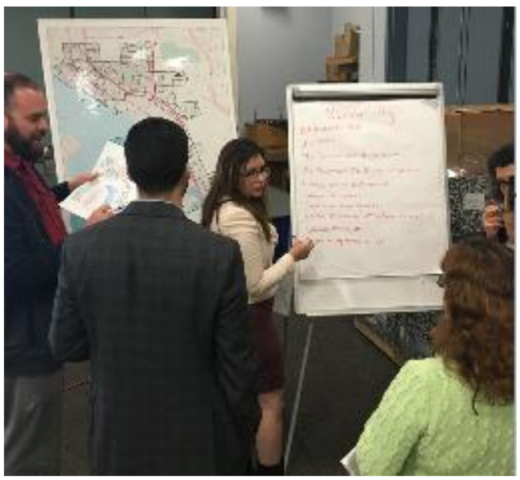
SAN DIEGO COUNTY AIR POLLUTION CONTROL DISTRICT



Community Monitoring
AB 617 Elements and Required Criteria

Version 1.0

June 2019

Contents

List of Abbreviations

Abbreviation	Meaning
APCD	San Diego Air Pollution Control District
AQDA	Air Quality Data Action
AQS	Air Quality System
BC	Black Carbon
Caltrans	California Department of Transportation
CAPCOA	California Air Pollution Control Officers Association
CARB	California Air Resources Board
CCV	Continuing Calibration Verification
CES3.0	CalEnviroScreen 3.0
CFR	Code of Federal Regulations
CV	Coefficient of Variation
DPM	Diesel Particulate Matter
DQO	Data Quality Objectives
EC	Elemental Carbon
ECOC	Elemental Carbon/Organic Carbon
EHC	Environmental Health Coalition
EJSM Score	Environmental Justice Screening Method Score
eLogbook	Electronic Logbook
GC/MS	Gas Chromatography/Mass Spectrometry
GGRF	Greenhouse Gas Reduction Fund
HAP	Hazardous Air Pollutant
HPI	Healthy Places Index
HQ	Hazard Quotient
IO	Inorganic Compounds methods
ICP/MS	Inductively Coupled Plasma/Mass Spectrometry
IEA	Industrial Environmental Association
IMPROVE_A	U.S. Interagency Monitoring of PROtected Visual Environments Revision A
IS	Internal Standard
KHP	Potassium Hydrogen Phthalate
LCS	Laboratory Control Sample
LIMS	Laboratory Information Management System
lpm	liters per minute
MDL	Method Detection Limit
MFC	Mass Flow Controller
ML	Minimum Level
MQO	Measurement Quality Objective
NAATS	National Air Toxics Trends Stations
NACAA	National Association of Clean Air Agencies
NASSCO	National Steel and Shipbuilding Company
NO_x	(Reactive) Oxides of Nitrogen = NO + NO_2

NPAP	National Performance Audit Program
OC	Organic Carbon
PM	Particulate Matter
PM_{10}	Particulate Matter exhibiting an aerodynamic diameter of 10 micrometers or less
$PM_{2.5}$	Particulate Matter exhibiting an aerodynamic diameter of 2.5 micrometers or less
PT	Proficiency Testing
QA	Quality Assurance
QC	Quality Control
RPD	Relative Percent Difference
SANDAG	San Diego Association of Governments
sccm	standard cubic centimeters per minute
SDGE	San Diego Gas & Electric
SDPZ	San Diego Promise Zone
SOP	Standard Operating Procedure
SQL	Sample Quantitation Limit
SSCV	Secondary Source Calibration Verification
SuperSASS	Super Speciation Air Sampling System
TAD	Technical Assistance Document
TAMT	Tenth Avenue Marine Terminal
TO	Toxics Organics methods
TTP	Through-The-Probe
USEPA	(United States) Environmental Protection Agency
VOCs	Volatile Organic Compounds
XRF	X-ray Fluorescence Spectroscopy

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INTRODUCTION

In response to Assembly Bill 617 (AB 617) [C. Garcia, Chapter 16, Statutes of 2017], the California Air Resources Board (CARB) established the Community Air Protection Program (CAPP or Program). The Program's focus is to reduce exposure to air pollutants in the most impacted communities in the state.

The San Diego Air Pollution Control District (District or APCD) nominated the Portside Communities of San Diego to be included in this CARB-funded program. The Portside Communities includes the communities of, and portions of: Barrio Logan, Logan Heights, Sherman Heights, and National City.

The Portside Communities was accepted as one of ten communities within the State to be granted monies to conduct air quality monitoring during the first round of AB 617 funding. Prior to this acceptance for receiving AB 617 funds, the District began reaching out to members of the community to discuss areas of mutual interest. These meetings were key to identifying air pollution concerns within the Portside Communities and helped start the process of forming community partnerships.

To facilitate information sharing and dissemination of AB 617-related information, the District created a new webpage on its website (https://www.sdapcd.org/content/sdc/apcd/en.html).

The Community Air Protection Program Webpage can be found at:

https://www.sandiegocounty.gov/content/sdc/apcd/en/community-air-protection-program--ab-617-.html

This document and the entire AB 617 air monitoring program are very dynamic, so the AB 617 webpage is the best place to find the most current information regarding this program. Specific webpages and sources of current information will be referenced in this document as appropriate.

This Air Monitoring Plan describes the Community Air Protection Program in San Diego county, the composition of the Steering Committee, and how the AB 617 air monitoring program is set up and operated by the District.

The San Diego Community Air Monitoring Plan below is organized based on elements and criteria identified by CARB Community Air Protection Blueprint, Appendix E (Statewide Air Monitoring Plan). The complete CARB Community Air Protection Blueprint can be found at:

https://ww2.arb.ca.gov/index.php/our-work/programs/community-air-protection-program/community-air-protection-blueprint

The District has strived to include all relevant information about the Community Air Monitoring Plan in this document. However, due to the dynamic nature of this program it will be impossible to keep it totally up to date and will only be revised upon major additions or changes to the program. Readers of this document are encouraged to provide feedback regarding the program and/or this document to the District at any time.

Monitoring Plan Element 1: COMMUNITY PARTNERSHIPS

As mentioned above, the District reached out to members of the community to discuss areas of mutual interest. The first of these meetings took place even before the community nomination process. This process began the discussions to identify air pollution concerns within the Portside Communities and helped start the formation of community partnerships.

