “Operating Schedules”

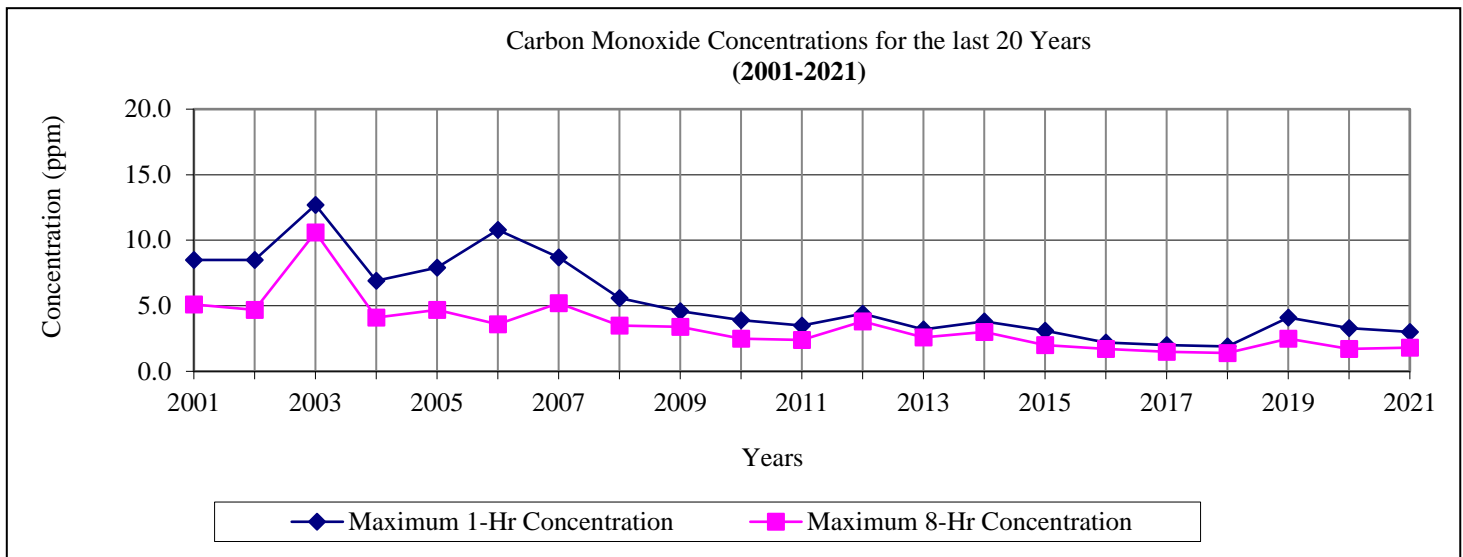


Figure 5.2 Carbon Monoxide Concentrations for San Diego-for the Last 20 Years Graph

Section 5.4.2 Carbon Monoxide Concentrations for San Diego-by Site for the Year

Table 5-10 lists the maximum carbon monoxide measurements for each carbon monoxide monitoring location and NCore; Figure 5.3 shows the values graphically with respect to the National Standard.

FOR INFORMATIONAL PURPOSES ONLY
 Annual values are not comparable to the NAAQS

Table 5-10 Carbon Monoxide Concentrations for San Diego-by Site for the Year, 2021

No. (#)	Site (name)	Site Abbreviation	Maximum 8-Hr Concentration (ppm)	Maximum 1-Hr Concentration (ppm)	Number of Days Above the National Standard (#)	Annual Average (ppm)
1	Lexington Elementary School	LES	1.1	1.2	0	0.3
2	Rancho Carmel Dr.	RCD	1.8	3.0	0	0.5

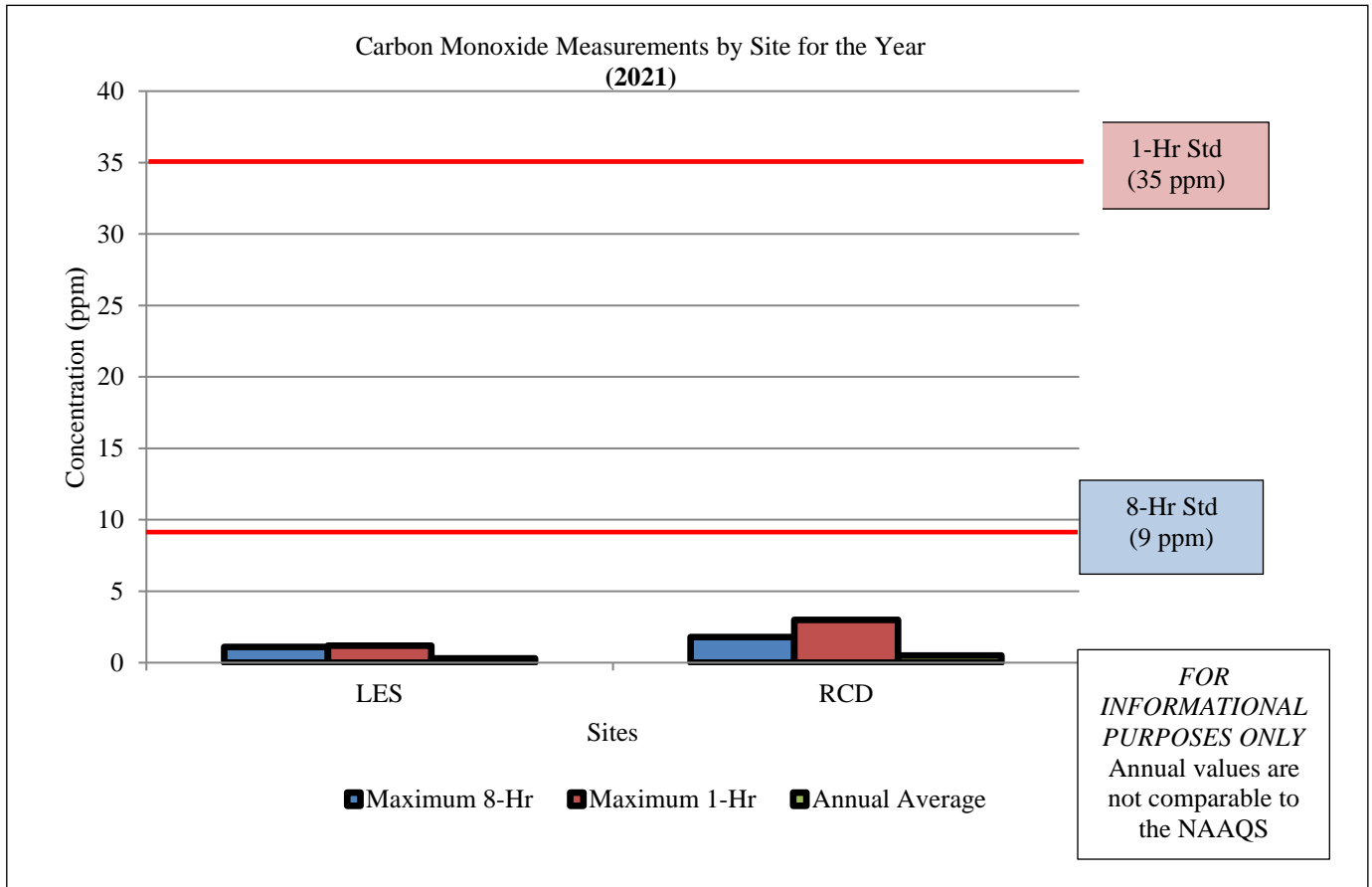


Figure 5.3 Carbon Monoxide Concentrations for San Diego-by Site for the Year Graph



Table 6-2 Sulfur Dioxide Monitoring Network

Abbreviation	LES
Name	Lexington Elementary School
AQS ID	06-073-1022
Monitor Type	SLAMS
Method	FL
Affiliation	NCore
Spatial Scale	NS
Site Type	PE
Objective (Federal)	PI, NAAQS
Equipment	Thermo 43i-TLE

Glossary of Terms

Monitor Type

E= EPA
 O= Other
 SLAMS= State & Local monitoring station
 SPM= Special purpose monitor
 CATAC= California Toxics Monitoring

Site Type

HC= Highest concentration
 PE= Population exposure
 SO= Source oriented
 UPBD= Upwind background
 G/B= General/Background
 RT= Regional Transport
 WRI= Welfare related impacts
 QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
 CT= Low Volume, size selective inlet, continuous
 FL= Fluorescence
 HV= High volume
 IR= Nondispersive infrared
 SI= High volume, size selective inlet
 SP= Low volume, size selective inlet, speciated
 SQ= Low volume, size selective inlet, sequential
 UV= Ultraviolet absorption
 Canister= Evacuated stainless steel canisters
 Cartridges= Di-nitrophenylhydrazine cartridges
 FSL= Fused Silica Lined
 Filter= Quartz filters
 Auto= GCFID continuous

Monitor Designation

PRI= Primary
 QAC= Collocated

Network Affiliation

BG= Border Grant
 CSN STN= Trends Speciation
 CSN SU= Supplemental Speciation
 NATTS= National Air Toxics Trends Stations
 NCore= National Core Multi-pollutants
 NR= Near-road
 PAMS= Photochemical Assessment Monitoring

Spatial Scale

MI= Micro
 MS= Middle
 NS= Neighborhood

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
 Research= Research support
 PI= Public Information
 N/A= Not Applicable
 O= Other



Section 6.2 Sulfur Dioxide Minimum Monitoring Requirements

The District is federally mandated to monitor SO₂ levels in accordance with the CFR. This section will state the different monitoring requirements for each program, ambient, NCore, etc. that the District operates and the references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other SO₂ network requirements, e.g. ambient SO₂ monitor can fulfill a PAMS SO₂ monitor requirement.

The District meets or exceeds all minimum requirements for SO₂ monitoring for all programs.

Section 6.2.1 Sulfur Dioxide Minimum Monitoring Requirements-NCore

The District is required to operate an NCore site. There are several associated requirements to operate this site. Table 6-3 lists NCore Sulfur Dioxide (SO₂) monitoring requirements.

3.1 Design Criteria for NCore Sites²⁵

(b) The NCore sites must measure, at a minimum, PM_{2.5} particle mass using continuous and integrated/filter-based samplers, speciated PM_{2.5}, PM_{10-2.5} particle mass, O₃, SO₂, CO, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature.

Table 6-3 Sulfur Dioxide Minimum Monitoring Requirements-NCore

MSA & County	Number of NCore SO ₂ Monitors Required (#)	Number of NCore SO ₂ Monitors Active (#)	Number of NCore SO ₂ Monitors Needed (#)	Met NAAQS? (yes/no)
San Diego	1	1	0	yes

Section 6.2.2 Sulfur Dioxide Minimum Monitoring Requirements-Ambient

The procedure to determine the minimum number of ambient level monitors required is different than the other gaseous criteria pollutants. It is based on the total SO₂ emissions in the air basin with respect to the population of the air basin. Table 6-4 lists these requirements.

4.4.2(a) Sulfur Dioxide Design Criteria Requirement for Monitoring by Population Weighted Emissions Index²⁶

The population weighted emissions index (PWEI) shall be calculated by States for each core based statistical area (CBSA) they contain or share with another State or States for use in the implementation of or adjustment to the SO₂ monitoring network. The PWEI shall be calculated by multiplying the population of each CBSA, using the most current census data or estimates, and the total amount of SO₂ in tons per year emitted within the CBSA area, using an aggregate of the most recent county level emissions data available in the National Emissions Inventory for each county in each CBSA. The resulting product shall be divided by one million, providing a PWEI value, the units of which are million persons-tons per year. For any CBSA with a calculated PWEI value equal to or greater than 1,000,000, a minimum of three SO₂ monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 100,000, but less than 1,000,000, a minimum of two SO₂ monitors are required within that CBSA. For any CBSA with a calculated PWEI value equal to or greater than 5,000, but less than 100,000, a minimum of one SO₂ monitor is required within that CBSA.

²⁵ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 3(b), “Network Design for NCore Sites.

²⁶ (2021) CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.4 “Sulfur Dioxide (SO₂) Design Criteria, subpart 4.4.2(a) “Requirement for Monitoring by the Population Weighted Emissions Index”



If the PWEI is below a certain threshold, the EPA allows Districts the minimum required SO₂ monitor to be the NCore SO₂ required monitor. Table 6-5 lists these requirements

4.4 Sulfur Dioxide (SO₂) Design Criteria²⁷

4.4.2(1) The SO₂ monitoring site(s) required as a result of the calculated PWEI in each CBSA shall satisfy minimum monitoring requirements if the monitor is sited within the boundaries of the parent CBSA and is one of the following site types: population exposure, highest concentration, source impacts, general background, or regional transport. SO₂ monitors at NCore stations may satisfy minimum monitoring requirements if that monitor is located within a CBSA with minimally required monitors under this part.

Table 6-4 Sulfur Dioxide Minimum Monitoring Requirements - EPA NEI SO₂

MSA & County (name)	Population from 2020 Census ²⁸ (yes/no)	Total SO ₂ Emissions from NEI (tons/yr)	Total SO ₂ Emissions ÷ 1,000,000 (TPY-1M)	Calculated PWEI= Total SO ₂ Emissions x Population (MPeople-TPY)
San Diego	3.3 Million	626	0.000626	2,065.8

Table 6-5 Sulfur Dioxide Minimum Monitoring Requirements-Ambient

Calculated PWEI (MP-TPY)	Are the Emissions <5,000 MP-TPY? (yes/no)	Number of Required SO ₂ Monitors (#)	Number of Active SO ₂ Monitors (#)	Number of Ambient SO ₂ Monitors Needed (#)
2,065.8	Yes	1	1	0

Section 6.2.3 Sulfur Dioxide Minimum Monitoring Requirements-Summary

Table 6-6 summarizes all the SO₂ minimum monitoring requirements from Sections 6.2.1 to 6.2.2.

Table 6-6 Sulfur Dioxide Minimum Monitoring Requirements-Summary

CFR Programs Requirements for SO ₂ Monitors (name)	Number of SO ₂ Monitors Required (#)	Number of Active SO ₂ Monitors (#)	Number of Needed SO ₂ Monitors (#)
PWEI	1	1	0*
NCore	1	1	0*

*For the SDAB, the PWEI is less than 5,000, which means the NCore SO₂ monitor is allowed to be used in the count for required PWEI SO₂ monitors; therefore, the total count of SO₂ monitor is “1” in the SDAB.

²⁷ (2021) CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.4 “Sulfur Dioxide (SO₂) Design Criteria, subpart 4.4.2(1) “Requirement for Monitoring by the Population Weighted Emissions Index”

²⁸ Based on initial counts of official U.S Census statistics.



Section 6.3 Sulfur Dioxide Suitability for Comparison to the NAAQS

The CFR requires that for SO₂ data to be used in regulatory determinations of compliance with the SO₂ NAAQS, the SO₂ monitors must be sited according to Federal Regulations²⁹ and the sampling frequency must be in accordance with Federal regulations³⁰. All District SO₂ monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 6-7 summarizes these requirements.

Table 6-7 Sulfur Dioxide Suitability for Comparison to the NAAQS-Sampling Equipment

	Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID	
NCore	Sulfur dioxide Trace Level	SO ₂	42101	ppb	008	1-Hr	1 5-min	Thermo 43i-TLE	Fluorescence	560	7/24	EQSA-0486-060

Section 6.4 Sulfur Dioxide Concentrations for San Diego

Over the years, sulfur dioxide concentration levels have been decreasing. This section will illustrate the different metrics for comparison.

Section 6.4.1 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years

Emissions of sulfur dioxide (SO₂) have declined tremendously in California over the last 20 years, due to improved source controls and switching from fuel oil to natural gas for electric generation and industrial boilers. Note: the “Days Above National Standard” row in Table 6-8 reflects the SO₂ standards for that year and are shown graphically in Figure 6.2.

Table 6-8 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years, 2001-2021

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Maximum 1-Hr Concentration (ppm)	0.060	0.044	0.036	0.045	0.040	0.045	0.027	0.037	0.029	0.027	0.001	0.002	0.007	0.001	0.001	0.001	0.001	0.003	0.001	0.002	0.002
Maximum 24-Hrs Concentration (ppm)	0.014	0.012	0.011	0.015	0.013	0.011	0.009	0.008	0.009	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Maximum Annual Average (ppm)	0.004	0.004	0.004	0.006	0.005	0.004	0.003	0.003	0.004	0.002	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Days above the National Standard	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

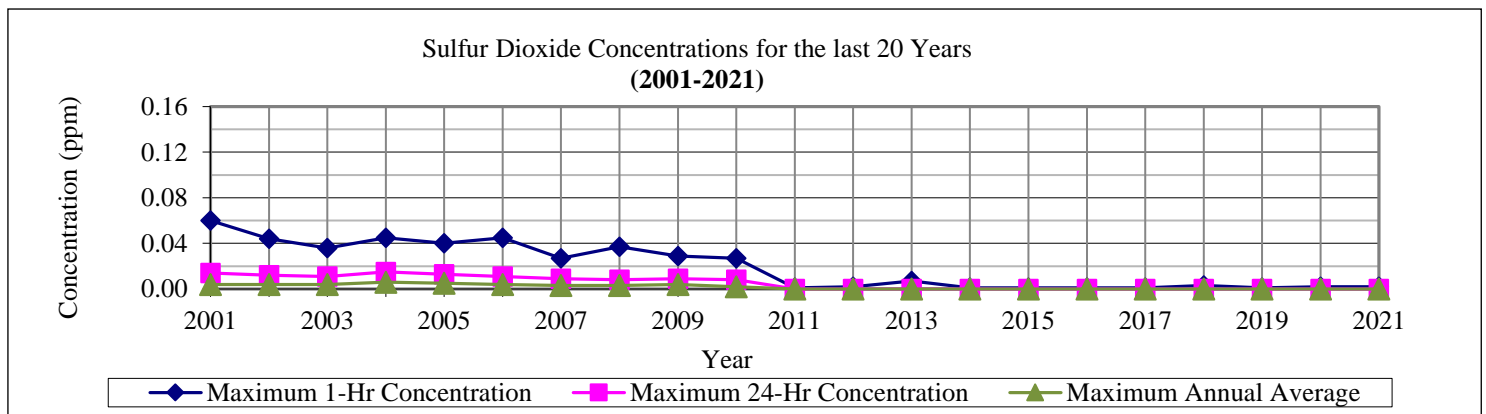


Figure 6.2 Sulfur Dioxide Concentrations for San Diego-for the Last 20 Years Graph

²⁹ (2021) 40 CFR Part 58, Appendix E, “Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring” and Table E-4.

³⁰ (2021) 40 CFR Part 58, Subpart B, Section 58.12, “Operating Schedules”



Section 6.4.2 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value

Table 6-9 lists the maximum sulfur dioxide measurements for the NCore monitoring location and Figure 6.3 shows the values graphically with respect to the National Standard.

Table 6-9 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value, 2019-2021

Site (site)	Site Abbreviation	Design Value Maximum Concentration 1-Hr (ppm)	Number of Days Above the National Standard (#)
Lexington Elementary School	LES	0.001	0

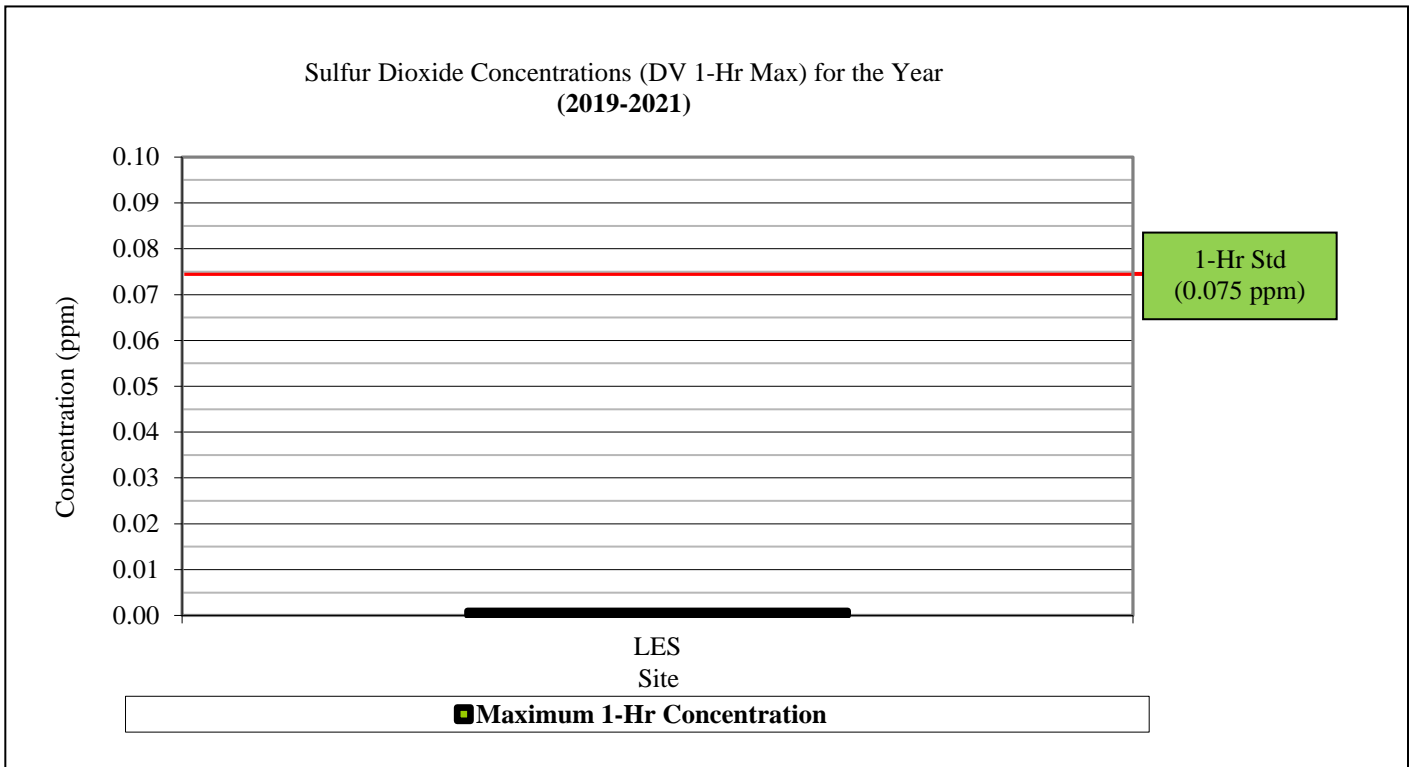


Figure 6.3 Sulfur Dioxide Concentrations for San Diego-by Site for the Design Value Graph



Chapter 7: Lead (Pb)

Section 7.1 Lead Introduction

Regulatory Lead (Pb) was sampled for at one location in the SDAB (Figure 7.1 and Table 7-2) and referenced to the lead standards of the year (Table 7-1). Source level lead was sampled at McClellan-Palomar airport.

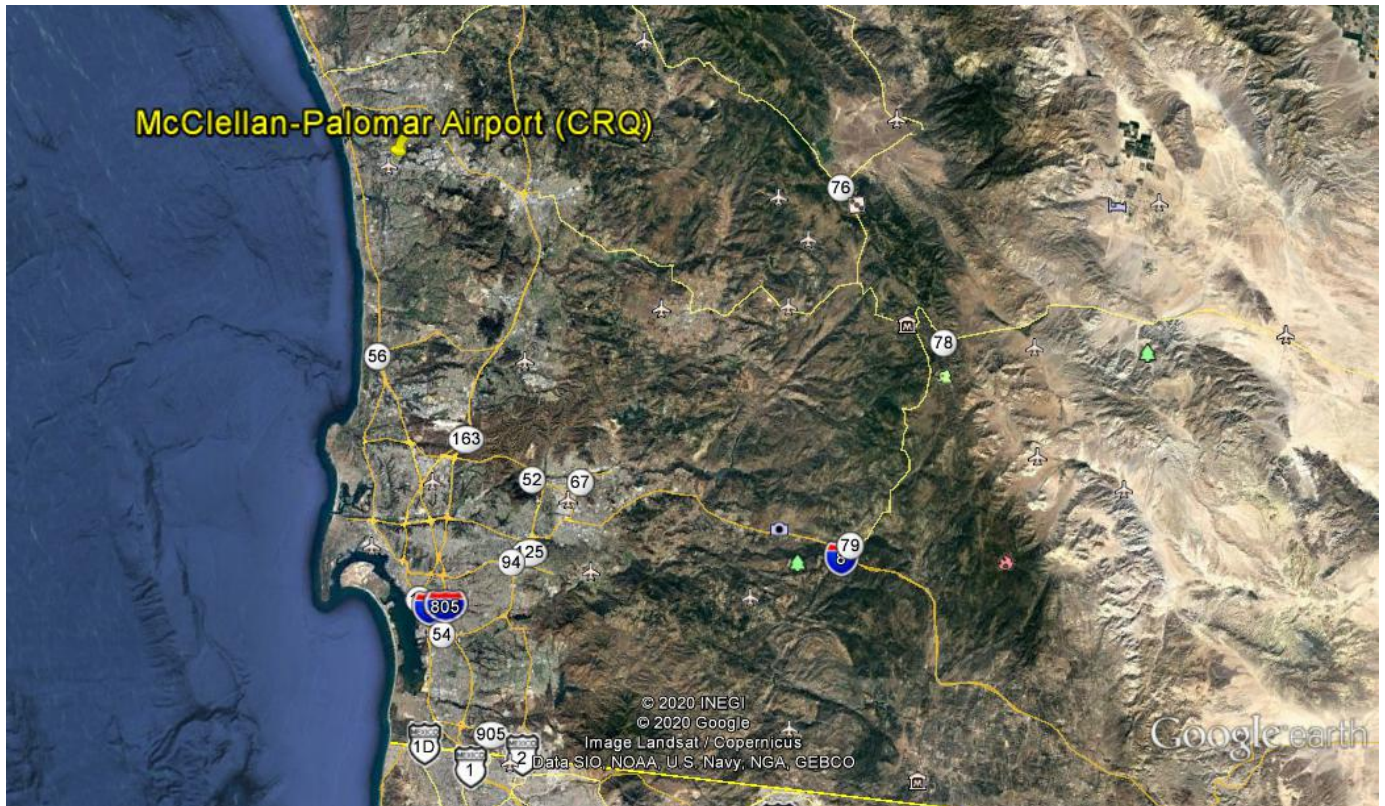


Figure 7.1 Lead Network Map

Table 7-1 Lead State and National Standards for the Year

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Lead (Pb)	30 Day Average	1.5 $\mu\text{g}/\text{m}^3$	Not Applicable	Not Applicable
	Calendar Quarter	Not Applicable	1.5 $\mu\text{g}/\text{m}^3$ (for certain areas)	1.5 $\mu\text{g}/\text{m}^3$ (for certain areas)
	Rolling 3-Month Average	Not Applicable	0.15 $\mu\text{g}/\text{m}^3$	0.15 $\mu\text{g}/\text{m}^3$



Table 7-2 Lead Sampling Network (regulatory collection and analysis)

Abbreviation	CRQ		
Name	Palomar Airport		
AQS ID	06-073-1023		
Lead	Monitor Type	SLAMS	SLAMS
	Monitor Designation	PRI	QAC
	Method	HV	HV
	Affiliation	Not Applicable	Not Applicable
	Spatial Scale	MI	MI
	Site Type	SO	QA
	Objective (Federal)	NAAQS	NAAQS
	Analysis	APCD	APCD
	Frequency	1:6	1:6
	Equipment	Tisch TE-5170BLVFC+	Tisch TE-5170BLVFC+

Glossary of Terms

Monitor Type

E= EPA
 O= Other
 SLAMS= State & Local monitoring station
 SPM= Special purpose monitor
 CATAC= California Toxics Monitoring

Site Type

EXDN= Extreme downwind
 HC= Highest concentration
 MXO= Maximum ozone concentration
 MXP= Maximum precursor impact
 PE= Population exposure
 SO= Source oriented
 UPBD= Upwind background
 G/B= General/Background
 RT= Regional Transport
 WRI= Welfare related impacts
 QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
 CT= Low Volume, size selective inlet, continuous
 FL= Fluorescence
 HV= High volume
 IR= Nondispersive infrared
 SI= High volume, size selective inlet
 SP= Low volume, size selective inlet, speciated
 SQ= Low volume, size selective inlet, sequential
 UV= Ultraviolet absorption
 Canister= Evacuated stainless steel canisters
 Cartridges= Di-nitrophenylhydrazine cartridges
 FSL= Fused Silica Lined
 Filter= Quartz filters

Spatial Scale

MI= Micro
 MS= Middle
 NS= Neighborhood
 US= Urban Scale

Affiliation

BG= Border Grant
 CSN STN= Trends Speciation
 CSN SU= Supplemental Speciation
 NATTS= National Air Toxics Trends Stations
 NCORE= National Core Multi-pollutant Monitoring Stations
 NR= Near-road
 PAMS= Photochemical Assessment Monitoring Stations
 UNPAMS= Unofficial PAMS site

Monitor Designation

PRI= Primary
 QAC= Collocated
 O= Other

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
 Research= Research support
 PI= Public Information



Section 7.2 Lead Minimum Monitoring Requirements

The District is federally mandated to monitor Pb levels in accordance with the CFR. This section will state the different minimum monitoring requirements for each program, e.g. ambient, NCore, Airports, etc. that the District operates and the references therein (Note: only the passages applicable/informative to the District are referenced).

The District meets or exceeds all minimum requirements for Pb monitoring for all programs.

Section 7.2.1 Lead Minimum Monitoring Requirements-Source (non-Airport) & Source (Airport)

The procedure to determine the minimum number of non-Airport source level monitors required is based on any non-Airport source emitting more than 0.5 tons/year of Pb emissions. Table 7-3 lists these requirements for non-Airport sources. The procedure to determine the minimum number of Airport source level monitors is the same, except that the threshold is 1.0 tons/year. Table 7-4 lists these requirements for Airport source level sampling. The sources and their Pb emissions are from the latest published EPA NEI database.

4.5(a) Lead (Pb) Design Criteria³¹

State and, where appropriate, local agencies are required to conduct ambient air Pb monitoring near Pb sources which are expected to or have been shown to contribute to a maximum Pb concentration in ambient air in excess of the NAAQS, taking into account the logistics and potential for population exposure. At a minimum, there must be one source-oriented SLAMS site located to measure the maximum Pb concentration in ambient air resulting from each non-airport Pb source which emits 0.50 or more tons per year and from each airport which emits 1.0 or more tons per year based on either the most recent National Emission Inventory (<http://www.epa.gov/ttn/chief/einformation.html>) or other scientifically justifiable methods and data (such as improved emissions factors or site-specific data) taking into account logistics and the potential for population exposure...

Table 7-3 Lead Minimum Monitoring Requirements-Source (non-Airport) based on the NEI

MSA & County (name)	From NEI ³² Any Non-Airport Pb Sources >0.5 TPY? (yes/no)	From NEI What is the Largest Non-Airport Pb Source?	From NEI What is the Largest Non-Airport Pb Emissions Rate? (TPY)	Number of Non-Airport Sources Pb Monitors Required (#)	Number of Non-Airport Sources Pb Monitors Active (#)	Number of Non-Airport Sources Pb Monitors Needed (#)
San Diego	No	Camp Pendleton	0.24	0	0	0

Table 7-4 Lead Minimum Monitoring Requirements-Source (Airport) based on the NEI

MSA & County (name)	From NEI Any Airport Pb Sources >=1.0 TPY? (yes/no)	From NEI What is the Largest Airport Pb Source (TPY)	From NEI What is the Largest Airport Pb Emissions Rate? (TPY)	Number of Airport Sources Pb Monitors Required (#)	Number of Airport Sources Pb Monitors Active (#)	Number of Airport Sources Pb Monitors Needed (#)
San Diego	No	Montgomery Field	0.59	0	0	0

³¹ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.5 “Lead (Pb) Design Criteria”, subsection (a)

³² Most complete and recent EPA NEI Data base, 2017



Section 7.2.2 Lead Minimum Monitoring Requirements-Special Study (Airport)

One EPA regulation states that if an airport emits less than 1.0 TPY of Pb emissions, no source sampling is required. The EPA added a regulation that listed several airports to undergo temporary Pb sampling, regardless if the NEI listed Pb emissions were less than 1.0 TPY. If emissions exceeded the NAAQS by 50%, the sampler was to become permanent, or until the emissions were proven to be less than 50% of the NAAQS (over a minimum 3-yr period). Table 7-5 lists these requirements.

4.5(iii) Lead (Pb) Design Criteria³³

...agencies are required to conduct ambient air Pb monitoring near each of the airports listed in Table D-3A for a period of 12 consecutive months ...Any monitor that exceeds 50 percent of the Pb NAAQS on a rolling 3-month average (as determined according to 40 CFR part 50, Appendix R) shall become a required monitor under paragraph 4.5(c) of this Appendix, and shall continue to monitor for Pb unless a waiver is granted ...

