



**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](mailto: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 <sub>2.5</sub> Sequential Filter Sampler	X	X	X	X
PM <sub>2.5</sub> Continuous Monitor	X	X	X	X
PM <sub>10</sub> Continuous Monitor	X	X	X	X
PM <sub>10</sub> Federal Reference Method Filter Monitor	X	--	--	--
Ultrafine Particle Counter	X	-- <sup>1</sup>	X	X
Aethalometer – Black Carbon	X	X	X	X
CO Analyzer	X	-- <sup>2</sup>	X	-- <sup>2</sup>
NO <sub>2</sub> Analyzer	X	-- <sup>3</sup>	X	-- <sup>3</sup>
O <sub>3</sub> Analyzer	X	X	X	X
SO <sub>2</sub> Analyzer	X	-- <sup>2</sup>	-- <sup>4</sup>	-- <sup>2</sup>

1. Delivery of final UFP counter at Coastal Boundary Station expected January 2023.
2. Delivery of CO and SO<sub>2</sub> analyzers expected mid-January 2023.
3. Delivery of NO<sub>2</sub> analyzers expected March 2023.
4. San Pedro Community Station SO<sub>2</sub> analyzer currently offline (will be replaced).

# Air Quality Monitoring Program – 2022/2023 Upgrade

## Criteria Pollutants

- |   |  |
|---|--|
| ▪ Ozone (O <sub>3</sub> )                                   | Thermo Model 49IQ  |
| ▪ Sulfur Dioxide (SO <sub>2</sub> )                         | Thermo Model 43IQ-TL (Trace Level)                                       |
| ▪ Carbon Monoxide (CO)                                      | Thermo Model 48IQ  |
| ▪ Nitrogen Dioxide (NO <sub>2</sub> )                       | T-API Model N500 CAPS True NO <sub>2</sub> -NO <sub>x</sub> -NO Analyzer |
| ▪ Particulate Matter < 10 micrometers (PM <sub>10</sub> )   | Met One BAM 1020   |
| ▪ Particulate Matter < 2.5 micrometers (PM <sub>2.5</sub> ) | 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



Air Quality Monitoring Site

<https://monitoring.cleanairactionplan.org>

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

## Welcome to the San Pedro Bay Ports

Welcome to the San Pedro Bay Ports' real-time air quality monitoring site. The Port of Long Beach and the Port of Los Angeles each operate an air quality monitoring network which collect continuous data on ambient air quality and meteorological conditions in the San Pedro Bay region.

The monitoring stations are strategically located throughout the Ports. Within the Port of Long Beach, the monitoring stations are located at (1) the Inner Harbor area, near West Long Beach, and (2) the Outer Harbor area on the Navy Mole. The Port of Los Angeles' stations are located in (1) the Outer Harbor area at Berth 47, (2) the Terminal Island Treatment Plant (TITP), (3) within the San Pedro community near the intersection of South Harbor Boulevard and 3rd Street, and (4) within the Wilmington Community at the Sts. Peter & Paul Elementary School.

The Port of Long Beach and Port of Los Angeles monitoring programs support their joint commitment to improving air quality within the San Pedro Bay region under the Clean Air Action Plan. The environmental information collected by these programs will be used to better manage and provide feedback on the Ports' air quality improvement efforts. Each Ports' monitoring stations collect real-time measurements for various air pollutants including ozone, carbon monoxide, sulfur dioxide, nitrogen dioxide, and particulate matter. The stations may also be used to collect other environmental data which can be



**CURRENT DATA**

Shows the last 24 hours of readings for any station and parameter.

[Read more](#)



**DATA DASHBOARD**

View up to 6 different charts at the same time across different stations or parameters.

[Read more](#)



**YESTERDAY'S DATA**

A summary of Yesterday's Air Quality Data.

[Read more](#)



**DAILY HIGHS**

A focus on the daily highs for any site or parameter, in either Table or Chart view.

[Read more](#)



**HISTORICAL DATA**

Choose any station, any parameter, and timeframe to view almost any historical data.

[Read more](#)



**AQI REPORTING**

View a collection of our Air Quality data in a simplified, easy to visualize format.

[Read more](#)



**MAP VIEW**

View the AQ monitoring stations' geographical layout on a map of the ports.



**DATA REQUESTS**

Receive data in CSV format for your own education and analysis.



**REPORTS**

Read the Annual Reports by the Air Quality Monitoring Programs at the Ports of Los Angeles and

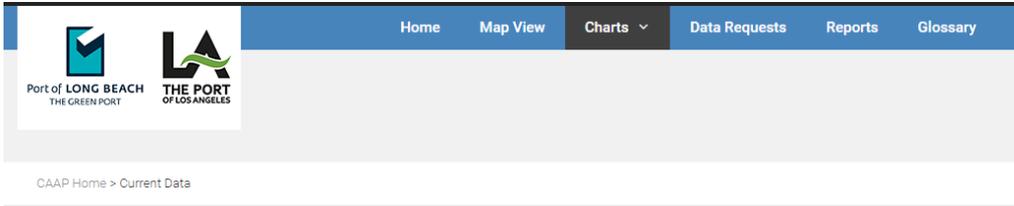
**Select a Station**

Port of Los Angeles - San Pedro Community

Station Name: Port of Los Angeles - San Pedro Community  
 Last Reading Date/Time: 2022-12-21 11:00am PDT  
 Current Date/Time: 2022-12-21 01:00pm PDT

Parameter	AQI Value	AQI Description	Averaging Period	Parameter Description	Meaning
O <sub>3</sub>	6	Good	8 hr	Ozone	Air quality is considered satisfactory, and air pollution poses little or no risk.
PM <sub>2.5</sub>	55	Moderate	24 hr	Fine Particulate Matter	Unusually sensitive people should consider reducing prolonged or heavy exertion
PM <sub>10</sub>	26	Good	24 hr	Particulate Matter	Air quality is considered satisfactory, and air pollution poses little or no risk.
NO <sub>2</sub>	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



## CURRENT DATA

\*The Port of Los Angeles is in the process of upgrading its four air monitoring stations with new instrumentation and equipment. The procurement process is expected to be completed by the end of September 2022. The instrumentation and equipment will be installed as they are delivered, with all installation completed by the end of March 2023. [Click here for details.](#)

\* ALL DATA IS PRELIMINARY. DATA IS PRESENTED IN PACIFIC STANDARD TIME EVEN DURING DAYLIGHT SAVINGS TIME.

Select A Site

Port of Los Angeles - San Pedro Community

Observation To Graph

SO2 (24-HR)

**San Pedro Community - SO<sub>2</sub> (24 hr)**

No data found...

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 <sub>3</sub>	1 hr	0.016	ppm	0.090	--
O <sub>3</sub>	8 hr	0.022	ppm	0.070	0.070
PM <sub>10</sub>	24 hr	14.0	ug/m <sup>3</sup>	50.0	150.0
PM <sub>2.5</sub>	24 hr	8.3	ug/m <sup>3</sup>	--	35.0
NO <sub>2</sub>	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 <sub>2</sub>	1 hr		ppm	--	0.075
SO <sub>2</sub>	24 hr	--	ppm	0.040	0.140
Wind Speed	1 hr	--	mph	--	--
Wind Direction	1 hr	--	direction	--	--
UFP	1 hr	21,450	counts/cm <sup>3</sup>	--	--
BC	1 hr	0.824	ug/m <sup>3</sup>	--	--
BC	24 hr	0.810	ug/m <sup>3</sup>	--	--
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

# 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<sub>10</sub>)
  - Particulate Matter < 2.5 micrometers (PM<sub>2.5</sub>)
  - 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.