The community air monitoring program in San Diego is overseen by the Steering Committee, which is comprised by a majority number of community residents, along with representatives from business interests and local government/agencies. The Steering Committee is further described below.

1.1 Steering Committee and Affiliations

By design, the Steering Committee is comprised of an odd number of members, with a majority being residents who live within the boundaries of the Portside Communities. The Steering Committee members include: individuals residing, working, or owning businesses within the Portside Communities; local community-based environmental justice organizations; local public health organizations that work within the Portside Communities; schools; academic researchers; labor unions; land use planning agencies; city/county officials; transportation agencies; locally-based business associations; and, workers or managers from larger industrial sources located in the Portside Communities.

The Steering Committee operates under the Steering Committee Charter:

https://www.sandiegocounty.gov/content/dam/sdc/apcd/PDF/AB_617/PORTSIDE%20COMMUNITY%20STEERING%20COMMITTEE%20CHARTER11-20-18.pdf

This Charter spells out the composition of the Committee, how meetings will be conducted, and how information will be made available to Committee members and the general public. The current Steering Committee roster can be found at:

https://www.sandiegocounty.gov/content/dam/sdc/apcd/PDF/AB_617/PortsideMembers.pdf

1.2 Steering Committee Meeting Information

The first Steering Committee meeting occurred on October 25, 2018, at Perkins Elementary School in Barrio Logan (located at Main Street and Beardsley Street). There were 43 people in attendance that included, 16 out of 20 regular steering committee members, 1 committee alternate, 6 people from the public, 1 interpreter, 12 District staff, and 7 CARB staff.

Figure 1-1: Steering Committee Meeting at Perkins Elementary School (10-25-2018)

All Steering Committee meetings are planned to be held monthly in the evening (6 pm to 8 pm). The location (primarily at the Perkins Elementary School location (in the school cafeteria) and times are designed to accommodate residents that have obligations during the day, thus making it easier for them to attend and participate. The meeting dates, times, and location are posted on the District website:

https://www.sandiegocounty.gov/content/sdc/apcd/en/community-air-protection-program--ab-617-.html

1.3 Community Involvement and Available Resources

Starting in March 2018, the District invited stakeholders to participate in meetings to assist in developing the community monitoring nomination document. The draft nominating document was submitted to CARB on April 30, 2018, and the final document on July 31, 2018. Stakeholders in the document preparation included: the public; non-profit organizations (Casa Familiar and the Environmental Health Coalition (EHC)); academics from local universities; industry representatives; San Diego Gas & Electric (SDGE); the City of San Diego; the San Diego Association of Governments (SANDAG); the Port of San Diego; and, the U.S. Navy. Additionally, there were individual presentations given to SANDAG, the City of San Diego, the Port of San Diego, Casa Familiar, and industry. There were also two evening meetings with EHC where information was provided to residents in Spanish by bilingual District Compliance Inspectors.

The District developed English and Spanish applications and a draft charter for interested parties to apply as Steering Committee members. The goal of the Steering Committee composition was to have a diverse group that represented the recommended communities. The charter and committee membership makeup have since been updated to comply with CARB's final blueprint document.

A list of all Steering Committee meeting dates, agendas, and approved minutes can be found at:

https://www.sandiegocounty.gov/content/sdc/apcd/en/community-air-protection-program--ab-617-/ab-617-steering-committee-documents.html

A list of meetings and workshops that the District attended, participated in, or led in preparation of nominating a community, preparing to implement the monitoring program if selected in order to meet the July 1, 2019 deadline, through the first Steering Committee meeting is shown in Table 1-1.

Table 1-1: Summary of AB 617 Meetings with District Participation

Date	Subject	City	Attendees	Notes
October 23, 2017	CARB AB 617 Workshop	Los Angeles	~35	Listened to CARB/SCAQMD/Non-Profits/Public/Christina Garcia
November 18, 2017	APCD Advisory Group Meeting	San Diego	4	Update on AB 617 was an agenda item; answered questions
November 28, 2017	CARB Freight / AB 617 Workshop	National City	~35	Evening CARB community meeting on AB 617 and freight
February 14, 2018	APCD Advisory Group Meeting	San Diego	4	Update on AB 617 was an agenda item; answered questions
February 28, 2018	State of CA Community Air Protection Summit	Riverside	~150	Workshop on AB 617 Implementation- Best Practices
March 12, 2018	State of CA Community Leadership Summit	Riverside	~150	Workshop best practices in having community project success
March 14, 2018	APCD Advisory Group Meeting	San Diego	4	Update on AB 617 was an agenda item; answered questions
March 23, 2018	Stakeholder Kick-Off Meeting	San Diego	~20	Two community organizations, academia, utility, industry, EPA
March 29, 2018	San Ysidro Community Meeting	San Ysidro	~25	Residential concerns in San Ysidro/Otay Mesa
Month of April 2018	Door-to-Door Grant Outreach	San Diego		Outreach to companies in Portside Community
April 11, 2018	Portside Community Presentation	National City	20	Presentation at Environmental Health Coalition
April 14, 2018	SDAPCD Advisory Board Meeting	San Diego	4	Agenda item was an AB 617 update
April 24, 2018	Project Workshop	San Diego	20	ARB presented program details, Q&A
April 26, 2018	Grant Outreach	San Diego		Outreach grants at industry Mexport Conference
April 27, 2018	Stakeholders Meeting	San Diego	20	Progress on monitoring, incentives grants
Month of May 2018	Door-to-Door Grant Outreach	San Diego		Outreach to companies in Portside Community
May 17, 2018	Monitoring Stakeholders Tour of District Facilities	San Diego	3	Tour of District lab and monitoring station for 2 professors and Joy Williams of EHC
May 29, 2018	Meeting with City officials	San Diego	6	Talk with City of San Diego Executive Team and Mayoral staff
May 31, 2018	Stakeholders Meeting	San Diego	24	Progress on monitoring, incentives
May 31, 2018	San Ysidro Community Meeting	San Diego	~25	Presentation at Casa Familiar Community Meeting
Month of June 2018	Door-to-Door Grant Outreach	San Diego		Outreach to companies in Portside Community
June 1 and 2, 2018	Meeting, tour of communities	San Ysidro/ National City	~25	Workshop and Port tour with CARB, EHC, and Casa Familiar
June 5, 2018	SANDAG presentation	San Diego	5	Project update for SANDAG Planning staff
June 7, 2018	SANDAG CBO Working Group presentation	San Diego	12	Provided AB 617 update
June 7, 2018	Grant Outreach	San Diego	~15	Port Tenants Association Environmental Managers Meeting
June 13, 2018	Environmental Health Coalition Community Meeting	National City	10	Instructed residents how to report air quality complaints to District; bilingual inspectors presented