Table D-3A Airports to be Monitored for Lead

Airport	County	State
McClellan-Palomar	San Diego	CA
Gillespie Field	San Diego	CA

Table 7-5 Lead Minimum Monitoring Requirements - Airport (Special Study) Results

Names of Airport Monitors Required (name)	Was Airport Testing Done? (yes/no)	Did the Airport Pass? (yes/no)	Does the Airport Require Continued Sampling? (yes/no)	Is Continued Sampling Active? (yes/no)	Number of Continued Sampling Sites Needed (#)
McClellan-Palomar	yes	NO	YES	YES	0
Gillespie Field	yes	yes	no	Not Applicable	Not Applicable

*Gillespie Field

The Airport study at Gillespie Field officially concluded and it was determined by EPA to discontinue all lead sampling at this airport.

McClellan-Palomar

The Airport study at McClellan-Palomar Airport officially concluded and the airport did not pass the minimum tolerances. Consequently, permanent sampling was established. The concentrations for lead have met the waiver criteria (three continuous years of sampling at this location and less than 50% of the NAAQS) and the District has requested the cessation of regulatory lead sampling. At this time, EPA is not approving the District’s requested discontinuation of Pb monitoring at Palomar Airport, but EPA Region 9 will continue to work with EPA Headquarters to determine discontinuation eligibility.

³³ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.5 “Lead (Pb) Design Criteria”, subsection (iii)



Section 7.2.3 Lead Minimum Monitoring Requirements-Regional Administrator

The EPA Regional Administrator may require additional lead sampling beyond what is required in section 4.5 particularly near industrial sources of lead. No industrial sources of lead have required additional monitoring as directed by the EPA Regional Administrator. Table 7-6 lists these requirements.

4.5(c) Lead (Pb) Design Criteria³⁴

The EPA Regional Administrator may require additional monitoring beyond the minimum monitoring requirements contained in paragraph 4.5(a) of this appendix ...

Table 7-6 Lead Minimum Monitoring Requirements-Regional Administrator

MSA & County (name)	Number of Regional Administrator Pb Monitors Required (#)	Number of Regional Administrator Pb Monitors Active (#)	Number of Regional Administrator Pb Monitors Needed (#)
San Diego	0	0	0

Section 7.2.4 Lead Minimum Monitoring Requirements-QA Collocation & Filter Submittal to EPA

Table 7-7 summarizes the collocation requirements for quality assurance purposes.

3.4.4.1 A PQAO must³⁵ (a) Have 15 percent of the primary monitors (not counting non-source oriented NCore sites in PQAO) collocated. Values of 0.5 and greater round up; and (b) Have at least one collocated quality control monitor (if the total number of monitors is less than three).

3.4.7... In addition³⁶, each year, four collocated samples from PQAOs with less than or equal to five ... must be sent to an independent laboratory, the same laboratory as the performance evaluation audit, for analysis.

Table 7-7 Lead Minimum Monitoring Requirements-QA Collocation & Filter Submittal to EPA

Number of Pb-TSP Samplers Required (#)	Number of Pb-TSP Samplers Active (#)	Number of Pb-TSP Samplers Calculated for Collocation (#)	Number of Pb-TSP Samplers Active for Collocation (#)	Number of Pb-TSP Samplers Needed for Collocation (#)	Location of Collocated Site (name)	Are four collocated samples sent to PEP laboratory for analysis? (yes/no)
1	1	1 x (15%) = 1	1	0	Palomar (CRQ) 06-073-1023	Yes

³⁴ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.5 “Lead (Pb) Design Criteria”, subsection (c)

³⁵ (2021) 40 CFR Part 58, Appendix A, Section 3, Measurement Quality Check Requirements, chapter 3.4, “Pb”, section 3.4.4.1 (a)-(b)

³⁶ (2021) 40 CFR Part 58, Appendix A, Section 3, Measurement Quality Check Requirements, chapter 3.4, “Pb”, section 3.4.7



Section 7.2.5 Lead Minimum Monitoring Requirements-Summary

Table 7-8 summarizes the Pb minimum monitoring requirements.

Table 7-8 Lead Minimum Monitoring Requirements-Summary

CFR Programs Pb-TSP Samplers Requirements (name)	Number of Pb-TSP Samplers Required (#)	Number of Pb-TSP Samplers Active (#)	Number of Pb-TSP Samplers Needed (#)
Source (non-Airport) =	0	0	0
Source (Airport)=	0	0	0
Airport Study=	0	0	0
Airport Study Exceedance=	1*	1	0
Regional Administrator=	0	0	0
QA Collocation=	1	1	0
QAC filters sent to EPA for analysis	4	4	0

* The District is seeking EPA approval to discontinue regulatory lead sampling at Palomar Airport.

Section 7.3 Lead Suitability for Comparison to the NAAQS

The CFR requires that for Pb data to be used in regulatory determinations of compliance with the Pb NAAQS, the Pb monitors must be sited according to Federal Regulations³⁷ and the sampling frequency must be in accordance with Federal regulations. All District Pb monitors meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 7-9 and

Table 7-10 summarize these requirements.

Table 7-9 Lead Suitability for Comparison to the NAAQS-Sampling Equipment

Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID	
Lead	Pb	14129	µg/m ³ LC	105	24-Hr	7	Tisch TE-5170 BLVFC+	ICP/MS Acid filter extract with hot nitric acid	192	1:6	EQL-0710-192

Section 7.3.1 Lead Suitability for Comparison to the NAAQS – Operating Frequency

The CFR requires that for Pb-TSP data to be used in regulatory determinations of compliance with the Pb NAAQS, the Pb-TSP samplers’ sampling frequency must be in accordance with Federal regulations. All District Pb-TSP samplers meet or exceed all minimum monitoring requirements for the sampling frequency and can be compared to the NAAQS.

Table 7-10 summarizes these requirements.

58.12(e) Operating schedules

For PM₁₀ samplers, a 24-hour sample must be taken from midnight to midnight (local standard time) to ensure national consistency. The minimum monitoring schedule for the site in the area of expected maximum concentration shall be based on the relative level of that monitoring site concentration with

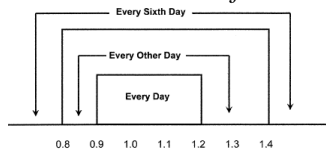


Figure 1 – Ratio to Standard

³⁷ (2021) 40 CFR Part 58, Appendix E, “Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring” and Table E-4.



respect to the 24-hour standard as illustrated in Figure 1 below.... The minimum sampling schedule for all other sites in the area remains once every six days.

Table 7-10 Lead Suitability for Comparison to the NAAQS-Sampling Equipment

What is the Minimum EPA Permitted Sampling Frequency? (#)	What is the Actual Sampling Frequency? (#)	Does the Actual Sampling Frequency Meet EPA Specifications? (yes/no)
1:6	1:6	yes

Section 7.4 Lead Concentrations for San Diego

Over the years, lead concentrations decreased so much that ambient sampling was no longer required. In 2012, the EPA lowered the NAAQS and sampling resumed. This section will illustrate the different metrics for comparison.

Section 7.4.1 Lead Concentrations for San Diego-for the Last 20 Years

The rapid decrease in lead emissions since the 1980s can be attributed primarily to phasing out the lead in gasoline in the 1970s by EPA and CARB. Note: the “Days Above National Standard” row in Table 7-11 and Figure 7.2 reflect the lead standard for that year. No Testing (NT) was done in the SDAB from 1997 until 2012. The measured concentrations for 2012 are from the NCore location, which is categorized as neighborhood scale and representative concentrations. The airport sampler is categorized as source impact and microscale, and is not considered representative concentrations.

Table 7-11 Lead Concentrations for San Diego-for the Last 20 Years, 2001-2021

	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Maximum Calendar Quarter (µg/m ³)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.006	0.007	0.010	0.015	0.010	0.020	0.020	0.020	0.020	0.020
Maximum Rolling 3-Month Average (µg/m ³)	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0.006	0.007	0.011	0.015	0.010	0.020	0.020	0.020	0.020	0.020
Days above the National Standard	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	NT	0	0	0	0	0	0	0	0	0	0

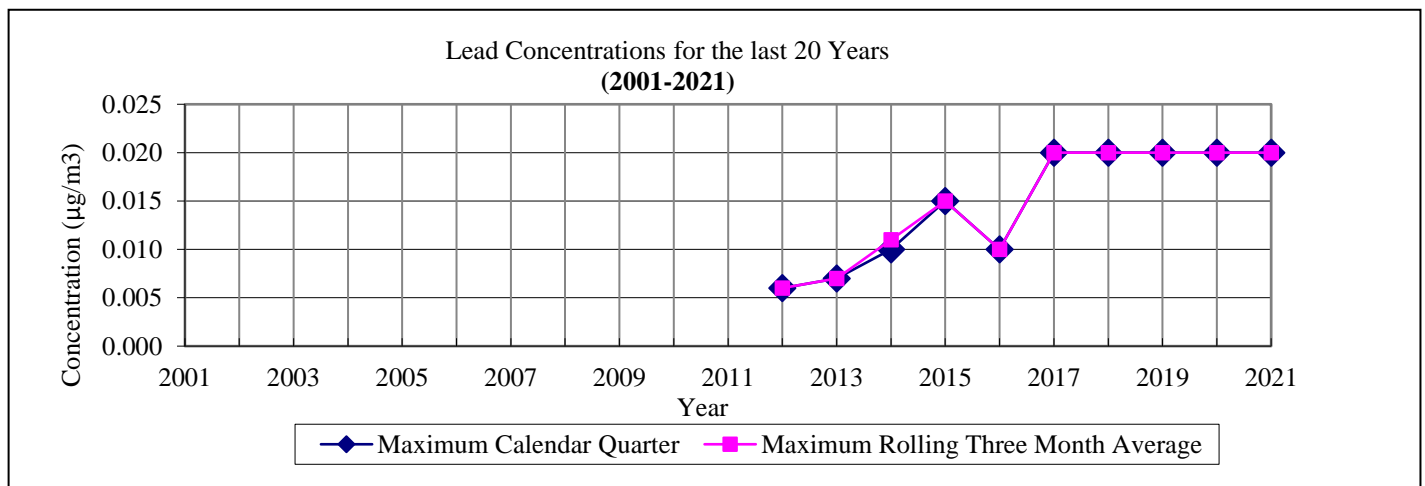


Figure 7.2 Lead Concentrations for San Diego-for the Last 20 Years



Section 7.4.2 Lead Concentrations for San Diego-by Site for the Year

Table 7-12 lists the maximum lead measurements for each lead monitoring location; Figure 7.3 shows the values graphically with respect to the National Standard.

Table 7-12 Lead Concentrations for San Diego-by Site for the Year

No. (#)	Site (name)	Site Abbreviation	Maximum Rolling 3-Month Average 2021 ($\mu\text{g}/\text{m}^3$)	Design Value Maximum Calendar Quarter 2021 ($\mu\text{g}/\text{m}^3$)	Number of Days Above the NAAQS 2021 (#)
2	Palomar Airport*	CRQ	0.020	0.020	0

*Source impact and microscale monitors.

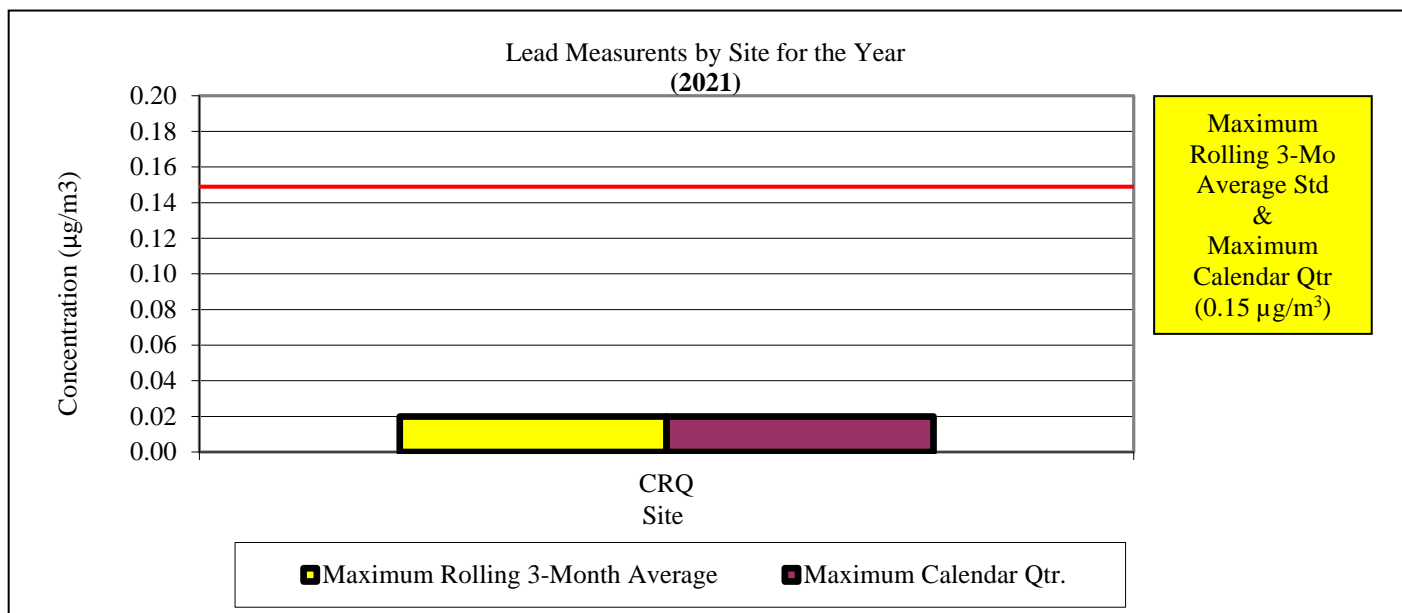


Figure 7.3 Lead Concentrations for San Diego-by Site for the Year Graph

The measured concentrations at the Palomar Airport location have been consistently well below the NAAQS and they have been for three (3) continuous years of operation. At this time, EPA is not approving the District's requested discontinuation of Pb monitoring at Palomar Airport, but EPA Region 9 will continue to work with EPA Headquarters to determine discontinuation eligibility.



Chapter 8: Particulate Matter 2.5 μm (PM_{2.5})

Section 8.1 PM_{2.5} Introduction

PM_{2.5} was sampled on both a continuous basis and sequentially (on a schedule set by the EPA) at several locations in the SDAB (Figure 8.1 and Table 8-2) and were referenced to the PM_{2.5} standards of the year (Table 8-1), when applicable. The equipment is listed in Table 8-2. Please note:

- In 2015, the District was evicted from our Escondido site (it was on the City of Escondido property) and relocated the station 20 meters southeast of the original location to be on San Diego County property and is currently in the permitting process for the City of Escondido. Once permits are approved, the construction can begin.

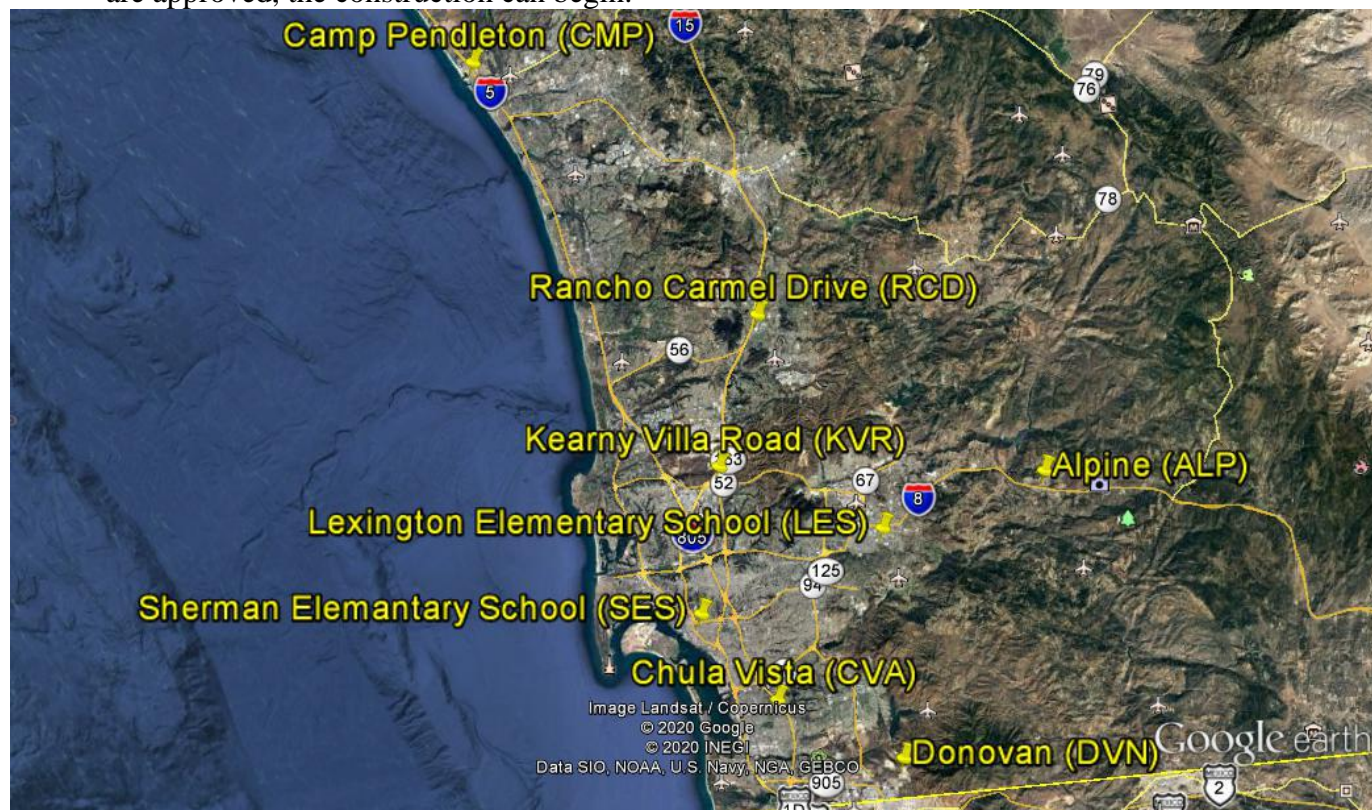


Figure 8.1 PM_{2.5} Network Map

Table 8-1 PM_{2.5} State and National Standards for the Year

Pollutant	Averaging Time	Ambient Air Quality Standards		
		California Standards	National Standards	
		Concentration	Primary	Secondary
Fine Particulate Matter (PM _{2.5})	24 hour	Not Applicable	35 $\mu\text{g}/\text{m}^3$	35 $\mu\text{g}/\text{m}^3$
	Annual Arithmetic Mean	12 $\mu\text{g}/\text{m}^3$	12 $\mu\text{g}/\text{m}^3$	15 $\mu\text{g}/\text{m}^3$



Table 8-2 PM_{2.5} Sampling Network

Site Abbreviation	ALP	CMP	CVA	LES		KVR		DVN	SES		RCD	
Site Name	Alpine	Camp Pendleton	Chula Vista	Lexington Elementary School		Kearny Villa Rd		Donovan	Sherman Elementary School		Rancho Carmel Drive	
AQS ID	06-073-1006	06-073-1008	06-073-0001	06-073-1022		06-073-1016		06-073-1014	06-073-1026		06-073-1017	
PM _{2.5} (non-specified)	Monitor Type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	
	Designation	O	O	PRI	O	PRI	PRI	QAC	O	O	PRI	PRI
	Method	CT (non-FEM)	CT (non-FEM)	SQ (FRM)	CT (non-FEM)	SQ (FRM)	SQ (FRM)	SQ (FRM)	CT (non-FEM)	CT (non-FEM)	SQ (FRM)	SQ (FRM)
	Affiliation	N/A	N/A	N/A	NCore	NCore	N/A	N/A	N/A	N/A	N/A	NR
	Spatial Scale	US	US	NS	US	NS	NS	NS	NS	NS	NS	MS
	Site Type	PE	PE	PE	PE	HC	PE	PE	PE	PE	PE	SO
	Objective (Federal)	PI, Research	PI, Research	NAAQS	PI, Research	NAAQS	NAAQS	NAAQS	PI, Research	PI, Research	NAAQS	NAAQS
	Analysis	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD
	Frequency	7/24	7/24	1:3	7/24	1:1	1:3	1:6	7/24	7/24	1:3	1:3
	Equipment	Met One BAM-1020	Met One BAM-1020	Met One E-SEQ-FRM	Met One BAM-1020	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One BAM-1020	Met One BAM-1020	Met One E-SEQ-FRM	Met One E-SEQ-FRM
PM _{2.5} (specified)	Monitor Type				SLAMS	SLAMS						
	Method				SP & SQ	SP & SQ						
	Affiliation				NCORE, CSN, STN	NCORE, CSN, STN						
	Spatial Scale				NS	NS						
	Site Type				PE	PE						
	Objective (Federal)				Research	Research						
	Analysis				EPA	EPA						
	Frequency				1:3	1:3						
Equipment				URG-3000N	Met One SuperSASS							



Glossary of Terms

Monitor Type

E= EPA
O= Other
SLAMS= State & Local monitoring station
SPM= Special purpose monitor
CATAC= California Toxics Monitoring

Site Type

HC= Highest concentration
PE= Population exposure
SO= Source oriented
UPBD= Upwind background
G/B= General/Background
RT= Regional Transport
WRI= Welfare related impacts
QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
CT= Low Volume, size selective inlet, continuous
FL= Fluorescence
HV= High volume
IR= Nondispersive infrared
SI= High volume, size selective inlet
SP= Low volume, size selective inlet, speciated
SQ= Low volume, size selective inlet, sequential
UV= Ultraviolet absorption
Canister= Evacuated stainless steel canisters
Cartridges= Di-nitrophenylhydrazine cartridges
FSL= Fused Silica Lined
Filter= Quartz filters
Auto= GC/FID continuous

Monitor Designation

PRI= Primary
QAC= Collocated

Network Affiliation

BG= Border Grant
CSN STN= Trends Speciation
CSN SU= Supplemental Speciation
NATTS= National Air Toxics Trends Stations
NCORE= National Core Multi-pollutants
NR= Near-road
PAMS= Photochemical Assessment Monitoring

Spatial Scale

MI= Micro
MS= Middle
NS= Neighborhood

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
Research= Research support
PI= Public Information
N/A= Not Applicable
O= Other



Section 8.2 PM_{2.5} Manual Minimum Monitoring Requirements

The District is federally mandated to monitor PM_{2.5} levels in accordance with the CFR. This section will state the needs for PM_{2.5} manual method samplers only. The District uses the PM_{2.5} manual sampler to satisfy all minimum monitoring requirements, other than those requirements that specifically state PM_{2.5} continuous sampler. This section will also state the different monitoring requirements for each program, e.g. ambient, manual, NCore, speciated, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other PM_{2.5} network requirements, e.g. ambient PM_{2.5} sampling can fulfill an NCore requirement.

The District meets or exceeds all minimum requirements for PM_{2.5} manual monitoring for all programs except for the following:

- Change in the number of PM_{2.5} FRM SIP samplers, due to relocations.
- Due to multiple relocations, there are DV data gaps. Once all the new stations have been operational for 3 continuous years (possibly 2024), the designations for the DV location will be revisited for the subsequent Annual Network Report.

Section 8.2.1 PM_{2.5} Manual Minimum Monitoring Requirements-Design Criteria (24-Hr. & Annual Average)

The District is required to operate a minimum number of PM_{2.5} samplers irrespective of the PM_{2.5} network affiliation. To ascertain the minimum number of samplers required for ambient air sampling, the Highest Concentration value must be calculated. Table 8-3 – Table 8-5 summarize these requirements.

4.7.1(a) Fine Particulate Matter (PM_{2.5}) Design Criteria.³⁸

...agencies must operate the minimum number of required PM_{2.5} SLAMS sites listed in Table D-5 of this appendix...

Table D-5 of Appendix D to Part 58—PM_{2.5} Minimum Monitoring Requirements

<i>MSA population (#)</i>	<i>Most recent 3-year design value \geq85% of any PM_{2.5} NAAQS (#)</i>	<i>Most recent 3-year design value <85% of any PM_{2.5} NAAQS (#)</i>
<i>>1,000,000</i>	<i>3</i>	<i>2</i>

Table 8-3 PM_{2.5} Manual Minimum Monitoring Requirements-Design Criteria (Annual Average)

Annual Design Value	Annual Design Value Location	Is the Annual Design Value \geq 85% of the NAAQS? (yes/no)	Is the Annual Design Value < 85% of the NAAQS? (yes/no)	Does the Annual Design Value Meet the NAAQS? (yes/no)
2019-2021 ($\mu\text{g}/\text{m}^3$)	(name)			
9.6	Lexington Elementary School (LES) 06-073-1022	NO	yes	yes

³⁸ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.7 “Fine Particulate Matter (PM_{2.5}) Design Criteria”, subsection 4.7.1 General Requirements (a)



Table 8-4 PM_{2.5} Manual Minimum Monitoring Requirements-Design Criteria (24-Hr)

24-hr Design Value 2019-2021 ($\mu\text{g}/\text{m}^3$)	Annual Design Value Location (name)	Is the 24-hr Design Value \geq 85% of the NAAQS? (yes/no)	Is the 24-hr Design Value < 85% of the NAAQS? (yes/no)	Does the 24-hr Design Value Meet the NAAQS? (yes/no)
24.0	Chula Vista (CVA) 06-073-0001	NO	yes	yes

Table 8-5 PM_{2.5} Manual Minimum Monitoring Requirements-Ambient

MSA & County (name)	Population Estimated from 2020 Census ³⁹ (#)	Number of Required PM _{2.5} Manual Samplers (#)	Number of Active PM _{2.5} Manual Samplers (#)	Number of Needed PM _{2.5} Manual Samplers (#)
San Diego	3.3 Million	3	5	0

Section 8.2.2 PM_{2.5} Manual Minimum Monitoring Requirements-State (SIP)

In 1998, the San Diego Air Pollution Control District, in partnership with the California Air Resources Board (ARB), developed a PM-fine monitoring network to implement the new PM_{2.5} NAAQS and is outlined in the “California Particulate Matter Monitoring Network Description”.⁴⁰ Table 8-6 summarizes these requirements.

The EPA Region 9 governing authority approved the ARB’s statewide distribution plan for the placement of the PM_{2.5} monitors within each district and the location of the collocated monitors for each district to satisfy the sampling and quality assurance requirements of 40 CFR Part 58. Any changes to the PM_{2.5} network in the SDAB will be undertaken in partnership and with advisement of ARB. If a PM_{2.5} monitor is violating the NAAQS and the District is forced to relocate the station or the sampler, the District will provide a minimum 30-day period for public review, prior to the relocation of the monitor or the station.

Table 8-6 PM_{2.5} Manual Minimum Monitoring Requirements- State (SIP)

MSA & County (name)	Population Estimated from 2020 Census (#)	Number of PM _{2.5} Manual Samplers Required (non- microscale) (#)	Number of PM _{2.5} Manual Samplers Active (#)	Number of PM _{2.5} Manual Samplers Needed (#)
San Diego	3.3 Million	5	4*	1*

* The Near-road is microscale and cannot be used in this total

³⁹ Based on the most recent official U.S Census statistics.

⁴⁰ <http://www.arb.ca.gov/aqd/pm25/pmfdsign.htm>



Section 8.2.3 PM_{2.5} Manual Minimum Monitoring Requirements-Site of Expected Maximum Concentration (24-Hr & Annual Average)

The District is required to designate PM_{2.5} sampling locations for specific purposes or needs. One of these designations is called the site of expected maximum concentrations with respect to the 24-Hr and annual average NAAQS. For the District these locations can change yearly. For both the 24-Hr and annual average NAAQS, these locations routinely alternate between Escondido (when operational), Lexington, and Sherman monitoring locations. Table 8-7 summarize these requirements.

4.7.1(b)(1) Fine Particulate Matter (PM_{2.5}) Design Criteria.⁴¹

At least one monitoring station is to be sited at neighborhood or larger scale in an area of expected maximum concentration.

Table 8-7 PM_{2.5} Manual Minimum Monitoring Requirements-Site of Expected Maximum Concentration (Annual Average) & 24-Hr

Site of Expected Maximum Concentration for Design Value Annual NAAQS (name)	Site of Expected Maximum Concentration for 24-Hr NAAQS (name)
Lexington Elementary School (LES) 06-073-1022	Lexington Elementary School (LES) 06-073-1022

Section 8.2.4 PM_{2.5} Manual Minimum Monitoring Requirements-Near-road

The District is required to have a PM_{2.5} sampler at a near-road location. The District is required to operate two near-road sites. The District installed a PM_{2.5} FRM sampler at the first near-road site (RCD), thus fulfilling our near-road particulate requirement. Table 8-8 lists these requirements.

4.7.1(b)(2) Fine Particulate Matter (PM_{2.5}) Design Criteria.⁴²

For CBSAs with a population of 1,000,000 or more persons, at least one PM_{2.5} monitor is to be collocated at a near-road NO₂ station required in section 4.3.2(a) of this appendix.

⁴¹ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.7 “Fine Particulate Matter (PM_{2.5}) Design Criteria”, subsection 4.7.1 General Requirements, (b) “Specific Design Criteria for PM_{2.5}, (1)

⁴² (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.7 “Fine Particulate Matter (PM_{2.5}) Design Criteria”, subsection (b)(2)



Table 8-8 PM_{2.5} Manual Minimum Monitoring Requirements-Near-road

MSA & County (name)	Population Estimated from 2020 Census (#)	Are PM _{2.5} Near-road Samplers Required? (yes/no)	Number of PM _{2.5} Near-road Samplers Required? (#)	Number of PM _{2.5} Near-road Samplers Active (#)	Number of PM _{2.5} Near-road Samplers Needed (#)	Near-road Site Location Name (name)
San Diego	3.3 million	YES	1	1	0	Rancho Carmel Dr. (RCD) 06-073-1017

Section 8.2.5 PM_{2.5} Manual Minimum Monitoring Requirements-Site of Poor Air Quality

The District is required to designate PM_{2.5} sampling locations for specific purposes or needs. One of these designations is called the site of Poor Air Quality with respect to the 24-Hr and annual average NAAQS (Note: the site that serves as fulfilling the requirement for the location of maximum concentration cannot also be the site of poor air quality). Table 8-9 summarizes these requirements.

4.7.1(b)(3) Fine Particulate Matter (PM_{2.5}) Design Criteria⁴³

For areas with additional required SLAMS, a monitoring station is to be sited in an area of poor air quality.

Table 8-9 PM_{2.5} Manual Minimum Monitoring Requirements-Site of Poor Air Quality

Site of Poor Air Quality (name)
Sherman Elementary School (SES) 06-073-1026

Section 8.2.6 PM_{2.5} Manual Minimum Monitoring Requirements-NCORE

The District is required to operate a PM_{2.5} sampler as part of the NCore multipollutant monitoring program. This program was designed to measure pollutants at lower levels, as well as other pollutants. For the NCore program, the District is required to collect PM_{2.5} and PM_{coarse} (PM_{10-2.5}) data. PM_{coarse} data is obtained by operating collocated PM₁₀ and PM_{2.5} samplers of the same make and model and on the same sampling frequency. The PM_{2.5} concentrations are then subtracted from the PM₁₀ concentrations to get the PM_{coarse} fraction.

Table 8-10 lists the NCore PM_{2.5} requirements.

3(b) Design Criteria for NCore Sites⁴⁴

The NCore sites must measure, at a minimum, PM_{2.5} particle mass using continuous and integrated/filter-based samplers, speciated PM_{2.5}, PM_{10-2.5} particle mass, speciated PM_{10-2.5}...

4.8.1(a) Coarse Particulate Matter (PM_{10-2.5}) Design Criteria.⁴⁵

The only required monitors for PM_{10-2.5} are those required at NCore Stations.

⁴³ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.7 “Fine Particulate Matter (PM_{2.5}) Design Criteria”, subsection (b)(3)

⁴⁴ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 3, “Design Criteria for NCore sites”, subpart (b)

⁴⁵ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.8 “Coarse Particulate Matter (PM_{2.5}) Design Criteria”, subsection 4.8.1(a)



Table 8-10 PM_{2.5} Manual Minimum Monitoring Requirements-NCORE

Number of PM _{2.5} Samplers Required at NCore Sites (#)	Number of PM _{2.5} Samplers Active at NCore Sites (#)	Number of PM _{2.5} Samplers Needed at NCore Sites (#)	Can this PM _{2.5} Sampler be used for PMcoarse? (yes/no)	Number of PM _{2.5} Samplers Needed for PMcoarse? (#)	NCore Site Location Name (name)
1	1	0	yes	0	Lexington Elementary School (LES) 06-073-1022

Section 8.2.7 PM_{2.5} Manual Minimum Monitoring Requirements- QA Collocation

For quality assurance purposes, there are requirements for analyzers or samplers of the same make and model to be collocated. In 1998, the District and the ARB gave criteria for choosing a site for collocation. Collocation guidance is from the CFR. Table 8-11 summarizes these requirements.

