THE PORT OF LOS ANGELES

Air Quality Monitoring Program Meeting

January 11, 2023 – 1:00pm to 3:00pm

Zoom Webinar

Please provide questions in the Q&A box or raise your hand on the web application to participate.

Phone controls for participants:

The following commands can be used on your phone's dial pad while in the Zoom meeting:

*6 - Toggle mute/unmute

*9 - Raise hand

Agenda:

1. Welcome
2. Status Update on the Air Quality Monitoring Program Upgrade
3. Air Quality Monitoring Program Overview
4. 17th Annual Monitoring Report (May 2021 – April 2022) Summary
5. Q3/Q4 2022 Stakeholder Questions

For more information, please visit the air quality monitoring website at: https://monitoring.cleanairactionplan.org/ or contact Amber Coluso, Environmental Specialist, at acoluso@portla.org.

Port of Los Angeles

Air Quality Monitoring Program Update

Presented by: Joel Torcolini, Air Quality Program Manager

January 11, 2023

Current Status of Stations

Status of Air Monitoring Stations (as of 12/22/2022)				
Instruments/Equipment	Monitoring Station			
	Wilmington Community Station	Coastal Boundary Station	San Pedro Community Station	Source-Dominated Station
$PM_{2.5}$ Sequential Filter Sampler	X	X	X	X
$PM_{2.5}$ Continuous Monitor	X	X	X	X
PM_{10} Continuous Monitor	X	X	X	X
PM_{10} Federal Reference Method Filter Monitor	X	--	--	--
Ultrafine Particle Counter	X	--[1]	X	X
Aethalometer – Black Carbon	X	X	X	X
CO Analyzer	X	--[2]	X	--[2]
NO_2 Analyzer	X	--[3]	X	--[3]
O_3 Analyzer	X	X	X	X
SO_2 Analyzer	X	--[2]	--[4]	--[2]

1. Delivery of final UFP counter at Coastal Boundary Station expected January 2023.
2. Delivery of CO and SO_2 analyzers expected mid-January 2023.
3. Delivery of NO_2 analyzers expected March 2023.
4. San Pedro Community Station SO_2 analyzer currently offline (will be replaced).

Air Quality Monitoring Program – 2022/2023 Upgrade

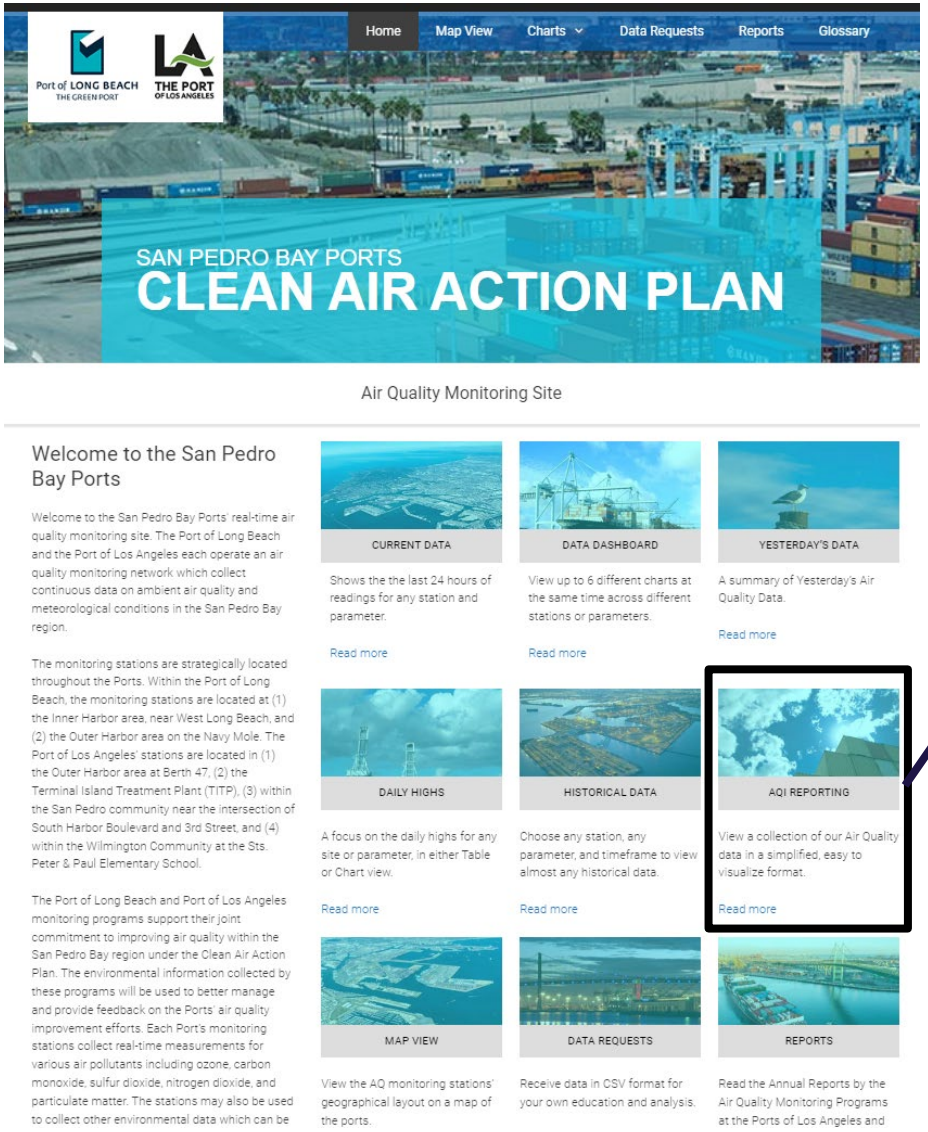
Criteria Pollutants

▪ Ozone (O_3)	Thermo Model 49IQ
▪ Sulfur Dioxide (SO_2)	Thermo Model 43IQ-TL (Trace Level)
▪ Carbon Monoxide (CO)	Thermo Model 48IQ
▪ Nitrogen Dioxide (NO_2)	T-API Model N500 CAPS True NO_2-NO_X-NO Analyzer
▪ Particulate Matter < 10 micrometers (PM_{10})	Met One BAM 1020
▪ Particulate Matter < 2.5 micrometers ($PM_{2.5}$)	Met One BAM 1020

Supplemental PM

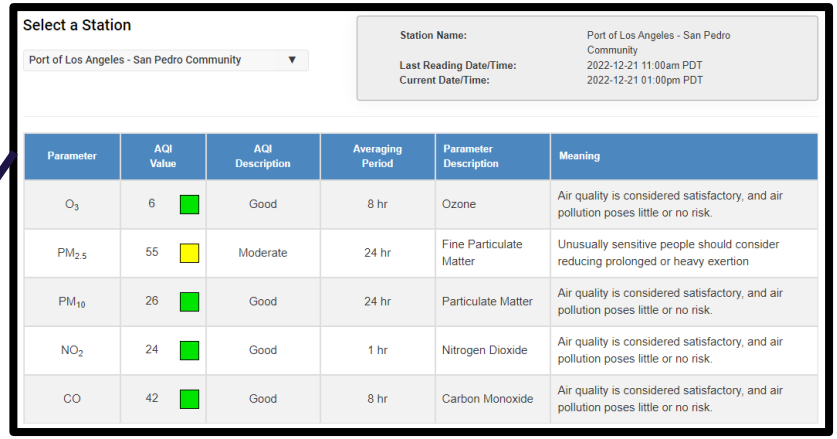
▪ Ultrafine Particle Counts (UFP)	TSI, Inc. Model 3783
▪ Black Carbon (BC)	Magee Scientific Model AE-33