### Criteria Pollutants – have EPA NAAQS

- Ozone (O<sub>3</sub>)
- Nitrogen Dioxide (NO<sub>2</sub>)
- Sulfur Dioxide (SO<sub>2</sub>)
- Carbon Monoxide (CO)
- Particulate Matter < 10 micrometers (PM<sub>10</sub>)
- Particulate Matter < 2.5 micrometers (PM<sub>2.5</sub>)

### Supplemental PM

- 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  $\mu\text{g}$  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



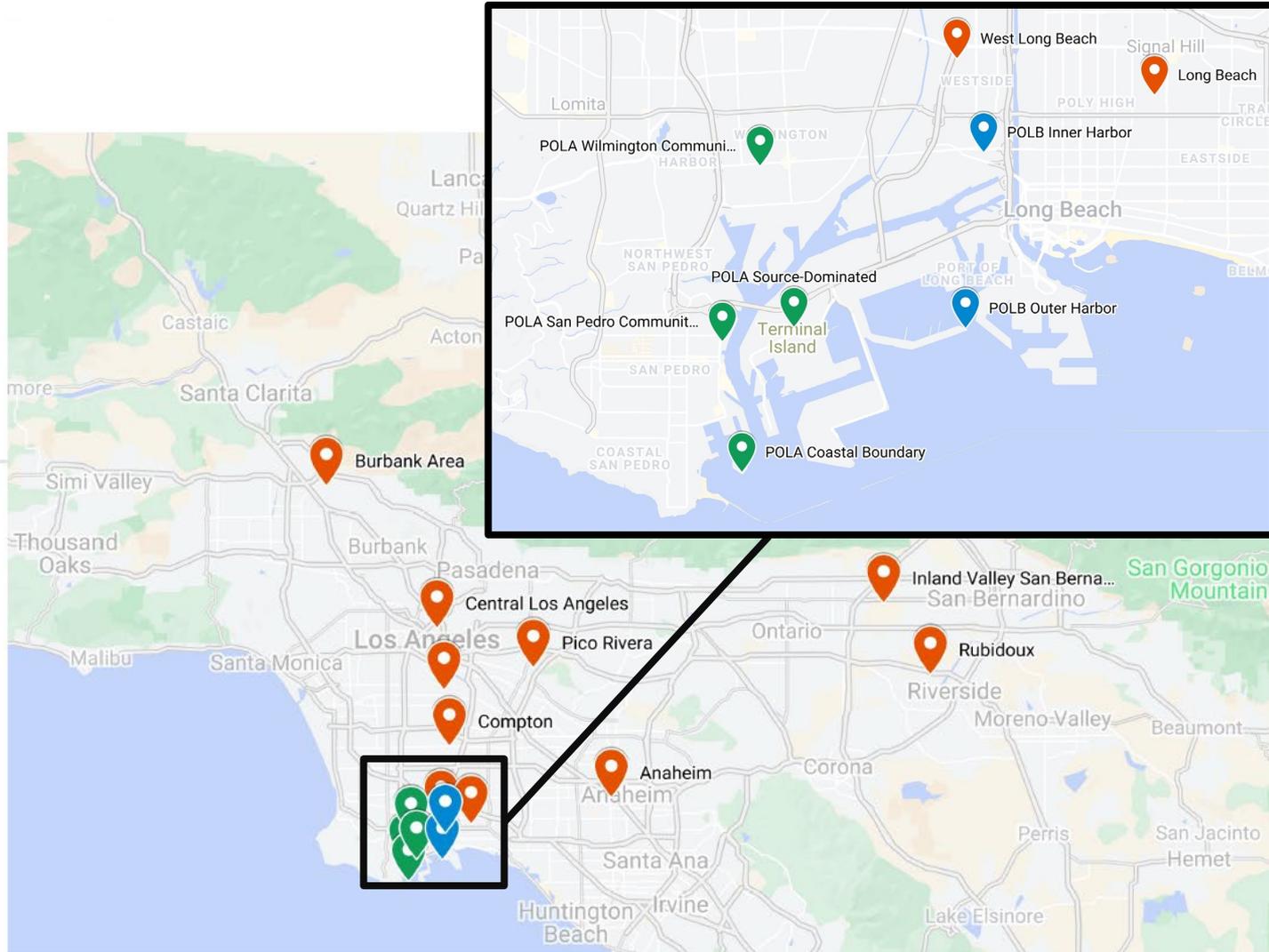
# Air Quality Monitoring Program – Stations

## 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	
Regional	Localized
CO	NO <sub>2</sub>
O <sub>3</sub>	SO <sub>2</sub>
PM <sub>2.5</sub>	PM <sub>2.5</sub>
PM <sub>10</sub>	PM <sub>10</sub>
--	EC
--	BC
--	UFP

Meteorology
Variable
Wind Speed
Wind Direction
Temperature
Relative Humidity
--
--
--

# 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 <sub>2</sub> (ppb)	13	12	14	19
O <sub>3</sub> (ppb)	29	21	24	23
SO <sub>2</sub> (ppb)	0.5	1.5*	1.5*	2.3
PM <sub>10</sub> (µg/m <sup>3</sup> )	25.0	26.4	24.7	38.7
PM <sub>2.5</sub> (µg/m <sup>3</sup> )	13.8	14.7	14.6	14.5
<b>Supplemental Pollutants</b>				
BC (µg/m <sup>3</sup> )	1.16	0.96	0.85	1.08
EC (µg/m <sup>3</sup> )	--	0.69	0.66	--
UFP (counts)	19,344	10,100	12,600	--

\* Current SO<sub>2</sub> instruments cannot detect levels below 1 ppb; measurements are at the lower detection limit. New SO<sub>2</sub> 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.