3.2.3.1 Collocated Quality Control Sampling Procedures for PM_{2.5}⁴⁶

For each distinct monitoring method designation (FRM or FEM) that a PQAO is using for a primary monitor, the PQAO must have 15 percent of the primary monitors of each method designation collocated (values of 0.5 and greater round up)...

Table 8-11 PM_{2.5} Manual Minimum Monitoring Requirements- QA Collocation

Number of PM _{2.5} Samplers Required from Table D-5 (#)	Number of PM _{2.5} Samplers Active (#)	Number of PM _{2.5} Samplers Needed for Collocation (#)	Number of PM _{2.5} Samplers Active for Collocation (#)	Number of PM _{2.5} Samplers Needed for Collocation (#)	Collocation Site Name (name)
3	5	5 x (15%) = 1	1	0	Kearny Villa Rd. (KVR) 06-073-1016

The District meets or exceeds all minimum requirements for PM_{2.5} collocation.

Section 8.2.8 PM_{2.5} Manual Minimum Monitoring Requirements-Summary

Table 8-12 summarizes all the PM_{2.5} manual minimum monitoring requirements from Sections 8.2.1 to 8.2.7.

⁴⁶ (2021) 40 CFR Part 58, Appendix A, Section 3.2.3.1, Quality System Requirements, PM_{2.5}, 3.2.3.1



Table 8-12 PM_{2.5} Manual Minimum Monitoring Requirements-Summary

CFR Programs PM _{2.5} Samplers Requirements (name)	Number of PM _{2.5} Samplers Required (#)	Number of PM _{2.5} Samplers Active (#)	Number of PM _{2.5} Samplers Needed (#)
CFR EPA Table D-2 only=	3	5	0
California Particulate Matter Network (non-microscale)=	5	4	1
DV Maximum Concentration, 24-Hr =	1	1	0
DV Maximum Concentration, Annual Average=	1	1	0
Expected Maximum Concentration, 24-Hr =	1	1	0
Expected Maximum Concentration, Annual Average=	1	1	0
Near-road=	1	1	0
Poor Air Quality=	1	1	0
NCore=	1	1	0
QA Collocation=	1	1	0

Section 8.3 PM_{2.5} Continuous Minimum Monitoring Requirements

The District is federally mandated to monitor PM_{2.5} levels in accordance with the CFR. This section will state the needs for PM_{2.5} continuous method samplers only and will state the different monitoring requirements for each program, e.g. ambient, NCore, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced).

The District meets or exceeds all minimum requirements for PM_{2.5} continuous monitoring for all programs.

Section 8.3.1 PM_{2.5} Continuous Minimum Monitoring Requirements-Ambient

The District is required to operate a minimum number of PM_{2.5} continuous samplers irrespective of the PM_{2.5} network affiliation. Table 8-13 summarizes these requirements.

*4.7.2 Fine Particulate Matter (PM_{2.5}) Design Criteria. Requirement for Continuous PM_{2.5} Monitoring⁴⁷
 The State, or where appropriate, local agencies must operate continuous PM_{2.5} analyzers equal to at least one-half (round up) the minimum required sites listed in Table D-5 of this appendix.*

Table 8-13 PM_{2.5} Continuous Minimum Monitoring Requirements-Ambient

Minimum Number of PM _{2.5} Manual Samplers Required from Table D-5 (#)	Minimum Number of PM _{2.5} Continuous Analyzers Required= ½ Minimum Number of Required PM _{2.5} Manual Samplers Round Up (#)	Number of PM _{2.5} Continuous Analyzers Active (#)	Number of PM _{2.5} Continuous Analyzers Needed (#)
3	3 x (½) = 2	5	0

⁴⁷ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.7 “Fine Particulate Matter (PM_{2.5}) Design Criteria”, subsection 4.7.2, “Requirement for Continuous PM_{2.5} Monitoring”



Section 8.3.2 PM_{2.5} Continuous Minimum Monitoring Requirements-Collocation with Manual

The District is required to operate a minimum number of PM_{2.5} continuous analyzers collocated with PM_{2.5} manual samplers. Table 8-14 summarizes these requirements.

*4.7.2 Fine Particulate Matter (PM_{2.5}) Design Criteria. Requirement for Continuous PM_{2.5} Monitoring⁴⁸
 At least one required continuous analyzer in each MSA must be collocated with one of the required FRM/FEM/ARM monitors*

Table 8-14 PM_{2.5} Continuous Minimum Monitoring Requirements-Collocation with Manual

Minimum Number of PM _{2.5} Continuous Analyzers Required to be Collocated with PM _{2.5} Manual Samplers (#)	Minimum Number of PM _{2.5} Continuous Analyzers Actively Collocated with PM _{2.5} Manual Samplers (#)	Minimum Number of PM _{2.5} Continuous Analyzers Needed to be Collocated with PM _{2.5} Manual Samplers (#)	Collocation Locations (name)
1	1	0	Lexington Elementary School (LES) 06-073-1022

Section 8.3.3 PM_{2.5} Continuous Minimum Monitoring Requirements-NCORE

The District is required to operate a PM_{2.5} continuous sampler as part of the NCore multipollutant monitoring program. Table 8-15 lists the NCore PM_{2.5} continuous requirements.

*3. Design Criteria for NCore Sites⁴⁹
 (b) The NCore sites must measure, at a minimum, PM_{2.5} particle mass using continuous*

Table 8-15 PM_{2.5} Continuous Minimum Monitoring Requirements-NCORE

Number of PM _{2.5} Continuous Analyzers Required at NCore Sites (#)	Number of PM _{2.5} Continuous Analyzers Active at NCore Sites (#)	Number of PM _{2.5} Continuous Analyzers Needed at NCore Sites (#)	NCORE Location (name)
1	1	0	Lexington Elementary School (LES) 06-073-1022

⁴⁸ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.7 “Fine Particulate Matter (PM_{2.5}) Design Criteria”, subsection 4.7.2, “Requirement for Continuous PM_{2.5} Monitoring”

⁴⁹ (2021) 40 CFR Part 58, App. D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 3, “Design Criteria for NCore sites”, subpart (b)



Section 8.3.4 PM_{2.5} Continuous Minimum Monitoring Requirements-Collocation

For quality assurance purposes, there are requirements for analyzers or samplers of the same make and model to be collocated. Table 8-16 summarize these requirements.

*3.2.3.2(b) Collocated Quality Control Sampling Procedures for PM 2.5... monitors selected for collocation must also meet the following requirements:⁵⁰
 ... Table A-2 of this appendix demonstrates the collocation procedure with a PQAQO having one type of primary FRM and multiple primary FEMs.*

Table A-2

#Primary FEMS of a unique method designation	#Collocated	#Collocated with an FRM	#Collocated with same method designation
1-9	1	1	0
10-16	2	1	1

Section 8.3.4.1 PM_{2.5} Continuous Minimum Monitoring Requirements- Collocation with Manual

See Section 8.3.2

Section 8.3.4.2 PM_{2.5} Continuous Minimum Monitoring Requirements- QA Collocation with Continuous

The District does not operate any PM_{2.5} continuous analyzer in FEM mode, so none are designated as a primary analyzer and cannot be used for comparison to the NAAQS. Therefore, technically, there is no requirement for QA collocation. Table 8-16 summarizes these requirements.

Table 8-16 PM_{2.5} Continuous Minimum Monitoring Requirements-Collocation

Number of PM _{2.5} Continuous Samplers Designated as FEM (#)	Number of PM _{2.5} Continuous Samplers Required for Collocation (from Table A-2) (#)	Number of PM _{2.5} Continuous Samplers Needed for Collocation (#)
0	0	0

Section 8.3.5 PM_{2.5} Continuous Minimum Monitoring Requirements-Summary

Table 8-17 summarizes all the PM_{2.5} continuous monitoring requirements from Sections 8.3.1 to 8.3.4.

Table 8-17 PM_{2.5} Continuous Minimum Monitoring Requirements-Summary

CFR Programs PM _{2.5} Continuous Requirements (name)	Number of PM _{2.5} Continuous Required (#)	Number of PM _{2.5} Continuous Active (#)	Number of PM _{2.5} Continuous Needed (#)
Minimum number required=	2	5	0
Minimum number of continuous collocated w/ manual=	1	1	0
NCore=	1	1	0
QA collocation PM _{2.5} continuous with PM _{2.5} continuous	0	0	0

⁵⁰ (2021) 40 CFR Part 58, App. A, Section 3.2.3, “Collocated Quality Control Sampling Procedures for PM_{2.5}”, Subsection 3.2.3.2(b)



Section 8.4 PM_{2.5} Speciation Minimum Monitoring Requirements

The State is federally mandated to monitor PM_{2.5} speciation in accordance with the CFR. This section will state the needs for PM_{2.5} speciation method instruments.

The District meets or exceeds all minimum requirements for PM_{2.5} State Regional monitoring.

Section 8.4.1 PM_{2.5} Speciation Minimum Monitoring Requirements-Ambient

One of the requirements is for the STN & CSN network to maintain the current speciation network as designed by the governing authorities. Table 8-18 lists these requirements.

4.7.4 PM_{2.5} Chemical Speciation Site Requirements.⁵¹

Each State shall continue to conduct chemical speciation monitoring and analyses at sites designated to be part of the PM_{2.5} Speciation Trends Network

Table 8-18 PM_{2.5} Speciation Minimum Monitoring Requirements-Ambient

Established PM _{2.5} CSN Samplers (Sites) (#)	Established PM _{2.5} STN Samplers (Sites) (#)	Are the PM _{2.5} CSN & STN Monitor (Sites) Active? (yes/no)	Number of PM _{2.5} CSN & STN Monitor (Sites) Needed? (#)
Lexington Elementary School (LES) 06-073-1022	Lexington Elementary School (LES) 06-073-1022	Yes	0
Escondido (ESC) 06-073-1002	Escondido (ESC) 06-073-1002	No	1*

*Escondido is temporarily closed for remodeling. Once the construction is completed, sampling will resume.

Section 8.4.2 PM_{2.5} Speciation Minimum Monitoring Requirements-NCORE

The District is required to operate PM_{2.5} speciation samplers as part of the NCore multipollutant monitoring program. Table 8-19 lists these requirements.

3.(b) Design Criteria for NCore Sites⁵²

The NCore sites must measure, at a minimum... speciated PM_{2.5}...

Table 8-19 PM_{2.5} Speciation Minimum Monitoring Requirements-NCORE

Number of NCore Site(s) (#)	Location of NCore Site(s) (name)	Are the Monitors (Sites) Active (yes/no)	Number of Monitors (Sites) Needed (#)
1	Lexington Elementary School (LES) 06-073-1022	Yes	0

Section 8.4.3 PM_{2.5} Speciation Minimum Monitoring Requirements-Summary

Table 8-20 summarizes all the PM_{2.5} speciation minimum monitoring requirements.

⁵¹ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.7 “Fine Particulate Matter (PM_{2.5}) Design Criteria”, subsection 4.7.4.

⁵² (2021) 40 CFR Part 58, App D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 3, “Design Criteria for NCore Sites”, subsection (b).



Table 8-20 PM_{2.5} Speciation Minimum Monitoring Requirements-Summary

CFR Programs PM _{2.5} Other Requirements (name)	Number of PM _{2.5} Speciation Required (#)	Number of PM _{2.5} Speciation Active (#)	Number of PM _{2.5} Speciation Needed (#)
PM _{2.5} STN and CSN Speciation=	2	1	1*
NCORE=	1	1	0

*Escondido is temporarily closed for remodeling. Once the construction is completed, sampling will resume.

Section 8.5 PM_{2.5} Suitability for Comparison to the NAAQS

The CFR requires that certain operating and siting parameters be met for an instrument to be suitable to be compared to the NAAQS. Some PM_{2.5} instrumentation are not compared to the NAAQS. This includes PM_{2.5} speciation samplers, and PM_{2.5} analyzers not operating in regulatory mode (non-FEM BAM PM_{2.5} continuous samplers). All District PM_{2.5} samplers are sited to specified CFR parameters to collect valid data. This section will list those requirements.

Section 8.5.1 PM_{2.5} Manual Suitability for Comparison to the NAAQS

The CFR requires that for PM_{2.5} Manual data to be used in regulatory determinations of compliance with the PM_{2.5} NAAQS, the PM_{2.5} samplers must be sited according to Federal Regulations⁵³ and the sampling frequency must be in accordance with Federal Regulations.⁵⁴ All District PM_{2.5} Manual samplers meet or exceed all minimum monitoring requirements and sampling frequencies, as to be able to be compared to the NAAQS. Table 8-21 summarizes these requirements.

Table 8-21 PM_{2.5} Manual Suitability for Comparison to the NAAQS – Sampling Equipment

Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID	
Particulate Matter ≤ 2.5 µm (manual)	PM _{2.5}	88101	µg/m ³ LC STD	105 001	24-Hr	7	Met One E-SEQ-FRM PM _{2.5} Air Sampler w/VSCC	Gravimetric	545	1:1 or 1:3	RFPS-0717-245

Section 8.5.2 PM_{2.5} Continuous Unsuitability for Comparison to the NAAQS

The CFR requires that for PM_{2.5} FEM data to be used in regulatory determinations of compliance with the PM_{2.5} NAAQS, the PM_{2.5} FEM samplers must operate according to FEM designation requirements. In 2014, the District received approval from the EPA Region IX authorities to operate the PM_{2.5} Continuous samplers in non-FEM mode. The District operates all PM_{2.5} continuous samplers at 36% relative humidity, per the manufacturer’s recommendation. Therefore, the PM_{2.5} continuous samplers cannot be compared to the NAAQS. The PM_{2.5} continuous samplers are an important tool to define and develop abatement strategies to curtail PM_{2.5} pollution. The PM_{2.5} continuous samplers are used for trends analysis and real-time reporting for public information. Table 8-22 summarizes the equipment requirements.

Table 8-22 PM_{2.5} Continuous Unsuitability for Comparison to the NAAQS – Sampling Equipment

Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID	
Particulate Matter ≤ 2.5 µm (continuous)	PM _{2.5}	88502	µg/m ³ LC	105	1-Hr	1	Met One BAM 1020 w/VSCC	Beta Attenuation	733	7/24	Not Applicable

Section 8.5.3 PM_{2.5} Speciation Unsuitability for Comparison to the NAAQS

There are no NAAQS for the PM_{2.5} Speciation program. Table 8-23 summarizes the equipment requirements.

⁵³ (2021) 40 CFR Part 58, Appendix E, “Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring” and Table E-4.

⁵⁴ (2021) 40 CFR Part 58, Subpart B, Section 58.12, “Operating Schedules”



Table 8-23 PM_{2.5} Speciation Unsuitability for Comparison to the NAAQS – Sampling Equipment

Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Particulate Matter ≤ 2.5 µm (speciated)	PM _{2.5} CSN	See ARB or EPA	See EPA	24-Hr	7	URG-3000N	See EPA	See EPA	1:3 or 1:6	Not Applicable
Particulate Matter ≤ 2.5 µm (speciated)	PM _{2.5} STN	See ARB or EPA	See EPA	24-Hr	7	Met One SuperSASS	See EPA	See EPA	1:3 or 1:6	Not Applicable

Section 8.6 PM_{2.5} Manual Operating Schedule

PM_{2.5} Manual samplers must operate on a specified frequency based upon several factors, e.g. maximum concentration, percentage to the NAAQS, etc. This section will list those requirements. Table 8-24 to Table 8-27 summarize these requirements.

58.12(d)(1)(i) Operating schedules for manual PM_{2.5} samplers⁵⁵

Manual PM_{2.5} samplers at required SLAMS stations without a collocated continuously operating PM_{2.5} monitor must operate on at least a 1-in-3 day schedule unless a waiver for an alternative schedule has been approved per paragraph (d)(1)(ii) of this section.

(ii) For SLAMS PM_{2.5} sites with both manual and continuous PM_{2.5} monitors operating, the monitoring agency may request approval for a reduction to 1-in-6 day PM_{2.5} sampling or for seasonal sampling from the EPA Regional Administrator.

(iii) Required SLAMS stations whose measurements determine the 24-hour design value for their area and whose data are within ±5 percent of the level of the 24-hour PM_{2.5} NAAQS must have an FRM or FEM operate on a daily schedule if that area's design value for the annual NAAQS is less than the level of the annual PM_{2.5} standard. A continuously operating FEM or ARM PM_{2.5} monitor satisfies this requirement unless it is identified in the monitoring agency's annual monitoring network plan as not appropriate for comparison to the NAAQS and the EPA Regional Administrator has approved that the data from that monitor may be excluded from comparison to the NAAQS. The daily schedule must be maintained until the referenced design value no longer meets these criteria for 3 consecutive years.

(2) Manual PM_{2.5} samplers at NCore stations and required regional background and regional transport sites must operate on at least a 1-in-3 day sampling frequency.

(3) Manual PM_{2.5} speciation samplers at STN stations must operate on at least a 1-in-3 day sampling frequency ...

⁵⁵ (2021) 40 CFR Part 58, Section 58.12, Subpart B, “Operating Schedules”, (d) For manual PM_{2.5} samplers (1)(i) to (3)



Table 8-24 PM_{2.5} Operating Schedule-for All PM_{2.5} Instruments

	Camp Pendleton	Rancho Carmel Dr.	Alpine	Lexington Elementary School (NCore, PAMS, DV 24-hr)	Kearny Villa Rd.	Donovan	Chula Vista	Sherman Elementary School
PM _{2.5} -manual FRM		1:3		1:1	1:3		1:3	1:3
PM _{2.5} -continuous non-FEM	7/24		7/24	7/24		7/24		7/24
PM _{2.5} -speciation				1:3				

Note: Historically, the DV alternates between three FRM locations (Downtown, Escondido, and El Cajon). While the Downtown site at Sherman Elementary School began operating, there is not enough data for the DV and the Escondido site is still temporarily inoperable, due to relocation; therefore, El Cajon (Lexington Elementary School) is the DV location. Once the new sites have been operational for 3 continuous calendar years (for DV calculations purposes) this DV location designation will be re-evaluated in the subsequent Annual Network Report.

Table 8-25 PM_{2.5} Manual Operating Schedule-for Manual Samplers Collocated with Continuous Samplers (DV-24-hr)

Is the 24-hr DV PM _{2.5} Manual sampler Collocated with PM _{2.5} Continuous Samplers? (yes/no)	Location of 24-hr DV PM _{2.5} Manual sampler Collocated with PM _{2.5} Continuous Samplers (name)	Calculations 24-hr DV		Any 24-Hr DV NAAQS Exceedances over the Last 3-years (yes/no)	What is the Required Sampling Frequency? (#)	What is the Actual Sampling Frequency? (#)	Does the Actual Sampling Frequency Meet EPA Specifications (yes/no)
		(years)	($\mu\text{g}/\text{m}^3$)				
yes	Lexington Elementary School (LES) 06-073-1022	2019-2021	23	NO	1.1	1:1	yes
		2018-2020	22	NO			
		2017-2019	19	NO			
		2016-2018	19	NO			
		2015-2017	18	NO			

Table 8-26 PM_{2.5} Manual Operating Schedule-NCore

Is there a NCore PM _{2.5} Manual Sampler? (yes)	Location of NCore PM _{2.5} Manual Sampler (name)	What is the Minimum EPA Sampling Frequency? (#)	What is the Actual Sampling Frequency? (#)	Does the Actual Sampling Frequency Meet EPA Specifications? (yes/no)
yes	Lexington Elementary School (LES) 06-073-1022	1:3	1:1	yes



Table 8-27 PM_{2.5} Speciation Operating Schedule-NCORE

Is there a NCore PM _{2.5} Speciation Sampler?	Location of NCore PM _{2.5} Speciation Sampler	What is the Minimum EPA Sampling Frequency?	What is the Actual Sampling Frequency?	Does the Actual Sampling Frequency Meet EPA Specifications?
(yes)	(name)	(#)	(#)	(yes/no)
yes	Lexington Elementary School (LES) 06-073-1022	1:3	1:3	yes

Section 8.7 PM_{2.5} Manual Concentrations for San Diego

As with the State, PM_{2.5} concentrations in the San Diego Air Basin have declined over the years. This section will illustrate the different metrics for comparison.

Section 8.7.1 PM_{2.5} Manual Concentrations for San Diego-for the Last 20 Years

Annual average PM_{2.5} FRM concentrations in the County have declined over the years, see Table 8-28. The 98th percentile of 24-Hr PM_{2.5} concentrations showed substantial variability within this period, a reflection of changes in meteorology and the influence of the 2003 and 2007 wildfires. Furthermore, the standard was lowered in 2007, which corresponded to increased incidents of “Days above the Standard”. Note: the “Days Above the Standard” row in Table 8-28 reflects the PM_{2.5} standard for that year. Figure 8.2 graphs the SDAB PM_{2.5} concentrations over the years.

Table 8-28 PM_{2.5} Manual Concentrations for San Diego-for the Last 20 Years (24-Hr), 2001-2021

Maximum 24-Hr Concentration ($\mu\text{g}/\text{m}^3$)	2001	2002	2003*	2004	2005	2006	2007*	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
	60.0	53.6	239.2	67.3	44.1	63.3	126.2	42.0	65.0	33.3	34.7	70.7	56.3	36.7	33.5	34.4	42.7	41.9	23.8	51.9	30.2
Days above the National Std	0	0	2	1	0	1	17	3	3	0	0	2	2	1	0	0	1	1	0	3	0

n/a= not applicable

*Wildfires in San Diego County

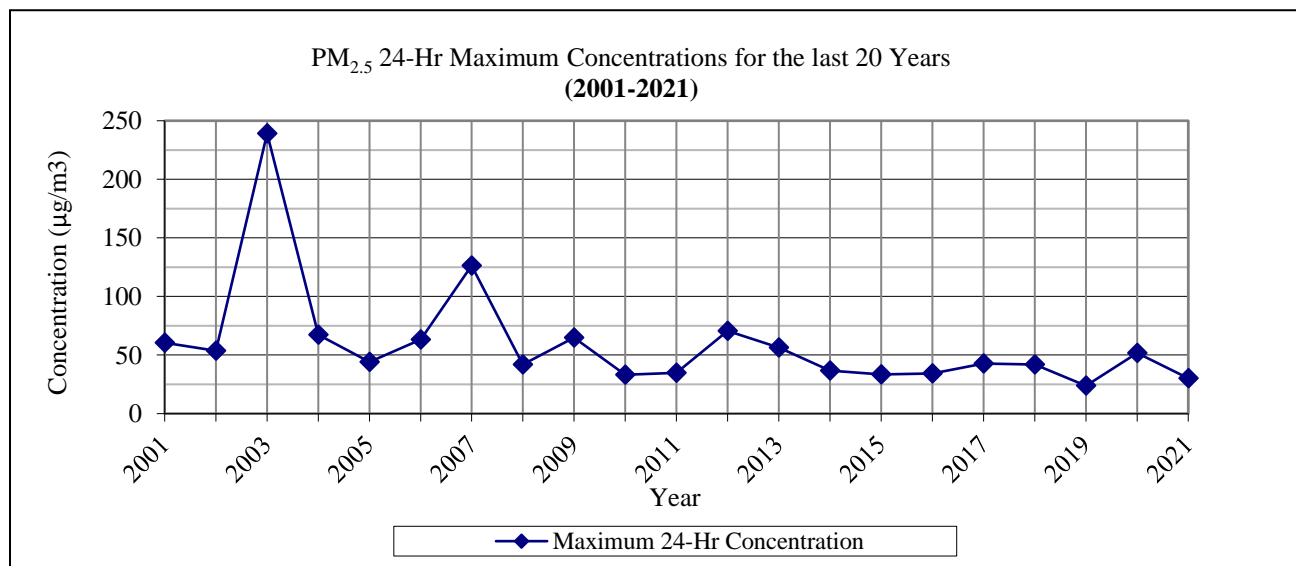


Figure 8.2 PM_{2.5} Manual Concentrations for San Diego-for the Last 20 Years (24-Hr) Graph



Section 8.7.2 PM_{2.5} Manual Concentrations for San Diego-by Site for the Year

Table 8-29 lists the maximum PM_{2.5} Manual measurements for each PM_{2.5} Manual method monitoring location and Figure 8.3 shows the values graphically with respect to the National Standard.

FOR INFORMATIONAL PURPOSES ONLY.

NAAQS is for DV calculations. Annual values are not comparable to the NAAQS.

Table 8-29 PM_{2.5} Manual Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average), 2021

Manual Method	No	Site	Site	Maximum 24-Hr	Annual	Number of
	(#)	(name)	Abbreviation	Concentration	Average	Days Above the
				($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)	National Standard
						(#)
	1	Rancho Carmel Dr.	RCD	23.5	8.5	0
	2	Kearny Villa Rd.	KVR	20.9	7.6	0
	3	Lexington Elementary School	LES	30.2	9.7	0
	4	Sherman Elementary School	SES	25.6	9.7	0
	5	Chula Vista	CVA	24.9	9.5	0

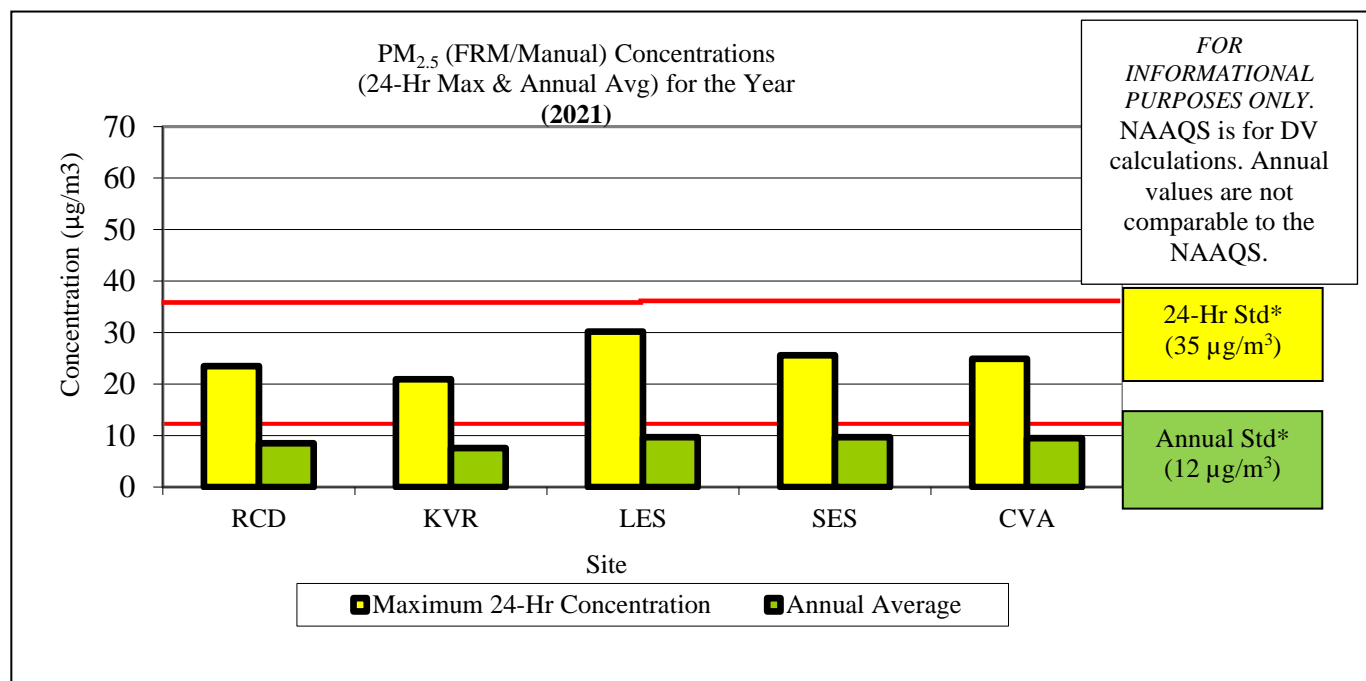


Figure 8.3 PM_{2.5} Manual Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average) Graph



Section 8.7.3 PM_{2.5} Manual Concentrations for San Diego-by Site for the Design Value (24-Hr)

Table 8-30 lists the PM_{2.5} Manual 24-Hr Design Values for each PM_{2.5} Manual method monitoring location and Figure 8.4 shows the concentrations graphically with respect to the National Standard.

Table 8-30 PM_{2.5} Manual Concentrations for San Diego-by Site for the Design Value (24-Hr), 2019-2021

Manual Method	No	Site	Site Abbrev	24-Hr Design Value	Number of Days Above the 24-Hr NAAQS	Is the 24-Hr Design Value \geq 85% of the NAAQS?	Is the 24-Hr Design Value $<$ 85% of the NAAQS?	Does the 24-Hr Design Value Meet the NAAQS?
	(#)	(name)		($\mu\text{g}/\text{m}^3$)	(#)	(yes/no)	(yes/no)	(yes/no)
Manual Method	1	Rancho Carmel Dr.*	RCD	22	0	no	yes	yes
	2	Kearny Villa Rd.	KVR	20	0	no	yes	yes
	3	Lexington Elementary School	LES	23	0	no	yes	yes
	4	Sherman Elementary School*	SES	--	0	--	--	yes
	5	Chula Vista	CVA	24	0	no	yes	yes

*Not sampled for 3-yrs

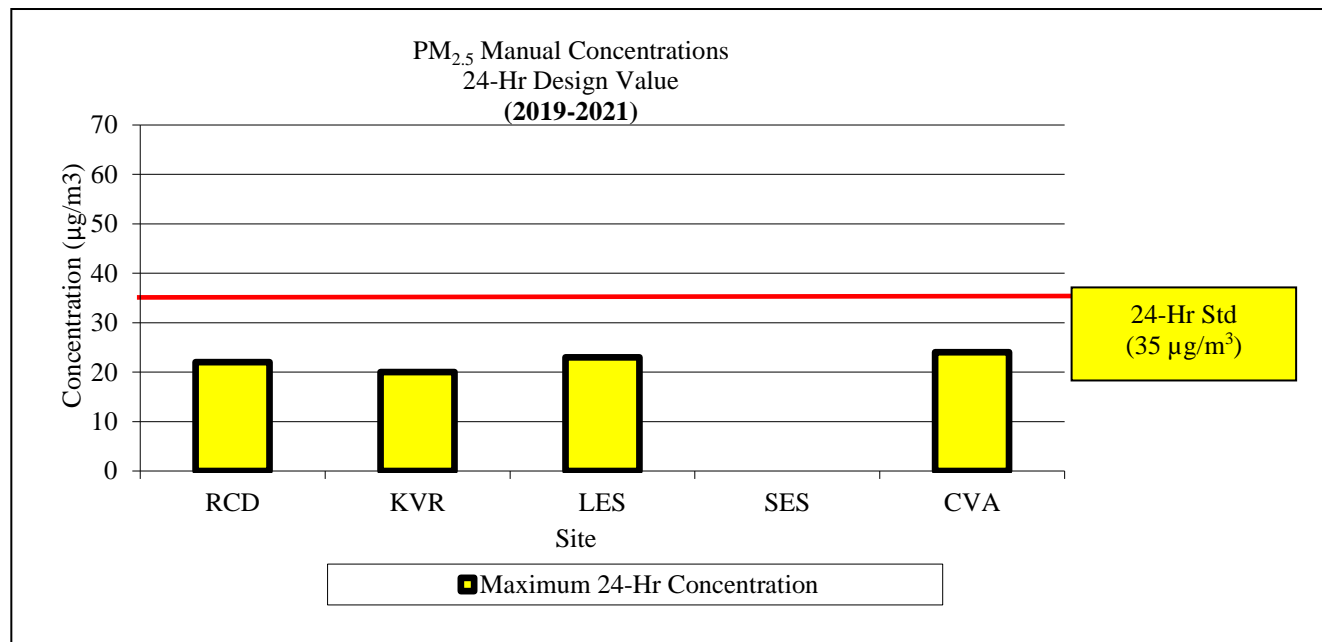


Figure 8.4 PM_{2.5} Manual Concentrations for San Diego-by Site for the Design Value (24-Hr) Graph



Section 8.7.4 PM_{2.5} Manual Concentrations for San Diego-by Site for the Design Value (Annual Average)

Table 8-31 lists the PM_{2.5} Manual annual average Design Values for each PM_{2.5} Manual method monitoring location and Figure 8.5 shows the concentrations graphically with respect to the National Standard.