Air Monitoring Website



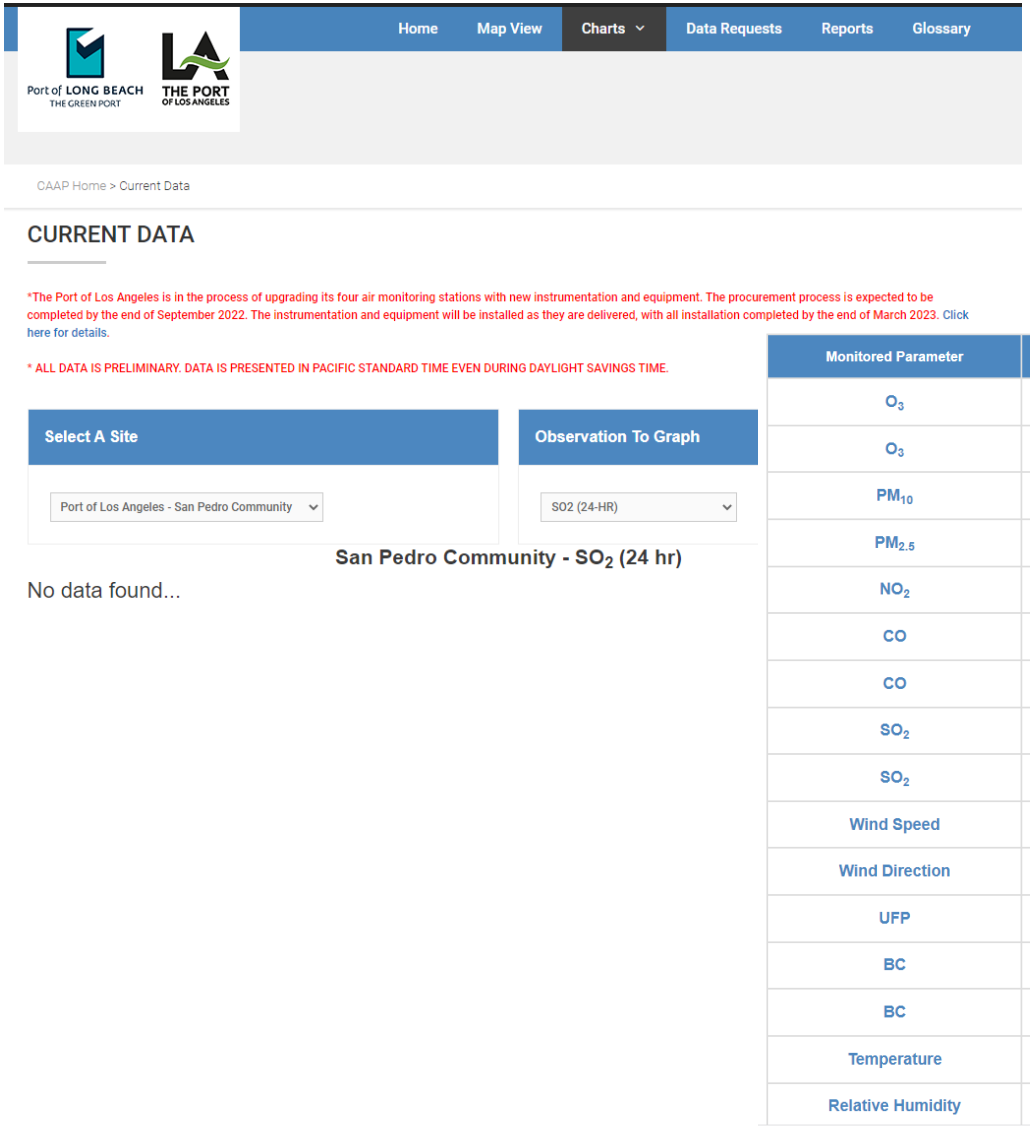
https://monitoring.cleanairactionplan.org

Real-time, air quality and meteorological data made available to the public on a near-real-time basis.



Parameter	AQI Value	AQI Description	Averaging Period	Parameter Description	Meaning
O_3	6	Good	8 hr	Ozone	Air quality is considered satisfactory, and air pollution poses little or no risk.
$PM_{2.5}$	55	Moderate	24 hr	Fine Particulate Matter	Unusually sensitive people should consider reducing prolonged or heavy exertion
PM_{10}	26	Good	24 hr	Particulate Matter	Air quality is considered satisfactory, and air pollution poses little or no risk.
NO_2	24	Good	1 hr	Nitrogen Dioxide	Air quality is considered satisfactory, and air pollution poses little or no risk.
CO	42	Good	8 hr	Carbon Monoxide	Air quality is considered satisfactory, and air pollution poses little or no risk.

Air Monitoring Website - Continued



Offline equipment and reasoning are noted in Current Data webpage of the monitoring website

Monitored Parameter	Averaging Period	Current Value	Units	State Standard	Federal Standard
O_3	1 hr	0.016	ppm	0.090	--
O_3	8 hr	0.022	ppm	0.070	0.070
PM_{10}	24 hr	14.0	ug/m^3	50.0	150.0
$PM_{2.5}$	24 hr	8.3	ug/m^3	--	35.0
NO_2	1 hr	0.013	ppm	0.180	0.100
CO	1 hr	3.3	ppm	20.0	35.0
CO	8 hr		ppm	9.0	9.0
SO_2	1 hr		ppm	--	0.075
SO_2	24 hr	--	ppm	0.040	0.140
Wind Speed	1 hr	--	mph	--	--
Wind Direction	1 hr	--	direction	--	--
UFP	1 hr	21,450	counts/cm^3	--	--
BC	1 hr	0.824	ug/m^3	--	--
BC	24 hr	0.810	ug/m^3	--	--
Temperature	1 hr	51.6°	deg F	--	--
Relative Humidity	1 hr	94.0	%	--	--

SO2 Instrument at San Pedro Community Station offline for instrument repairs.

Questions?

Air Quality Monitoring Program

Overview

leidos

Air Quality Monitoring Program – History

Air monitoring program commenced in February 2005.

- Main objective of monitoring program is to estimate levels of diesel particulate matter (DPM) in proximity to Port complex.
  - DPM became a focal point since California Air Resources Board (CARB) identified it as an air toxic.
  - DPM is a complex mixture of gases and particulates, ambient concentrations cannot be measured directly.
  - In air quality monitoring, elemental carbon (EC) and black carbon (BC) are surrogates for DPM.
- POLA air monitoring program uses filter-based sampling to measure:
  - Particulate Matter < 10 micrometers (PM_{10})
  - Particulate Matter < 2.5 micrometers ($PM_{2.5}$)
  - Elemental Carbon (EC)

Air Quality Monitoring Program - Expansion

In 2007, a secondary objective for the monitoring program was established to estimate ambient gaseous pollutant and particulate matter (PM) levels in adjacent communities.

To accomplish this, the Port expanded the monitoring program to include continuous monitoring in early 2008.

<u>Criteria Pollutants – have EPA NAAQS</u>

- Ozone (O_3)
- Nitrogen Dioxide (NO_2)
- Sulfur Dioxide (SO_2)
- Carbon Monoxide (CO)
- Particulate Matter < 10 micrometers (PM_{10})
- Particulate Matter < 2.5 micrometers ($PM_{2.5}$)

<u>Supplemental PM</u>

- Ultrafine Particle Counts (UFP)

Supplemental Ultrafine Particle Monitoring

In 2011, the Port added four (4) TSI Model 3783 Environmental Particle Counters to the program for continuous measurement of ultrafine particle (UFP) counts at all stations in the Port's network.

Particle counts are important since fine and ultrafine particles, while having little mass, can significantly influence on human health due to ability to cross the blood-brain barrier.

TSI Model 3783 Particle Counter

- Provides continuous monitoring of particle counts.
- Detects particles down to 7 nm.
- Highly localized pollutant; common for traffic patterns to significantly influence UFP levels.
- No NAAQS or CAAQS for ultrafine particle counts.

Supplemental Black Carbon Monitoring

In 2013, the Port added one (1) Model AE-33 Aethalometer to the program for continuous measurement of black carbon (BC) at the Source-Dominated station.

Black carbon is a 0.1 - 0.5 µg particulate matter cluster of different compounds produced by the incomplete burning of:

a) Fossil fuels (primarily oil, diesel and fuel oil)
b) Biomass burning (wood, coal, etc.)

Model AE33 Aethalometer

- Real-time, continuous (BC) measurements via filter-based optical technology
- BC is also surrogate for diesel particulate matter (DPM) emissions
- SCAQMD uses same instrument to measure BC levels
- Source Apportionment
  - Differentiates Biomass Burning vs Fossil Fuel