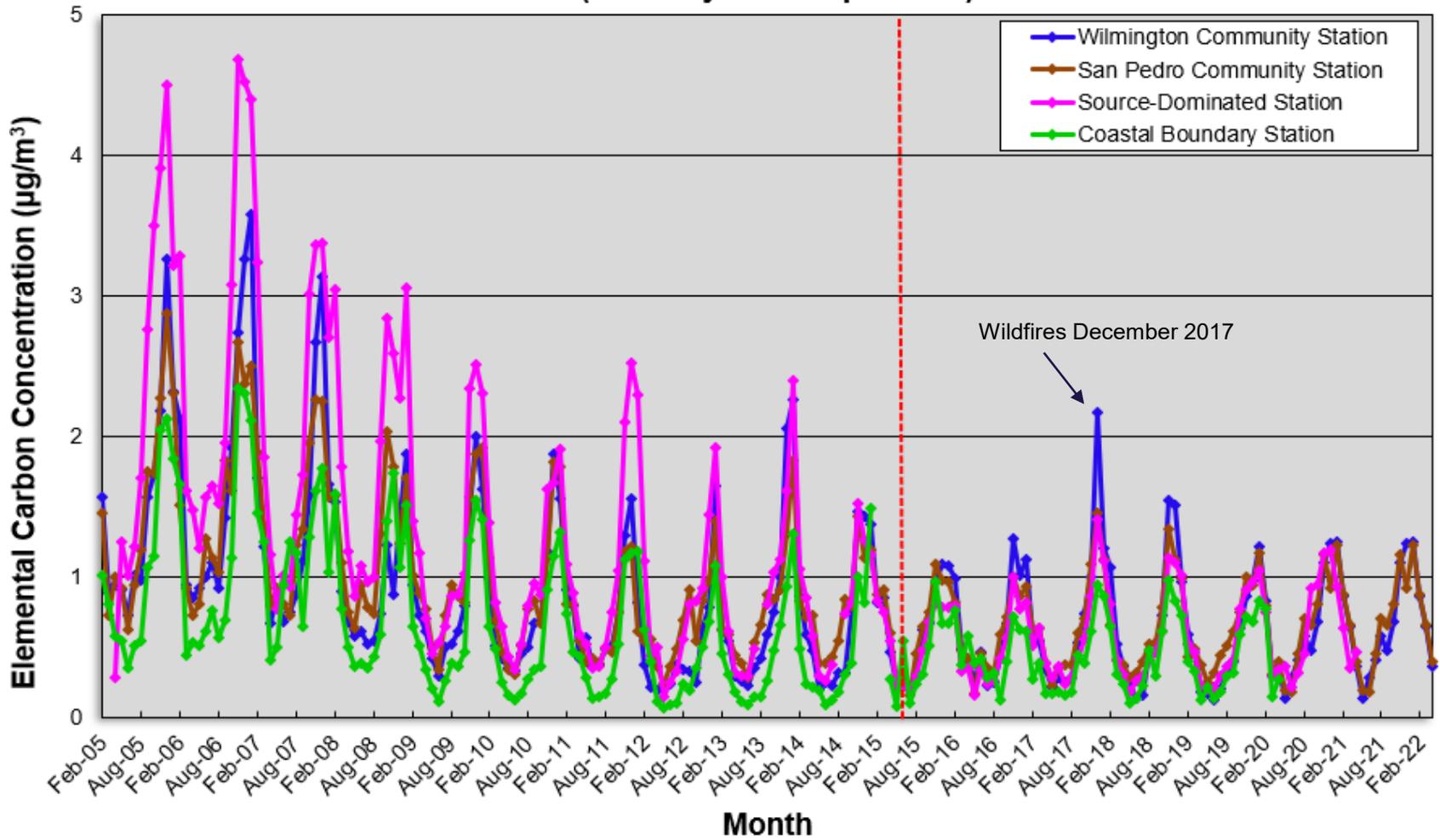
Summer



Winter

# Period of Record EC Monitoring Results

## Monthly Average Elemental Carbon Concentrations at the Port of Los Angeles (February 2005 - April 2022)

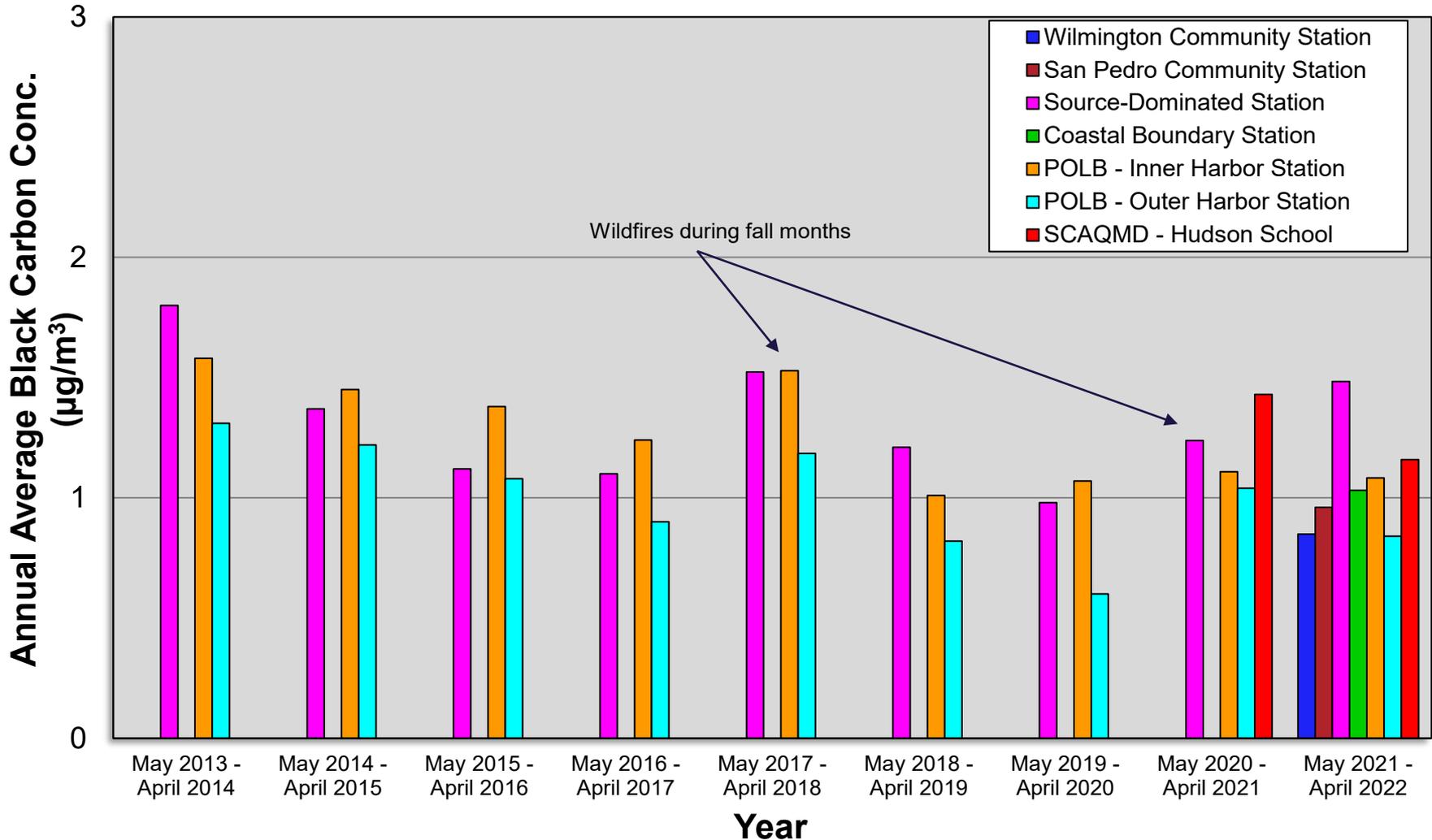


## Year 17 - Black Carbon Monitoring Results

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 ( $\mu\text{g}/\text{m}^3$ )	0.96	0.85	1.08	0.84	1.16
Compared to SCAQMD WLB	-17.2%	-26.7%	-6.9%	-27.5%	--