June 18, 2018	IEA/APCD Workshop for industry	San Diego	32	Update on Emission Inventory Tool
June 22, 2018	Project Meeting	San Diego		Progress on monitoring, incentives grants
June 25, 2018	IEA/APCD Workshop for industry	San Diego	~20	AB 617 update including CARB Blueprint
June 27, 2018	Stakeholders Meeting	San Diego	~25	Update; Progress on monitoring, incentives grants, inspections; getting feedback from stakeholders
August 23, 2018	Stakeholders Meeting	San Diego	~25	Update; Progress on monitoring, incentives grants, inspections; getting feedback from stakeholders
October 4, 2018	Stakeholders Meeting	San Diego	~20	Update; Progress on monitoring, incentives grants, inspections; getting feedback from stakeholders
October 4, 2018	First Steering Committee Meeting	San Diego	42	16 of 20 committee members; CARB/District staff

In all the meetings listed in Table 1-1 the District engaged attendees, solicited ideas and comments and incorporated their suggestions into the District's nominations and plans. The District will continue this collaborative approach with the Steering Committee and the Portside Communities throughout the entire AB 617 program.

1.4 District Webpage for Community Air Monitoring Program

The District's website has a section devoted to AB 617 that is prominently included on the District Homepage:

https://www.sdapcd.org/content/sdc/apcd/en.html

An image of the District's Homepage on April 8, 2019 is shown in Figure 1-2. This shows how users can easily find the District's AB 617 webpage. The Homepage content immediately below that shown in Figure 1-2 is shown in Figure 1-3, which shows how easily users can find links to the AB 617 webpage and documents.

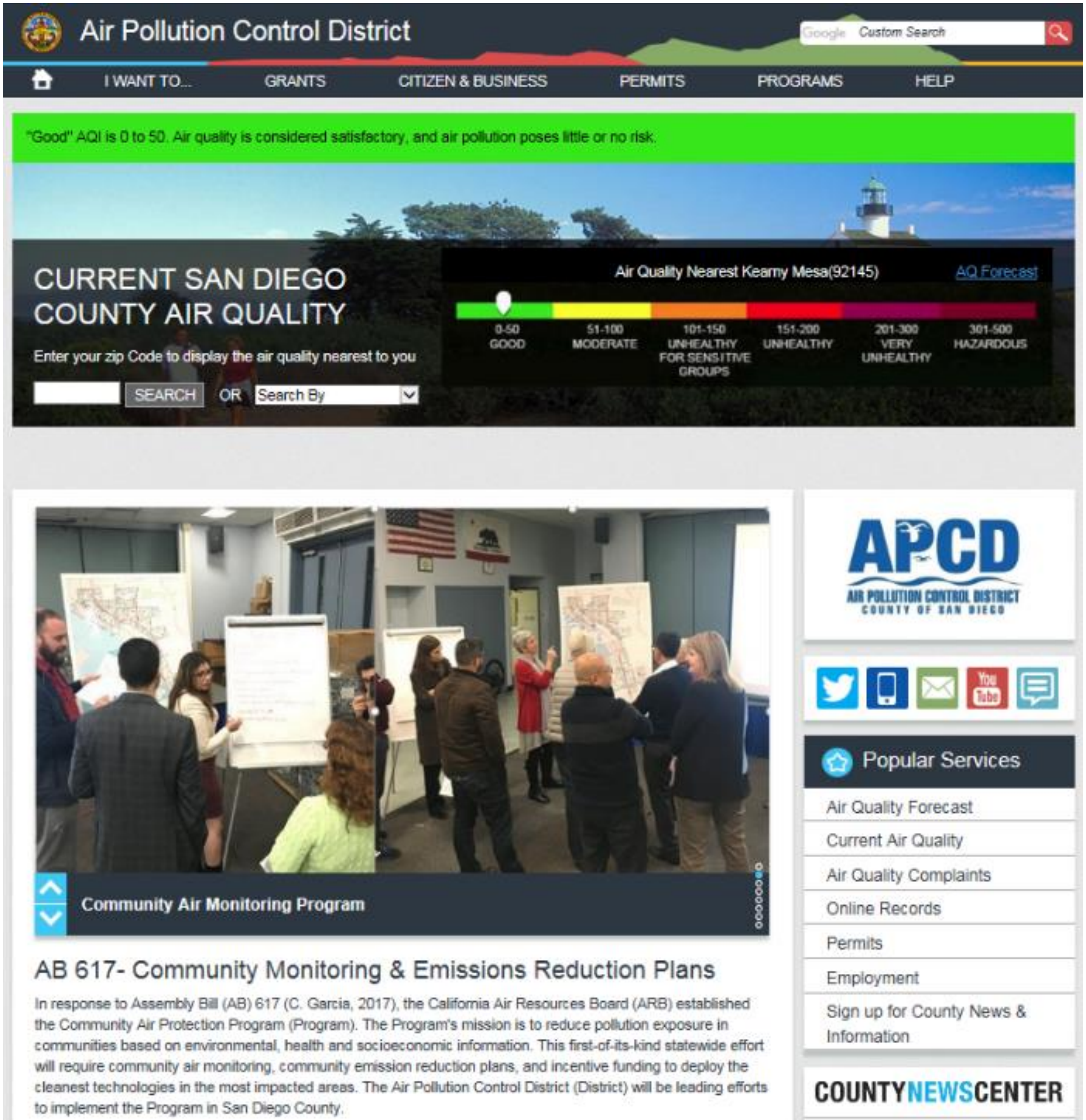
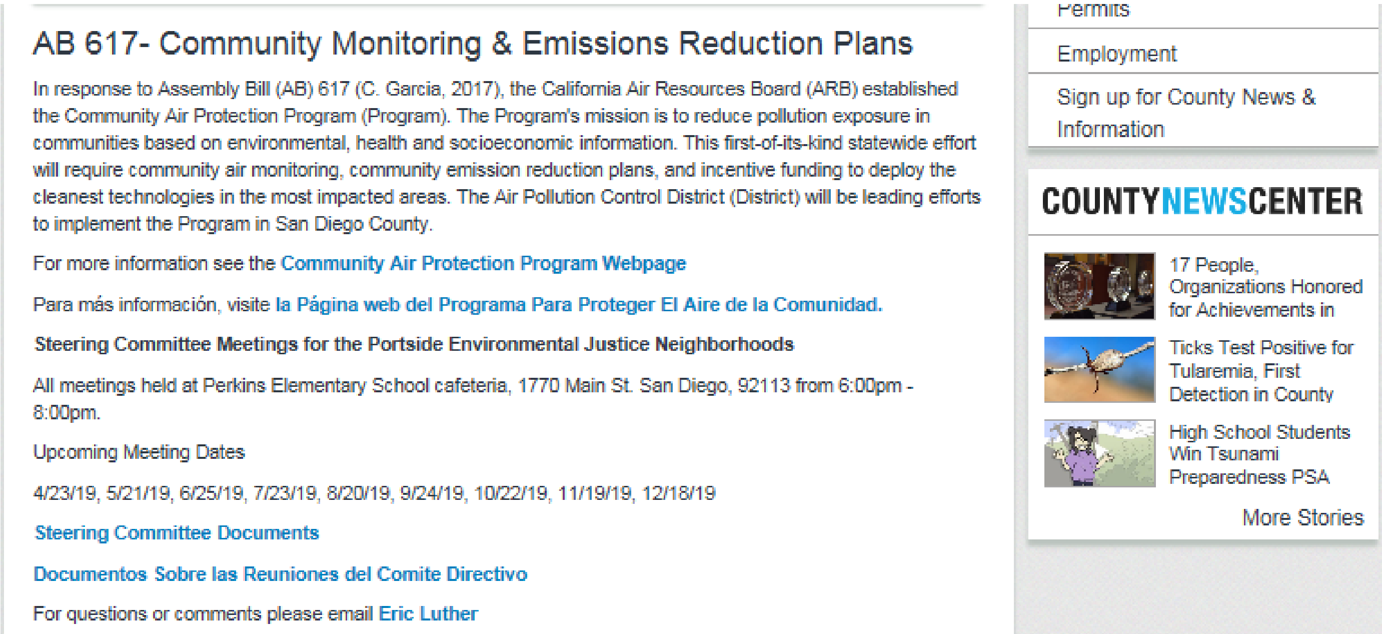