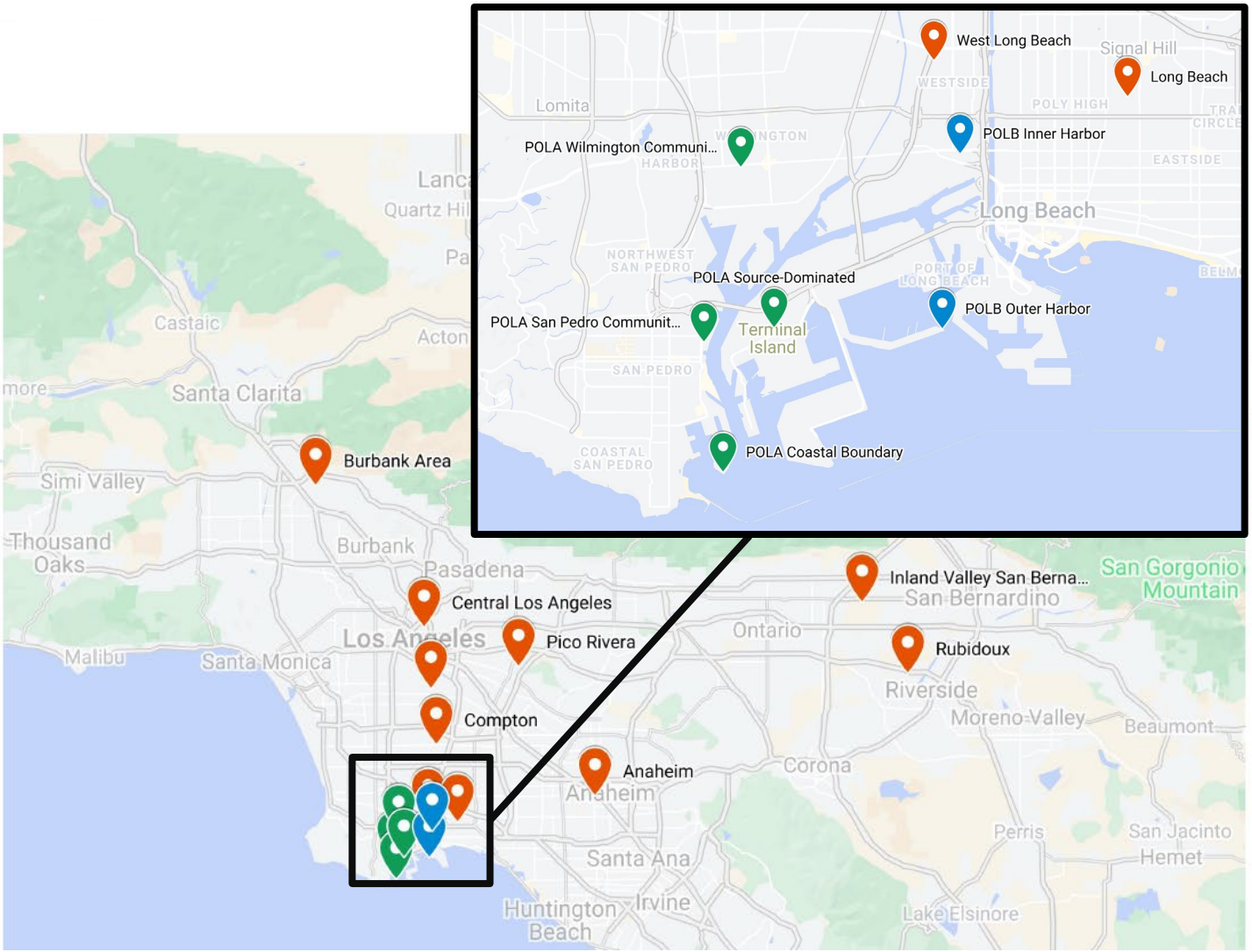
Air Quality Monitoring Program – Stations

SPBP AQ Monitoring Stations

- POLA San Pedro Community
- POLA Wilmington Community
- POLA Coastal Boundary
- POLA Source-Dominated
- POLB Inner Harbor
- POLB Outer Harbor

SCAQMD Monitoring Stations

- West Long Beach
- Rubidoux
- Pico Rivera
- Central Los Angeles
- Long Beach
- Huntington Park
- Inland Valley San Bernardino
- Compton
- Burbank Area
- Anaheim



Summary of Year 17 Monitoring Data (May 2021 - April 2022)

Air Quality and Meteorological Parameters

Pollutant Type		Meteorology
Regional	Localized	Variable
CO	NO_2	Wind Speed
O_3	SO_2	Wind Direction
$PM_{2.5}$	$PM_{2.5}$	Temperature
PM_{10}	PM_{10}	Relative Humidity
--	EC	--
--	BC	--
--	UFP	--

Year 17 Annual Report - Pollutant Comparison

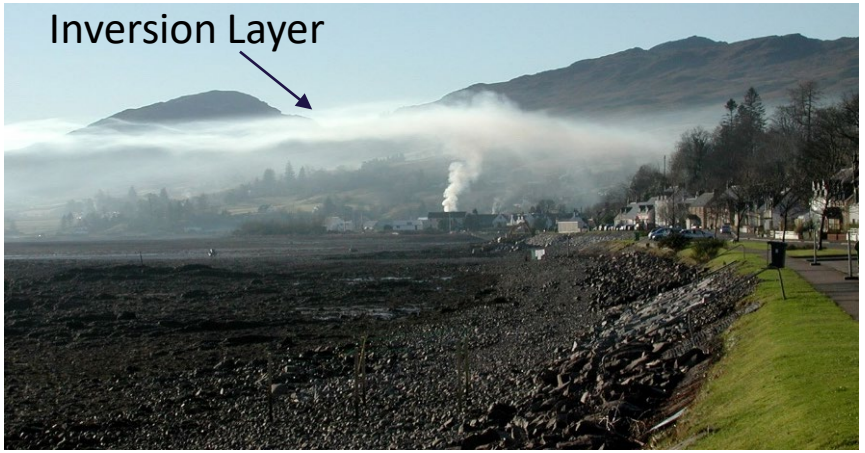
Parameter	Annual Average (May 2021 - April 2022)			
	Nearest South Coast AQMD Station	POLA San Pedro Community Station	POLA Wilmington Community Station	POLB Inner Harbor Station
CO (ppm)	0.35	0.30	0.45	0.41
NO_2 (ppb)	13	12	14	19
O_3 (ppb)	29	21	24	23
SO_2 (ppb)	0.5	1.5*	1.5*	2.3
PM_{10} ($\mu g/m^3$)	25.0	26.4	24.7	38.7
$PM_{2.5}$ ($\mu g/m^3$)	13.8	14.7	14.6	14.5
Supplemental Pollutants				
BC ($\mu g/m^3$)	1.16	0.96	0.85	1.08
EC ($\mu g/m^3$)	--	0.69	0.66	--
UFP (counts)	19,344	10,100	12,600	--

* Current SO_2 instruments cannot detect levels below 1 ppb; measurements are at the lower detection limit.
New SO_2 analyzer will be “trace level instrumentation” with detection limits below 1 ppb similar to South Coast AQMD.

Impacts of Meteorology on Air Quality

Inversion Layer

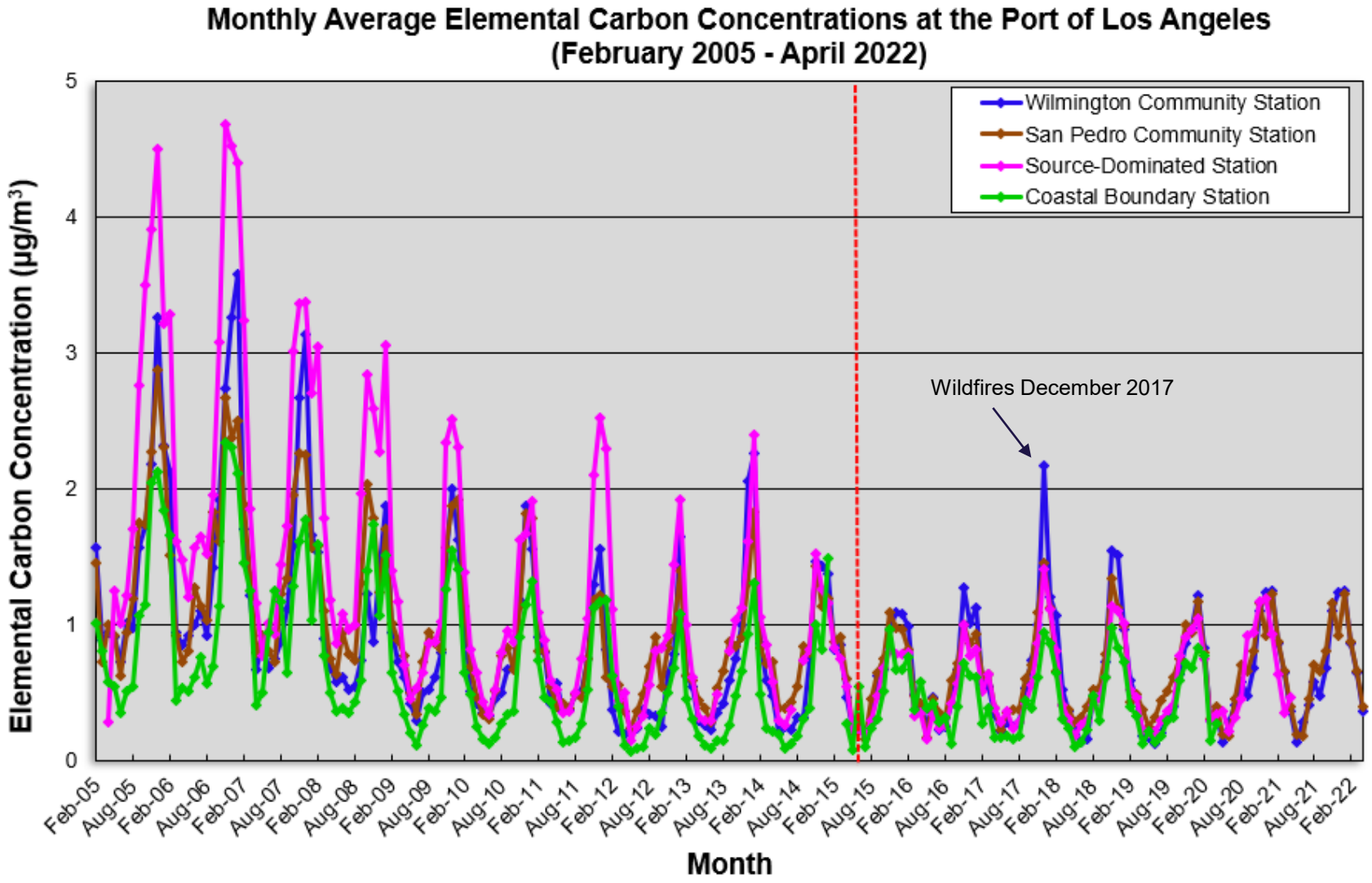
- Does not allow transport of pollutants to free atmosphere.