Table 8-31 PM_{2.5} Manual Concentrations for San Diego-by Site for the Design Value (Annual Average), 2019-2021

Manual Method	No	Site	Site Abbrev	Design Value for the Annual Avg	Is the Annual Avg Design Value \geq 85% of the NAAQS?	Is the Annual Avg. Design Value < 85% of the NAAQS?	Does the Annual Avg Design Value Meet the NAAQS?
	(#)	(name)		2019-2021 ($\mu\text{g}/\text{m}^3$)	2021 (yes/no)	2021 (yes/no)	2021 (yes/no)
	1	Rancho Carmel Dr.*	RCD	8.7	no	yes	yes
	2	Kearny Villa Rd.	KVR	7.8	no	yes	yes
	3	Lexington Elementary School	LES	9.6	yes	no	yes
	4	Sherman Elementary School*	SES	--	--	--	yes
	5	Chula Vista	CVA	9.5	yes	no	yes

*Not sampled for 3-yrs

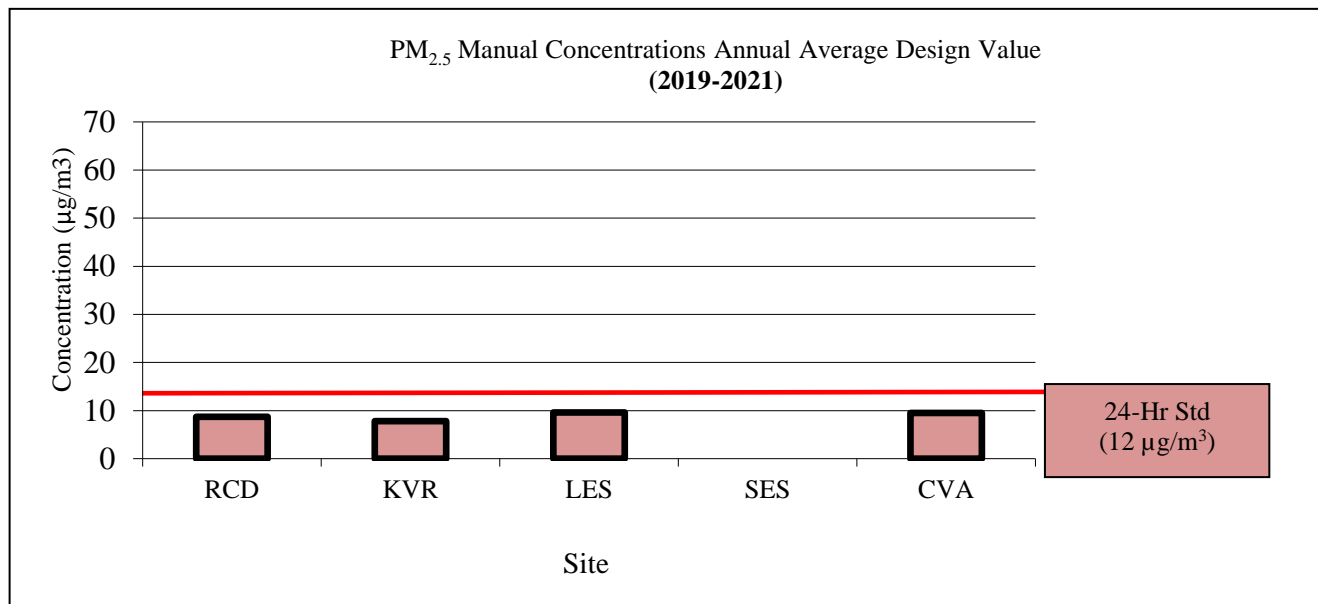


Figure 8.5 PM_{2.5} Manual Concentrations for San Diego-by Site for the Design Value (Annual Average) Graph



Section 8.8 PM_{2.5} Continuous Concentrations for San Diego

All District PM_{2.5} continuous samplers cannot be compared to the NAAQS, because they are non-regulatory units; therefore, the values cannot be compared to the PM_{2.5} standards and can only be used for trends analysis and public information. All PM_{2.5} continuous samplers are operated at 36% relative humidity (per manufacturer recommendation), which makes them non-regulatory.

Section 8.8.1 PM_{2.5} Continuous Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average)

Table 8-32 lists the maximum PM_{2.5} continuous 24-Hr measurements and Annual Average for each PM_{2.5} continuous monitoring location and Figure 8.6 shows the concentrations graphically. The measurements are not the Design Value (Yearly only).

Note: *FOR INFORMATIONAL PURPOSES ONLY.* Not an FRM/FEM instrument.

Table 8-32 PM_{2.5} Continuous Concentrations for San Diego-by Site for the Year (24-Hr & Annual Average), 2021

Continuous Method	No.	Site	Site Abbreviation	Maximum 24-Hr Concentration	Annual Average
	(#)	(name)		($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)
	1	Camp Pendleton	CMP	20.7	8.5
	2	Alpine	ALP	23.1	5.7
	3	Lexington Elementary School	LES	31.5	10.3
	4	Sherman Elementary School	SES	26.3	9.4
	5	Donovan	DVN	31.7	12.3

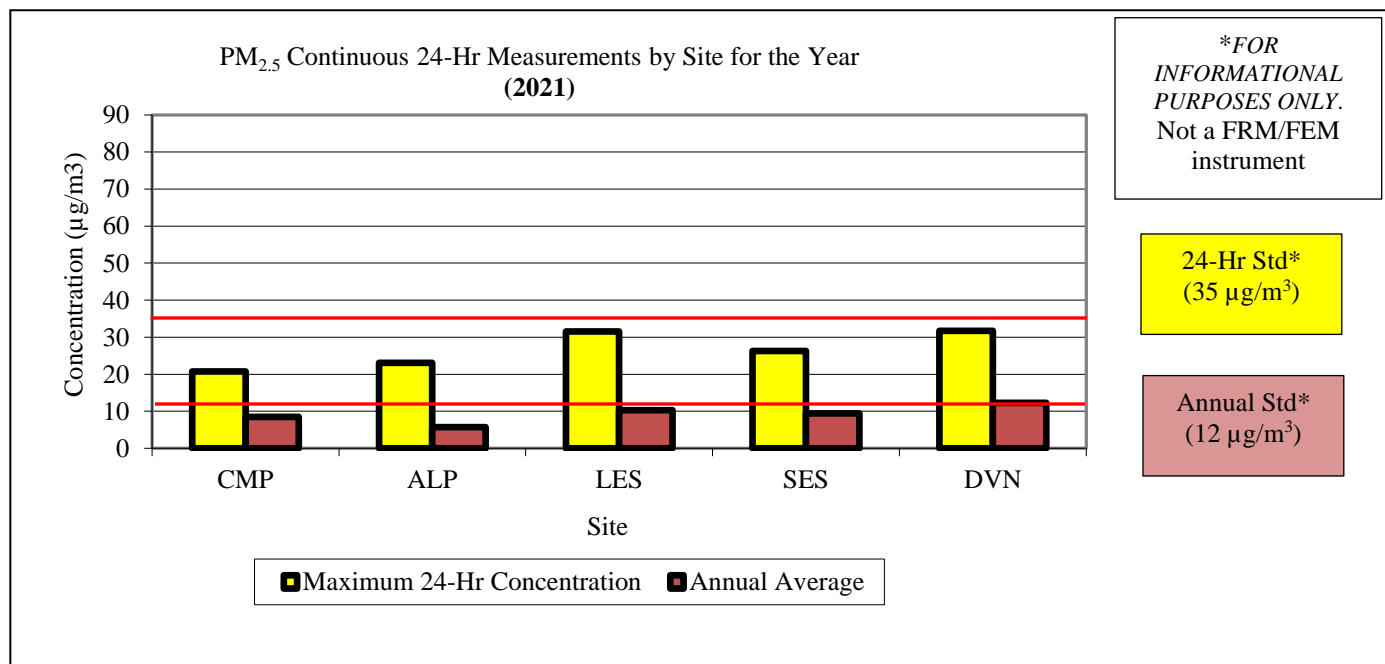


Figure 8.6 PM_{2.5} Continuous Yearly 24-Hr & Annual Average Measurements by Site Graph



Section 8.8.2 PM_{2.5} Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average)

Table 8-33 lists the PM_{2.5} continuous 24-Hr Design Values and Annual Average Design Values for each PM_{2.5} continuous monitoring location and **Figure 8.7** shows the values graphically.

Note: *FOR INFORMATIONAL PURPOSES ONLY.* Not an FRM/FEM instrument.

Table 8-33 PM_{2.5} Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average), 2019-2021

Continuous Method	No.	Site	Site Abbreviation	24-Hr Design Value	Design Value Annual Average
	(#)	(name)		($\mu\text{g}/\text{m}^3$)	($\mu\text{g}/\text{m}^3$)
Continuous Method	1	Camp Pendleton	CMP	21.1	8.1
	2	Alpine	ALP	14.6	5.8
	3	Lexington Elementary School	LES	23.0	10.7
	4	Sherman Elementary School*	SES	25.1	10.2
	5	Donovan	DVN	32.4	13.0

*Not sampled for 3-yrs

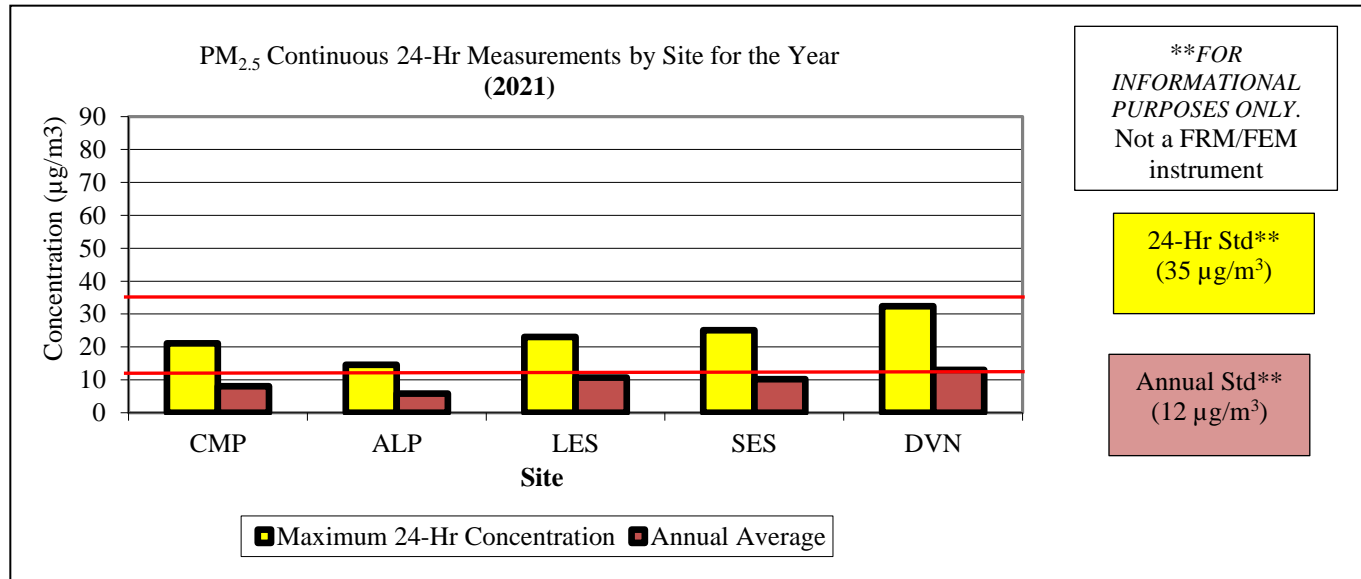


Figure 8.7 PM_{2.5} Continuous Concentrations for San Diego-by Site for the Design Value (24-Hr & Annual Average) Graph



Chapter 9: Particulate Matter 10 µm (PM₁₀)

Section 9.1 PM₁₀ Introduction

PM₁₀ was sampled for at three locations throughout the SDAB (Figure 9.1) and referenced to the PM₁₀ standards of the year (Table 9-1). The equipment is listed in Table 9-2. There is a PM₁₀ (Lo-Vol) sampler at the Lexington Elementary School (LES) location that is also part of the paired Lo-Vol samplers needed to calculate PM_{coarse}. Please Note:

- In 2015, the District was evicted from our Escondido site (it was on the City of Escondido property) and are in the process of relocating the station 20 meters southeast of the original location to be on San Diego County property.
- In 2019, the District recorded a maximum PM₁₀ concentration of 199 µg/m³. This has triggered the requirement for 6 to 10 monitors. The District currently has 4 monitors and is working to deploy additional particulate matter (PM_{2.5} & PM₁₀) analyzers to satisfy this requirement.

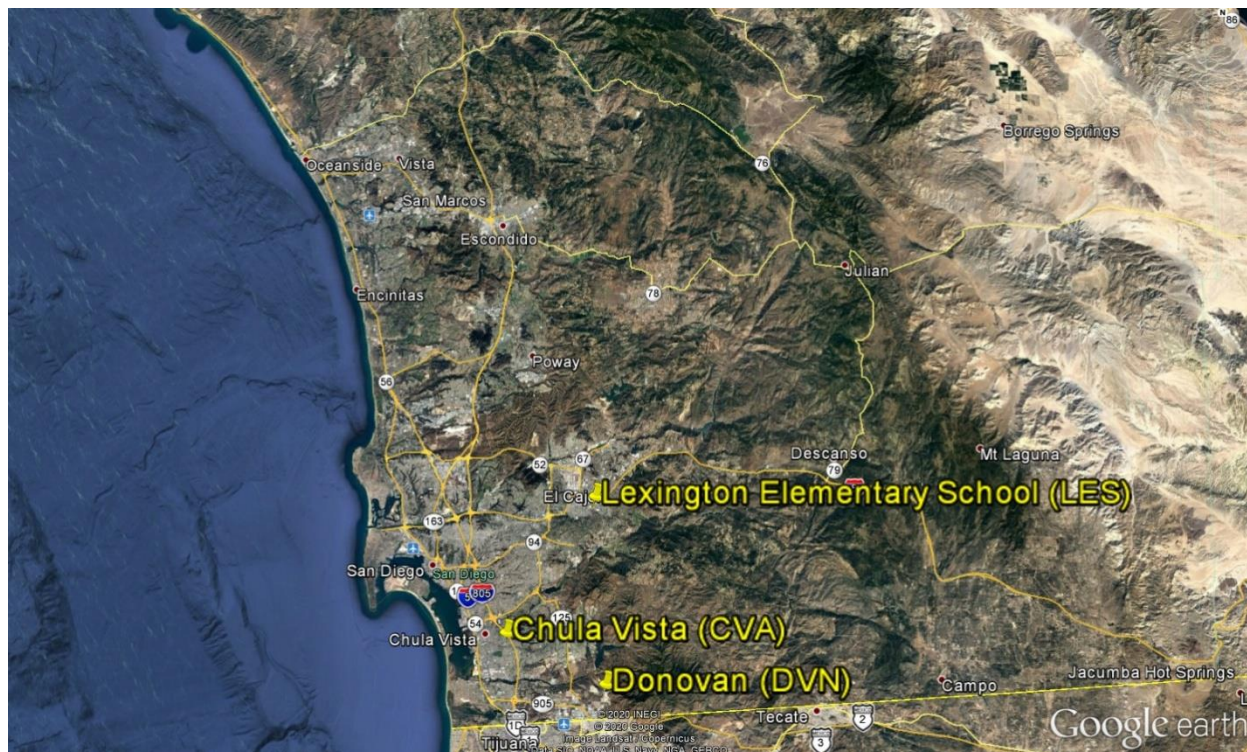


Figure 9.1 PM₁₀ Overall Map

Table 9-1 PM₁₀ State and National Standards for the Year

Ambient Air Quality Standards				
Pollutant	Averaging Time	California Standards	National Standards	
		Concentration	Primary	Secondary
Fine Particulate Matter (PM ₁₀)	24 hour	50 µg/m ³	150 µg/m ³	150 µg/m ³
	Annual Arithmetic Mean	20 µg/m ³	Not Applicable	Not Applicable



Table 9-2 PM₁₀ Sampling Network

Abbreviation	CVA	DVN		LES
Name	Chula Vista	Donovan		Lexington Elementary School
AQS ID	06-073-0001	06-073-1014		60-076-1022
PM ₁₀	Monitor Type	SLAMS	SLAMS	SLAMS
	Monitor Designation	PRI	PRI	PRI
	Method	SQ	SQ	SQ
	Affiliation	Not Applicable	Not Applicable	NCore
	Spatial Scale	NS	NS	NS
	Site Type	PE	HC	PE
	Objective (Federal)	NAAQS	NAAQS	NAAQS
	Frequency	1:6	1:6	1:6
	Equipment	Met One E-SEQ-FRM w/o VSCC	Met One E-SEQ-FRM w/o VSCC	Met One E-SEQ-FRM w/o VSCC

Glossary of Terms

Monitor Type

E= EPA
 O= Other
 SLAMS= State & Local monitoring station
 SPM= Special purpose monitor
 CATAC= California Toxics Monitoring

Site Type

HC= Highest concentration
 PE= Population exposure
 SO= Source oriented
 UPBD= Upwind background
 G/B= General/Background
 RT= Regional Transport
 WRI= Welfare related impacts
 QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
 CT= Low Volume, size selective inlet, continuous
 FL= Fluorescence
 HV= High volume
 IR= Nondispersive infrared
 SI= High volume, size selective inlet
 SP= Low volume, size selective inlet, speciated
 SQ= Low volume, size selective inlet, sequential
 UV= Ultraviolet absorption
 Canister= Evacuated stainless steel canisters
 Cartridges= Di-nitrophenylhydrazine cartridges
 FSL= Fused Silica Lined
 Filter= Quartz filters
 Auto= GC/FID continuous

Monitor Designation

PRI= Primary
 QAC= Collocated

Network Affiliation

BG= Border Grant
 CSN STN= Trends Speciation
 CSN SU= Supplemental Speciation
 NATTS= National Air Toxics Trends Stations
 NCore= National Core Multi-pollutants
 NR= Near-road
 PAMS= Photochemical Assessment Monitoring

Spatial Scale

MI= Micro
 MS= Middle
 NS= Neighborhood

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
 Research= Research support
 PI= Public Information
 N/A= Not Applicable
 O= Other



Section 9.2 PM₁₀ Minimum Monitoring Requirements

The District is federally mandated to monitor PM₁₀ levels in accordance with the CFR. This section will state the different monitoring requirements for each program, e.g. ambient, NCore, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). These monitors can serve as fulfilling other PM₁₀ network requirements, e.g. ambient PM₁₀ sampler can fulfill an NCore PM₁₀ sampler requirement.

The District meets or exceeds all minimum requirements for PM₁₀ monitoring for all programs.

Section 9.2.1 PM₁₀ Minimum Monitoring Requirements-Ambient

All Districts are required to operate a minimum number of PM₁₀ samplers irrespective of the PM₁₀ network affiliation. These monitors can serve as fulfilling other PM₁₀ network requirements. To ascertain the minimum number of samplers required, the Maximum Concentration value must be calculated and is summarized in Table 9-3 to Table 9-4.

4.6(a) Particulate Matter (PM₁₀) Design Criteria.⁵⁶

Table D-4 indicates the approximate number of permanent stations required in MSAs to characterize national and regional PM₁₀ air quality trends and geographical patterns...

Table D-4 of Appendix D to Part 58—PM₁₀ Minimum Monitoring Requirements (Approximate Number of Stations per MSA)

<i>Population Category</i>	<i>High Concentration (120% of NAAQS²)</i>	<i>Medium Concentration (>80% of NAAQS)</i>	<i>Low Concentration (<80% of NAAQS)</i>
<i>>1,000,000</i>	<i>6-10</i>	<i>4-8</i>	<i>2-4</i>

Table 9-3 PM₁₀ Minimum Monitoring Requirement-Design Criteria for the Year, 2021 (24-Hr)

24-hr Maximum Concentration 2021 ($\mu\text{g}/\text{m}^3$)	24-hr Maximum Concentration Location (name)	High Concentration Is the 24-hr Maximum Concentration $\geq 120\%$ of the NAAQS? (yes/no)	Medium Concentration Is the 24-hr Maximum Concentration $> 80\%$ of the NAAQS? (yes/no)	Low Concentration Is the 24-hr Maximum Concentration $< 80\%$ of the NAAQS? (yes/no)	Does the 24-hr Maximum Concentration Meet the NAAQS? (yes/no)
122	DVN	no	yes	no	no

Table 9-4 PM₁₀ Minimum Monitoring Requirements-Ambient

MSA & County (name)	Population Estimated from 2020 Census⁵⁷ (#)	Number of PM₁₀ Samplers Required (#)	Number of PM₁₀ Samplers Active (#)	Number of PM₁₀ Samplers Needed (#)
San Diego	3.3 million	6 - 10	4	2

⁵⁶ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Section 4, “Pollutant-Specific Design Criteria for SLAMS Sites”, part 4.6 “Particulate Matter (PM₁₀) Design Criteria” and Table D-4

⁵⁷ Based on the most recent official U.S Census statistics.



Section 9.2.2 PM₁₀ Minimum Monitoring Requirements-NCORE

The District is required to operate a PM₁₀ sampler as part of the NCore multipollutant monitoring program for the calculation of PM_{10-2.5} data. Table 9-5 lists the NCore PM₁₀ requirements.

3(b) Design Criteria for NCore Sites⁵⁸

The NCore sites must measure, at a minimum, PM_{2.5} particle mass using continuous and integrated/filter-based samplers, speciated PM_{2.5}, PM_{10-2.5} particle mass...

Table 9-5 PM₁₀ Minimum Monitoring Requirements-NCORE

Number of PM ₁₀ Samplers Required for NCore Sites* (#)	Number of PM ₁₀ Samplers Active at NCore Sites (#)	Number of PM ₁₀ Samplers Needed at NCore Sites (#)	Name of NCore Site (name)
1	1	0	Lexington Elementary School (LES) 06-073-1022

*While the PM₁₀ sampler is not specifically needed to fulfill NCore requirement, it is needed for PM_{10-2.5} (PMcoarse) measurements.

Section 9.2.3 PM₁₀ Manual Minimum Monitoring Requirements-QA Collocation

Collocation guidance is from the CFR. Table 9-6 summarizes these requirements.

3.3.4 Collocated Quality Control Sampling Procedures for Manual PM₁₀⁵⁹

...For manual PM₁₀ samplers, a PQA must:(a) Have 15 percent of the primary monitors collocated (values of 0.5 and greater round up)... (b) If an organization has no sites with daily concentrations within plus or minus 20 percent of the NAAQS...(e)

Table 9-6 PM₁₀ Manual Minimum Monitoring Requirements-Collocation

Number of PM ₁₀ Samplers Required (#)	Number of PM ₁₀ Samplers Active (#)	Number of PM ₁₀ Samplers Required for Collocation (#)	Number of PM ₁₀ Samplers Active for Collocation (#)	Number of PM ₁₀ Samplers Needed for Collocation (#)	Location of Collocated Site(s) (name)
2 - 4	4	4 x (15%) = 1	1	0	Donovan (DVN) 06-073-1014

Section 9.2.4 PM₁₀ Minimum Monitoring Requirements-Summary

Table 9-7 summarizes all the PM₁₀ minimum monitoring requirements from Sections 9.2.1 to 9.2.3.

⁵⁸ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”, Sec. 3, “Design Criteria for NCore sites”, subpart (b)
⁵⁹ (2021) 40 CFR Part 58, Appendix A, Section 3.3.4, “Collocated Quality Control Sampling Procedures for Manual PM₁₀”, subsection 3.3.4.1 (a)-(e)



Table 9-7 PM₁₀ Minimum Monitoring Requirements-Summary

CFR Programs PM ₁₀ Samplers Requirements (name)	Number of PM ₁₀ Samplers Required (#)	Number of PM ₁₀ Samplers Active (#)	Number of PM ₁₀ Samplers Needed (#)
CFR EPA Table D-2 only=	2-4	4	0
NCore=	1	1	0
QA collocation	1	1	0

Section 9.3 PM₁₀ Suitability for Comparison to the NAAQS

Many different criteria are required for PM₁₀ data to be considered to be suitable for comparison to the NAAQS, e.g. siting, sampling frequency, etc. This section will state those criteria.

Section 9.3.1 PM₁₀ Suitability for Comparison to the NAAQS - Equipment & Siting

The CFR requires that for PM₁₀ data to be used in regulatory determinations of compliance with the PM₁₀ NAAQS, the PM₁₀ monitors must be sited according to Federal Regulations⁶⁰. All District PM₁₀ samplers meet or exceed all minimum monitoring requirements and can be compared to the NAAQS. Table 9-8 summarizes them.

Table 9-8 PM₁₀ Suitability for Comparison to the NAAQS, Equipment & Siting

	Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Frequency	Method ID
Amb	Particulate Matter ≤ 10 µm (Lo-Vol)	PM ₁₀	µg/m ³ STD	001	24-Hr	7	Met One E-SEQ-FRM Sampler w/o VSCC	Gravimetric	246	1:6	RFPS-0717-246
NCore	Particulate Matter ≤ 10 µm (Lo-Vol)	PM ₁₀	µg/m ³ LC STD	105 001	24-Hr	7	Met One E-SEQ-FRM Sampler w/o VSCC	Gravimetric	246 246	1:3	RFPS-0717-246

Section 9.3.2 PM₁₀ Suitability for Comparison to the NAAQS - Sampling Frequency

The CFR requires that for PM₁₀ data to be used in regulatory determinations of compliance with the PM₁₀ NAAQS, the PM₁₀ monitors’ sampling frequency must be in accordance with Federal regulations⁶¹. All District PM₁₀ samplers meet or exceed all minimum monitoring requirements for the sampling frequency and can be compared to the NAAQS. Table 9-9 summarizes these requirements.

58.12(e) Operating schedules

For PM₁₀ samplers, a 24-hour sample must be taken from midnight to midnight (local standard time) to ensure national consistency. The minimum monitoring schedule for the site in the area of expected maximum concentration shall be based on the relative level of that monitoring site concentration with respect to the 24-hour standard as illustrated in Figure 1 below.... The minimum sampling schedule for all other sites in the area remains once every six days.

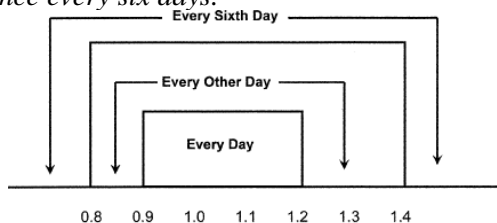


Figure 1 – Ratio to Standard

⁶⁰ (2021) 40 CFR Part 58, Appendix E, “Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring” and Table E-4.

⁶¹ (2021) 40 CFR Part 58, Subpart B, Section 58.12, “Operating Schedules.”



Table 9-9 PM₁₀ Suitability for Comparison to the NAAQS - Sampling Frequency

Site of Expected Maximum Concentration for 24-Hr (name)	Maximum Concentration for 24-Hr (µg/m ³)	Is Site of Expected Maximum Concentration for 24-Hr < 80% to the NAAQS (yes/no)	What is the Minimum EPA Permitted Sampling Frequency? (#)	What is the Actual Sampling Frequency? (#)	Does the Actual Sampling Frequency Meet EPA Specifications? (yes/no)
Donovan (DVN) 06-073-1014	122	no	1:6	1:6	yes

Section 9.4 PM₁₀ Concentrations for San Diego

PM₁₀ concentrations do not correlate well to growth in population or vehicle usage, and high PM₁₀ concentrations do not always occur in high population areas. Emissions from stationary sources and motor vehicles form secondary particles that contribute to PM₁₀ in many areas. This section will illustrate the different metrics for comparison.

Section 9.4.1 PM₁₀ Concentrations for San Diego-for the Last 20 Years

The three-year average of the annual average shows a large decrease; however, there is a great deal of variability from year-to-year. Much of this variability is due to meteorological conditions rather than changes in emissions. Note: the “Days Above the National 24-Hr Standard” row in Table 9-10 and Figure 9.2 reflect the PM₁₀ standard for that year.

Table 9-10 PM₁₀ Concentrations for San Diego - for the Last 20 Years, 2001-2021

Maximum 24-Hr Concentration (µg/m ³)	2001	2002	* 2003	2004	2005	2006	* 2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Days above the National Standard	0	0	2	0	2	0	2	1	0	0	0	0	0	0	0	0	0	0	1	2	0

*Due to the firestorms of 2003 and 2007, the 24-hr value exceeded the National standard for those years. The firestorms are considered as exceptional events, and they do not have a lasting impact in the SDAB. Even with the last two firestorms, the County still qualifies for attainment status.

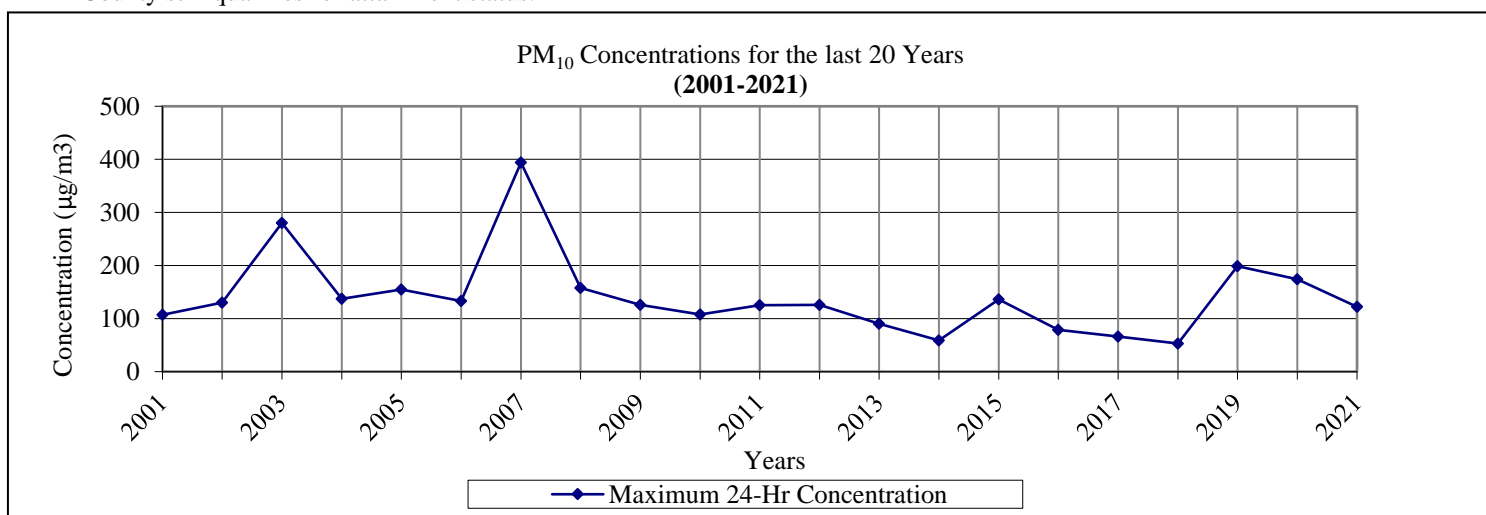


Figure 9.2 PM₁₀ Concentrations for San Diego-for the Last 20 Years Graph



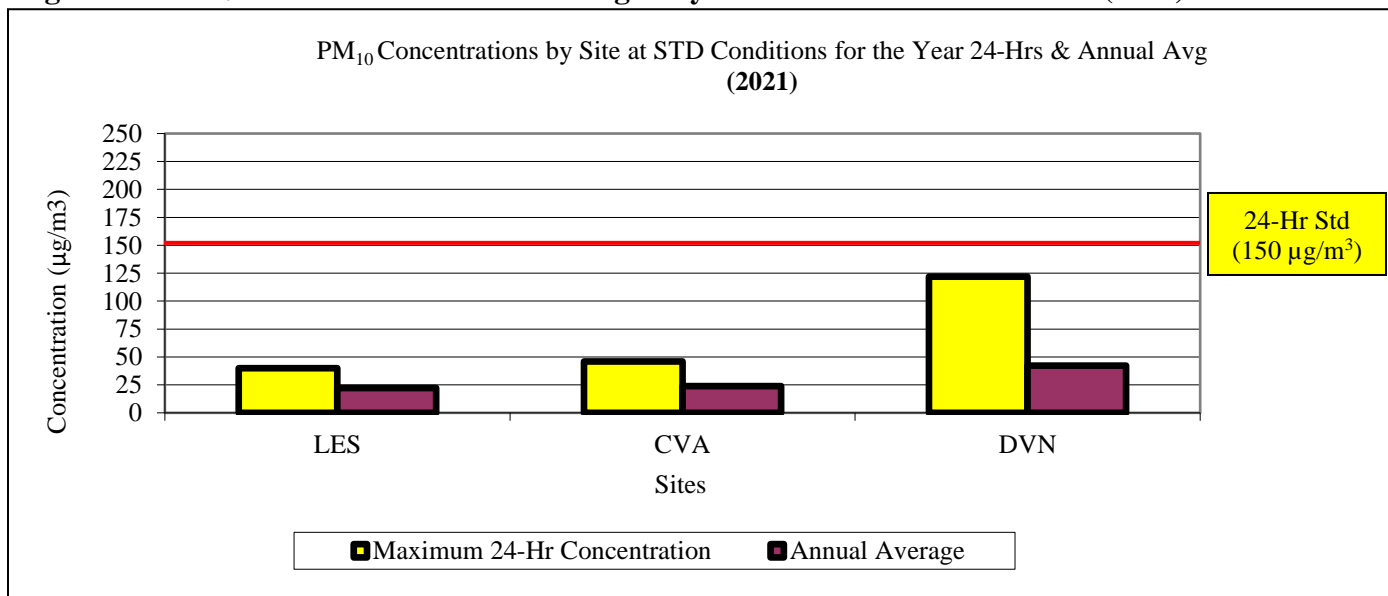
Section 9.4.2 PM₁₀ Concentrations for San Diego - by Site at Standard Conditions (STD) for the Year (24-Hr & Annual Average)

Data from the Lexington Elementary School PM₁₀ sampler is reported in Local conditions (LC) and Standard Conditions (STD) conditions and PM₁₀ data at Chula Vista and Donovan are reported only in Standard conditions. The Standard concentration is shown in Table 9-11 and Figure 9.3. The PM₁₀ samplers are operated in Local Conditions (LC) and must be converted to STD conditions.