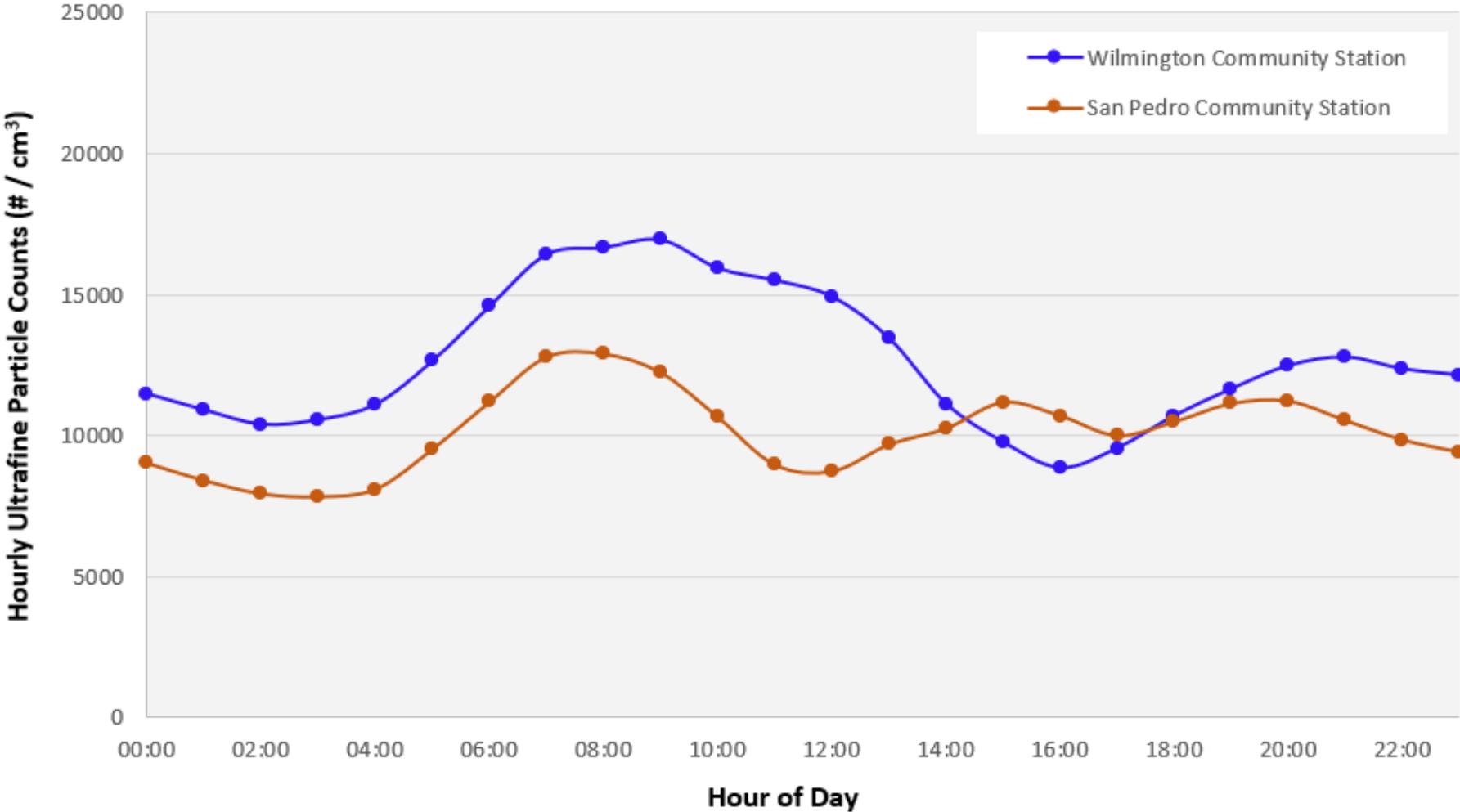
- Overall, BC measurements consistent across the five (5) stations in the San Pedro Bay Ports region.
- Port stations' annual average BC concentrations are slightly lower than corresponding BC measurements at SCAQMD West Long Beach (aka Hudson School) station.

# Annual Average Black Carbon Concentrations

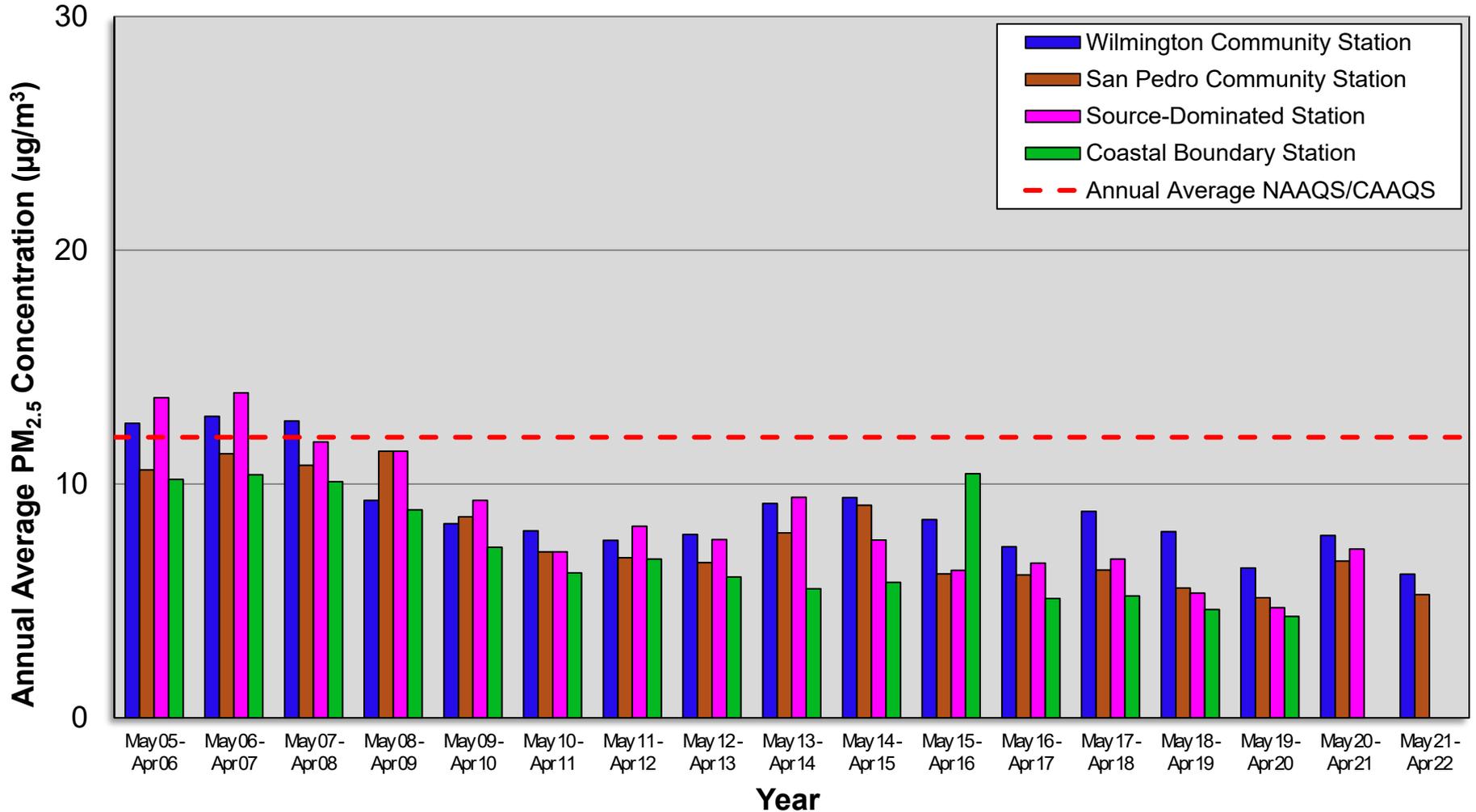


Note: 2021/2022 Annual Average BC at Source-Dominated station calculated with only 63% data completeness as instrument was offline May 1 to September 11, 2021 when BC concentrations are seasonally low.