Summer

Winter

Period of Record EC Monitoring Results

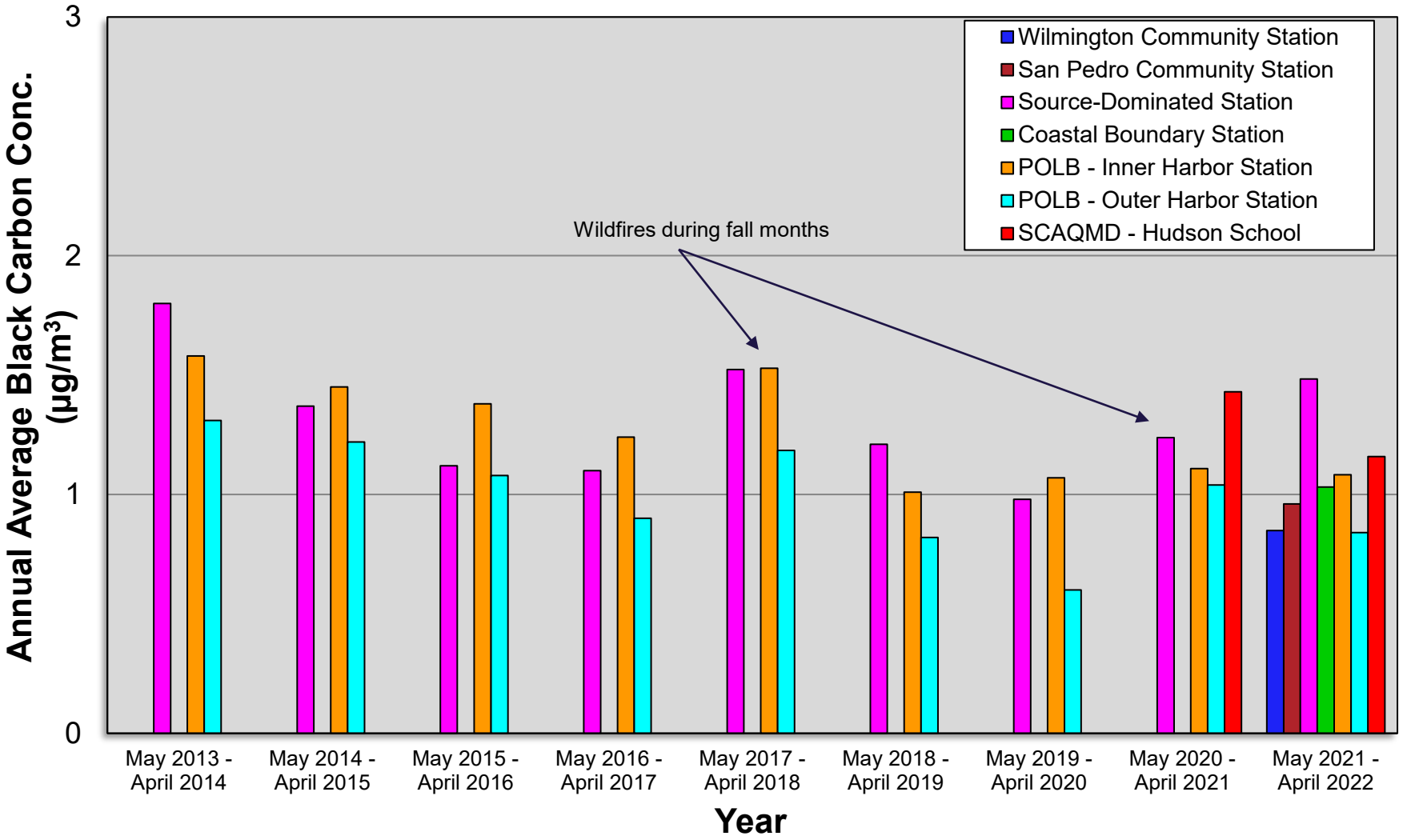


Year 17 - Black Carbon Monitoring Results

Parameter	Annual Average (April 2021 - May 2022)				
	POLA Wilmington Community	POLA San Pedro Community	POLB Inner Harbor	POLB Outer Harbor	SCAQMD West Long Beach (WLB)
BC ($\mu g/m^3$)	0.96	0.85	1.08	0.84	1.16
Compared to SCAQMD WLB	-17.2%	-26.7%	-6.9%	-27.5%	--

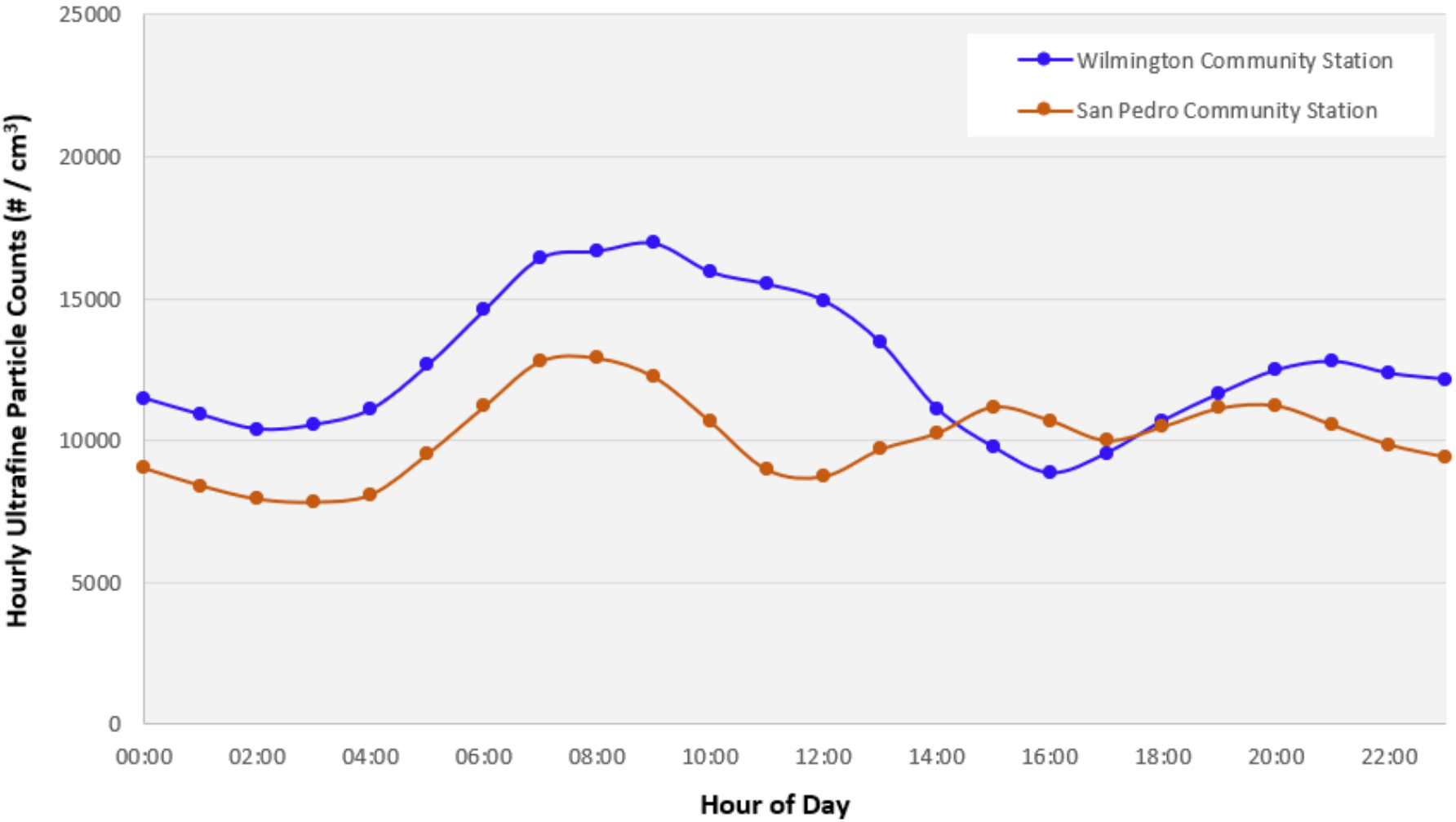
- Overall, BC measurements consistent across the five (5) stations in the San Pedro Bay Ports region.
- Port stations' annual average BC concentrations are slightly lower than corresponding BC measurements at SCAQMD West Long Beach (aka Hudson School) station.