Figure 1-2: Image of District AB-617 Webpage (April 8, 2019)



AB 617- Community Monitoring & Emissions Reduction Plans

In response to Assembly Bill (AB) 617 (C. Garcia, 2017), the California Air Resources Board (ARB) established the Community Air Protection Program (Program). The Program's mission is to reduce pollution exposure in communities based on environmental, health and socioeconomic information. This first-of-its-kind statewide effort will require community air monitoring, community emission reduction plans, and incentive funding to deploy the cleanest technologies in the most impacted areas. The Air Pollution Control District (District) will be leading efforts to implement the Program in San Diego County.

For more information see the Community Air Protection Program Webpage

Para más información, visite la Página web del Programa Para Proteger El Aire de la Comunidad.

Steering Committee Meetings for the Portside Environmental Justice Neighborhoods

All meetings held at Perkins Elementary School cafeteria, 1770 Main St. San Diego, 92113 from 6:00pm - 8:00pm.

Upcoming Meeting Dates

4/23/19, 5/21/19, 6/25/19, 7/23/19, 8/20/19, 9/24/19, 10/22/19, 11/19/19, 12/18/19

Steering Committee Documents

Documentos Sobre las Reuniones del Comite Directivo

For questions or comments please email Eric Luther

Permits

Employment

Sign up for County News & Information

COUNTYNEWSCENTER

17 People, Organizations Honored for Achievements in

Ticks Test Positive for Tularemia, First Detection in County

High School Students Win Tsunami Preparedness PSA

More Stories

Figure 1-3: Additional Details of District Homepage showing Links to AB-617 Webpage (April 8, 2019)

1.5 District Contacts

The District maintains a contact list of individuals that have worked with interested parties, provided expert advice, and assisted with presentations. Individuals include:

- Lead Contacts:

Jon Adams: jon.adams@sdcounty.ca.gov or (858) 586-2653
William Jacques: william.jacques@sdcounty.ca.gov or (858) 586-2671

- District Subject Matter Experts:

  - Air Quality Monitoring

Bill Brick: **bill.brick@sdcounty.ca.gov**

  - Emissions/BARCT

Jim Swaney: **jim.swaney@sdcounty.ca.gov**

  - Incentives/Grants

Kathy Keehan: **kathleen.keehan@scounty.ca.gov**
Nick Cormier: **nick.cormier@sdcounty.ca.gov**

  - Inspections and Public Complaints

Mahiany Luther: **mahiany.luther@sdcounty.ca.gov**

Monitoring Plan Element 2: COMMUNITY-SPECIFIC AIR MONITORING

The Portside Communities are located adjacent to numerous stationary sources of air pollution along the waterfront of San Diego Harbor (e.g., shipyards), as well as smaller sources interspersed within the communities. Mobile sources in the area include ships on the harbor, trains, and automobile and heavy-duty diesel truck traffic along the nearby freeways and local roadways located throughout the communities.

These sources and locations of residences in Barrio Logan and Logan Heights are shown in Figure 2-1. This map shows the primarily residential areas highlighted in green; mixed-use areas in purple; shipyards and commercial zones in black; trainyard in red; and the Tenth Avenue Marine Terminal (TAMT) in yellow. The red star shows the location of Perkins Elementary School, where the District operated an air monitoring station from July 2005 through October 2016. The yellow star shows the location of Memorial Academy, where the District and CARB operated an air monitoring station from October 1999 through February 2001.