# Average Ultrafine Particle Counts by Hour of Day

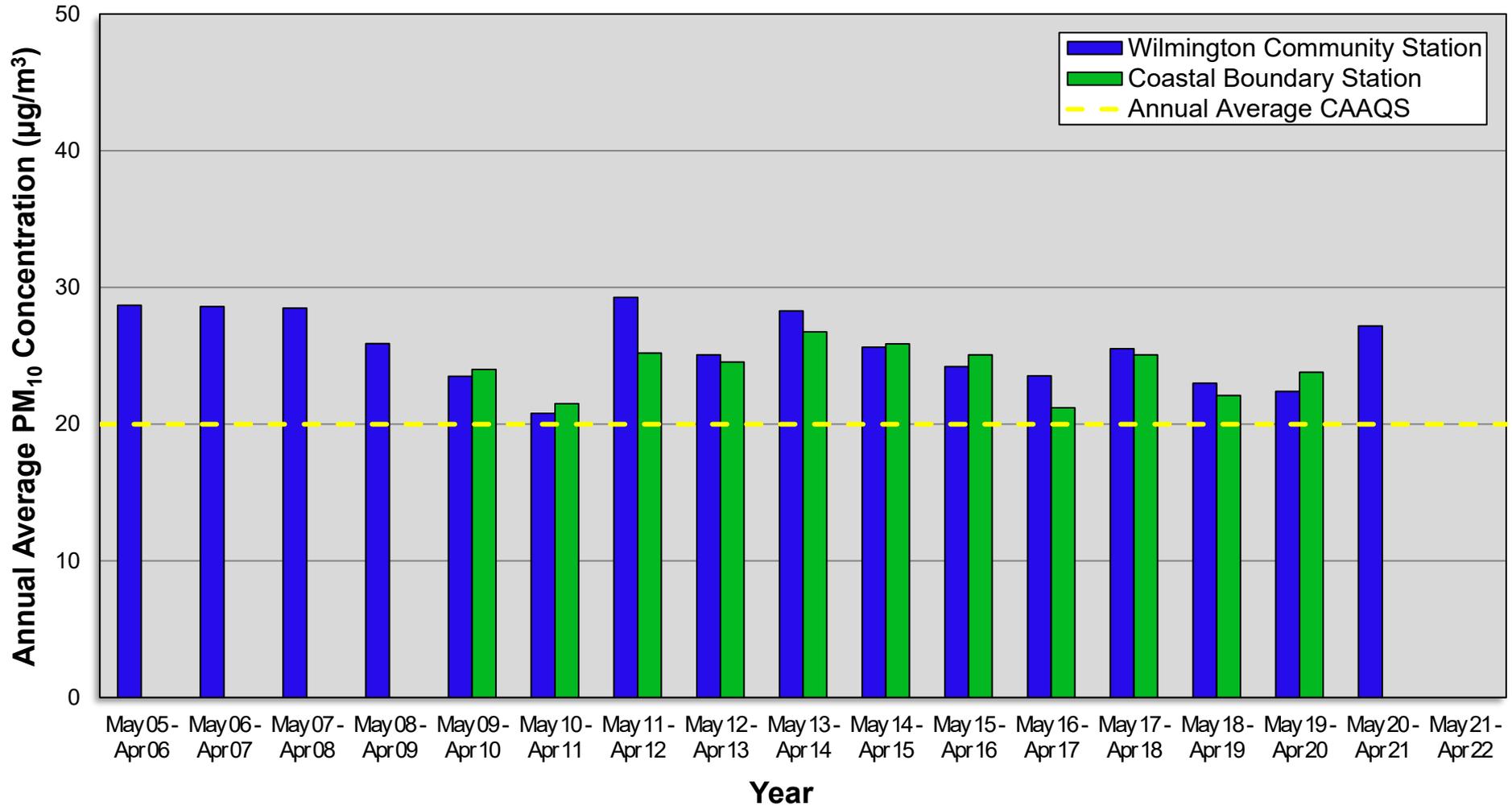


# Annual Average Filter-Based PM<sub>2.5</sub> Concentrations



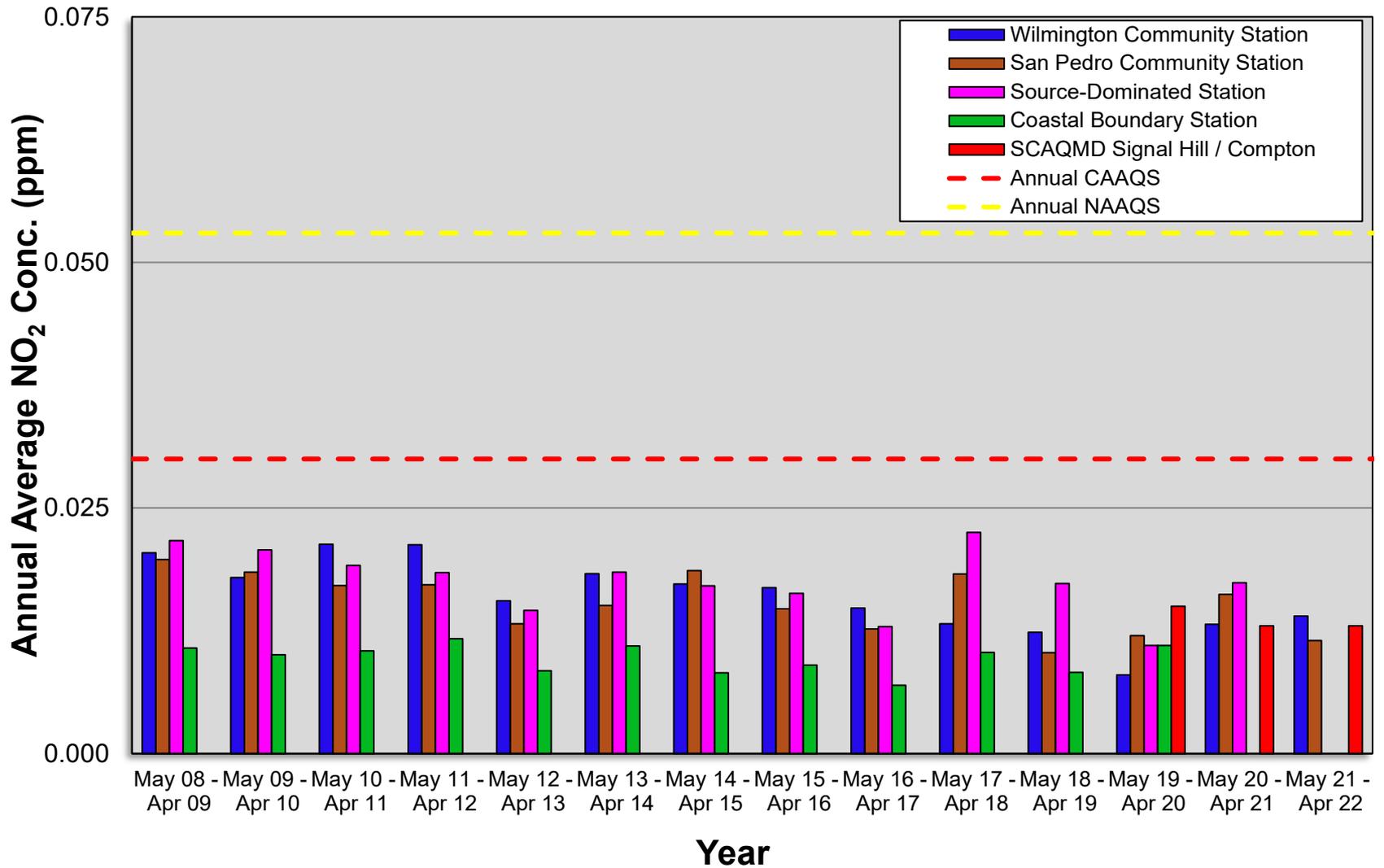
Note: Coastal Boundary station was suspended May 2020 - April 2022.  
 Source-Dominated station was suspended May 2021 - April 2022.