Annual Average Black Carbon Concentrations

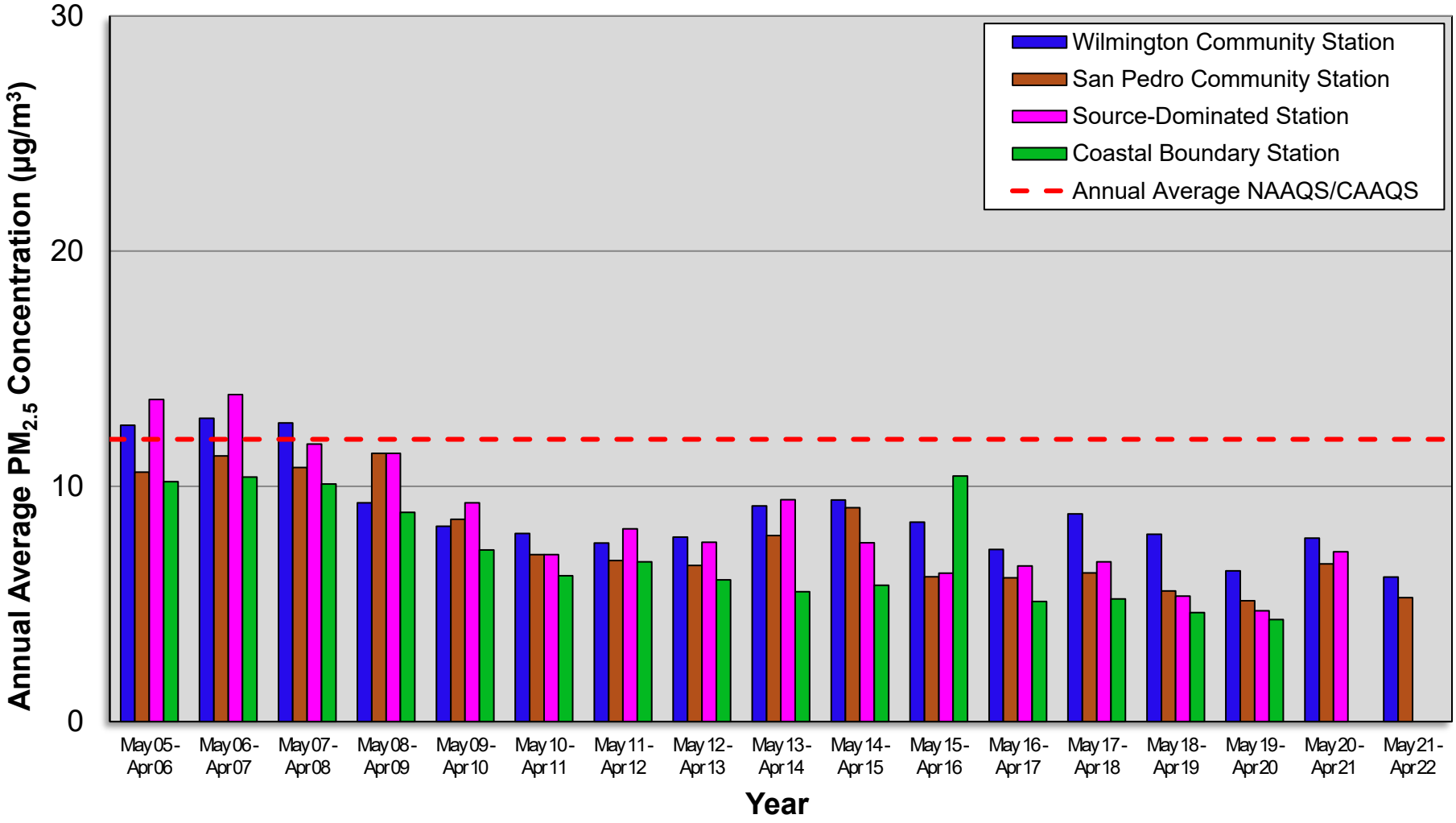


Note: 2021/2022 Annual Average BC at Source-Dominated station calculated with only 63% data completeness as instrument was offline May 1 to September 11, 2021 when BC concentrations are seasonally low.