Table 9-11 PM₁₀ Concentrations for San Diego-by Site at Standard Conditions (STD) for the Year, 2021

No. (#)	Site	Site Abbreviation	Maximum Concentration for 24-hrs ($\mu\text{g}/\text{m}^3$)	Annual Average ($\mu\text{g}/\text{m}^3$)	Number of Days Above the National Standard (#)
1	Lexington Elementary School	LES	40	22.1	0
2	Chula Vista	CVA	46	23.9	0
3	Donovan	DVN	122	42.2	0

Figure 9.3 PM₁₀ Concentrations for San Diego - by Site at Standard Conditions (STD) for the Year



Section 9.4.3 PM₁₀ Concentrations for San Diego - by Site at Local Conditions (LC) for the Year (24-Hr & Annual Average)

Table 9-12 and Figure 9.4 illustrate the data in Local Conditions (LC).



FOR INFORMATIONAL PURPOSES ONLY.

NAAQS is for DV calculations. Annual values are not comparable to the NAAQS.

Table 9-12 PM₁₀ Concentrations for San Diego - by Site at Local Conditions (LC) for the Year, 2021

No. (#)	Site	Site Abbreviation	Maximum Concentration for 24-hrs ($\mu\text{g}/\text{m}^3$)	Annual Average ($\mu\text{g}/\text{m}^3$)
1	Lexington Elementary School	LES	41	22.3
2	Chula Vista	CVA	*	*
3	Donovan	DVN	*	*

*The District only submits PM₁₀ data in local conditions for LES as part of PMcoarse data. No PM₁₀ data reported in local conditions at Chula Vista and Donovan.

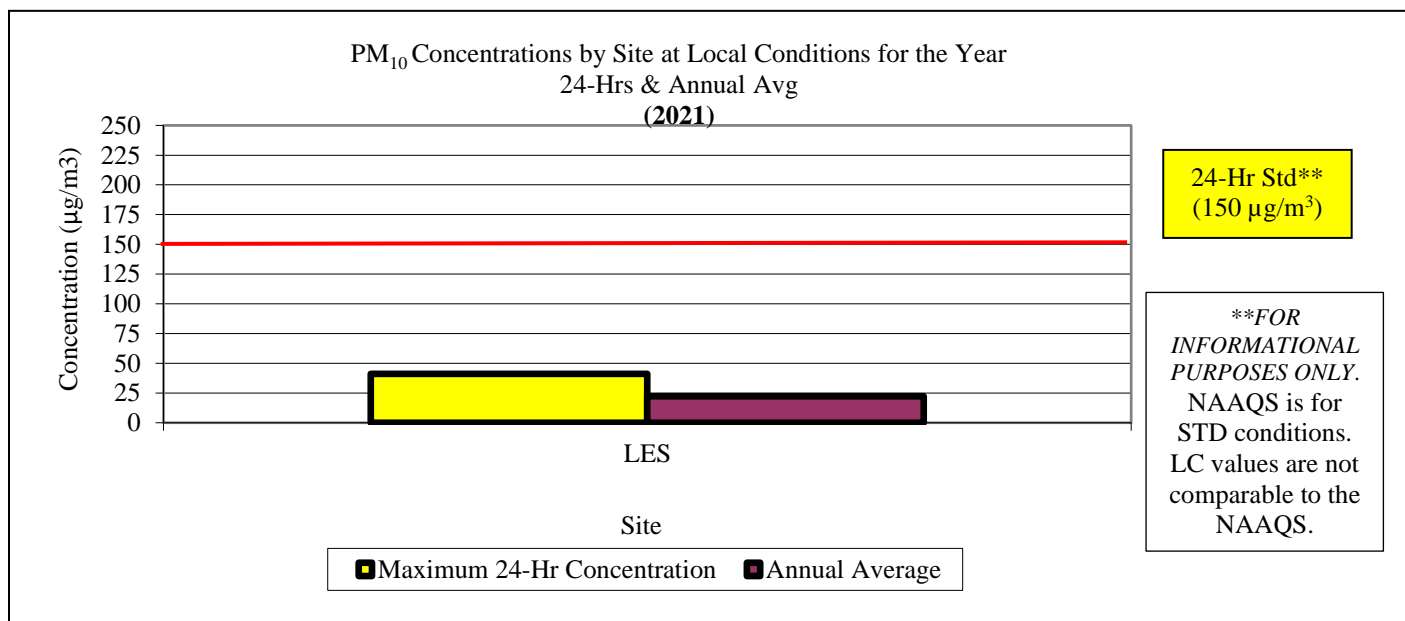


Figure 9.4 PM₁₀ Concentrations for San Diego - by Site at Local Conditions (LC) for the Year Graph (24-Hr & Annual Average)



Chapter 10: National Core (NCore)

Section 10.1 NCore Introduction

National Core (NCore) is a multi-pollutant network that integrates several advanced measurement systems for particles, as well as pollutant gases with the existing equipment for a Photochemical Assessment Monitoring Station (PAMS). The EPA designated the El Cajon-Lexington Elementary School (Figure 10.1) as the NCore site for the SDAB, so there is additional instrumentation, including PM_{coarse} (values calculated from paired Low-Volume particulate samplers, by subtracting the measured concentrations from a PM_{2.5} Low Volume sampler from the measured concentrations from a PM₁₀ Low Volume sampler), CO (trace level), SO₂ (trace level), and NO_y (Reactive Nitrogen Oxides).

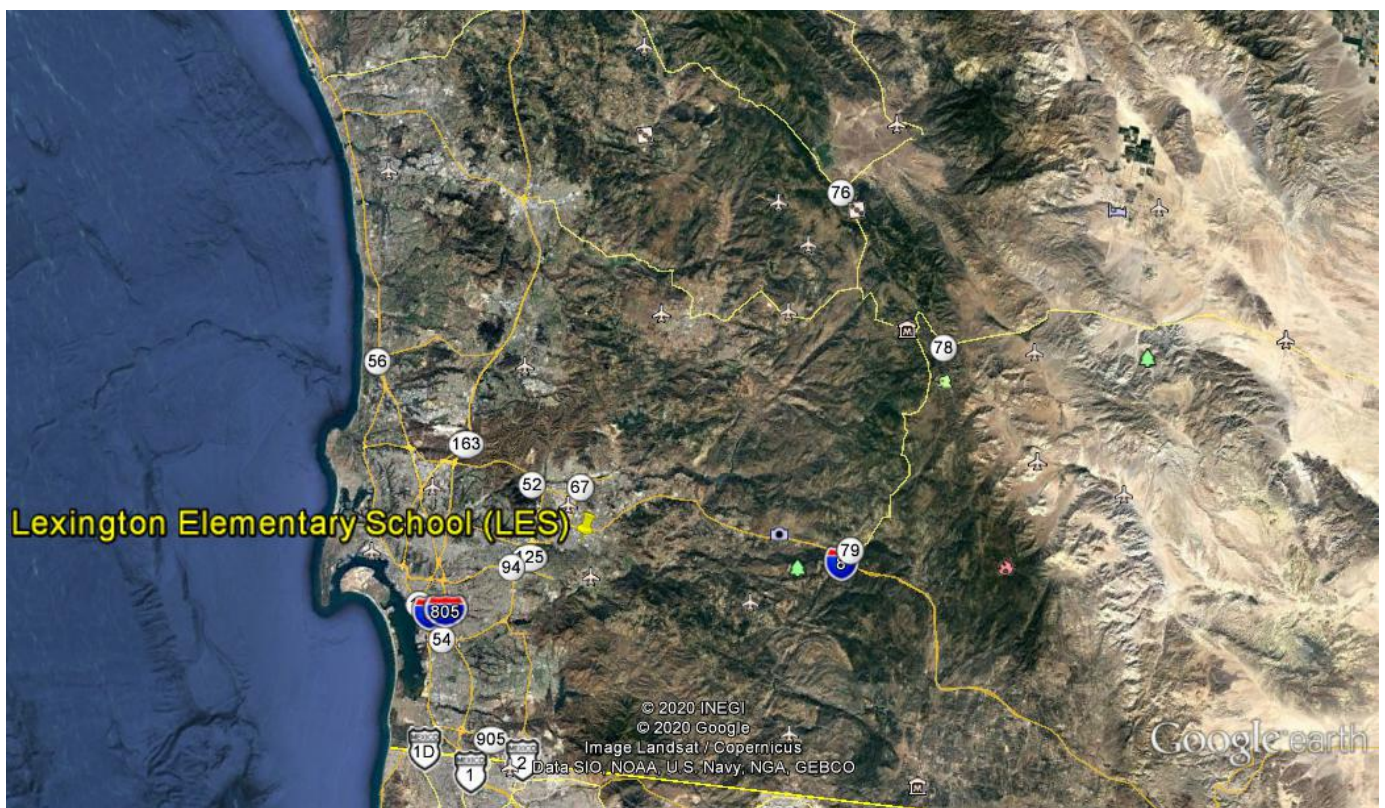


Figure 10.1 NCore Network Map



Section 10.1.1 NCore Minimum Monitoring Requirements

The District is federally mandated to measure multipollutants at lower levels for the NCore program in accordance with the CFR. This section will state the different monitoring requirements for each part of the NCore program (Note: only the passages applicable/informative to the District are referenced).

The District meets or exceeds all minimum requirements for NCore monitoring.

Section 10.1.2 PM₁₀ Minimum Monitoring Requirements-Ambient

Several Districts are required to operate instrumentation that is specific to the NCore program. Prior to 2016, participation was based on the population of the CBSA. Now, EPA directives are to maintain existing NCore stations. Table 10-1 summarizes these requirements.

3. Design Criteria for NCore Sites⁶²

(b) The NCore sites must measure, at a minimum, PM_{2.5} particle mass using continuous and integrated/filter-based samplers, speciated PM_{2.5}, PM_{10-2.5} particle mass, O₃, SO₂, CO, NO/NO_y, wind speed, wind direction, relative humidity, and ambient temperature.(1) Although the measurement of NO_y is required in support of a number of monitoring objectives, available commercial instruments may indicate little difference in their measurement of NO_y compared to the conventional measurement of NO_x, particularly in areas with relatively fresh sources of nitrogen emissions. Therefore, in areas with negligible expected difference between NO_y and NO_x measured concentrations, the Administrator may allow for waivers that permit NO_x monitoring to be substituted for the required NO_y monitoring at applicable NCore sites.

Table 10-1 NCore Minimum Monitoring Requirements-Equipment & Summary

Parameters	Number of Monitors Required (#)	Number of Monitors Active (#)	Number of Monitors Needed (#)
PM _{2.5} -Continuous=	1	1	0
PM _{2.5} -Manual (Integrated/filter-based)=	1	1	0
PM _{2.5} -Speciated=	1	1	0
PM _{10-2.5} (PMcoarse)=	1	1	0
NCore & PAMS O ₃ =	1	1	0
SO ₂ -TLE=	1	1	0
CO-TLE=	1	1	0
NCore & PAMS NO/NO _y =	1	1	0
NCore & PAMS Wind speed/Wind direction=	1	1	0
NCore & PAMS % Relative Humidity=	1	1	0
NCore & PAMS Ambient temperature=	1	1	0

*PM₁₀-Manual sampling is not officially required, but PM_{10-2.5} sampling is required. In order obtain PM_{10-2.5} concentrations, PM_{2.5}-Manual and PM₁₀-Manual samplers must be run concurrently with the difference between the two to serve as the PM_{10-2.5} concentrations.

⁶² (2021) 40 CFR, Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring," Section 3, "Design Criteria for NCore Sites", part (b)



Section 10.2 NCore Suitability for Comparison to the NAAQS

Requirements for the sampling frequency of monitors for NCore pollutants are in the 40 CFR Part 58- “Ambient Air Quality Surveillance”, Subpart B, Section 58.12 “Operating Schedules” and are shown in Table 10-2.

Table 10-2 NCore Suitability for Comparison to the NAAQS-Frequency & Equipment

Parameter	Code	Unit	Code	Duration	Code	Equipment	Method	Code	Sampling Frequency	Method ID
Ozone	O ₃ 44201	ppm	007	1-Hr	1	Thermo 49 series	Ultraviolet absorption	047	7/24	EQOA-0880-047
Carbon monoxide Trace Level	CO 42101	ppb	008	1-Hr	1	Thermo 48i-TLE	Nondispersive infrared	554	7/24	RFCA-0981-054
Sulfur dioxide Trace Level	SO ₂ 42401	ppb	008	1-Hr	1 5-min	Thermo 43i-TLE	Fluorescence	560	7/24	EQSA-0486-060
Particulate Matter ≤ 2.5 µm (continuous)	PM _{2.5} 88502	µg/m ³ LC	105	1-Hr	1	Met One BAM 1020 w/VSCC	Beta Attenuation	733	7/24	Not Applicable
Particulate Matter ≤ 2.5 µm (speciated)	PM _{2.5} CSN See EPA	See EPA	See EPA	24-Hr	7	URG-3000N	See EPA	See EPA	1:3	Not Applicable
Particulate Matter ≤ 2.5 µm (speciated)	PM _{2.5} STN See EPA	See EPA	See EPA	24-Hr	7	Met One SuperSASS	See EPA	See EPA	1:3	Not Applicable
Particulate Matter ≤ 10 µm (Lo-Vol)	PM ₁₀ 88501-LC 81102-STD	µg/m ³ LC STD	105 001	24-Hr	7	Met One E-SEQ-FRM Sampler w/o VSCC	Gravimetric	246	1:3	RFPS-0717-246
Particulate Matter ≤ 2.5 µm (manual)	PM _{2.5} 88101	µg/m ³ LC STD	105 001	24-Hr	7	Met One E-SEQ-FRM Sampler w/VSCC	Gravimetric	545	1:1 or 1:3	RFPS-0717-245



Section 10.3 NCore Concentrations

The instrumentation needed for NCore designation are: PM_{coarse} (calculated values from paired PM₁₀ & PM_{2.5} Low Volume samplers); CO (trace level); SO₂ (trace level); NO_y (total reactive Nitrogen Oxides). Table 10-3 to Table 10-7 list the data.

Table 10-3 NCore Concentrations for PM_{10-2.5} (PM_{coarse})

PM _{coarse} (µg/m ³)*	2016	2017	2018	2019	2020	2021
Max. 24-Hr. Concentration	29.6	30.0	26.2	27.1	30.4	24.4
98th Percentile of 24-Hr Concentration	26.3	25.1	22.3	23.7	22.6	20.4
Average of the Quarterly Means	14.0	13.3	13.4	10.8	13.3	12.8

*Note: PM_{coarse} (PM_c) does not have FRM or FEM designation and cannot be compared to any NAAQS. FSD and ECA were combined

Table 10-4 NCore Concentrations for CO-TLE

CARBON MONOXIDE (ppm)	2016	2017	2018	2019	2020	2021
Maximum 1-Hr. Concentration	1.7	1.5	1.5	1.3	1.6	1.2
Maximum 8-Hr. Concentration	1.3	1.4	1.1	1.0	1.4	1.1

Table 10-5 NCore Concentrations for SO₂-TLE

SULFUR DIOXIDE (ppm)	2016	2017	2018	2019	2020	2021
Maximum 1-Hr SO ₂	0.001	0.001	0.003	0.001	0.002	0.002
Maximum 24-Hr SO ₂	0.000	0.000	0.000	0.000	0.000	0.000
Annual Average SO ₂	0.000	0.000	0.000	0.000	0.000	0.000

Table 10-6 NCore Concentrations for NO_y-NO

NO _y –NO (ppm)**	2016	2017	2018	2019	2020	2021
Maximum 1-Hr. Concentration	**	**	0.049	0.041	0.043	0.040
Annual Average	**	**	0.009	0.009	0.008	0.008

**The NO_y sampler was not operational at the temporary NCore site at Floyd Smith Drive.

Table 10-7 NCore Concentrations for NO₂

NO ₂ (ppm)	2016	2017	2018	2019	2020	2021
Maximum 1-Hr. Concentration	0.057	0.044	0.045	0.086	0.044	0.038
Annual Average	0.009	0.010	0.007	0.014	0.008	0.006



Chapter 11: Photochemical Assessment Monitoring Stations (PAMS)

Section 11.1 PAMS Introduction

PAMS and PAMS-related sampling will be conducted at Lexington Elementary School in El Cajon (see Figure 11.1). As yet, there are no NAAQS standards to compare the data. The location and equipment are listed in Table 11-1. Please note:

- Per EPA, PAMS re-engineering sampling parameters have an official EPA start date of June 1, 2021. The PAMS re-engineering program includes the operation of an hourly VOC monitor (Auto-GC) and meteorology, in addition to carbonyl sampling.

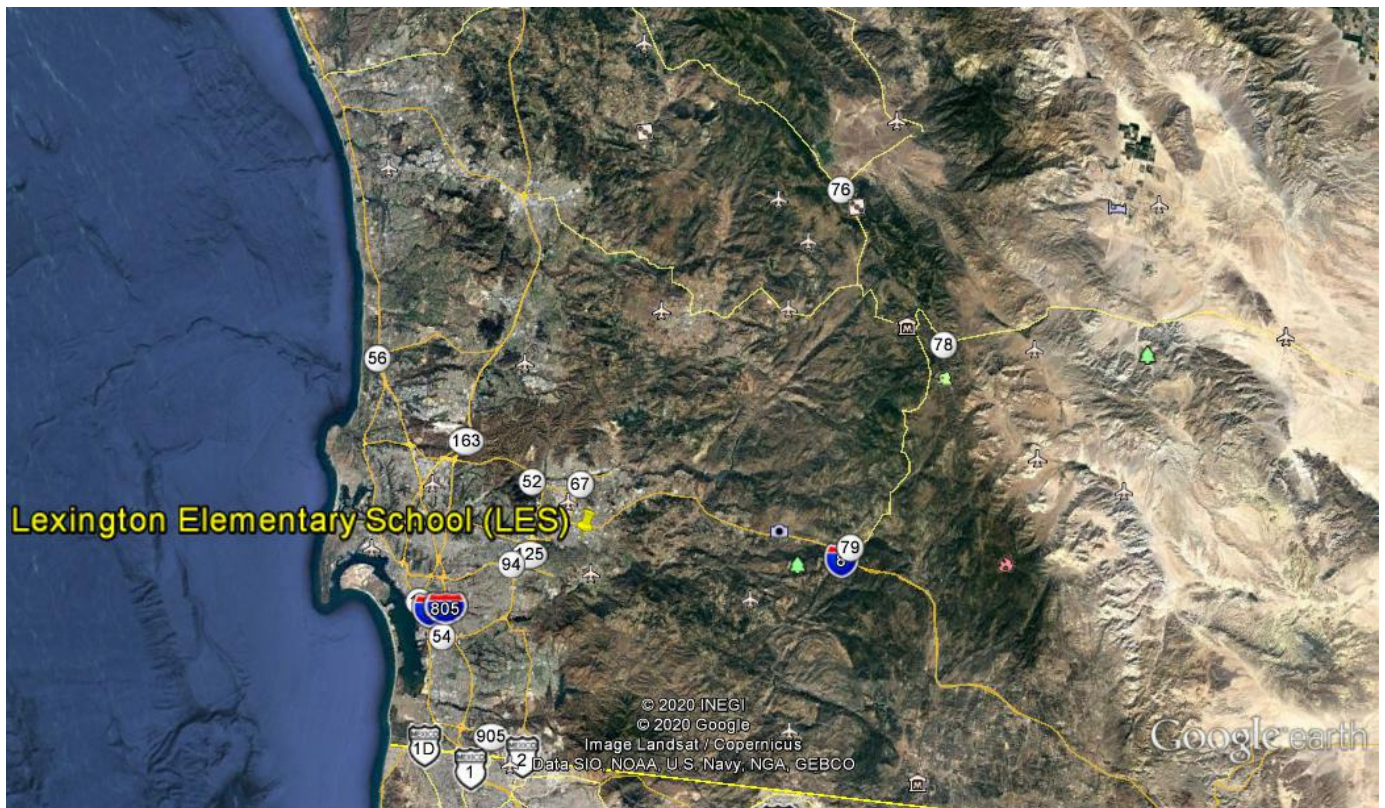


Figure 11.1 PAMS (Carbonyls and VOCs) Network Map

The range of compounds for the PAMS program is in excess of 50 different possible ozone precursors and other compounds (See Table 11-5 and Table 11-6). The toxicity is gauged by risk factors instead of limits.



Table 11-1 PAMS Sampling Network

Abbreviation		LES		
Name		Lexington Elementary School		
AQS ID		06-073-1022		
PAMS	Monitor Type	SLAMS	SLAMS	SLAMS
	Method	Auto	Cartridges	Cartridges
	Affiliation	PAMS	PAMS	PAMS
	Spatial Scale	NS	NS	NS
	Site Type	PE	PE	PE
	Objective (Federal)	Research	Research	Research
	Analysis By	APCD	APCD	APCD
	Frequency	24/7	1:3	1:6
	Equipment	GCFID	Atec 8000	Atec 8000

Glossary of Terms

Monitor Type

E= EPA
 O= Other
 SLAMS= State & Local monitoring station
 SPM= Special purpose monitor
 CATAC= California Toxics Monitoring

Site Type

HC= Highest concentration
 PE= Population exposure
 SO= Source oriented
 UPBD= Upwind background
 G/B= General/Background
 RT= Regional Transport
 WRI= Welfare related impacts
 QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
 CT= Low Volume, size selective inlet, continuous
 FL= Fluorescence
 HV= High volume
 IR= Nondispersive infrared
 SI= High volume, size selective inlet
 SP= Low volume, size selective inlet, speciated
 SQ= Low volume, size selective inlet, sequential
 UV= Ultraviolet absorption
 Canister= Evacuated stainless steel canisters
 Cartridges= Di-nitrophenylhydrazine cartridges
 FSL= Fused Silica Lined
 Filter= Quartz filters
 Auto= GCFID continuous

Monitor Designation

PRI= Primary
 QAC= Collocated

Network Affiliation

BG= Border Grant
 CSN STN= Trends Speciation
 CSN SU= Supplemental Speciation
 NATTS= National Air Toxics Trends Stations
 NCORE= National Core Multi-pollutants
 NR= Near-road
 PAMS= Photochemical Assessment Monitoring

Spatial Scale

MI= Micro
 MS= Middle
 NS= Neighborhood

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
 Research= Research support
 PI= Public Information
 N/A= Not Applicable
 O= Other



Section 11.2 PAMS Minimum Monitoring Requirements

The PAMS program is a multipronged approach to understand, predict, and control ozone concentrations. Ozone is not emitted directly; it is created by the interactions of several different pollutants/emissions, e.g. oxides of nitrogen (NO_x), and volatile organic compounds (VOC), some carbonyls, etc. This enhanced monitoring network to track these different emissions has several different monitoring requirements, e.g. laboratory needs, meteorological needs, etc. that the District operates and references therein (Note: only the passages applicable/informative to the District are referenced). This section will state these requirements. Some of these monitors or samplers can serve as fulfilling other network requirements, e.g. ambient O₃ monitor can fulfill a PAMS O₃ monitoring requirement.

The District meets or exceeds all minimum requirements for PAMS monitoring except for the following:

- PAMS re-engineering implementation is scheduled for June 1, 2021 per EPA.

Section 11.2.1 PAMS Minimum Monitoring Requirements-Equipment

The District is required to operate equipment required for the PAMS parameters for a minimum sampling period. Table 11-2 lists these requirements.

5. Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring. (a) State and local monitoring agencies are required to collect and report PAMS measurements at each NCore site required under paragraph 3(a) of this appendix located in a CBSA with a population of 1,000,000 or more, based on the latest available census figures.(b) PAMS measurements include:⁶³

- (1) Hourly averaged speciated volatile organic compounds (VOCs);*
- (2) Three 8-hour averaged carbonyl samples per day on a 1 in 3 day schedule, or hourly averaged formaldehyde;*
- (3) Hourly averaged O₃;*
- (4) Hourly averaged nitrogen oxide (NO), true nitrogen dioxide (NO₂), and total reactive nitrogen (NO_y);*
- (5) Hourly averaged ambient temperature;*
- (6) Hourly vector-averaged wind direction;*
- (7) Hourly vector-averaged wind speed;*
- (8) Hourly average atmospheric pressure;*
- (9) Hourly averaged relative humidity;*
- (10) Hourly precipitation;*
- (11) Hourly averaged mixing-height;*
- (12) Hourly averaged solar radiation; and*
- (13) Hourly averaged ultraviolet radiation.*

⁶³ (2021) 40 CFR Part 58, Appendix D, "Network Design Criteria for Ambient Air Quality Monitoring", Section 5(a) & (b), "Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring Pollutant-Specific Design Criteria for SLAMS Sites"



Table 11-2 PAMS Minimum Sampling Requirements-Equipment & Summary

CFR Programs PAMS Requirements (name)	Equipment Required (#)	Equipment On-hand (#)	Equipment Active (#)	Equipment Needed (#)
Hourly averaged speciated volatile organic compounds (VOCs)=	1	1	1*	0
Three 8-hour averaged carbonyl samples per day on a 1:3=	1	1	1*	0
NCore & PAMS O ₃ =	1	1	1	0
NO=	1	1	1	0
True-NO ₂ =	1	1	1	0
NCore & PAMS NO _y =	1	1	1	0
NCore & PAMS Hourly averaged ambient temperature=	1	1	1	0
NCore & PAMS Hourly vector-averaged wind direction=	1	1	1	0
Hourly average atmospheric pressure=	1	1	1	0
NCore & PAMS Hourly averaged relative humidity=	1	1	1	0
Hourly precipitation=	1	1	1	0
Hourly averaged mixing-height=	1	1	1	0
Hourly averaged solar radiation=	1	1	1	0
Hourly averaged ultraviolet radiation=	1	1	1	0

* EPA implementation timeline of June 1, 2021

Section 11.2.2 PAMS Minimum Monitoring Requirements-Sampling Season

The District is required to operate PAMS parameters for a minimum sampling period. This section lists that requirement in Table 11-3.

5. Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring⁶⁴

(g) At a minimum, the monitoring agency shall collect the required PAMS measurements during the months of June, July, and August.

Table 11-3 PAMS Minimum Monitoring Requirements-Minimum Sampling Season

Minimum PAMS Monitoring Period (months)	Actual PAMS Monitoring Period (months)	Is the PAMS Monitoring Period Active? (yes/no)
June-August	June-August	Yes*

*PAMS sampling official EPA start date of June 1, 2021.

Section 11.3 PAMS Sampling Frequency & Equipment

During the non-PAMS season, the auto-GC will not be operational.

⁶⁴ (2021) 40 CFR Part 58, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring.” Section 5, “Network Design for Photochemical Assessment Monitoring Stations (PAMS) and Enhanced Ozone Monitoring”, Part (g).



The auto-GC will sample every hour (24-hour sampling / daily). During the PAMS season (June to August), the PAMS carbonyls samplers will collect three samples that each have an 8-hour sampling duration. The 8-hour samples are collected on a set time schedule, as follows:

1. 0400 – 1200
2. 1200 – 2000
3. 2000 – 0400

See Table 11-4 for the summary of equipment used and Table 11-5 and Table 11-6 for the parameters.

Table 11-4 PAMS Sampling Equipment

Pollutant	Abbreviation	Samplers	Collection Method	Collection Frequency	Analytical Method	Parameter Code	Method Code
Volatile Organic Compounds	VOCs	n/a	Auto GC	24/7	GC-FID	Table 10.15	n/a
Carbonyl Compounds	n/a	Atec 8000	DNPH cartridges	1:3	HPLC	Table 10.16	202



Table 11-5 PAMS VOC Parameter Codes

Compound	Parameter
Ethylene	43203
Acetylene	43206
Ethane	43202
Propylene	43205
Propane	43204
Isobutane	43214
1-Butene	43280
n-Butane	43212
trans-2-Butene	43216
cis-2-Butene	43217
Isopentane	43221
1-Pentene	43224
n-Pentane	43220
Isoprene	43243
Trans-2-pentene	43226
cis-2-Pentene	43227
2,2-Dimethylbutane	43244
Cyclopentane	43242
2,3-Dimethylbutane	43284
2-Methylpentane	43285
3-Methylpentane	43230
1-Hexene	43245
n-Hexane	43231
Methylcyclopentane	43262
2,4-Dimethylpentane	43247
Benzene	45201
cyclohexane	43248
2-Methylhexane	43263
2,3-Dimethylpentane	43291
3-Methylhexane	43249

Compound	Parameter
2,2,4-Trimethylpentane	43250
n-Heptane	43232
Methylcyclohexane	43261
2,3,4-Trimethylpentane	43252
Toluene	45202
2-Methylheptane	43960
3-Methylheptane	43253
n-Octane	43233
Ethylbenzene	45203
m-Xylene	45205
p-Xylene	45206
Styrene	45220
o-Xylene	45204
n-Nonane	43235
Isopropylbenzene	45210
α -Pinene	43256
n-Propylbenzene	45209
m-Ethyltoluene	45212
p-Ethyltoluene	45213
1,3,5-Trimethylbenzene	45207
o-Ethyltoluene	45211
β -Pinene	43257
1,2,4-Trimethylbenzene	45208
n-Decane	43238
1,2,3-Trimethylbenzene	45225
m-Diethylbenzene	45218
p-Diethylbenzene	45219
Undecane	43954
Total PAMS	43000
Total NMOC	43102

Table 11-6 PAMS Carbonyls Parameter Codes

Compound	Parameter
Formaldehyde	43502
Acetaldehyde	43503
Acetone	43551



(left intentionally blank)



APPENDICES



Appendix A: Site Description Introduction

The appendices list the stations that comprise the San Diego Air Pollution Control District’s ambient air quality network (Network) along with specific information required by the EPA for each monitor. This specific information is cross-referenced against the requirements for siting.

Federal requirements for the monitoring objectives and spatial scales, Table A-1, are in the CFR annual update on July 1 of every year, 40 CFR Part 58, Subpart G-Federal Monitoring, Appendix D, “Network Design Criteria for Ambient Air Quality Monitoring”. Table A-1 summarizes these requirements and Table A-2 defines the terminology and lists the monitor types and the definitions.