# Annual Average Filter-Based PM<sub>10</sub> Concentrations

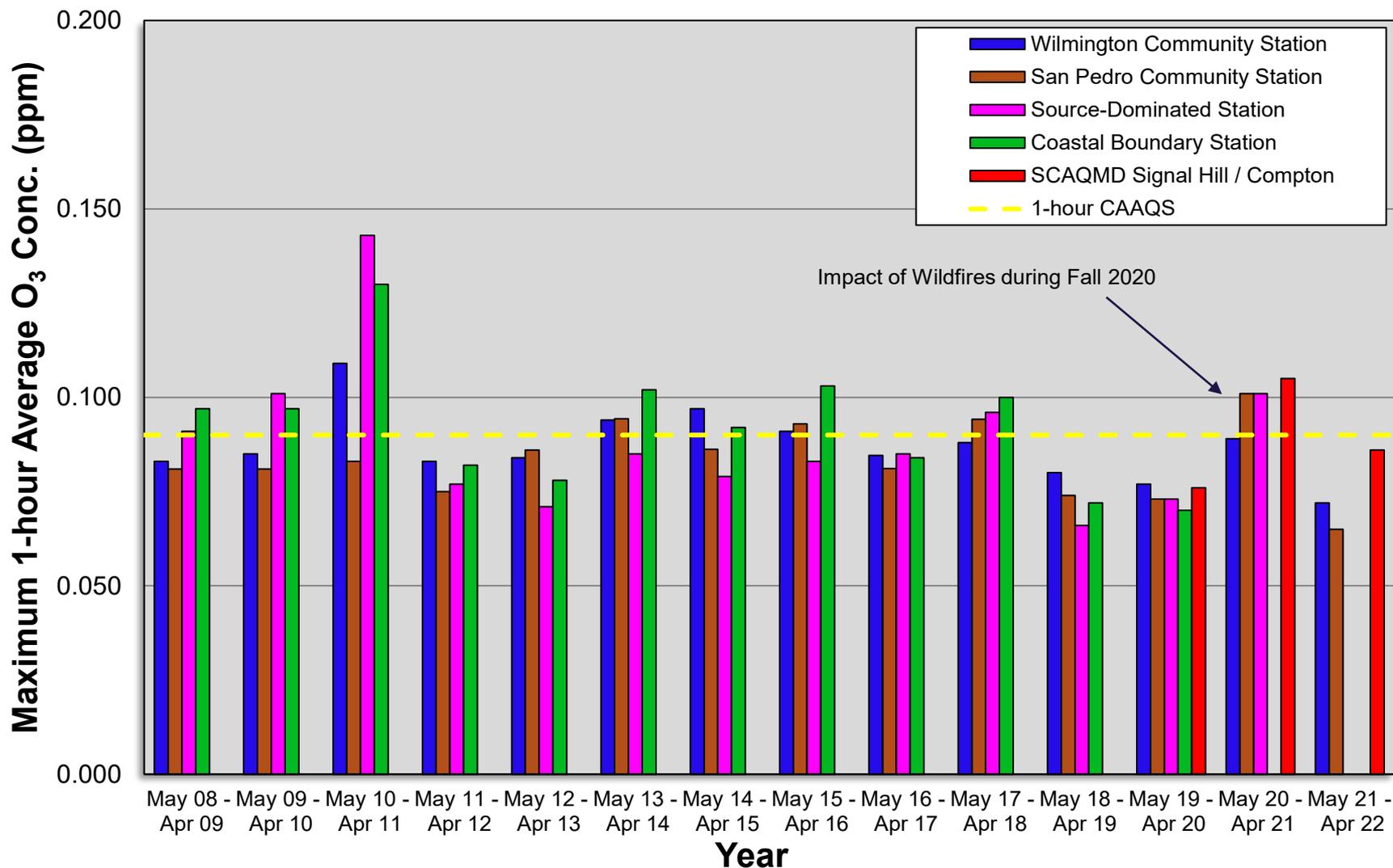


Notes: Filter-based PM<sub>10</sub> monitoring at Coastal Boundary station commenced in August 2008, suspended in May 2020.  
 Filter-based PM<sub>10</sub> monitoring at Wilmington Community station suspended in May 2021.

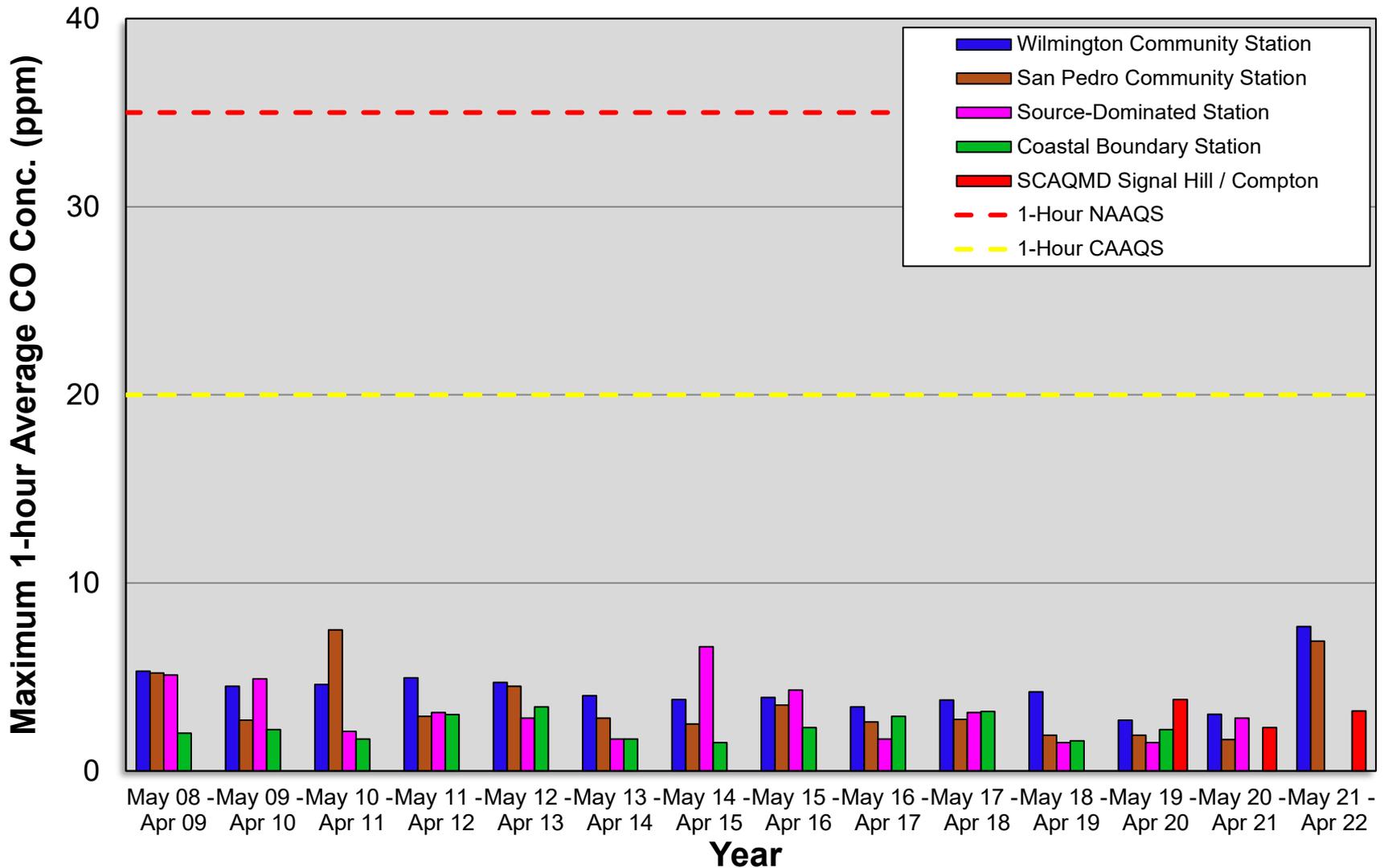
# Annual Average NO<sub>2</sub> Concentrations