Average Ultrafine Particle Counts by Hour of Day

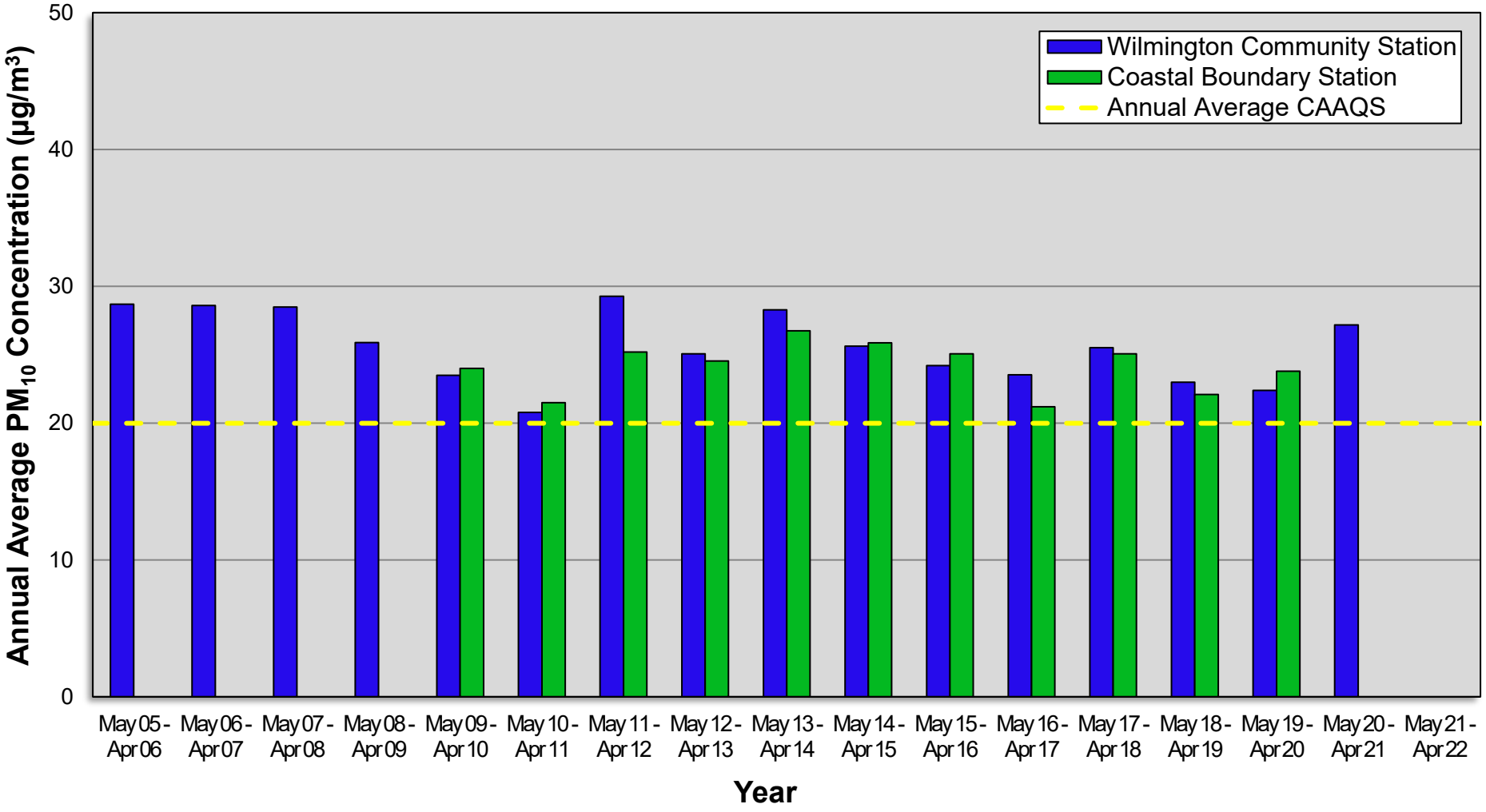


Annual Average Filter-Based $PM_{2.5}$ Concentrations



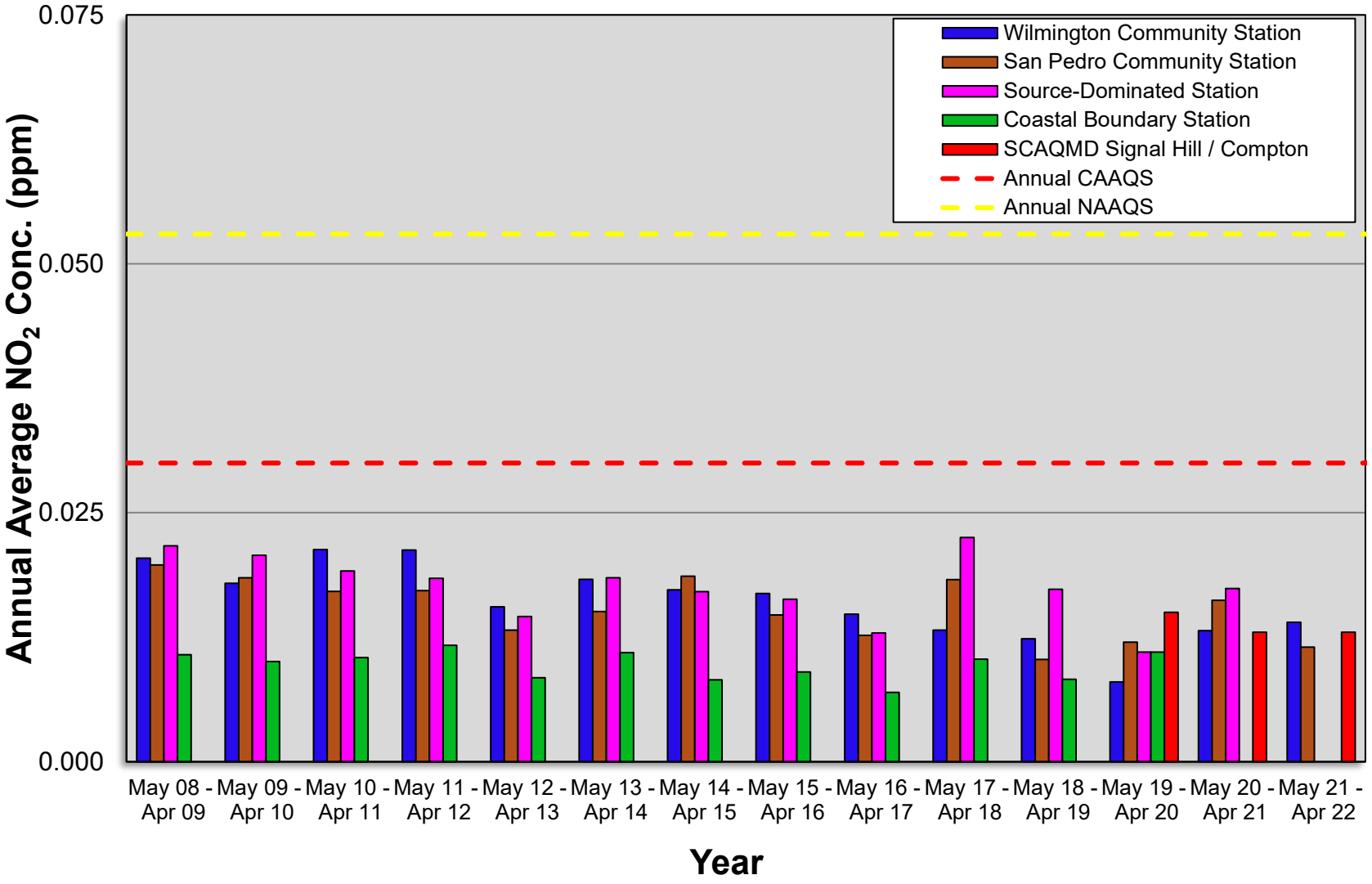
Note: Coastal Boundary station was suspended May 2020 - April 2022.
Source-Dominated station was suspended May 2021 - April 2022.

Annual Average Filter-Based PM_{10} Concentrations

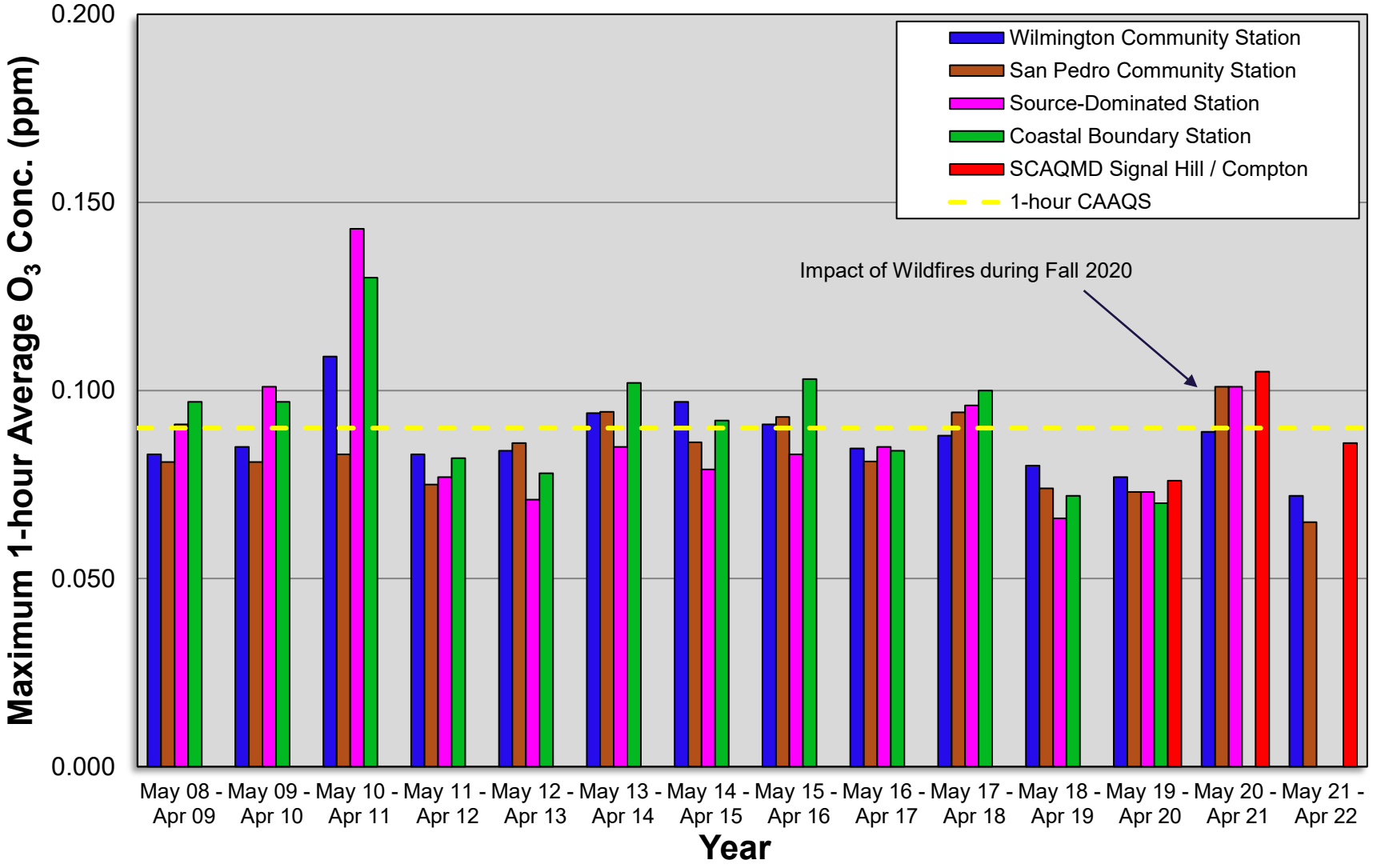


Notes: Filter-based PM_{10} monitoring at Coastal Boundary station commenced in August 2008, suspended in May 2020.
Filter-based PM_{10} monitoring at Wilmington Community station suspended in May 2021.