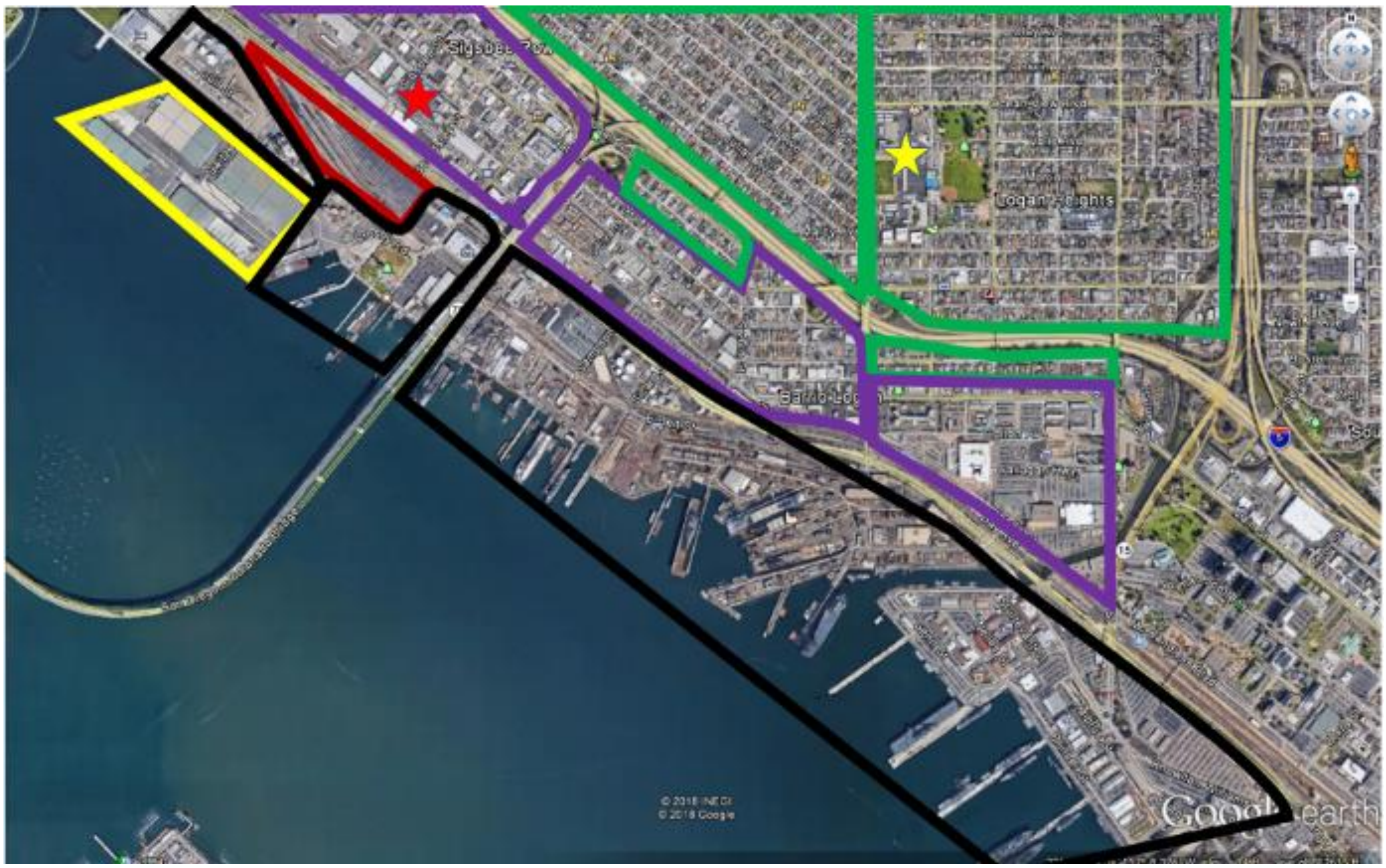


Figure 2-1: Land Use Highlighted Map of Barrio Logan and Logan Heights Area

There have been longstanding concerns regarding air pollution in these communities. Asthma rates in the Portside Communities are at the upper range documented for San Diego county. These elevated asthma rates also extend to the east-northeast, which is downwind of the harbor area and along major transportation corridors in the region.

As noted above, the APCD and CARB have monitored air pollution in Barrio Logan and Logan Heights in the past. Ambient air pollution levels measured did not find high concentrations of source-specific compounds or levels of mobile-source pollutants that were higher than other areas of the county. This monitoring, however, lacked localized and community-level data, and elevated air pollution levels may have been missed. It is important to locate areas of elevated air pollution levels in the Portside Communities, and to decrease air pollution levels in disadvantaged communities. Documenting the air pollution levels throughout the Portside Communities, and ultimately to reduce air pollution levels are the major goals of the AB 617 program for San Diego county. Details of this air monitoring program are provided in the Sections below.

2.1 Community-Specific Air Monitoring

Funding provided under AB 617 will provide the opportunity to simultaneously monitor air pollutants at multiple locations in the Portside Communities to better understand the levels and gradients through the community. This new information will hopefully provide insight into what pollutants and sources are responsible for the elevated rates of asthma and other health-related issues in these communities.

Pollutants of interest in the Portside Communities include emissions from diesel engines, which includes particulate matter of 2.5 micrometers and less in diameter ($PM_{2.5}$) and black carbon. Other pollutants of interest include airborne metals and volatile organic compounds (VOCs). The District is planning on installing numerous sites to measure these pollutants in the Portside Communities using state-of-the-art, scientific equipment. The equipment to be used and sampling schedules are included in Section 4 of this monitoring plan.

2.2 Background Information on Community Selection for Air Monitoring Program

Information from multiple sources and methods was used to determine which communities in the San Diego region to consider and ultimately nominate for consideration by CARB for AB 617 air monitoring funds. The District considered health statistics (as described above), air quality concerns from residents in multiple communities, as well as screening tools that combine environmental, health, and socio-economic information to calculate community-wide risk factors.

The information gathered and assessed in order to select communities to be nominated by the District for AB 617 funds are described below. The District ultimately nominated the Portside Communities and the San Ysidro/Otay Mesa communities for consideration of receiving AB 617 air monitoring funds. The Portside Communities in San Diego county received air monitoring funding for the first statewide selections in 2018. It is anticipated that the San Ysidro/Otay Mesa communities, and other communities in San Diego county will receive air monitoring grants in future years of AB 617 funding.

2.2.1 Communication with Community Residents

The District has met with community residents' numerous times over the past year (see Table 1-1). During these meetings residents have expressed concerns over truck traffic, truck idling, businesses located near and adjacent to homes, and commercial activities in the Port of San Diego. Pollutants of concern included diesel particulates, toxics, and metals. These concerns were emphasized during the EHC-CARB tour in the community on June 1st and 2nd, 2018.