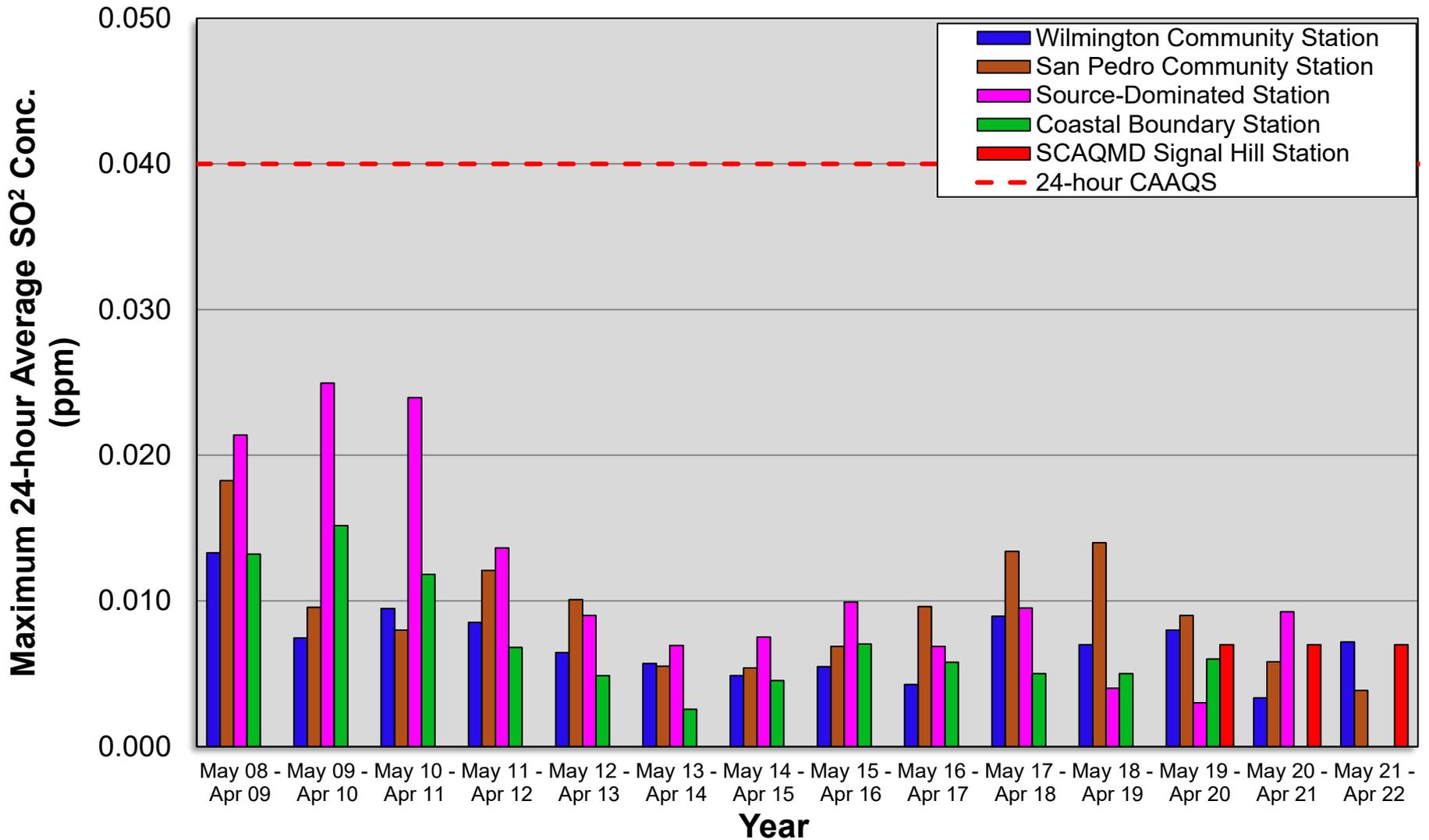
# Maximum 1-Hour O<sub>3</sub> Concentrations



# Maximum 1-Hour CO Concentrations



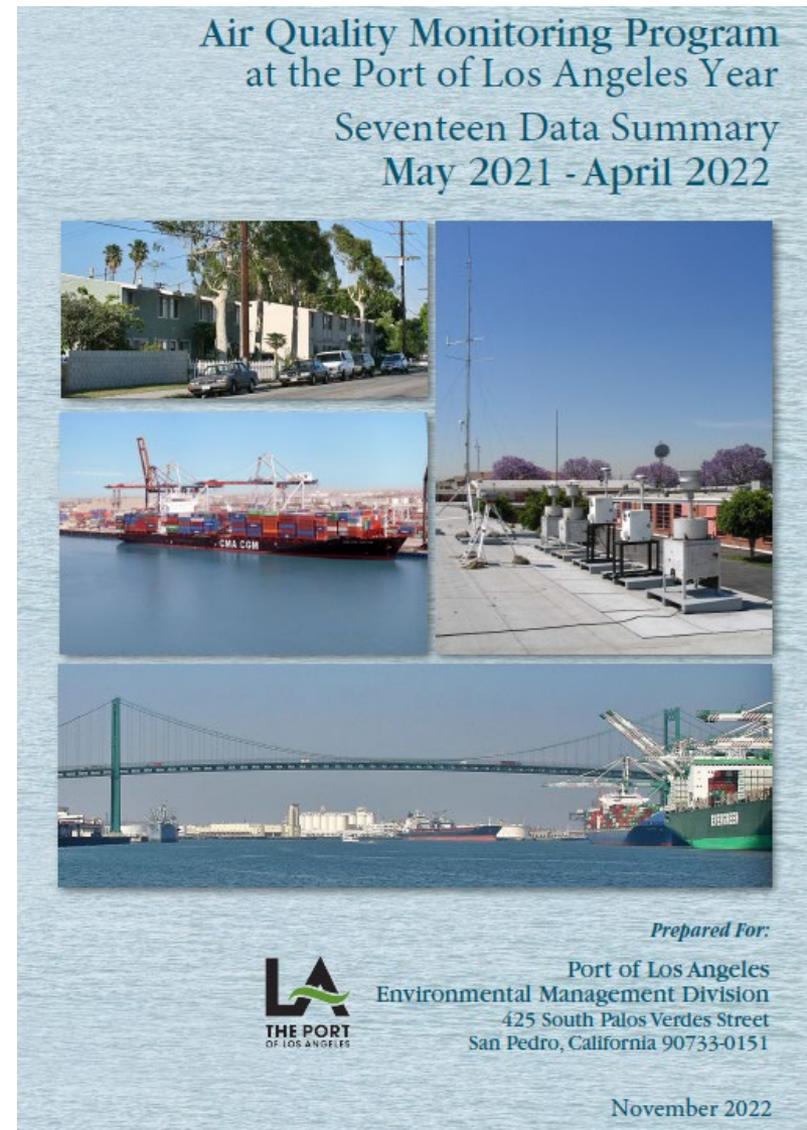
# Maximum 24-Hour SO<sub>2</sub> Concentrations