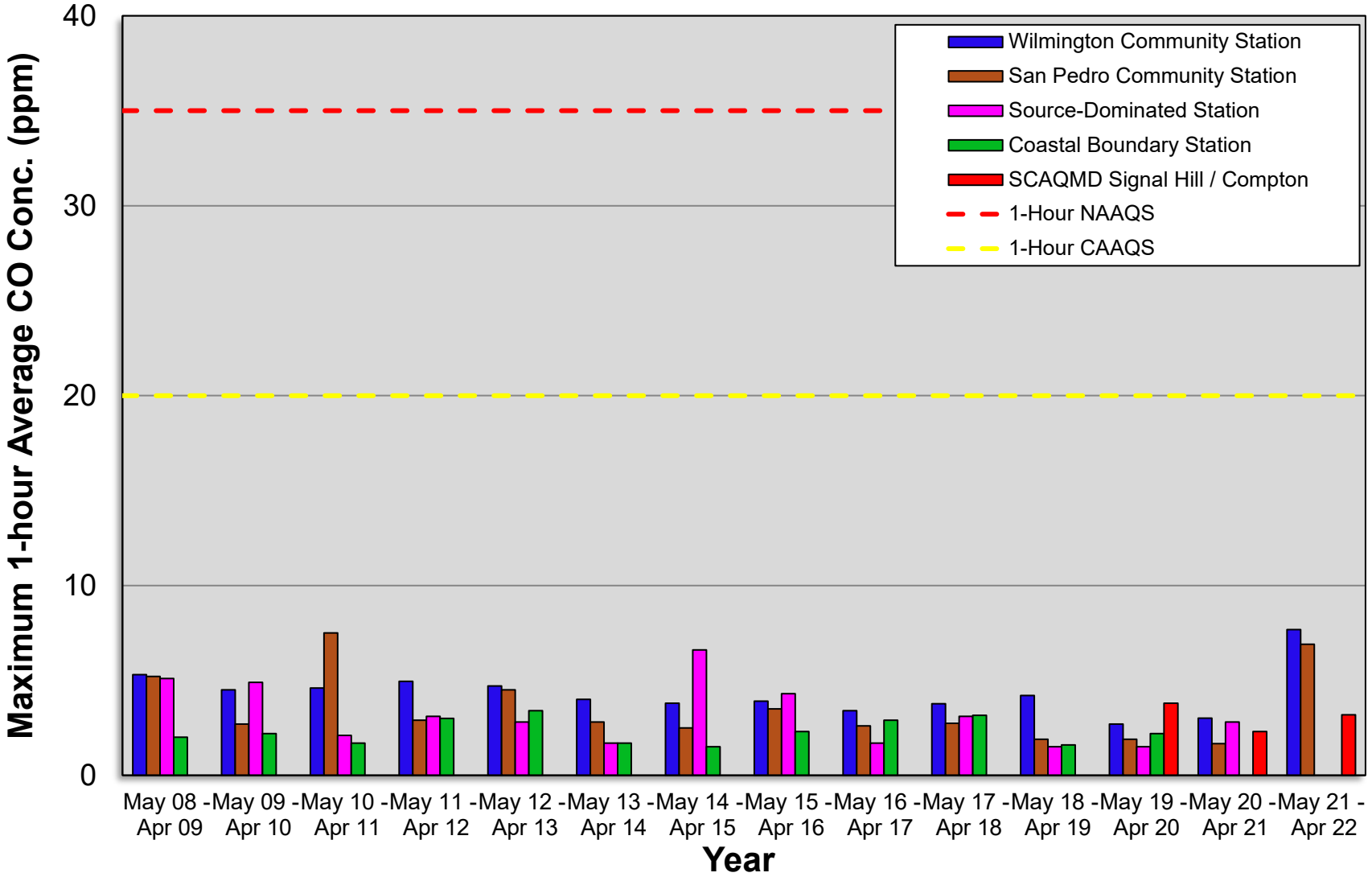
Annual Average NO_2 Concentrations



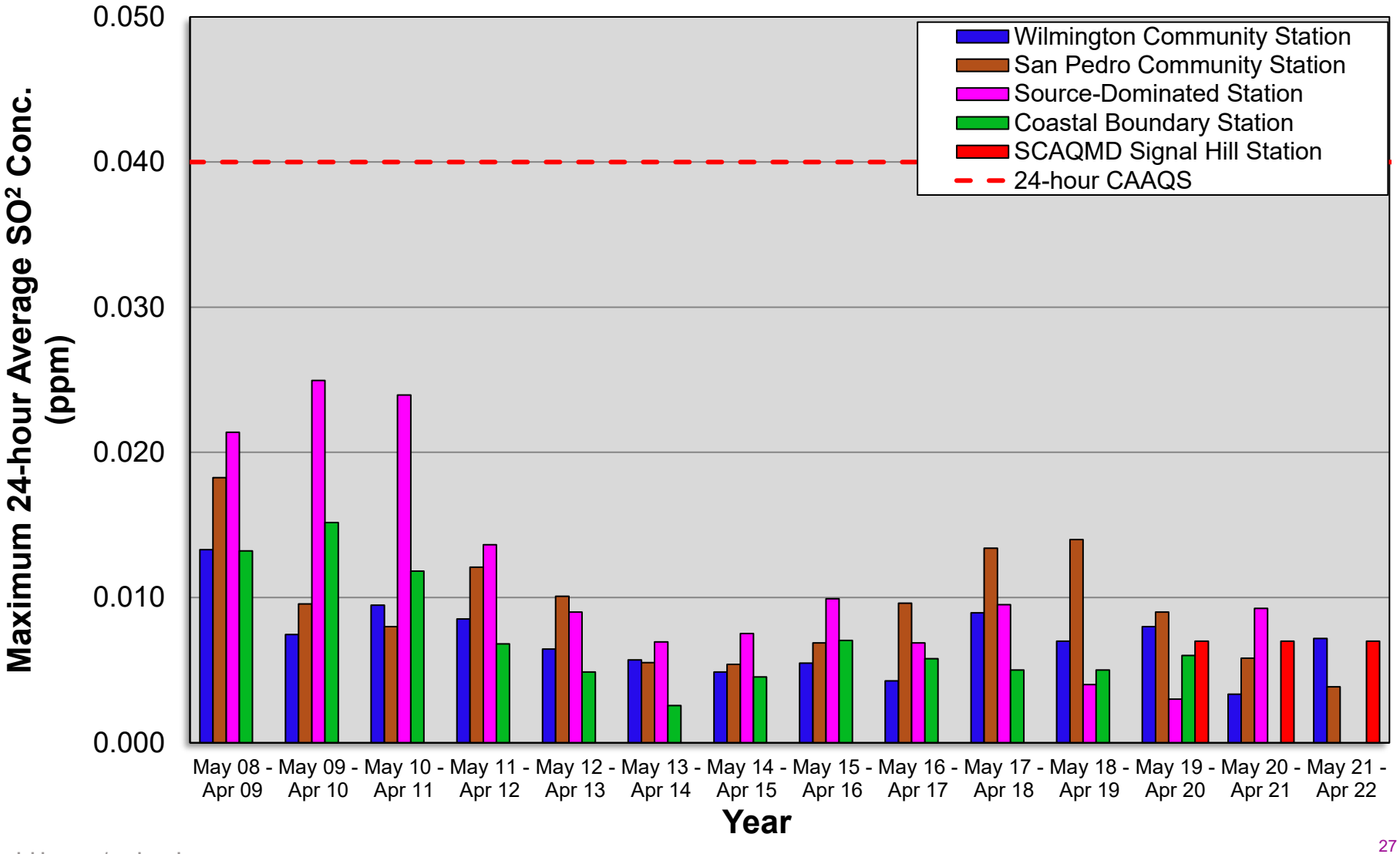
Maximum 1-Hour O_3 Concentrations



Maximum 1-Hour CO Concentrations



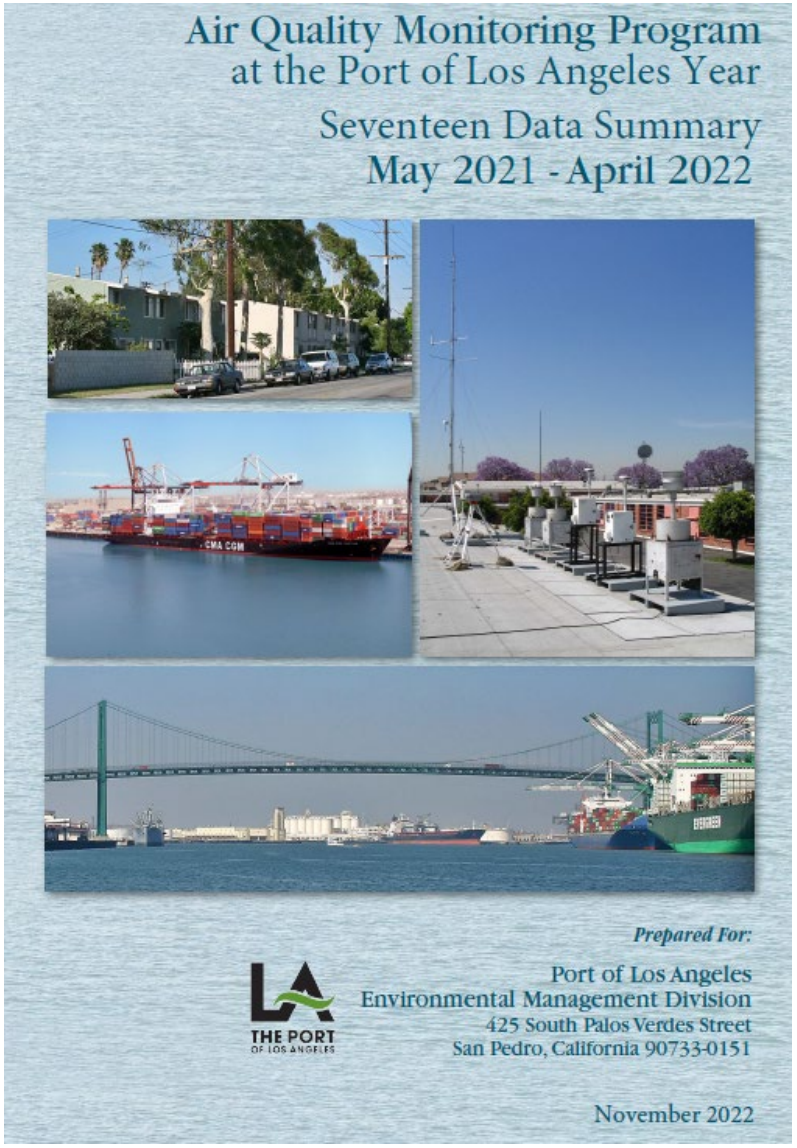
Maximum 24-Hour SO_2 Concentrations



Year 17 Annual Report

Available online at:

https://monitoring.cleanairactionplan.org/reports/



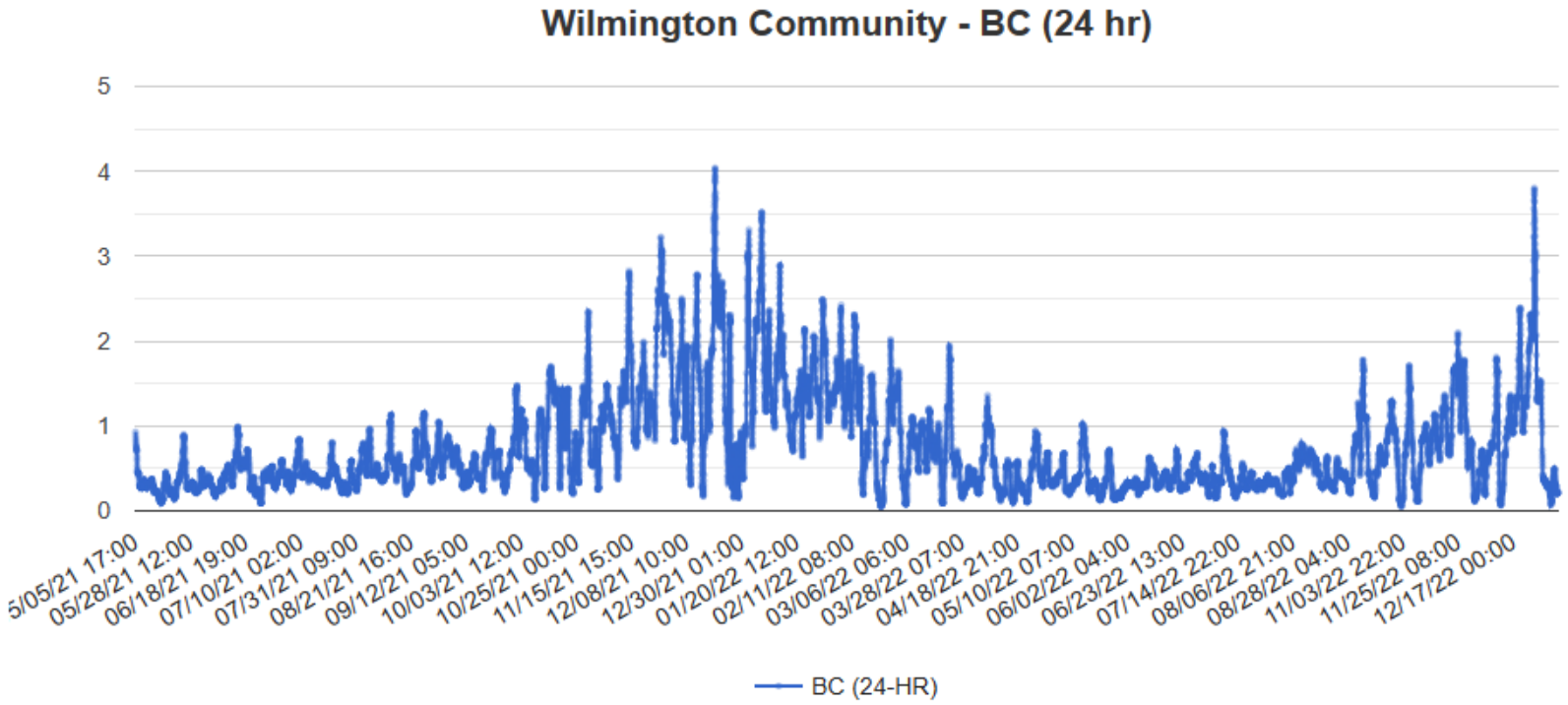
Questions?

Stakeholder Questions

Black Carbon Seasonality

Select A Site	Observation To Graph	Select A View	From	To
Port of Los Angeles - Wilmington	BC (24-HR)	Graph View	2021-05-01	2023-01-04

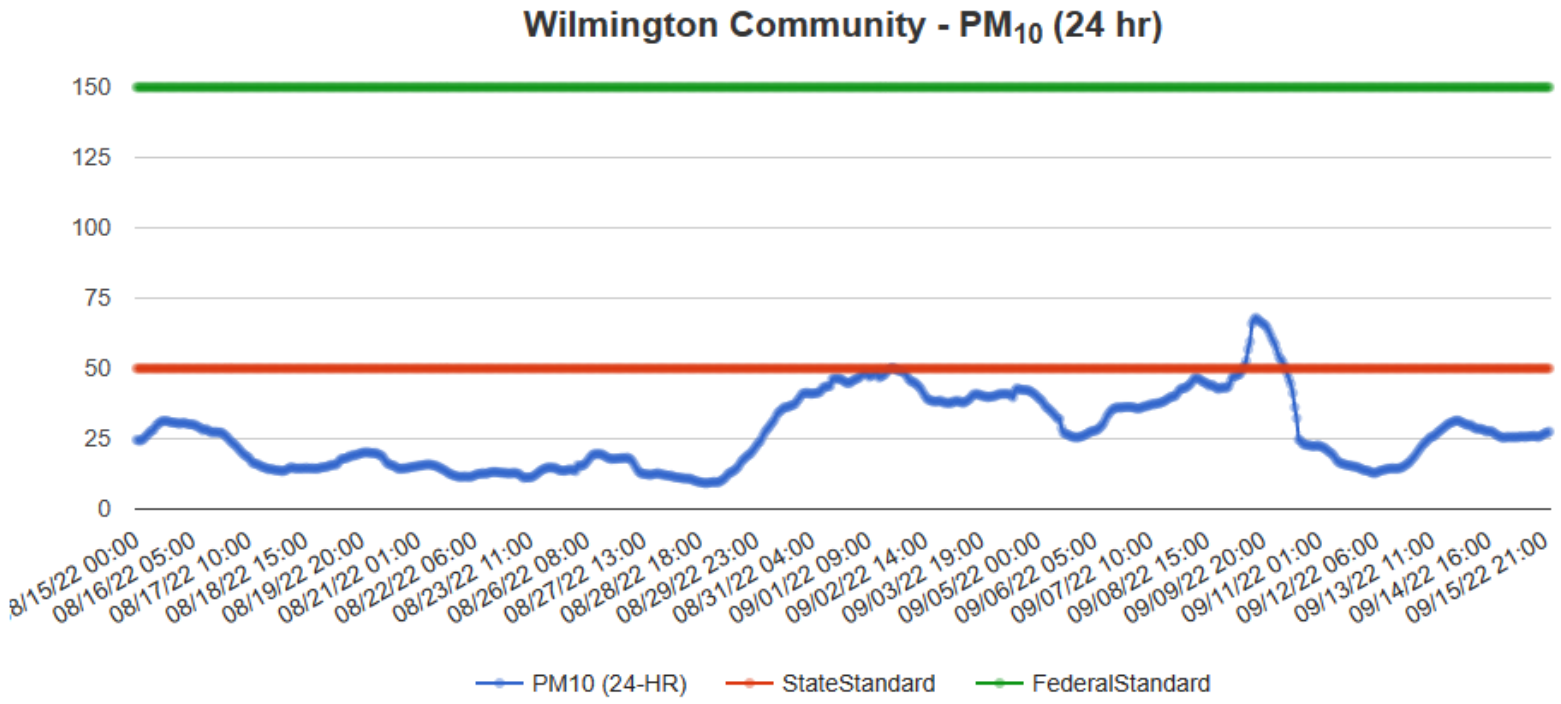
Submit



September 2022 - Elevated PM_{10} Concentrations

Select A Site	Observation To Graph	Select A View	From	To
Port of Los Angeles - Wilmington	PM10 (24-HR)	Graph View	2022-08-15	2022-09-15

Submit



Quality Assurance Protocols

Data Quality Assurance (QA)

- Technical Director / QA Officer
  - Dr. Gary Bertolin - Senior AQ Scientist
  - Over 38 years experience in design, implementation, and management of air quality programs.
- Real-Time Gaseous and PM Measurements
  - Daily calibrations on all gaseous instrumentation deployed
  - Daily review of the previous day's monitoring data and calibration
  - Manual checks on all real-time air quality and meteorological instruments on a 3-day basis
  - Monthly maintenance and cleaning of instruments per manufacturer's specifications
  - Monthly QA review of all real-time air quality and meteorological data
- Filter-Based PM Measurements
  - Field blanks taken monthly to determine background PM loading on filters
  - Instrument flow checks performed before and after each sampling period
  - Bi-monthly review of all filter-based PM measurements
- Independent Semi-Annual Audits
  - Independent contractor performs audits (per EPA guidelines) on all instruments twice per year