Table A-1 Relationship between Site Types and Scales or Representativeness

Site Type	Definition	Appropriate Siting Scales	Permissible Scales & Definitions
Highest concentration,	Site located to determine the highest concentrations expected to occur in the area covered by the network	Micro, Middle, Neighborhood, Urban	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)
Maximum ozone concentrations	Occurring downwind from the area of maximum precursor emissions.	Micro, Middle, Neighborhood, Urban	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)
Maximum precursor impact	Are typically placed near the downwind boundary of the central business district (CBD) or primary area of precursor emissions mix	Micro, Middle, Neighborhood, Urban	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)
Population Exposure	Sites located to determine typical concentrations in areas of high population density	Neighborhood, Urban	Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)
Source Oriented	Site located to determine the impact of significant sources or source categories on air quality	Micro, Middle, Neighborhood	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers)
General/Background	Sites located to determine general background concentration levels	Urban, Regional	Urban (4 – 50 kilometers) Regional (50 – 1,000 kilometers)
Regional transport	Sites located to determine the extent of regional pollutant transport among populated areas and in support of secondary standards.	Urban, Regional	Urban (4 – 50 kilometers) Regional (50 – 1,000 kilometers)
Welfare-related impacts	Sites located to measure air pollution impacts on visibility, vegetation damage, or other welfare based impacts	Urban, Regional	Urban (4 – 50 kilometers) Regional (50 – 1,000 kilometers)
Upwind Background	Sites located to measure overwhelming incoming transport of ozone. Situated in the predominant upwind direction from the maximum precursor emissions location	Neighborhood Urban Regional	Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers) Regional (50 – 1,000 kilometers)
Quality Assurance	Site located for quality assurance requirements	Micro, Middle, Neighborhood, Urban	Micro (0 – 100 meters), Middle (100 – 500 meters) Neighborhood (500 meters – 4 kilometers) Urban (4 – 50 kilometers)



Table A-2 Summary of Definitions in the Site Description Template

Glossary of Terms

Monitor Type

E= EPA
 O= Other
 SLAMS= State & Local monitoring station
 SPM= Special purpose monitor
 CATAc= California Toxics Monitoring

Site Type

HC= Highest concentration
 PE= Population exposure
 SO= Source oriented
 UPBD= Upwind background
 G/B= General/Background
 RT= Regional Transport
 WRI= Welfare related impacts
 QA= Quality assurance

Method (Sampling/Analysis)

CL= Chemiluminescence
 CT= Low Volume, size selective inlet, continuous
 FL= Fluorescence
 HV= High volume
 IR= Nondispersive infrared
 SI= High volume, size selective inlet
 SP= Low volume, size selective inlet, speciated
 SQ= Low volume, size selective inlet, sequential
 UV= Ultraviolet absorption
 Canister= Evacuated stainless steel canisters
 Cartridges= Di-nitrophenylhydrazine cartridges
 FSL= Fused Silica Lined
 Filter= Quartz filters
 Auto= GC/FID continuous

Monitor Designation

PRI= Primary
 QAC= Collocated

Network Affiliation

BG= Border Grant
 CSN STN= Trends Speciation
 CSN SU= Supplemental Speciation
 NATTS= National Air Toxics Trends Stations
 NCORE= National Core Multi-pollutants
 NR= Near-road
 PAMS= Photochemical Assessment Monitoring

Spatial Scale

MI= Micro
 MS= Middle
 NS= Neighborhood

Objective (Federal)

NAAQS= Suitable for NAAQS comparison
 Research= Research support
 PI= Public Information
 N/A= Not Applicable
 O= Other

Federal requirements for correctly siting the inlet sample probe(s) are in the 40 CFR Part 58, Subpart G- Federal Monitoring, Appendix E, “Probe and Monitoring Path Siting Criteria for Ambient Air Quality Monitoring”.

This specific information is presented in a site description template required by the EPA in all network plans. The pollutant monitors must be assigned a specific scale, type, monitoring objective, and designation. These parameters have specific guidelines that must be followed in order for the data collected from the monitors to be considered valid. Additionally, each monitor must meet certain physical parameters, e.g., distance from each other, distance from the road, distance from obstructions, etc. Table A-3 Summary of Probe Monitoring Paths summarizes these requirements. Figure A.1 illustrates the distances PM samplers must be from the nearest traffic lane.

Modifications to the Site Template and General Information

The EPA supplies monitoring organizations with a site description template to use for the input of site information in the Annual Network Report. The District has modified the site description template into two tables. The section of the EPA template that lists the distance from obstructions, collocated monitors, etc., has been moved into a separate table with a more detailed accounting of the requirements provided in Table A-3.

The traffic count is referenced to the closest cross street listed in the current Traffic Count database maintained by the San Diego Association of Governments (SANDAG). At some station locations, the closest cross street with an Annual Average Daily Traffic (AADT) count may be several hundred meters away. The vehicle count is estimated visually (this is stated, when applicable) and the traffic count for the closest major thoroughfare is also reported for comparison purposes. Traffic count data from SANDAG is done in 5-year allotments. All Traffic counts used for this report is from the latest SANDAG report.



Table A-3 Summary of Probe Monitoring Paths

Pollutant (name)	Scale <maximum monitoring path length> (name)	Height from the ground to the probe, inlet or 80% of monitoring path ¹ (meters)	Horizontal and vertical distance from supporting structures ² to probe, inlet, or 90% of monitoring path ¹ (meters)	Distance from trees to probe, inlet, or 90% of the monitoring path ¹ (meters)	Average daily traffic count (#)	Distance from roadways to probe, inlet, or monitoring path ^{1,10} (meters)
SO ₂ ^{3,4,5,6}	Middle Neighborhood	Min= 2, Max= 15	> 1	> 10	For all scales Not Applicable	For all scales Not Applicable
	Urban	Min= 2, Max= 15	> 1	> 10		
	Regional	Min= 2, Max= 15	> 1	> 10		
		Min= 2, Max= 15	> 1	> 10		
CO ^{4,5,7}	Micro	Min= 3.5, Max= 15	> 1	> 10	For micro scale Not Applicable	For micro scale Min= 2, Max= 10
	Middle Neighborhood	Min= 2, Max= 15 Min= 2, Max= 15	> 1 > 1	> 10 > 10	For all other scales ≤ 10,000 15,000 20,000 30,000 40,000 50,000 ≥ 60,000	For all other scales 10 25 45 80 115 135 150
O ₃ ^{3,4,5}	Middle Neighborhood	Min= 2, Max= 15	> 1	> 10	For all scales ≥ 10,000 15,000 20,000 40,000 70,000 ≥ 110,000	For all scales 10 20 30 50 100 250
	Urban	Min= 2, Max= 15	> 1	> 10		
	Regional	Min= 2, Max= 15	> 1	> 10		
		Min= 2, Max= 15	> 1	> 10		
NO _y & NO ₂ ^{3,4,5}	Micro	Min= 2, Max= 7	> 1	> 10	For all scales ≥ 10,000 15,000 20,000 40,000 70,000 ≥ 110,000	For all scales 10 20 30 50 100 250
	Middle Neighborhood	Min= 2, Max= 15	> 1	> 10		
	Urban	Min= 2, Max= 15	> 1	> 10		
	Regional	Min= 2, Max= 15	> 1	> 10		
		Min= 2, Max= 15	> 1	> 10		
PAMS ^{3,4,5}	Neighborhood	Min= 2, Max= 15	> 1	> 10	For all scales > 10,000 15,000 20,000 40,000 70,000 ≥ 110,000	For all scales 10 20 30 50 100 250
	Urban	Min= 2, Max= 15	> 1	> 10		
Pb ^{3,4,5,6,8} PM ^{3,4,5,6,8,9}	Micro	Min= 2, Max= 7	> 2	> 10		Min= 5, Max= 15 (street canyon) Min= 2, Max= 10 (street)
	Neighborhood	Min= 2, Max= 15	> 2	> 10		
	Urban	Min= 2, Max= 15	> 2	> 10		

¹Monitoring path for open path analyzers is applicable only to middle or neighborhood scale CO monitoring, middle, neighborhood, urban, and regional scale Now monitoring, and all applicable scales for monitoring SO₂, O₃ and O₃ precursors.

²When probe is located on a rooftop, this separation distance is in reference to walls, parapets, or penthouses located on roof.

³ Should be > 20 meters from the dripline of tree(s) and must be 10 meters from the dripline when the tree(s) act as an obstruction

⁴Distance from sampler, probe, or 90% of monitoring path to obstacle, such as a building, must be at least twice the height the obstacle protrudes above the sampler, probe, or monitoring path. Sites not meeting this criterion may be classified as middle scale.

⁵Must have unrestricted airflow 270 degrees around the probe or sampler; 180 degrees if the probe is on the side of a building or a wall.

⁶The sampler, probe, or monitoring path should be away from minor source, such as furnace or incineration flues. The separation distance is dependent on the height of the minor source's emission point, the type of waste burned, and the quality of the fuel (sulfur, ash, or lead content). This criterion is designed to avoid undue influences from minor sources.

⁷For microscale CO monitoring sites, the probe must be > 10 meters from a street intersection and preferably at a midblock location

⁸ Collocated monitors must be within 4 meters of each other and at least 2 meters apart for flow rates > 200 liters/min or at least 1 meter apart for samplers having flow rates < 200 liters/min

⁹ For particulate sampling, a minimum of 2 meters of separation from walls, parapets, and structures is required for rooftop site placement.

¹⁰ Measured from the edge of the nearest lane to the sampler or inlet.

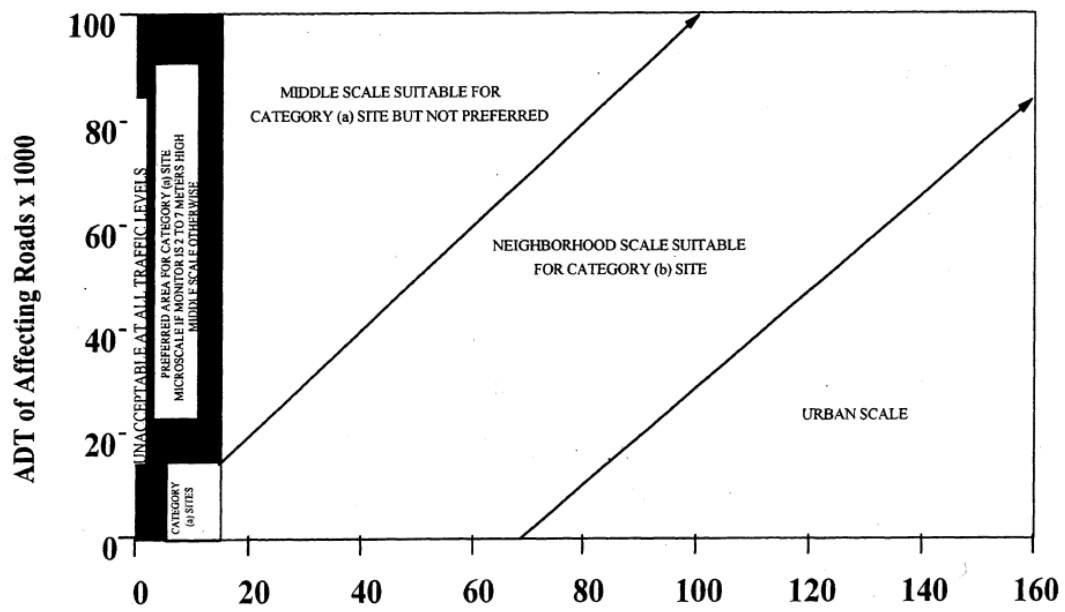


Figure A.1 Distance of PM samplers to nearest traffic lane



Appendix B: Alpine Station Description

Table B-1 General Site Information

County:	San Diego
Representative Area:	San Diego MSA
Site Name:	Alpine
Year Established:	1/1/1972
Site Address:	2300 W. Victoria Dr.
Site Name Abbreviation:	ALP
AQS Number:	06-073-1006
Latitude:	32.842312°
Longitude:	-116.768277°
Elevation above Sea Level:	627 m
General Location:	Trailer adjacent to Padre Reservoir
Ground Cover:	Asphalt
Distance to Road:	17 m west= W. Victoria Drive
Traffic Count (2016 AADT):	W. Victoria Dr. estimated= 500 (no traffic count is available) The closest cross-street with a traffic count is Alpine Blvd. at W. Victoria Dr. (south/slightly upwind 760 m) = 3,300
Site Description:	Due to its geographical location, each year the Alpine station records the highest ozone levels within the air basin. All particulate equipment is on the rooftop of the station.
Monitoring Objectives:	The Alpine location is used to assess downwind transport of fine particulates (PM _{2.5}). NO ₂ data continues to provide information on trends and are an indication of the relative effectiveness of NO _x regulatory and control measures. The Alpine site also provides information used in making burn/no-burn decisions.
Planned Changes:	<i>none</i>

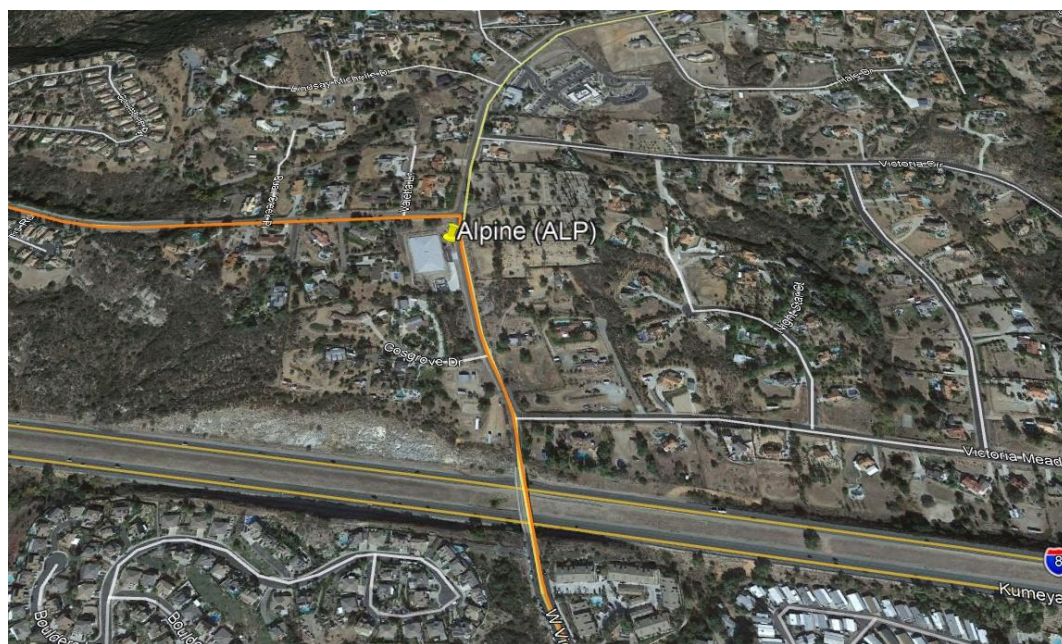


Figure B.1 Alpine – Picture of the Location of the Station



Table B-2 Alpine - Gaseous Pollutants Monitor Designations + Other

Pollutant	O ₃	NO ₂	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO ₂)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Highest Concentration	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Urban Scale	Urban Scale	N/A	N/A
Monitoring start date	1/1/1979	1/1/1982	4/29/2015	4/29/2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Lo-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
12/2Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	3.04 sec	4.65 sec	N/A	N/A
Any changes within the next 18 months?	No	Yes	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	N/A
Annual Performance Evaluation date	10/20/2021	11/29/2021	10/14/2021	N/A
NPAP date	*	*	N/A	N/A

*Not done this year



Table B-3 Alpine - Particulate Pollutants Monitor Designations

Pollutant	PM _{2.5} Continuous (non-FEM)	Black Carbon
POC	1	1
Monitor designation	Other	Other
Parameter code	88502 (LC)	88313
Basic monitoring objective	Public Information, NAAQS	Public Information
Site type	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Met One BAM 1020	Met One BC 1060
Method code	733	879
FRM/FEM/ARM/Other	Other (non-FEM)	Other
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Urban Scale	Urban Scale
Monitoring start date	4/2015	6/2020
Current sampling frequency	Continuous	Continuous
Required sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	None	None
Any PM Hi-Vol sampler w/in 2m	None	None
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	Yes	No
Suitable for comparison to the NAAQS?	No	No
Frequency of flow rate verification	Semi-Monthly	Monthly
Semi-Annual flow rate audits dates	06/16/2021, 10/15/2021	06/16/2021, 12/01/2021
Additional QA flow rate check dates*	01/21/2021, 07/07/2021	03/02/2021, 07/07/2021
NPAP date	**	N/A

*Additional QA checks are not official audits

**Not done this year



Table B-4 Alpine - Meteorology Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp	Meteorological Rel. Humidity
POC	1	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101	62201
Basic monitoring objective	N/A	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics	Qualimetrics 2030	Qualimetrics 2020	Rotronics	Rotronics
Method code	012	050	020	040	012
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD
Spatial scale	Urban	Urban	Urban	Urban	Urban
Monitoring start date	4/2015	4/2015	4/2015	4/2015	1972
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	12/01/2021	*	*	12/01/2021	12/01/2021
NPAP date	N/A	**	**	**	**

* Not performed this year

** EPA subcontractor does not have the equipment to audit



Table B-5 Alpine - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP, QAC (44.5 cfm)	PM ₁₀ , PRI (16.7 lpm)	PM ₁₀ , QAC (16.7 lpm)	BC 1060	PM _{2.5} FRM, PRI (16.7 lpm)	PM _{2.5} FRM, QAC (16.7 lpm)	PM _{2.5} non-FEM (16.7 lpm)	PM _{2.5} STN (6.7 lpm)	PM _{2.5} CSN (22.0 lpm)	† PAMS-VOC* (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	† Toxics-VOC (50 ccpm)	† Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a						4.1			1.2									6.0
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM ₁₀ , PRI																			
PM ₁₀ , QAC																			
BC 1060	4.1						n/a			3.7									4.9
PM _{2.5} FRM, PRI																			
PM _{2.5} FRM, QAC																			
PM _{2.5} non-FEM	1.2						3.7			n/a									4.8
PM _{2.5} STN																			
PM _{2.5} CSN																			
†PAMS-VOC																			
†PAMS-VOC QAC																			
†PAMS-Carbonyls																			
†Toxics-VOC																			
†Toxics-VOC, QAC																			
Toxics-Metals																			
Meteorology	6.0						4.9			4.8									n/a
<i>height from ground</i>	6.5						5.9			6.8									10.1
<i>distance: from the road</i>	11.7						14.4			13.5									14.1
<i>from the supporting structure (wood deck)</i>	2.0						1.3			2.2									5.6
<i>from obstructions on roof</i>	N						N			N									N
<i>from obstructions not on roof</i>	N						N			N									N
<i>from the closest tree</i>	38.8						38.8			38.8									38.8
<i>from furnace/flue</i>	N						N			N									N
<i>unrestricted air flow (degrees)</i>	360						360			360									360

n/a= Not Applicable; N= None; †On the side of the station/trailer; *Currently no canister sampling for PAMS. PAMS re-engineered program at Lexington Elementary School.



Figure B.2 Alpine – Pictures (Directional) from the Rooftop



Appendix C: Camp Pendleton Station Description

Table C-1 General Site Information

County:	San Diego
Representative Area:	San Diego MSA
Site Name:	Camp Pendleton
Year Established:	4/1997
Site Address:	21441 West B St.
Site Name Abbreviation:	CMP
AQS Number:	06-073-1008
Latitude:	33.217063 ^o
Longitude:	-117.396169 ^o
Elevation above Sea Level:	16 m
General Location:	Trailer in the W corner of the parking lot across the Corporal Training facility and above the Del Mar beach on Camp Pendleton.
Ground Cover:	Asphalt
Distance to Road:	41 m west= B St.
Traffic Count (2017 AADT):	B St. estimated= 500 (No traffic count is available for the base) The closest area with a traffic count, Interstate 5 (east/downwind 440 m)= 171,000
Site Description:	This station is a trailer located within the Marine Corps Camp Pendleton Base and sits atop a bluff overlooking the Pacific Ocean. In 1997, it replaced the Oceanside station about 7.6 km south east (east of I-5) of the CMP location. Due to its geographical location, this station records over-water transport from the South Coast Air Basin. Diesel truck motor pool 61 m west of the stations and at the base of the bluffs.
Monitoring Objectives:	This site functions as a transport site due to its geographical location. It is used to provide information on trends for the pollutants, including Ozone, NO _x , and PM _{2.5} .
Planned Changes:	<i>Not within the next 18-mon, but due to structures and heavy machinery (motor pool) encroaching on the station, as well as frequent power outages, this station will need to be relocated at some point. Once a suitable replacement location has been secured, the District will work with EPA to formalize the relocation process.</i>



Figure C.1 Camp Pendleton – Picture of the Location of the Station



Table C-2 Camp Pendleton - Gaseous Pollutants Monitor Designations + Other

Pollutant	O ₃	NO ₂	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO ₂)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Not Applicable	Not Applicable
Monitoring start date	1997	1997	4/29/2015	4/29/2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year round	Year round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	2.92 sec	3.98 sec	N/A	N/A
Any changes within the next 18 months?	No	Yes	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	N/A
Annual Performance Evaluation date	03/02/2021	02/18/2021	08/13/2021	N/A
NPAP date	05/06/2021	11/30/2021*	N/A	N/A



Table C-3 Camp Pendleton - Particulate Pollutants Monitor Designations

Pollutant	PM _{2.5} Continuous (non-FEM)
POC	1
Monitor designation	Other
Parameter code	88502 (LC)
Basic monitoring objective	Public Information, Research
Site type	N/A
Monitor type	O
Network affiliation	N/A
Instrument manufacturer & model	Met One BAM 1020
Method code	733
FRM/FEM/ARM/Other	Other (non-FEM)
Collecting agency	APCD
Analytical laboratory	APCD
Reporting agency	APCD
Spatial scale	Urban
Monitoring start date	10/24/2005
Current sampling frequency	Continuous
Required sampling frequency	Continuous
Sampling season	Year-round
Any PM Lo-Vol sampler w/in 1m	None
Any PM Hi-Vol sampler w/in 2m	None
Probe material for reactive gases	N/A
Residence time for reactive gases	N/A
Any changes within the next 18 months?	Yes
Suitable for comparison to the NAAQS?	No
Frequency of flow rate verification	Semi-monthly
Semi-Annual flow rate audits dates	03/04/2021, 09/01/2021
Additional QA flow rate check dates*	05/12/2021, 10/28/2021, 12/17/2021
NPAP date	**

*Additional QA checks are not official audits

**Not done this year



Table C-4 Camp Pendleton - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp
POC	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101
Basic monitoring objective	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics 4480	Qualimetrics 2030	Qualimetrics 2020	Qualimetrics 4480
Method code	012	050	020	040
FRM/FEM/ARM/Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	1997	1997	1997	1997
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	09/01/2021	08/04/2021	08/04/2021	09/01/2021
NPAP date	N/A	*	*	*

*EPA subcontractor does not have the equipment to audit.



Table C-5 Camp Pendleton - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP, QAC (44.5 cfm)	PM ₁₀ , PRI (16.7 lpm)	PM ₁₀ , QAC (16.7 lpm)	BC 1060	PM _{2.5} FRM, PRI (16.7 lpm)	PM _{2.5} FRM, QAC (16.7 lpm)	PM _{2.5} non-FEM (16.7 lpm)	PM _{2.5} STN (6.7 lpm)	PM _{2.5} CSN (22.0 lpm)	† PAMS-VOC* (50 ceph)	† PAMS-VOC, QAC (50 ceph)	† PAMS-Carbonyls (1.5 lpm)	† Toxics-VOC (50 ceph)	† Toxics-VOC, QAC (50 ceph)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a									1.5									4.4
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM ₁₀ , PRI																			
PM ₁₀ , QAC																			
BC 1060																			
PM _{2.5} FRM, PRI																			
PM _{2.5} FRM, QAC																			
PM _{2.5} non-FEM	1.5									n/a									4.9
PM _{2.5} STN																			
PM _{2.5} CSN																			
†PAMS-VOC																			
†PAMS-VOC QAC																			
†PAMS-Carbonyls																			
†Toxics-VOC																			
†Toxics-VOC, QAC																			
Toxics-Metals																			
Meteorology	4.4									4.9									n/a
<i>height from ground</i>	6.0									6.1									10.2
<i>distance: from the road</i>	45									47									45
<i>from the supporting structure (wood deck)</i>	2.2									2.3									6.4
<i>from obstructions on roof</i>	N									N									N
<i>from obstructions not on roof</i>	N									N									N
<i>from the closest tree</i>	40									40									41
<i>from furnace/flue</i>	N									N									N
<i>unrestricted air flow (degrees)</i>	360									360									360

n/a= Not Applicable; N= None; †On the side of the station/trailer; * PAMS canister sampling is not being performed. PAMS sampling is performed at Lexington Elementary School as part of the PAMS re-engineering



Figure C.2 Camp Pendleton – Pictures (Directional) from the Rooftop



Appendix D: Chula Vista Station Description

Table D-1 General Site Information

County:	San Diego
Representative Area:	San Diego MSA
Site Name:	Chula Vista
Year Established:	01/20/1972
Site Address:	84 East J St.
Site Name Abbreviation:	CVA
AQS Number:	06-073-0001
Latitude:	32.631175 ^o
Longitude:	-117.059115 ^o
Elevation above Sea Level:	55 m
General Location:	Trailer in the W corner of the Chula Vista Elementary School District offices parking lot
Ground Cover:	Asphalt
Distance to Road:	51 m northwest= E. J St.; 301 m south-southeast Hilltop Dr.
Traffic Count (2016 AADT):	Hilltop Dr. at E. J St.= 9,100
Site Description:	This station is a trailer located on the western corner of the Chula Vista Elementary School District Administration property, immediately south of Chula Vista Fire Station No. 2.
Monitoring Objectives:	Helps track trends for an area that has a high rate of asthma.
Planned Changes:	<i>This station and work area will be demolished and reconfigured, respectively (date TBD). During this phase, there will be no sampling (EPA approved).</i>

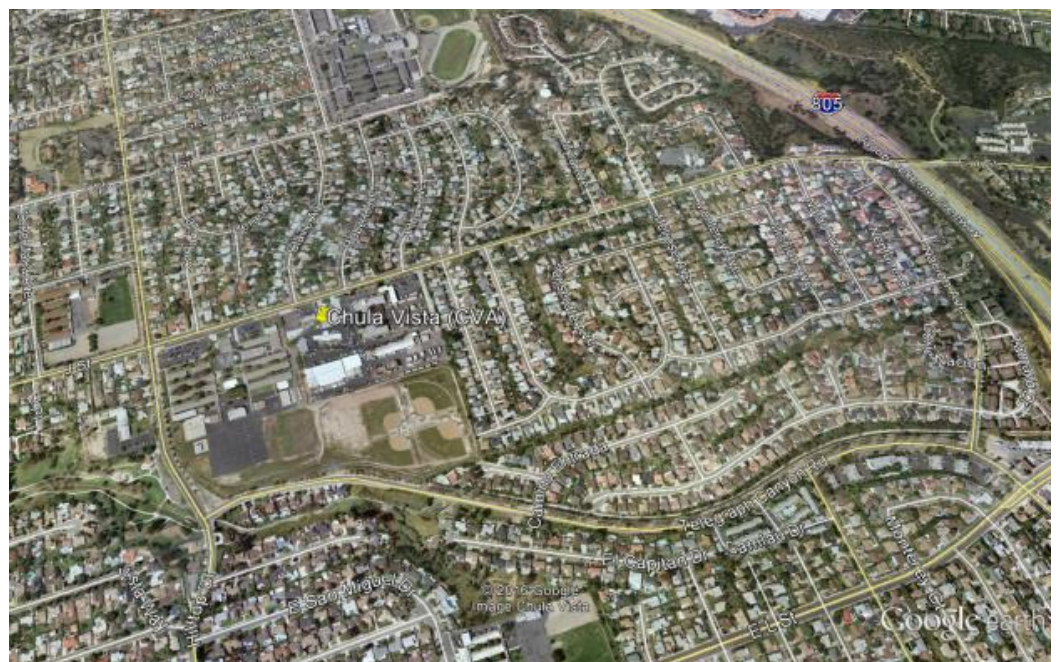


Figure D.1 Chula Vista – Pictures of the Location of the Station



Table D-2 Chula Vista - Gaseous Pollutants Monitor Designations + Other

Pollutant	O ₃	NO ₂	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO ₂)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	1972	1972	2015	2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	5.26 sec	17.06 sec	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	N/A
Annual Performance Evaluation date	03/10/2021	03/16/2021	09/15/2021	N/A
NPAP date	*	*	N/A	N/A

*Not done this year



Table D-3 Chula Vista - Particulate Pollutants Monitor Designations

Pollutant	PM _{2.5} Manual	PM ₁₀ Manual
POC	1	1
Monitor designation	Primary	Primary
Parameter code	88101 (LC)	81102 (STD)*
Basic monitoring objective	NAAQS	NAAQS
Site type	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Met One E-SEQ-FRM	Met One E-SEQ-FRM
Method code	545	246
FRM/FEM/ARM/Other	FRM	FRM
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	1999	1986
Current sampling frequency	1:3	1:6
Required sampling frequency	1:3	1:6
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	None	None
Any PM Hi-Vol sampler w/in 2m	None	None
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	Yes	Yes
Suitable for comparison to the NAAQS?	Yes	Yes
Frequency of flow rate verification	Monthly	Monthly
Semi-Annual flow rate audits dates	03/12/2021, 09/03/2021	03/12/2021, 09/03/2021
Additional QA flow rate check dates**	06/04/2021, 11/22/2021	06/04/2021, 11/22/2021
NPAP date	***	***
PEP date	05/10/2021	N/A

* Flow checks and operations are in LC and concentration data is in STD

** Additional QA checks are not official audits



Table D-4 Chula Vista - Other Pollutants Monitor Designations

Pollutant	Toxics-VOC	Toxics-Metals	Toxics-Cr(VI)	Toxics-Aldehyde
POC	See ARB	See ARB	See ARB	See ARB
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	See ARB	See ARB	See ARB	See ARB
Basic monitoring objective	Research	Research	Research	Research
Site type	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type	CA Toxics	CA Toxics	CA Toxics	CA Toxics
Network affiliation	CA Toxics	CA Toxics	CA Toxics	CA Toxics
Instrument manufacturer & model	Xontech 910	Xontech 924	Xontech 924	Xontech 924
Method code	See ARB	See ARB	See ARB	See ARB
FRM/FEM/ARM/Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	ARB	ARB	ARB	ARB
Reporting agency	ARB	ARB	ARB	ARB
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	1988	1988	1988	1988
Current sampling frequency	1:12	1:12	1:12	1:12
Required sampling frequency	1:6	1:6	1:6	1:6
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of flow rate verification	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	N/A	N/A	N/A	N/A
NPAP date	N/A	N/A	N/A	N/A



Table D-5 Chula Vista - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp
POC	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101
Basic monitoring objective	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics 4480	Qualimetrics 2030	Qualimetrics 2020	RM Young 41382VF
Method code	012	050	020	040
FRM/FEM/ARM/Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	1972	1972	1972	1998
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	Yes	Yes	Yes	Yes
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	09/24/2021	09/08/2021	09/08/2021	09/08/2021
NPAP date	N/A	*	*	*

Note: Deck needs repairs (TBD)

* EPA subcontractor does not have the equipment to audit.