At the Steering Committee meeting of December 17, 2018, members expressed concerns on how air pollution is negatively impacting children, the elderly, and other residents. At this meeting, the District held an interactive session, where there were two break-out groups; these two groups worked on possible future monitoring locations within the community. One group worked on the northern portion of the community while the other group worked on the southern half (see Figures 2-2 and 2-3).

The break-out groups and other community suggestions resulted in over 40 specific areas of interest for air monitoring in the Portside Communities. This number of locations is far too high to be realistically monitored as part of this program. The Steering Committee members therefore agreed that the District should seek a contractor to conduct mobile monitoring to help identify areas of localized “hot spots” in air pollutants. This information will be used to narrow down areas of interest for fixed air monitoring locations within the Portside Communities.

Steering Committee members agreed to have the District operate air monitoring equipment at the northwest corner of the Tenth Avenue Marine Terminal (TAMT) to measure air pollutant concentrations upwind of the Portside Communities. The Steering Committee also agreed that the Districts regional air quality monitoring station at Sherman Elementary School (in Sherman Heights) will be included in the Portside Communities air monitoring locations. The Sherman Elementary School location will monitor for criteria air pollutants (includes ozone, nitrogen dioxide, and particulate matter), meteorological parameters, as well as black carbon, elemental carbon, toxic VOCs, toxic-carbonyls (includes formaldehyde), toxic-metals, and PAMS-VOCs (C2-C6 compounds).

Figure 2-2: Steering Committee Break-out Sessions

Figure 2-3: Steering Committee Break-out Session Detail

2.2.2 CalEnviroScreen 3.0

The State's Office of Environmental Health Hazard Assessment (OEHHA) Department has created an environmental assessment tool known as CalEnviroScreen. The latest version of this assessment tool is 3.0. (Hence, known as CalEnviroScreen 3.0). Herein, we will also refer to this as assessment tool as CES3.0.

CES3.0 applies various environmental, health, and socio-economic variables to each census tract in the state. It uses these data to rank census tracts. These rankings are then be color-coded and displayed in map form to show the rankings relative to other census tracts across the state and within local communities. The data can also be downloaded to show the factors applied to each census tract.

A CES3.0 map for the entire state is shown in Figure 2-4. This map shows areas with the lowest CES3.0 scores in green tones and the highest scores in red tones (see Legend on map – these score colors will remain constant over the next few Figures below). In general, lower scores are associated with sparsely populated areas, while the higher scores tend to be centered on urban areas. One notable exception to this pattern is seen in the Central Valley, a predominately agricultural area that does have air quality issues, toxic chemicals, high levels of asthma, and socio-economic stresses.

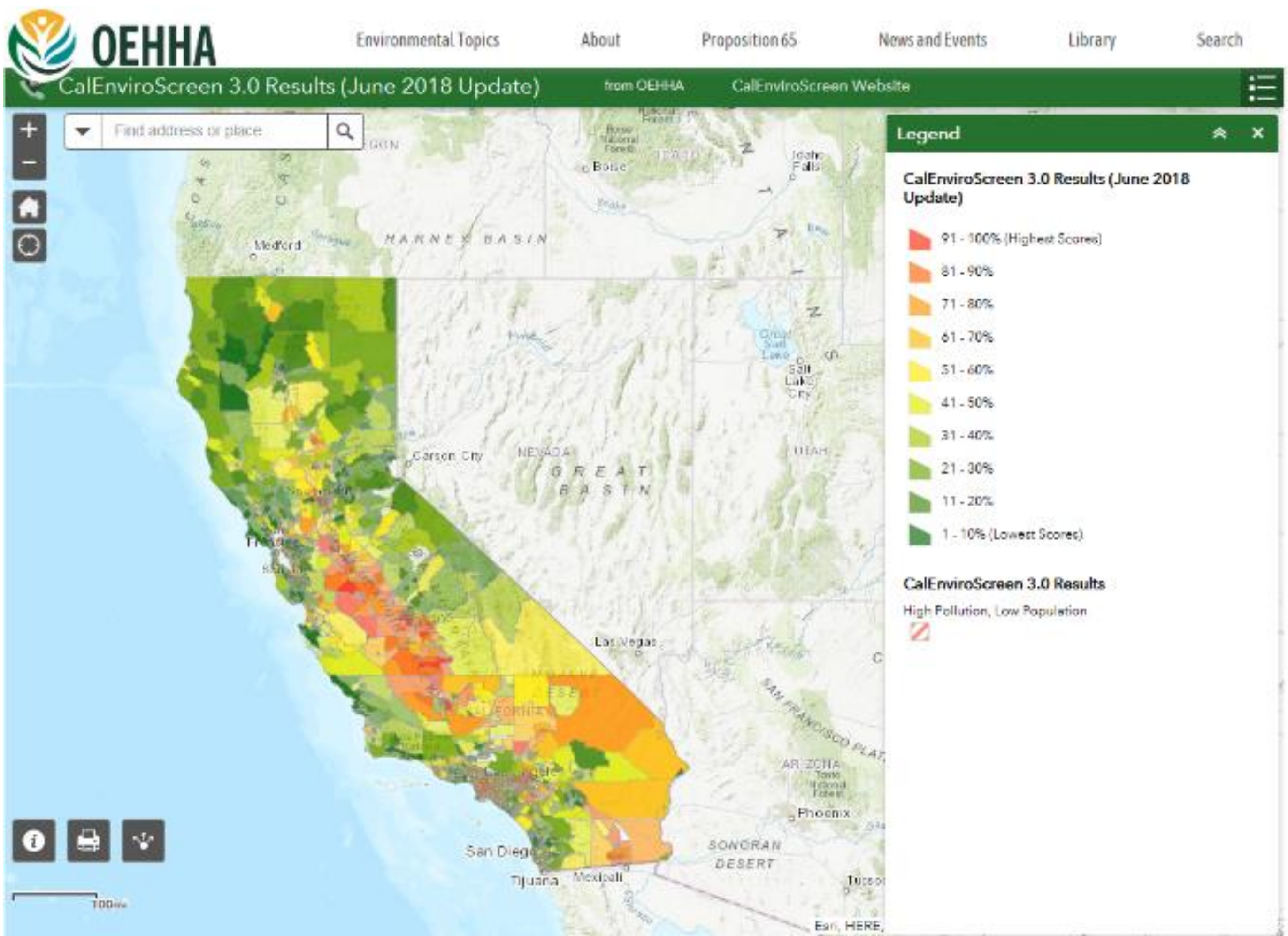


Figure 2-4: CalEnviroScreen 3.0 Map Showing All of California

A CES3.0 map for the Southern California is shown in Figure 2-5. This map clearly shows higher CES3.0 scores associated with population centers, industrial areas, and along transportation corridors. The CES3.0 scores in these areas are usually impacted by socio-economic factors as well.