# Year 17 Annual Report

Available online at:

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





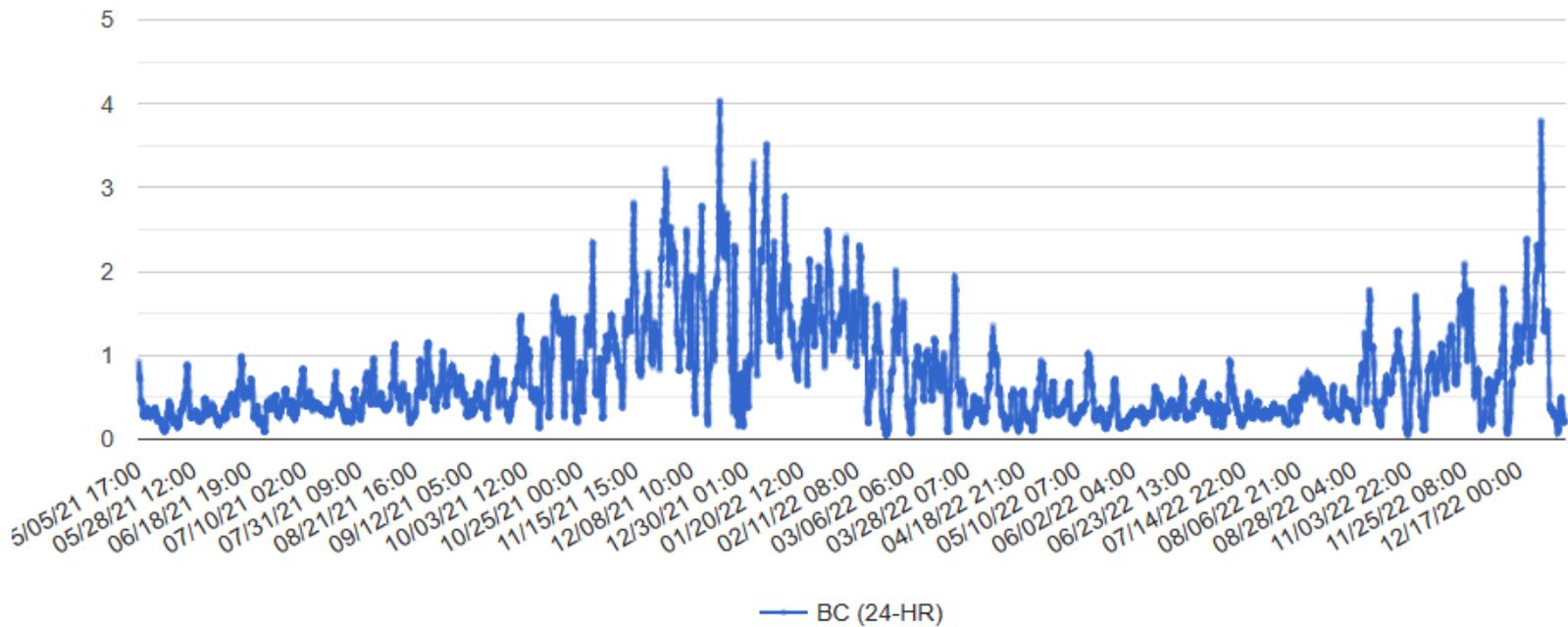
# Questions?

# 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 
<input type="button" value="Submit"/>				

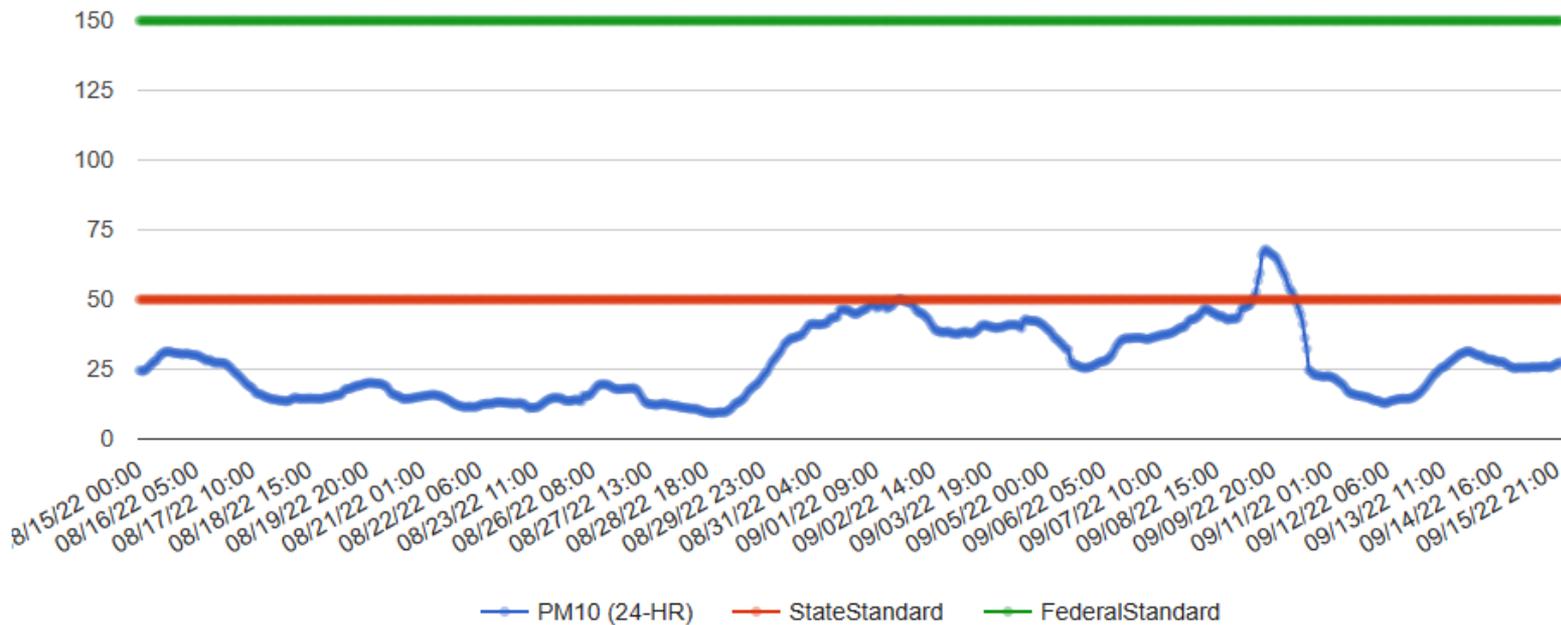
Wilmington Community - BC (24 hr)



# September 2022 - Elevated PM<sub>10</sub> 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
<input type="submit" value="Submit"/>				

### Wilmington Community - PM<sub>10</sub> (24 hr)



# 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