Table D-6 Chula Vista - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP, QAC (44.5 cfm)	PM ₁₀ , PRI (16.7 lpm)	PM ₁₀ , QAC (16.7 lpm)	BC 1060	PM _{2.5} FRM, PRI (16.7 lpm)	PM _{2.5} FRM, QAC (16.7 lpm)	PM _{2.5} non-FEM (16.7 lpm)	PM _{2.5} STN (6.7 lpm)	PM _{2.5} CSN (22.0 lpm)	† PAMS-VOC (50 ccppm)	† PAMS-VOC, QAC	† PAMS-Carbonyls (1.5 lpm)	Toxics-VOC (50 ccppm)	Toxics-VOC, QAC (50 ccppm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a				4.8			n/a								1.6		n/a	7.7
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM ₁₀ , PRI	4.8				n/a			7.4								4.6		11.4	n/a
PM ₁₀ , QAC																			
BC 1060																			
PM _{2.5} FRM, PRI	n/a				7.4			n/a								n/a		4.0	n/a
PM _{2.5} FRM, QAC																			
PM _{2.5} non-FEM																			
PM _{2.5} STN																			
PM _{2.5} CSN																			
†PAMS-VOC																			
†PAMS-VOC, QAC																			
†PAMS-Carbonyls																			
Toxics-VOC	1.6				4.6			n/a								n/a		n/a	n/a
Toxics-VOC, QAC																			
Toxics-Metals	n/a				11.4			4.0								n/a		n/a	n/a
Meteorology	7.69				n/a			n/a								n/a		n/a	n/a
<i>height from ground</i>	6.0				2.9			2.1								5.4		2.2	10.7
<i>distance: from the road</i>	51				51			51								51		51	51
<i>from the supporting structure</i>	2.6				2.0			2.0								N		2.0	N
<i>from obstructions on roof</i>	N				N			N								N		N	N
<i>from obstructions not on roof</i>	N				N			N								N		N	N
<i>from the closest tree</i>	N				N			N								N		N	N
<i>from furnace/flue</i>	N				N			N								N		N	N
<i>unrestricted air flow (degrees)</i>	360				270			270								360		270	360

n/a= Not Applicable; N= None; †On the side of the station/trailer



Figure D.2 Chula Vista – Pictures (Directional) from the Ground



Appendix E: Donovan Station Description

Table E-1 General Site Information

County:	San Diego
Representative Area:	San Diego MSA
Site Name:	Donovan
Year Established:	1/2005 PM ₁₀ sampler original site date; Relocated 800 m east on 7/2014
Site Address:	Donovan State Prison Rd. (200 m west of Alta Rd.)
Site Name Abbreviation:	DVN
AQS Number:	06-073-1014
Latitude:	32.578267 ^o
Longitude:	-116.921359 ^o
Elevation above Sea Level:	185 m
General Location:	200 m east of Alta Rd on the Donovan Prison Rd.
Ground Cover:	Asphalt
Distance to Road:	26 m north= Donovan Prison Rd.
Traffic Count (2016 AADT):	Donovan Prison Rd. AADT estimated= 300 (No traffic count available) The closest cross-street with a traffic count, Otay Mesa Rd. at Alta Rd. southwest/downwind 2,100 m = 6,400
Site Description:	This site is situated at the entrance to the Richard J. Donovan Correctional Facility.
Monitoring Objectives:	This site is primarily used to measure neighborhood scale concentrations in the southeast county.
Planned Changes:	none



Figure E.1 Donovan – Picture of the Location



Table E-2 Donovan - Gaseous Pollutants Monitor Designations + Other

Pollutant	O ₃	NO ₂	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO ₂)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Population Exposure	Highest Concentration	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	7/2014	7/2014	7/2014	2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	5.35 sec	11.10 sec	N/A	N/A
Any changes within the next 18 months?	No	Yes	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	N/A
Annual Performance Evaluation date	03/05/2021	03/09/2021	04/08/2021	N/A
NPAP date	*	*	N/A	N/A

*Not performed this year



Table E-3 Donovan - Particulate Pollutants Monitor Designations

Pollutant	PM _{2.5} Continuous (non-FEM)	PM ₁₀ Manual (Lo-Vol)	PM ₁₀ Manual (Lo-Vol)	Black Carbon
POC	1	1	2	1
Monitor designation	Other	Primary	Collocated	Other
Parameter code	88502 (LC)	81102 (STD)*	81102 (STD)*	88313
Basic monitoring objective	Public Information, Research	NAAQS	QAC	Public Information
Site type	Population Exposure	Highest Concentration	Highest Concentration	Population Exposure
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Met One BAM 1020	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One BC 1060
Method code	733	246	246	879
FRM/FEM/ARM/Other	Other (non-FEM)	FRM	FRM	Other
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Population Exposure	Neighborhood Scale	Neighborhood Scale	Urban Scale
Monitoring start date	1/2015	7/2014	3/2017	7/2021
Current sampling frequency	Continuous	1:6	1:6	Continuous
Required sampling frequency	Continuous	1:6	1:12	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	None	None	None	None
Any PM Hi-Vol sampler w/in 2m	None	None	None	None
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	Yes	No	No	No
Suitable for comparison to the NAAQS?	No	No	No	No
Frequency of flow rate verification	Semi-monthly	Monthly	Monthly	Monthly
Semi-Annual flow rate audits dates	02/16/2021, 07/22/2021	02/16/2021, 07/22/2021	02/16/2021, 07/22/2021	12/02/2021
Additional QA flow rate check dates**	04/16/2021, 10/15/2021	04/15/2021, 10/14/2021	04/15/2021, 10/14/2021	07/01/2021, 10/15/2021
NPAP date	***	***	***	N/A

* Flow checks and operations are in LC and concentration data is in STD

** Additional QA checks are not official audits

*** Not performed this year



Table E-4 Donovan - Other Pollutants Monitor Designations

Pollutant	TOXICS-VOC	TOXICS-VOC	TOXICS-Metals	TOXICS-Metals	TOXICS-Metals
POC	1	2	1	2	3
Monitor designation	Primary	Collocated	Primary	Collocated	Not Applicable
Basic monitoring objective	Research	Research	Research	Research	Research
Site type	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Population Exposure
Monitor type	Other (SDAPCD Network)	Other (SDAPCD Network)	Other (SDAPCD Network)	Other (SDAPCD Network)	Other (SDAPCD Network)
Network affiliation	N/A	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Xontech 910A (Fused Silica Lined)	Xontech 910A (Fused Silica Lined)	Xontech 924	Xontech 924	Met One E-SEQ-FRM w/TSP w/oVSCC
Method code	210	210	305	305	*
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD
Spatial scale	Middle	Middle	Middle	Middle	Middle
Monitoring start date	7/2014	7/2014	7/2014	7/2014	07/2020
Current sampling frequency	1:6	1:12	1:6	1:12	1:6
Required sampling frequency	1:6	1:12	1:6	1:12	1:6
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	None
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	None
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A	N/A
Frequency of flow rate verification	N/A	N/A	N/A	N/A	Monthly
Semi-Annual flow rate audits dates	N/A	N/A	N/A	N/A	02/16/2021, 07/22/2021
Additional QA flow rate check dates***	N/A	N/A	N/A	N/A	04/15/2021, 10/14/2021
Annual Performance Evaluation date	N/A	N/A	N/A	N/A	N/A
NPAP date	N/A	N/A	N/A	N/A	N/A

*Method code not available

**Not performed this year

***Additional QA checks are not official audits



Table E-5 Donovan – Other Additional Pollutants Monitor Designations

Pollutant	TOXICS-Carbonyls	TOXICS-Carbonyls
POC	1	2
Monitor designation	Primary	Collocated
Basic monitoring objective	Research	Research
Site type	Population Exposure	Population Exposure
Monitor type	Other (SDAPCD Network)	Other (SDAPCD Network)
Network affiliation	N/A	N/A
Instrument manufacturer & model	Atec 8000	Atec 8000
Method code	202	202
FRM/FEM/ARM/Other	Other	Other
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Middle	Middle
Monitoring start date	2017	2017
Current sampling frequency	1:6	1:12
Required sampling frequency	1:6	1:12
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	No	No
Suitable for comparison to the NAAQS?	N/A	N/A
Frequency of flow rate verification	N/A	N/A
Semi-Annual flow rate audits dates	N/A	N/A
Additional QA flow rate check dates	N/A	N/A
Annual Performance Evaluation date	N/A	N/A
NPAP date	N/A	N/A



Table E-6 Donovan - Meteorological Equipment Monitor Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp
POC	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101
Basic monitoring objective	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics 4480	Qualimetrics 2030	Qualimetrics 2020	RM Young 41382VF
Method code	012	050	020	040
FRM/FEM/ARM/Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	7/2014	7/2014	7/2014	7/2014
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	04/07/2021	03/18/2021	03/18/2021	04/07/2021
NPAP date	N/A	*	*	*

* The EPA subcontractor does not have the equipment to audit.



Table E-7 Donovan - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP, QAC (44.5 cfm)	PM ₁₀ , PRI (16.7 lpm)	PM ₁₀ , QAC (16.7 lpm)	BC 1060	PM _{2.5} FRM, PRI (16.7 lpm)	E-Seq TSP Metals (16.7 lpm)	PM _{2.5} non-FEM (16.7 lpm)	PM _{2.5} STN (6.7 lpm)	PM _{2.5} CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† Toxics-Carbonyls, PRI (1.5 lpm)	† Toxics-Carbonyls, QAC, (1.5 lpm)	Toxics-VOC (50 ccpm)	Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a				2.7	1.3	4.5		2.5	1.6				4.7	4.1	4.0	4.4	3.0	6.8
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM ₁₀ , PRI	2.7				n/a	1.2	2.1		4.1	4.0				6.6	5.8	6.0	6.3	3.2	5.4
PM ₁₀ , QAC	1.3				1.2		3.2		2.6	2.8				5.5	4.8	5.1	5.4	3.0	6.0
BC 1060	4.5				2.1	3.2				5.9				8.1	7.0			4.5	5.0
PM _{2.5} FRM, PRI																			
E-Seq TSP Metals	2.5				4.1	2.6				2.5				3.5	2.6	2.2	2.7	1.5	5.7
PM _{2.5} non-FEM	1.6				4.0	2.8	5.9		2.5	n/a				3.4	3.0	3.8	3.3	4.2	7.4
PM _{2.5} STN																			
PM _{2.5} CSN																			
†PAMS-VOC																			
†Toxics-Carbonyls	4.7				6.6	5.5	8.1		3.5	3.4									8.5
†Tox-Carbonyl,QAC	4.1				5.8	4.8	7.0		2.6	3.0									7.7
Toxics-VOC	4.0				6.0	5.0			2.2	3.8						n/a	0.5	3.7	0.6
Toxics-VOC, QAC	4.4				6.3	5.4			2.6	3.3						0.5	n/a	4.1	0.5
Toxics-Metals	3.0				3.2	3.0	4.5		1.5	4.2						3.7	4.1	n/a	n/a
Meteorology	6.8				5.4	6.0	5.0		5.7	7.4				8.5	7.7	0.6	0.5	n/a	n/a
<i>height from ground</i>	6.6				6.4	6.4	5.9		6.6	6.7				6.0	6.3	6.0	6.0	6.3	n/a
<i>distance: from the road</i>	26				26	26	26		26	26				26	26	26	26	26	26
<i>from the supporting structure (wood deck)</i>	2.1				2.0	2.0	1.4		2.1	2.3				n/a	n/a	n/a	n/a	2.1	n/a
<i>from obstructions on roof</i>	N				N	N	N		N	N				N	N	N	N	N	N
<i>from obstructions not on roof</i>	N				N	N	N		N	N				N	N	N	N	N	N
<i>from the closest tree</i>	N				N	N	N		N	N				N	N	N	N	N	N
<i>from furnace/flue</i>	N				N	N	N		N	N				N	N	N	N	N	N
<i>unrestricted air flow (degrees)</i>	360				360	360	360		360	360				360	360	360	360	360	360

n/a= Not Applicable; N= None; †On the side of the station/trailer

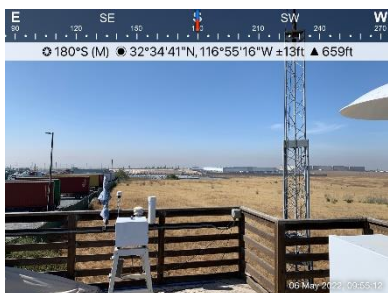


Figure E.2 Donovan – Pictures (Directional) from the Rooftop



Appendix F: Kearny Villa Road Station Description

Table F-1 General Site Information

County:	San Diego
Representative Area:	San Diego MSA
Site Name:	Kearny Villa Rd.
Year Established:	11/5/2010
Site Address:	6125A Kearny Villa Rd.
Site Name Abbreviation:	KVR
AQS Number:	06-073-1016
Latitude:	32.845722 ^o
Longitude:	-117.123983 ^o
Elevation above Sea Level:	132 m
General Location:	Trailer in the SW corner of Camp Elliot (adjacent to Marine Corps Air Station Miramar).
Ground Cover:	Asphalt & Packed dirt
Distance to Road:	180 m west= Kearny Villa Rd. 542 m southwest= Ruffin Rd.
Traffic Count (2016 AADT):	Kearny Villa Rd. at Ruffin Rd = 15,400
Site Description:	When this location housed only a wind profiler, it was originally called Miramar (MMR). In 2010, when the District relocated the Overland station (KMA) alongside the wind profiler for the PAMS program, it was formally re-designated as KVR. The profiler is decommissioned; the station is located on the southeast section of Marine Corps Air Station Miramar (MCAS) called Camp Elliot.
Monitoring Objectives:	It provides representative data for a large area and is quality assurance location for the PM _{2.5} Manual program.
Planned Changes:	none



Figure F.1 Kearny Villa Road – Picture of the Location



Table F-2 Kearny Villa Road - Gaseous Pollutants Monitor Designations + Other

Pollutant	O ₃	NO ₂	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	44201	42602 (NO ₂)	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	11/2010	11/2010	11/2010	2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	7.19 sec	6.04 sec	N/A	N/A
Any changes within the next 18 months?	No	Yes	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	N/A	N/A
Annual Performance Evaluation date	01/28/2021	01/29/2021	10/08/2021	N/A
NPAP date	*	*	N/A	N/A

*Not performed this year



Table F-3 Kearny Villa Road - Particulate Pollutants Monitor Designations

Pollutant	PM _{2.5} Manual	PM _{2.5} Manual
POC	1	2
Monitor designation	Primary	Collocated
Parameter code	88101 (LC)	88101 (LC)
Basic monitoring objective	NAAQS	NAAQS
Site type	Population Exposure	QAC
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Met One E-SEQ-FRM	Met One E-SEQ-FRM
Method code	545	545
FRM/FEM/ARM/Other	FRM	FRM
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	11/5/2010	11/5/2010
Current sampling frequency	1:3	1:6
Required sampling frequency	1:3	1:12
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	None	None
Any PM Hi-Vol sampler w/in 2m	None	None
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	No	No
Suitable for comparison to the NAAQS?	Yes	Yes
Frequency of flow rate verification	Monthly	Monthly
Semi-Annual flow rate audits dates	01/27/2021, 08/03/2021	01/27/2021, 08/03/2021
Additional QA flow rate check dates*	04/08/2021, 04/30/2021, 10/12/2021	04/08/2021, 04/30/2021, 10/12/2021
NPAP date	**	**
PEP date	2/24/2021	N/A

*Additional QA checks are not official audits

**Not done this year



Table F-4 Kearny Villa Road - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp	Meteorological Rel. Humidity
POC	1	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101	62201
Basic monitoring objective	N/A	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics 4480	Qualimetrics 2030	Qualimetrics 2020	RM Young 41382VF	RM Young 41382VF
Method code	012	050	020	040	012
FRM/FEM/ARM/Other	O	O	O	O	O
Collecting agency	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	11/5/2010	11/5/2010	11/5/2010	11/5/2010	11/5/2010
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year round	Year round	Year round	Year round	Year round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	11/24/2021	*	*	12/03/2021	12/03/2021
NPAP date	N/A	**	**	**	**

* Not performed this year

** EPA subcontractor does not have the equipment to audit



Table F-5 Kearny Villa Road - Meteorological Equipment (Additional) Designations

Pollutant	Barometric Pressure	Solar Radiation
POC	1	1
Monitor designation	N/A	N/A
Parameter code	64101	63301
Basic monitoring objective	N/A	N/A
Site type	N/A	N/A
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Met One 092	Eppley 8-48
Method code	014	011
FRM/FEM/ARM/Other	Other	Other
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	11/5/2010	11/5/2010
Current sampling frequency	Continuous	Continuous
Required sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	No	No
Suitable for comparison to the NAAQS?	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A
Annual Performance Evaluation date	11/24/2021	11/24/2021
NPAP date	*	*

*Not done this year



Table F-6 Kearny Villa Road - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP, QAC (44.5 cfm)	PM ₁₀ , PRI (16.7 lpm)	PM ₁₀ , QAC (16.7 lpm)	BC 1060	PM _{2.5} FRM, PRI (16.7 lpm)	PM _{2.5} FRM, QAC (16.7 lpm)	PM _{2.5} non-FEM (16.7 lpm)	PM _{2.5} STN (6.7 lpm)	PM _{2.5} CSN (22.0 lpm)	† PAMS-VOC (50 ccppm)	† PAMS-VOC, QAC (50 ccppm)	† PAMS-Carbonyls (1.5 lpm)	Toxics-VOC (50 ccppm)	Toxics-VOC, QAC (50 ccppm)	RADNET	Meteorology
Gas Inlet	n/a							2.8	2.0									1.7	7.0
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM ₁₀ , PRI																			
PM ₁₀ , QAC																			
BC 1060																			
PM _{2.5} FRM, PRI	2.8							n/a	2.0									4.1	5.9
PM _{2.5} FRM, QAC	2.0							2.0	n/a									2.7	7.1
PM _{2.5} non-FEM																			
PM _{2.5} STN																			
PM _{2.5} CSN																			
†PAMS-VOC																			
†PAMS-VOC, QAC																			
†PAMS-Carbonyls																			
Toxics-VOC																			
Toxics-VOC, QAC																			
RADNET	1.7							4.1	2.7										n/a
Meteorology	7.0							5.9	7.1									n/a	n/a
<i>height from ground</i>	6.1							6.1	6.1									6.6	11.4
<i>distance: from the road</i>	140							140	140									140	140
<i>from the supporting structure (wood deck)</i>	2.0							2.0	2.0									2.5	n/a
<i>from obstructions on roof</i>	N							N	N									N	N
<i>from obstructions not on roof</i>	N							N	N									N	N
<i>from the closest tree</i>	N							N	N									N	N
<i>from furnace/flue</i>	N							N	N									N	N
<i>unrestricted air flow (degrees)</i>	360							360	360									360	360

n/a= Not Applicable; N= None; †On the side of the station/trailer



Figure F.2 Kearny Villa Road – Pictures (Directional) from the Rooftop



Appendix G: Lexington Elementary School Station Description

Table G-1 General Site Information

County:	San Diego
Representative Area:	San Diego MSA
Site Name:	El Cajon – Lexington Elementary School
Year Established:	6/2016
Site Address:	533 B. First St.
Site Name Abbreviation:	LES
AQS Number:	06-073-1022
Latitude:	32.789562°
Longitude:	-116.944318°
Elevation above Sea Level:	143 m
General Location:	Trailer on the Lexington Elementary School property off First & Redwood St.
Ground Cover:	Cement pad
Distance to Road:	26.5 m west= First St.
Traffic Count (2016 AADT):	First St.= 5,700
Site Description:	This station is a trailer off the parking lot for the Lexington Elementary School. This area is primarily residences.
Monitoring Objectives:	The El Cajon site represents a major population center located in an inland valley, downwind of the heavily populated coastal zone. It is impacted from the transportation corridor of Interstate 8 and its major arteries. It is classified as a PAMS and NCore site
Planned Changes:	<i>Site of equipment for PAMS re-engineering. Not within 18-mon, but there is no room for expansion, the District will research the viability of reclassifying the Escondido site as NCore. Once this is proven and the Escondido site is operational, the District will work with EPA to formalize the relocation process.</i>



Figure G.1 Lexington Elementary School – Picture of the Location



Table G-2 Lexington Elementary School - Gaseous Pollutants Monitor Designations + Other

Pollutant	O ₃	NO ₂	CO-TLE	SO ₂ -TLE	NO _y -TLE	True-NO ₂	Other Zero Air	Other Calibrator
POC	1	1	1	1	1	2	N/A	N/A
Monitor designation	Primary	Primary	Primary	Primary	Other	Collocated	N/A	N/A
Parameter code	44201	42602 (NO ₂)	42101	42401	42612 (NO _y -NO ₂)	42602	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	Public Information, NAAQS	Public Information, NAAQS	Public Information, Research	Public Information, Research	N/A	N/A
Site type	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	N/A	N/A
Network affiliation	PAMS, NCore	PAMS	PAMS, NCore	NCore	PAMS, NCore	PAMS, NCore	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Thermo 48i-TLE	Thermo 43i-TLE	Thermo 42i-NO _y	Teledyne T500U	Teledyne-API 701H	Teledyne-API T700u
Method code	047	074	554	560	574	212	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	FRM	FEM	Other	FEM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	7/2016	7/2016	7/2016	7/2016	2/2018	9/2020	7/2016	7/2016
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	Borosilicate glass	Borosilicate glass	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	5.24 sec	16.32 sec	16.81	17.72 sec	5.66 sec	9.44 sec	N/A	N/A
Any changes within the next 18 months?	No	Yes	No	No	No	No	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	Yes	Yes	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	1:1	1:1	1:1	N/A	N/A
Annual Performance Evaluation date	03/17/2021	03/30/2021	07/07/2021, 12/04/2021	07/21/2021, 12/21/2021	06/24/2021, 12/22/2021	03/25/2021	12/29/2021	N/A
NPAP date	*	*	*	*	*	*	N/A	N/A

*Not done this year



Table G-3 Lexington Elementary School - Particulate Pollutants Monitor Designations

Pollutant	PM _{2.5} Manual	PM _{2.5} STN	PM _{2.5} CSN	PM ₁₀ Manual (Lo-Vol)	PM _{coarse} Manual (paired samplers)	PM _{2.5} Continuous (non-FEM)
POC	1	1	1	1	1	1
Monitor designation	Primary	Other	Other	Other	Other	Other
Parameter code	88101 (LC)	See RTI	See RTI	85101 (LC) 81102 (STD)	86101 (LC)	88502 (LC)
Basic monitoring objective	NAAQS	Research	Research	NAAQS	Research	Public Information, Research
Site type	Highest Concentration	Population Exposure	Population Exposure	Population Exposure	Population Exposure	Highest Concentration
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	NCore	NCore, CSN STN	NCore, CSN STN	NCore	NCore	NCore
Instrument manufacturer & model	Met One E-SEQ-FRM	Met One Super SASS	URG-3000N	Met One E-SEQ-FRM	Met One E-SEQ-FRM	Met One BAM 1020
Method code	545	See RTI	See RTI	246	247	733
FRM/FEM/ARM/Other	FRM	Other	Other	FRM	Other	Other (non-FEM)
Collecting agency	APCD	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	EPA	EPA	APCD	APCD	APCD
Reporting agency	APCD	EPA	EPA	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	6/2016	6/2016	6/2016	6/2016	6/2016	6/2016
Current sampling frequency	1:3	1:3	1:3	1:3	1:3	Continuous
Required sampling frequency	1:1	1:6	1:6	1:3	1:3	Continuous
Sampling Season	Year-round	Year-round	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	None	None	None	None	None	None
Any PM Hi-Vol sampler w/in 2m	None	None	None	None	None	None
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No	No	Yes
Suitable for comparison to the NAAQS?	Yes	No	No	Yes	No	No
Frequency of flow rate verification	Monthly	Monthly	Monthly	Monthly	Monthly	Semi-monthly
Semi-Annual flow rate audits dates	06/29/2021, 12/17/2021	06/29/2021, 12/17/2021	06/29/2021, 12/17/2021	06/29/2021, 12/17/2021	06/29/2021, 12/17/2021	06/30/2021, 12/30/2021
Additional QA flow rate check dates**	02/05/2021, 08/04/2021	02/23/2021, 08/06/2021	02/23/2021, 08/06/2021	02/05/2021, 08/04/2021	02/05/2021, 08/04/2021	02/01/2021, 08/05/2021
NPAP date	*	*	*	*	*	*
PEP date	09/01/2021	N/A	N/A	N/A	N/A	N/A

*Not done this year

**Additional QA checks are not official audits



Table G-4 Lexington Elementary School - Other Pollutants Monitor Designations

Pollutant	PAMS-VOC*	PAMS-Carbonyls*	PAMS-Carbonyls*
POC	TBD	1 for 3-8hr samples	2 for 1-8hr sample
Monitor designation	Other	Primary	Collocated
Parameter code	See PAMS Table 10.15	See PAMS Table 10.16	See PAMS Table 10.16
Basic monitoring objective	Research	Research	Research
Site type	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS
Network affiliation	PAMS	PAMS	PAMS
Instrument manufacturer & model	Agilent / Markes	Atec 8000	Atec 8000
Method code	228	202	202
FRM/FEM/ARM/Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	6/2021*	6/2021*	6/2021*
Current sampling frequency	continuous	1:3	1:6
Required sampling frequency	continuous	1:3	1:6
Sampling season	June-August	June-August	June-August
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A
Frequency of flow rate verification	N/A	N/A	N/A
Annual Performance Evaluation date	N/A	N/A	N/A
NPAP date	N/A	N/A	N/A

*PAMS re-engineering program official state date of 6/1/2021



Table G-5 Lexington Elementary School - Other Pollutants Monitor (Additional) Designations

Pollutant	Toxics-Metals	Toxics-Carbonyls	Toxics-Carbonyls
POC	1	1	2
Monitor designation	Not Applicable	Primary	Collocated
Basic monitoring objective	Research	Research	Research
Site type	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A
Instrument manufacturer & model	Xonteck 924	Atec 8000	Atec 8000
Method code	305	202	202
FRM/FEM/ARM/Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	7/18/2017	2017	2017
Current sampling frequency	1:6	1:6	1:12
Required sampling frequency	1:6	1:6	1:12
Sampling season	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A
Frequency of flow rate verification	N/A	N/A	N/A
Annual Performance Evaluation date	N/A	N/A	N/A
NPAP date	N/A	N/A	N/A



Table G-6 Lexington Elementary School - Meteorological Equipment Monitor Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp	Meteorological Rel. Humidity
POC	1	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101	62201
Basic monitoring objective	N/A	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	PAMS, NCore	PAMS, NCore	PAMS, NCore	PAMS, NCore	PAMS, NCore
Instrument manufacturer & model	Qualimetrics 4480	Qualimetrics 2030	Qualimetrics 2020	RM Young 41382VF	RM Young 41382VF
Method code	012	050	020	040	012
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	7/2016	7/2016	7/2016	7/2016	7/2016
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	*	*	*	*	*
NPAP date	N/A	**	**	**	**

* Not performed this year

**EPA subcontractor does not have the equipment to audit.



Table G-7 Lexington Elementary School - Meteorological Equipment (Additional) Designations

Pollutant	Meteorological Barometric Press.	Solar Radiation	Ultraviolet Radiation	Rainfall	Ceilometer
POC	1	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A	N/A
Parameter code	64101	63301	63302	65102	61301
Basic monitoring objective	N/A	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	PAMS, NCore	PAMS, NCore	PAMS, NCore	PAMS, NCore	PAMS, NCore
Instrument manufacturer & model	Met One 092	Eppley SPP	Kipp & Zonen SUV5	Met One 370D (8" Rain Gauge)	Vaisala CL-51
Method code	014	011	011	015	128
FRM/FEM/ARM/Other	Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	03/2017	04/2019	01/2020	10/2019	08/26/2021
Current sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round	Year Round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A	N/A	N/A	N/A
Annual Performance Evaluation date	*	*	*	*	N/A
NPAP date	**	**	**	**	N/A

* Not performed this year

**EPA subcontractor does not have the equipment to audit.



Table G-8 Lexington Elementary School - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP, QAC (44.5 cfm)	PM ₁₀ , PRI (16.7 lpm)	PM ₁₀ , QAC (16.7 lpm)	BC 1060	PM _{2.5} FRM, PRI (16.7 lpm)	PM _{2.5} FRM, QAC (16.7 lpm)	PM _{2.5} non-FEM (16.7 lpm)	PM _{2.5} STN (6.7 lpm)	PM _{2.5} CSN (22.0 lpm)	*PAMS-VOC-Auto GC	† PAMS-VOC, QAC	† PAMS-Carbonyls (1.5 lpm)	Toxics-VOC (50 ccpm)	Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a	3.9			2.3			1.3		2.0	3.3	2.0	3.0		1.4	1.2		3.1	5.5
NOy Inlet	3.9	n/a			5.1			4.4		5.1	6.1	5.1	4.7		4.5	4.6		4.5	1.9
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM ₁₀ , PRI	2.3	5.1			n/a			1.3		1.1	2.3	2.4	3.2		3.3	3.0		4.1	6.4
PM ₁₀ , QAC																			
BC 1060																			
PM _{2.5} FRM, PRI	1.3	4.4			1.3		n/a			1.8	3.5	2.6	3.0		2.3	2.0		4.1	5.5
PM _{2.5} FRM, QAC																			
PM _{2.5} non-FEM	2.0	5.1			1.1			1.8	n/a		1.7	1.3	2.2		3.0	2.7		3.0	6.3
PM _{2.5} STN	3.3	6.1			2.3			3.5		1.7	n/a	1.4	2.2		4.0	3.7		2.3	7.0
PM _{2.5} CSN	2.0	5.1			2.4			2.6		1.3	1.4	n/a	1.1		2.7	2.4		2.9	6.3
*PAMS-VOC	3.0	4.7			3.2			3.0		2.2	2.2	1.1	n/a		2.3	2.7		1.1	6.2
†PAMS-VOC QAC																			
†PAMS-Carbonyls	1.4	4.5			3.3			2.3		3.0	4.0	2.7	2.3		n/a	0.4		3.2	6.3
Toxics-VOC	1.2	4.6			3.0			2.0		2.7	3.7	2.4	2.7		0.4	n/a		3.0	6.5
Toxics-VOC, QAC																			
Toxics-Metals	3.1	4.5			4.1			4.0		2.9	2.2	1.8	1.1		3.2	3.0		n/a	6.9
Meteorology	5.5	1.9			6.4			5.5		6.3	7.0	6.3	6.2		6.3	6.5		6.9	n/a
<i>height from ground</i>	6.6	10.1			6.4			6.5		6.5	6.5	6.6	6.8		5.8	5.7		6.5	12.0
<i>distance: from the road</i>	22.9	23.2			22.2			21.8		23.7	24.7	24.5	24.7		22.9	22.9		24.7	23.2
<i>from the supporting structure (wood deck)</i>	2.2	5.8			2.0			2.0		2.0	2.0	2.1	2.2		1.4	1.3		2.0	n/a
<i>from obstructions on roof</i>	N	N			N			N		N	N	N	N		N	N		N	N
<i>from obstructions not on roof</i>	N	N			N			N		N	N	N	N		N	N		N	N
<i>from the closest tree</i>	5.0	9.9			4.2			4.9		4.3	4.3	5.7	6.3		7.0	6.3		6.5	N
<i>unrestricted air flow (degrees)</i>	360	360			360			360		360	360	360	360		360	360		360	360

n/a= Not Applicable; N= None; †On the side of the station/trailer(No PAMS canister sampling). *This is the manifold inlet for the PAMS Auto-GC.