A CES3.0 map for all of San Diego County is shown in Figure 2-6. This map shows that the highest scores are in the Portside Communities area, with other, high scoring areas to the south along the Bay and the I-5 corridor towards the U.S.-Mexico border at San Ysidro. There are also areas of elevated scores to the east and northeast along transportation corridors (e.g., City Heights). Additional pockets of higher scores are seen in the valley areas of El Cajon to the east-northeast, and further north in Escondido. In all these areas, socio-economic factors play a role in the score results.

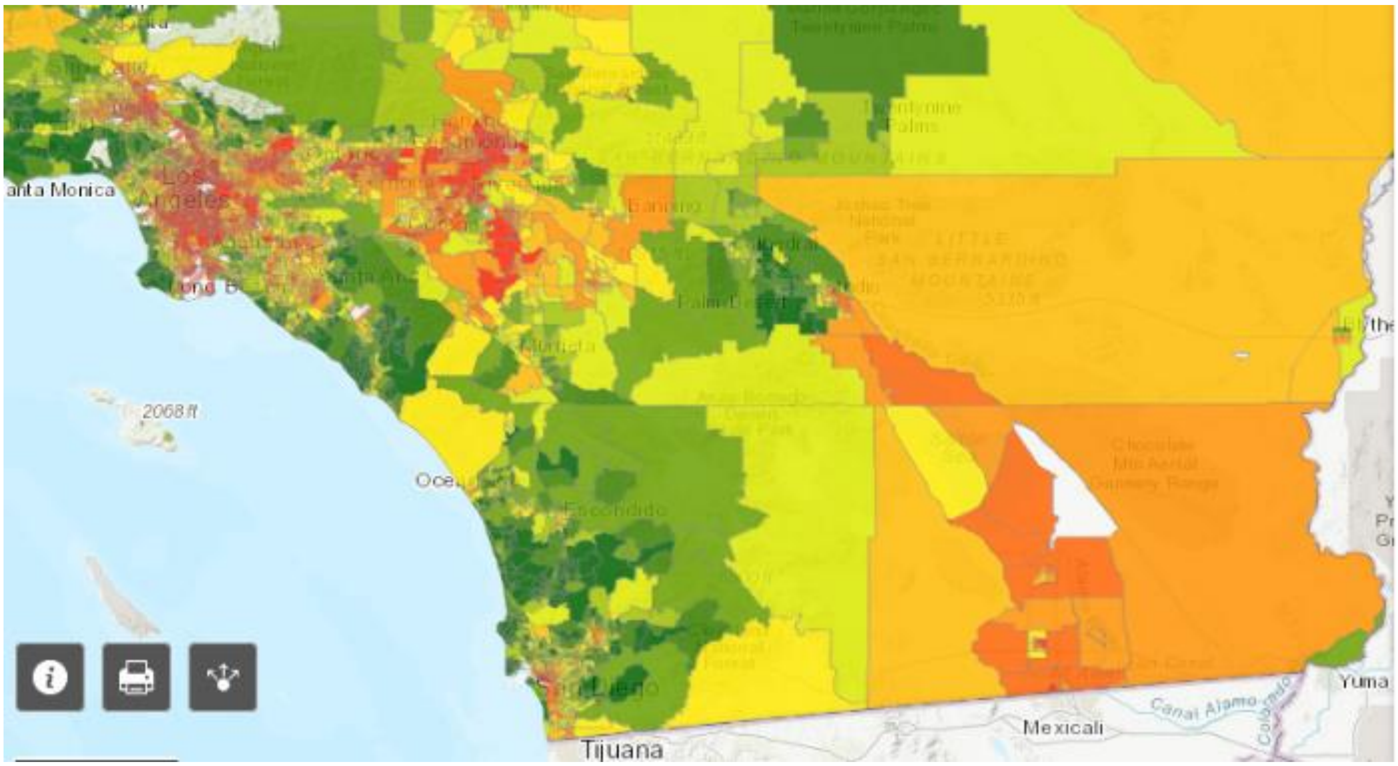


Figure 2-5: CalEnviroScreen 3.0 Map Showing Southern California