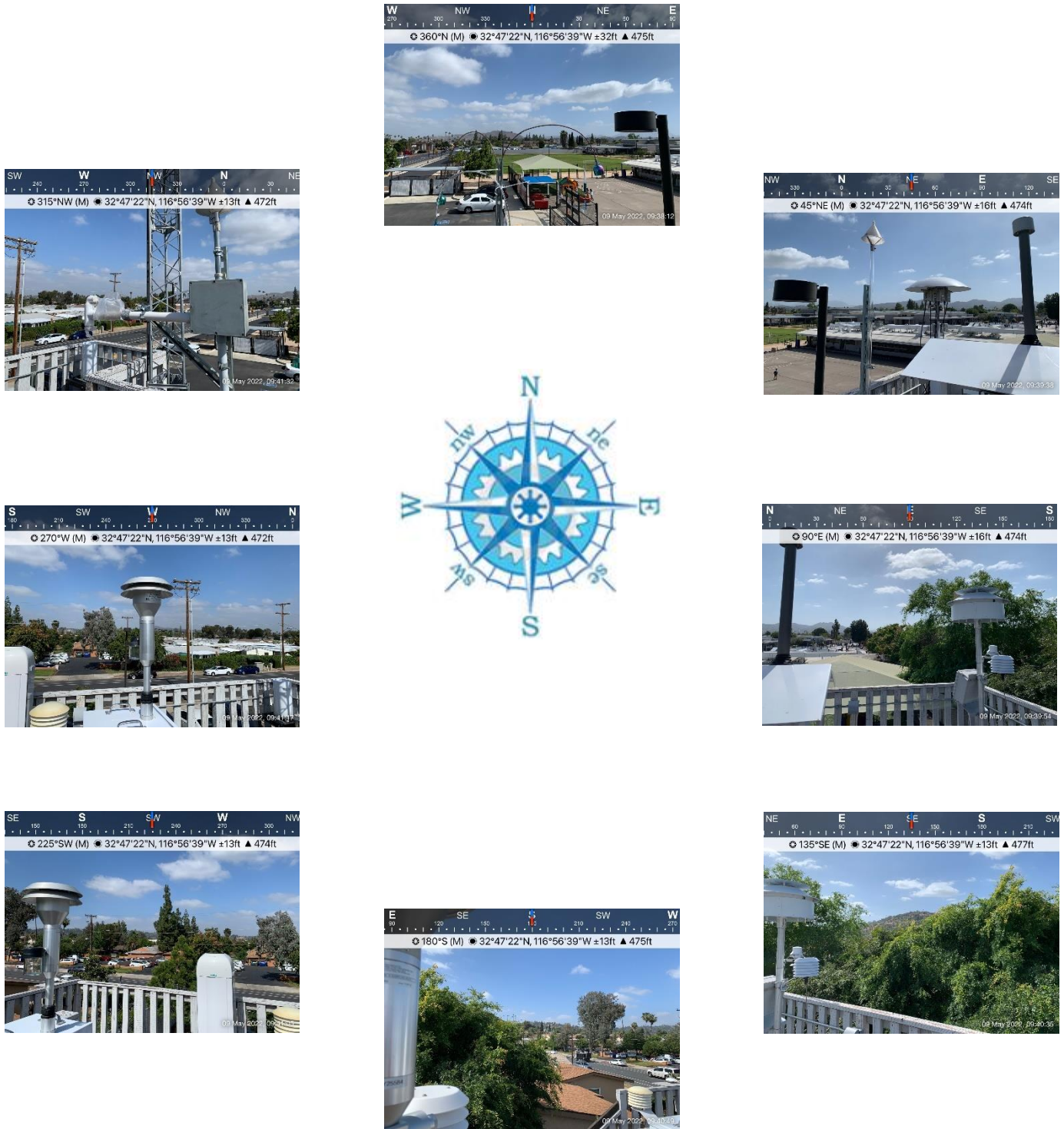


Figure G.2 Lexington Elementary School – Pictures (Directional) from the Rooftop



Appendix H: Rancho Carmel Drive Station Description

Table H-1 General Site Information

County:	San Diego
Representative Area:	San Diego MSA
Site Name:	Rancho Carmel Drive
Year Established:	3/26/2015
Site Address:	11403 Rancho Carmel Drive
Site Name Abbreviation:	RCD
AQS Number:	06-073-1017
Latitude:	32.985442°
Longitude:	-117.082180°
Elevation above Sea Level:	218 m
General Location:	On City of San Diego Pump Station grounds
Ground Cover:	Packed Dirt
Distance to Road:	33 meters to I-15 North; 24 meters to Rancho Carmel Drive
Traffic Count (2020 AADT):	AADT (FE adjusted) for I-15= 332,356 (estimate) 2016 AADT for Rancho Carmel Dr. at Carmel Mtn Rd.(700 meters downwind) = 16,100
Site Description:	Is on the hill overlooking I-15. The probe is horizontal.
Monitoring Objectives:	This is the 1 st near-road site. It measures NO ₂ , CO, and PM _{2.5} contributions from I-15
Planned Changes:	none

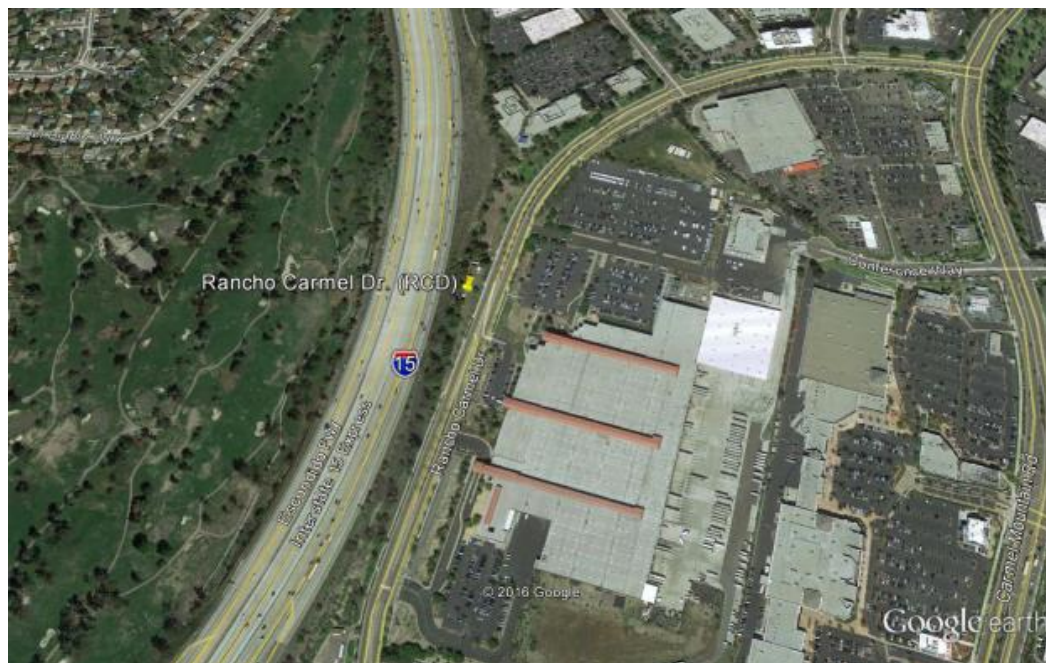


Figure H.1 Rancho Carmel Drive - Picture of the Location of the Station



Table H-2 Rancho Carmel Drive - Gaseous Pollutants Monitor Designations + Other

Pollutant	NO ₂	CO	Other Zero Air	Other Calibrator
POC	1	1	N/A	N/A
Monitor designation	Primary	Primary	N/A	N/A
Parameter code	42602 (NO ₂)	42101	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	N/A	N/A
Site type	Source Oriented	Source Oriented	N/A	N/A
Monitor type	SLAMS	SLAMS	N/A	N/A
Network affiliation	Near-road	Near-road	N/A	N/A
Instrument manufacturer & model	Thermo 42i	Thermo 48i-TLE *	Teledyne-API 701H	Teledyne-API T700U
Method code	074	554	N/A	N/A
FRM/FEM/ARM/Other	FRM	FRM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Micro Scale	Micro Scale	N/A	N/A
Monitoring start date	3/2015	4/2015	3/2015	3/2015
Current sampling frequency	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	13.69 sec	12.19 sec	N/A	N/A
Any changes within the next 18 months?	Yes	No	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	N/A	N/A
Annual Performance Evaluation date	05/26/2021	05/28/2021	06/10/2021	N/A
NPAP Date	**	**	N/A	N/A

* Instrument operated at ambient level range of 20 ppm

**Not performed this year



Table H-3 Rancho Carmel Drive - Particulate Pollutants Monitor Designations

Pollutant	PM _{2.5} Manual
POC	1
Monitor designation	Primary
Parameter code	88101 (LC)
Basic monitoring objective	NAAQS
Site type	Source Oriented
Monitor type	SLAMS
Network affiliation	Near-road
Instrument manufacturer & model	Met One E-SEQ-FRM
Method code	545
FRM/FEM/ARM/Other	FRM
Collecting agency	APCD
Analytical laboratory	APCD
Reporting agency	APCD
Spatial scale	Neighborhood Scale
Monitoring start date	06/2019
Current sampling frequency	1:3
Required sampling frequency	1:3
Any PM Lo-Vol sampler w/in 1m	None
Any PM Hi-Vol sampler w/in 2m	None
Probe material for reactive gases	N/A
Residence time for reactive gases	N/A
Any changes within the next 18 months?	No
Suitable for comparison to the NAAQS?	Yes
Frequency of flow rate verification	Monthly
Semi-Annual flow rate audits dates	06/10/2021, 12/01/2021
Additional QA flow rate check dates**	01/20/2021, 07/08/2021
NPAP date	*
PEP date	11/18/2021

*Not performed this year

**Additional QA checks are not official audits



Table H-4 Rancho Carmel Drive - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological External Temp
POC	1	1
Monitor designation	N/A	N/A
Parameter code	62107	62101
Basic monitoring objective	N/A	N/A
Site type	N/A	N/A
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Qualimetrics 4480	RM Young 41382VF
Method code	012	040
FRM/FEM/ARM/Other	Other	Other
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Micro-scale	Micro-scale
Monitoring start date	03/2015	03/2015
Current sampling frequency	Continuous	Continuous
Required sampling frequency	Continuous	Continuous
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	No	No
Suitable for comparison to the NAAQS?	N/A	N/A
Frequency of QC check (one-point)	N/A	N/A
Annual Performance Evaluation date	07/02/2021	07/02/2021
NPAP date	N/A	*

*Not performed this year



Table H-5 Rancho Carmel Drive - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP, QAC (44.5 cfm)	PM ₁₀ , PRI (16 lpm)	PM ₁₀ , QAC (16 lpm)	BC 1060	PM _{2.5} FRM, PRI (16.7 lpm)****	PM _{2.5} FRM, QAC (16.7 lpm)	PM _{2.5} non-FEM (16.7 lpm)	PM _{2.5} STN (6.7 lpm)	PM _{2.5} CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	† Toxics-VOC (50 ccpm)	† Toxics-VOC, QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a							4.8											
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM ₁₀ , PRI																			
PM ₁₀ , QAC																			
BC 1060																			
PM _{2.5} FRM, PRI	4.8																		
PM _{2.5} FRM, QAC																			
PM _{2.5} non-FEM																			
PM _{2.5} STN																			
PM _{2.5} CSN																			
†PAMS-VOC																			
†PAMS-VOC, QAC																			
†PAMS-Carbonyls																			
†Toxics-VOC																			
†Toxics-VOC, QAC																			
Toxics-Metals																			
Meteorology																			
<i>height from ground</i>	2.3							2.0											
<i>distance: from the road</i>	18.1							20.3											
<i>from the supporting structure(wall)</i>	**1.1							N											
<i>from obstructions on roof (deck)**</i>	N							N											
<i>from obstructions not on roof</i>	N							N											
<i>from the closest tree</i>	11 U 5.9 D							7.0											
<i>from furnace/flue</i>	N							N											
<i>unrestricted air flow (degrees)</i>	270							270											

n/a= Not Applicable; N= None; †On the side of the station/trailer U= upwind; D=downwind

** It is a horizontal probe placed in the direction of the prevailing wind flow. It goes directly from the analyzer inside the station and out the side of the building with a ledge-like support under the glass.

*** PM_{2.5} sampler is at street level and on no supporting structure.



Figure H.2 Rancho Carmel Drive– Pictures (Directional) from the Ground*

*There is no deck from which to take pictures. The probe is horizontal from the side of station on an incline, so all pictures are taken from behind the stations (about 5 meters behind the probe for safety reasons).



Figure H.3 Rancho Carmel Drive– Gas Inlet



Appendix I: McClean - Palomar Airport Station Description

Table I-1 General Site Information

County:	San Diego
Representative Area:	San Diego MSA
Site Name:	McClellan-Palomar (Palomar)
Year Established:	3/10/2012 at old location; 11/1/2014 at current location
Site Address:	2192 Palomar Airport Rd.
Site Name Abbreviation:	CRQ
AQS Number:	06-073-1023
Latitude:	33.130822 ^o
Longitude:	-117.272686 ^o
Elevation above Sea Level:	92 m
General Location:	Adjacent to the business park (immediately north of the paved access road)
Ground Cover:	Paved
Distance to Road:	380 m east= El Camino Real
Traffic Count (2016 AADT):	El Camino Real at Palomar Airport Rd. (27,300)
Site Description:	Adjacent to business park. In 2014, the samplers were moved from the blast shield area to the current location. There is an auxiliary Airport only access road about 3 meters from the samplers with an AADT= 8; because of this low traffic count, the El Camino Real Drive AADT was used. Additionally, the measurements from the road used El Camino Real Drive.
Monitoring Objectives:	To quantify airborne lead particulates from the combustion of aviation gasoline.
Planned Changes:	<i>In 2017, site was being petitioned by the District to the EPA for decommissioning.</i>

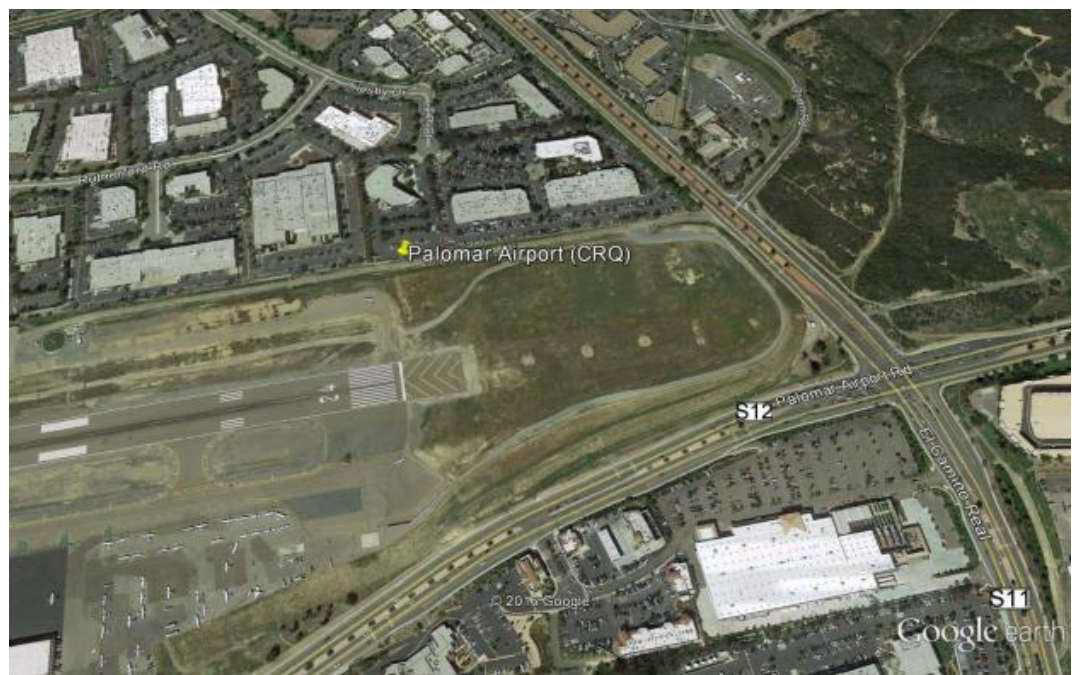


Figure I.1 Palomar Airport – Picture of the Location



Table I-2 Palomar Airport – Particulate Pollutants Monitor Designations

Pollutant	Pb-TSP Hi-Vol (primary)	Pb-TSP Hi-Vol (collocated)
POC	1	2
Monitor designation	PR1	QAC
Parameter code	14129	14129
Basic monitoring objective	NAAQS	NAAQS
Site type	Source Oriented	Source Oriented
Monitor type	SLAMS	SLAMS
Network affiliation	N/A	N/A
Instrument manufacturer & model	Tisch TE-5170BLVFC+	Tisch TE-5170BLVFC+
Method code	192	192
FRM/FEM/ARM/Other	FRM	FRM
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Micro Scale	Micro Scale
Monitoring start date	3/10/2012 (old site) 11/1/2014 (current site)	3/10/2012 (old site) 11/1/2014 (current site)
Current sampling frequency	1:6	1:12
Required sampling frequency	1:6	1:12
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	Yes	Yes
Suitable for comparison to the NAAQS?	Yes	Yes
Frequency of flow rate verification	Monthly	Monthly
Semi-Annual flow rate audits dates	03/24/2021, 09/29/2021	03/24/2021, 09/29/2021
Additional QA flow rate check dates*	06/14/2021, 12/15/2021	06/14/2021, 12/15/2021
NPAP date	**	**
PEP date	09/01/2021	09/01/2021

* Additional QA checks are not official audits

** Not done this year



Table I-3 Palomar Airport - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP, QAC (44.5 cfm)	PM ₁₀ , PRI (16 lpm)	PM ₁₀ , QAC (16 lpm)	BC 1060	PM _{2.5} FRM, PRI (16.7 lpm)	PM _{2.5} FRM, QAC (16.7 lpm)	PM _{2.5} non-FEM (16.7 lpm)	PM _{2.5} STN (6.7 lpm)	PM _{2.5} CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC (50 ccpm)	† PAMS-Carbonyls (1.5 lpm)	† Toxics-VOC (50 ccpm)	† Toxics-VOC QAC (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet																			
NOy Inlet																			
Pb-TSP, PRI			n/a	3.0															
Pb-TSP, QAC			3.0	n/a															
PM ₁₀ , PRI																			
PM ₁₀ , QAC																			
BC 1060																			
PM _{2.5} FRM, PRI																			
PM _{2.5} FRM, QAC																			
PM _{2.5} non-FEM																			
PM _{2.5} STN																			
PM _{2.5} CSN																			
†PAMS-VOC																			
†PAMS-VOC QAC																			
†PAMS-Carbonyls																			
†Toxics-VOC																			
†Toxics-VOC, QAC																			
Toxics-Metals																			
Meteorology																			
<i>height from ground</i>			2.3	2.3															
<i>distance: from the road</i>			356	356															
<i>from the supporting structure</i>			1.2	1.2															
<i>from obstructions on roof</i>			N	N															
<i>from obstructions not on roof</i>			N	N															
<i>from the closest tree</i>			32.0	28.8															
<i>from furnace/flue</i>			N	N															
<i>unrestricted air flow (degrees)</i>			360	360															

n/a= Not Applicable; N= None; †On the side of the station/trailer





Appendix J: Sherman Elementary School Station Description

Table J-1 General Site Information

County:	San Diego
Representative Area:	San Diego MSA
Site Name:	Sherman Elementary School
Site Address:	2019 450B 24 th St.
Site Name Abbreviation:	SES
AQS Number:	06-073-1026
Latitude:	32.710177 ^o
Longitude:	-117.142665 ^o
Elevation above Sea Level:	35 m
General Location:	At the junction of SR 94 and I-5 and downwind of Downtown San Diego and the Bay
Ground Cover:	Paved
Distance to Road:	14 m east= 24 th Street; 281 m NE= Market St & 25 St
Traffic Count (2016 AADT):	Market St. & 25 St.= 12,600
Site Description:	This site is downwind of the San Diego Bay industrial zone, and captures emissions from Interstates 5, 805, 15 and SR 94, downtown San Diego, Lindbergh Field, North Island Naval Air Station, marine terminals, NASSCO shipyards, Continental Maritime shipyard, Southwest Marine, and train yards.
Monitoring Objectives:	This site is in an Environmental Justice area. Forecasting of PM _{2.5} levels for several monitoring sites (from Chula Vista to Kearny Mesa) is partially based upon the values collected at this site. This location is useful for capturing high NO ₂ concentrations, and assessing ozone transport from the south (Baja, Mexico).
Planned Changes:	None

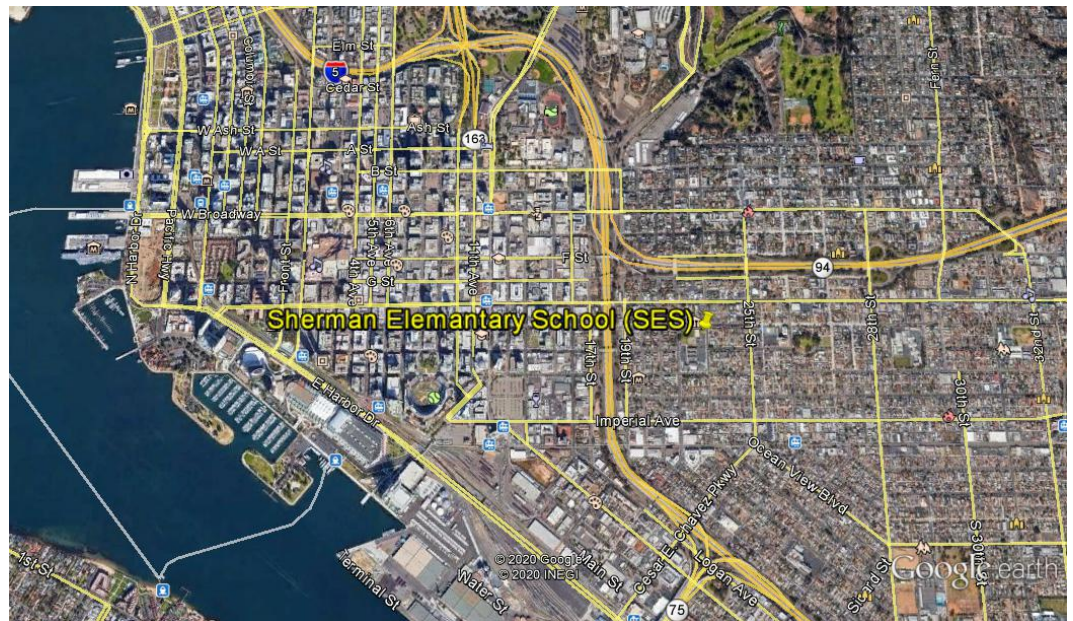


Figure J.1 Sherman Elementary School – Picture of the Location



Table J-2 Sherman Elementary School - Gaseous Pollutants Monitor Designations + Other

Pollutant	O ₃	NO ₂	True-NO ₂	Other Zero Air	Other Calibrator
POC	1	1	2	N/A	N/A
Monitor designation	Primary	Primary	Collocated	N/A	N/A
Parameter code	44201	42602 (NO ₂)	42602	N/A	N/A
Basic monitoring objective	Public Information, NAAQS	Public Information, NAAQS	Public Information, Research	N/A	N/A
Site type	Population Exposure	Population Exposure	Population Exposure	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	N/A	N/A
Network affiliation	N/A	Area-wide	Area-wide	N/A	N/A
Instrument manufacturer & model	Thermo 49i	Thermo 42i	Teledyne T500U	Teledyne-API 701H	Teledyne-API T700U
Method code	047	074	212	N/A	N/A
FRM/FEM/ARM/Other	FEM	FRM	FEM	N/A	N/A
Collecting agency	APCD	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale	Neighborhood Scale	N/A	N/A
Monitoring start date	07/2019	08/2019	06/30/2021	08/2019	08/2019
Current sampling frequency	Continuous	Continuous	Continuous	N/A	N/A
Required sampling frequency	Continuous	Continuous	Continuous	N/A	N/A
Sampling season	Year-round	Year-round	Year-round	N/A	N/A
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A	N/A
Probe material for reactive gases	Borosilicate glass	Borosilicate glass	Borosilicate glass	N/A	N/A
Residence time for reactive gases	5.80 sec	10.00 sec	9.28 sec	N/A	N/A
Any changes within the next 18 months?	No	Yes	No	No	No
Suitable for comparison to the NAAQS?	Yes	Yes	Yes	N/A	N/A
Frequency of QC check (one-point)	1:1	1:1	1:1	N/A	N/A
Annual Performance Evaluation date	06/18/2021	06/23/2021	12/28/2021	09/16/2021	N/A
NPAP date	02/24/2021	02/24/2021	*	N/A	N/A

*Not done this year



Table J-3 Sherman Elementary School - Particulate Pollutants Monitor Designations

Pollutant	PM _{2.5} Manual	PM _{2.5} Continuous (non-FEM)
POC	1	1
Monitor designation	Primary	Other
Parameter code	88101 (LC)	88502 (LC)
Basic monitoring objective	NAAQS	PI, Research
Site type	Population Exposure	Population Exposure
Monitor type	SLAMS	SLAMS
Network affiliation	Not Applicable	Not Applicable
Instrument manufacturer & model	Met One E-SEQ-FRM	Met One BAM 1020
Method code	545	733
FRM/FEM/ARM/Other	FRM	Other (non-FEM)
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Neighborhood Scale	Population Exposure
Monitoring start date	01/2020	08/2019
Current sampling frequency	1:3	Continuous
Required sampling frequency	1:3	Continuous
Any PM Lo-Vol sampler w/in 1m	None	None
Any PM Hi-Vol sampler w/in 2m	None	None
Probe material for reactive gases	N/A	None
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	No	Yes
Suitable for comparison to the NAAQS?	Yes	No
Frequency of flow rate verification	Monthly	Semi-monthly
Semi-Annual flow rate audits dates	06/22/2021, 12/02/2021	06/22/2021, 12/02/2021
Additional QA flow rate check dates*	03/12/2021, 09/15/2021	03/12/2021, 09/15/2021
NPAP date	**	**
PEP date	**	N/A

*Additional QA checks are not official audits

**Not done this year



Table J-4 Sherman Elementary School - Other Pollutants Monitor Designations

Pollutant	TOXICS- VOC	TOXICS- Metals
POC	1	1
Monitor designation	N/A	N/A
Basic monitoring objective	Research	Research
Site type	Population Exposure	Population Exposure
Monitor type	Other (SDAPCD Network)	Other (SDAPCD Network)
Network affiliation	N/A	N/A
Instrument manufacturer & model	Xontech 901 (Fused Silica Lined)	Met One E-SEQ-FRM
Method code	210	*
FRM/FEM/ARM/Other	Other	Other
Collecting agency	APCD	APCD
Analytical laboratory	APCD	APCD
Reporting agency	APCD	APCD
Spatial scale	Neighborhood Scale	Neighborhood Scale
Monitoring start date	N/A	07/2020
Current sampling frequency	1:6	1:6
Required sampling frequency	N/A	N/A
Sampling season	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	None
Any PM Hi-Vol sampler w/in 2m	N/A	None
Probe material for reactive gases	N/A	N/A
Residence time for reactive gases	N/A	N/A
Any changes within the next 18 months?	No	No
Suitable for comparison to the NAAQS?	N/A	N/A
Frequency of flow rate verification	N/A	Monthly
Semi-Annual flow rate audits dates	N/A	06/22/2021, 12/02/2021
Additional QA flow rate check dates***	N/A	03/12/2021, 09/15/2021
Annual Performance Evaluation date	N/A	N/A
NPAP date	N/A	N/A

*Method code not available

** Not done this year

***Additional QA checks are not official audits



Table J-5 Sherman Elementary School - Meteorological Equipment Designations + Other

Pollutant	Other Internal Temp	Meteorological Wind Speed	Meteorological Wind Direction	Meteorological External Temp
POC	1	1	1	1
Monitor designation	N/A	N/A	N/A	N/A
Parameter code	62107	61101	61104	62101
Basic monitoring objective	N/A	N/A	N/A	N/A
Site type	N/A	N/A	N/A	N/A
Monitor type	SLAMS	SLAMS	SLAMS	SLAMS
Network affiliation	N/A	N/A	N/A	N/A
Instrument manufacturer & model	Qualimetrics 4480	Qualimetrics 2030	Qualimetrics 2020	RM Young 41382VF
Method code	012	050	020	040
FRM/FEM/ARM/Other	Other	Other	Other	Other
Collecting agency	APCD	APCD	APCD	APCD
Analytical laboratory	APCD	APCD	APCD	APCD
Reporting agency	APCD	APCD	APCD	APCD
Spatial scale	Neighborhood	Neighborhood	Neighborhood	Neighborhood
Monitoring start date	07/2019	07/2019	07/2019	07/2019
Current sampling frequency	Continuous	Continuous	Continuous	Continuous
Required sampling frequency	Continuous	Continuous	Continuous	Continuous
Sampling season	Year-round	Year-round	Year-round	Year-round
Any PM Lo-Vol sampler w/in 1m	N/A	N/A	N/A	N/A
Any PM Hi-Vol sampler w/in 2m	N/A	N/A	N/A	N/A
Probe material for reactive gases	N/A	N/A	N/A	N/A
Residence time for reactive gases	N/A	N/A	N/A	N/A
Any changes within the next 18 months?	No	No	No	No
Suitable for comparison to the NAAQS?	N/A	N/A	N/A	N/A
Frequency of QC check (one-point)	Monthly	N/A	N/A	Monthly
Annual Performance Evaluation date	*	08/11/2021	08/11/2021	08/11/2021
NPAP date	N/A	**	**	**

* Not performed this year.

** EPA subcontractor does not have the equipment to audit.



Table J-6 Sherman Elementary School - Distance the Equipment are from Influences

(meters)	Gas Inlet	NOy Inlet	Pb-TSP, PRI (44.5 cfm)	Pb-TSP, QAC (44.5 cfm)	PM ₁₀ , PRI, (16.7 lpm)	PM ₁₀ , QAC (16.7 lpm)	BC 1060	PM _{2.5} FRM, PRI* (16.7 lpm)	E-Seq TSP Metals (16.7 lpm)	PM _{2.5} non-FEM (16.7 lpm)	PM _{2.5} STN (6.7 lpm)	PM _{2.5} CSN (22.0 lpm)	† PAMS-VOC (50 ccpm)	† PAMS-VOC, QAC	† PAMS-Carbonyls (1.5 lpm)	Toxics-VOC (50 ccpm)	Toxics-Carbonyls (50 ccpm)	Toxics-Metals (12 lpm)	Meteorology
Gas Inlet	n/a							2.2	3.8	1.2						3.1	2.8		5.2
NOy Inlet																			
Pb-TSP, PRI																			
Pb-TSP, QAC																			
PM ₁₀ , PRI, Hi-Vol																			
PM ₁₀ , QAC, Hi-Vol																			
BC 1060																			
PM _{2.5} FRM, PRI†	2.2							n/a	1.7	1.2						1.3	1.6		6.2
E-Seq TSP Metals	3.8							1.7	n/a	2.6						2.2	3.0		7.4
PM _{2.5} non-FEM	1.2							1.2	2.6	n/a						2.5	2.4		5.6
PM _{2.5} STN																			
PM _{2.5} CSN																			
†PAMS-VOC																			
†PAMS-VOC, QAC																			
†PAMS-Carbonyls																			
Toxics-VOC	3.1							1.3	2.2	2.5						n/a	1.0		7.1
Toxics-Carbonyls	2.8							1.6	3.0	2.4						1.0			6.8
Toxics-Metals																			
Meteorology	5.2							6.2	7.4	5.6						7.1	6.8		n/a
<i>height from ground</i>	5.9							6.0	6.0	6.1						5.8	5.8		11.0
<i>distance: from the road</i>	14.4							15.8	16.6	14.7						16.9	16.5		15.5
<i>from the supporting structure (wood deck)</i>	2.0							2.0	2.0	2.1						1.9	3.7		N
<i>from obstructions on roof</i>	N							N	N	N						N	N		N
<i>from obstructions not on roof</i>	N							N	N	N						N	N		N
<i>from the closest tree</i>	N							16.1	17.8	14.4						17.8	16.8		14.0
<i>from furnace/flue</i>	N							N	N	N						N	N		N
<i>unrestricted air flow (degrees)</i>	360							360	360	360						360	360		360

n/a= Not Applicable; N= None; †On the side of the station/trailer

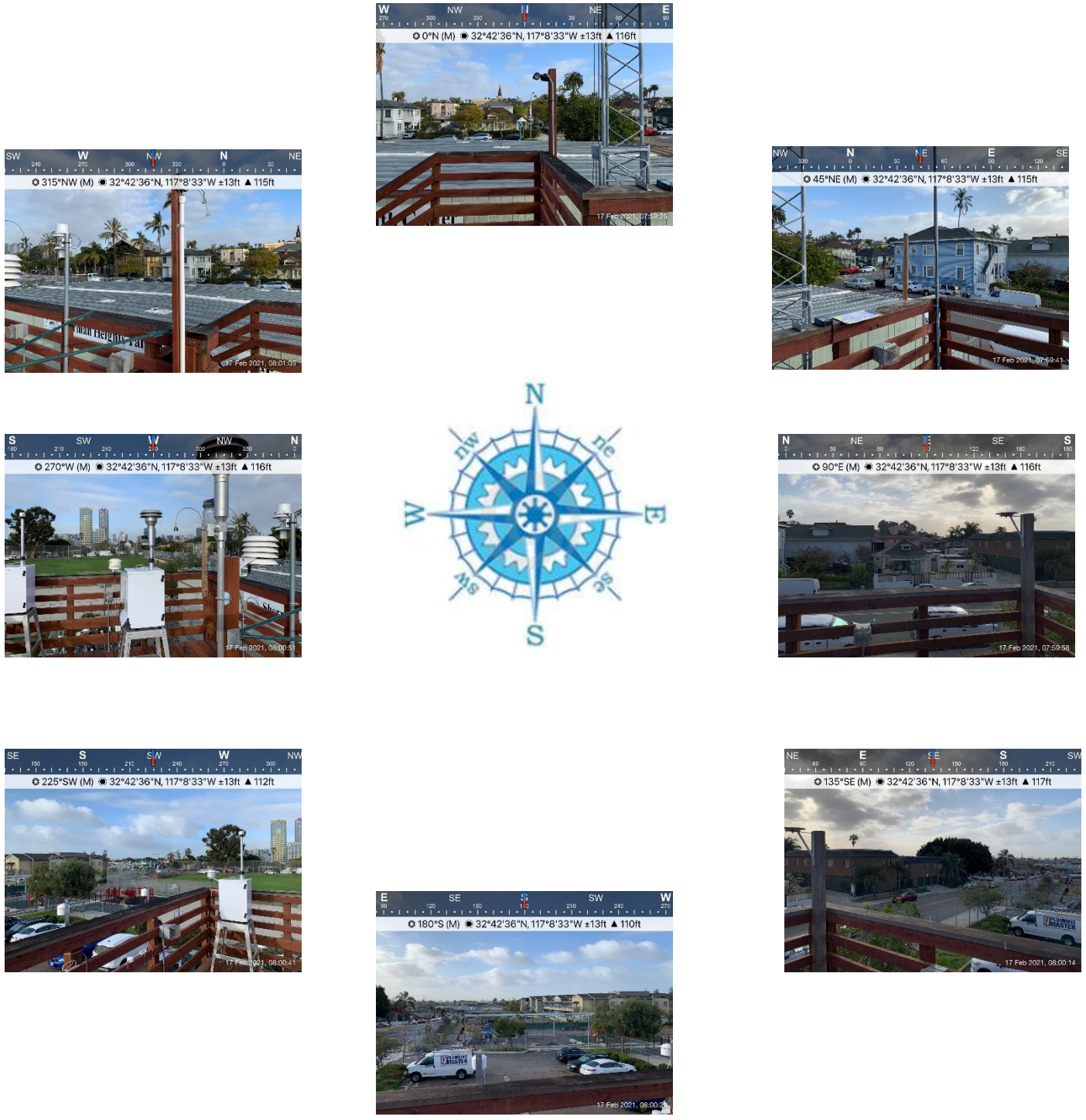


Figure J.2 Sherman Elementary – Pictures (Directional) from the rooftop