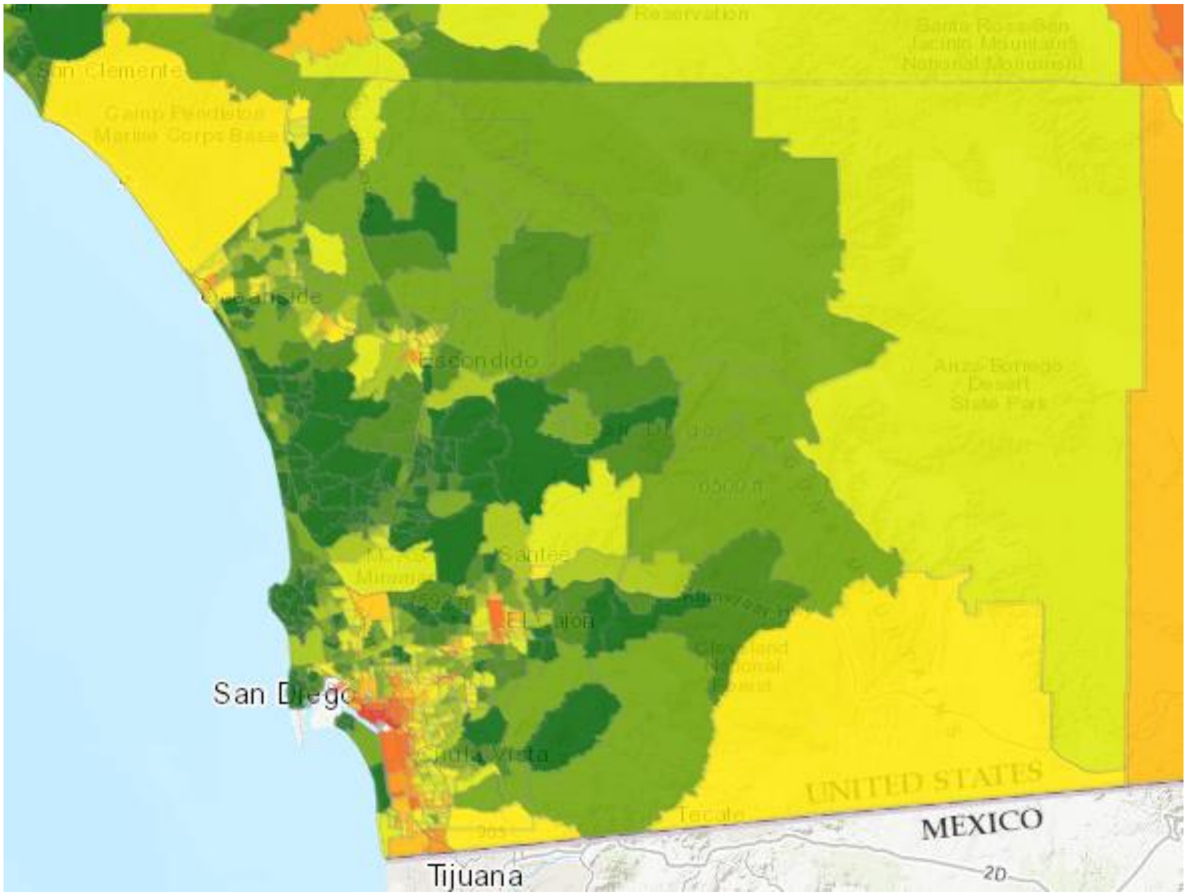


Figure 2-6: CalEnviroScreen 3.0 Map Showing San Diego County

A final CES3.0 map focuses on the Portside Communities and surrounding areas and is shown in Figure 2-7. This map shows greater detail of the higher CES3.0 scores in the Portside Communities and the other areas of elevated scores in surrounding communities.

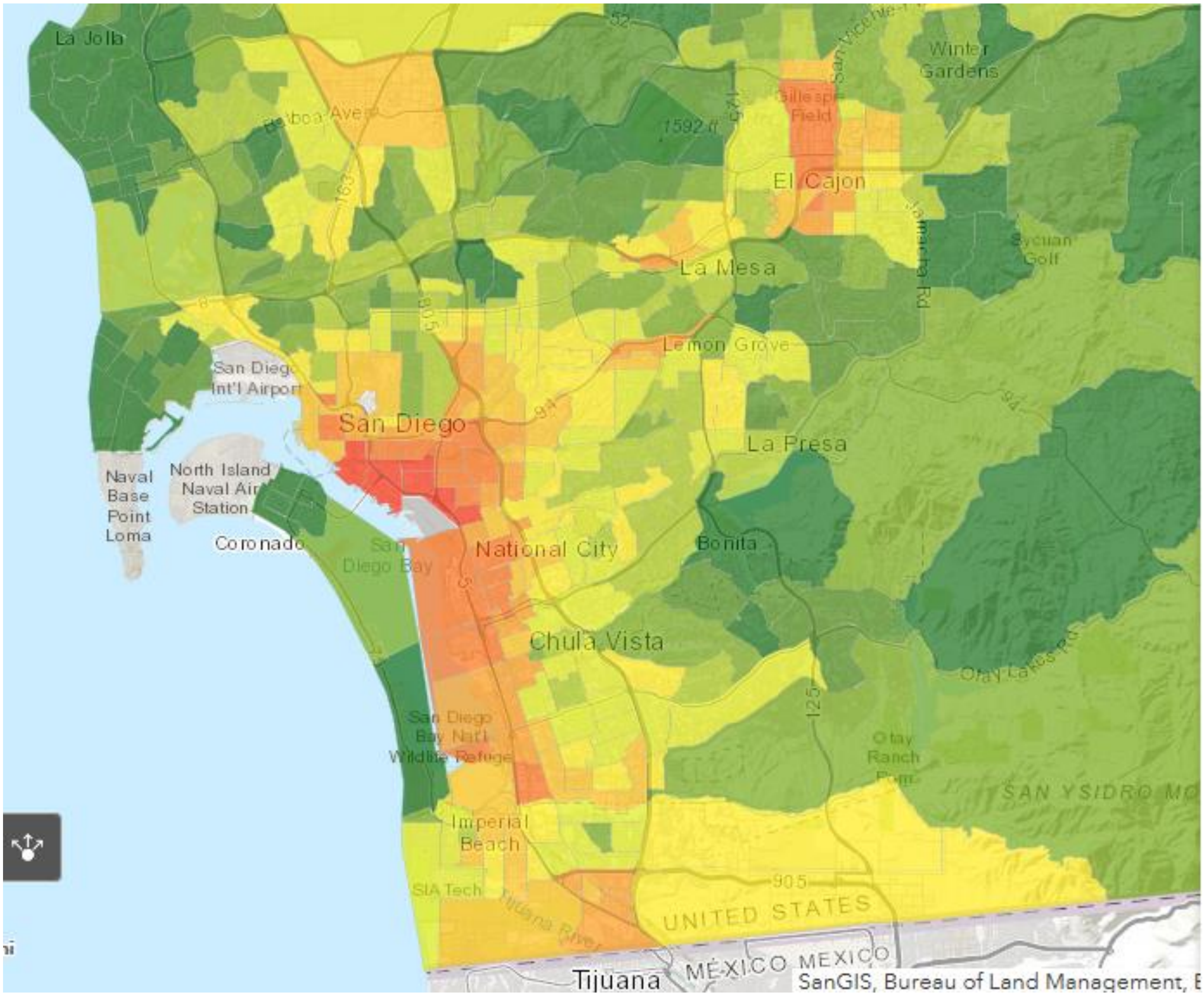


Figure 2-7: CalEnviroScreen 3.0 Map of the Portside Communities and Surrounding Areas

Further information regarding which factors contribute most to the CES3.0 scores can be found in the tabular data which can be downloaded from the CES3.0 website:

https://oehha.ca.gov/calenviroscreen/report/calenviroscreen-30

The CES3.0 data for the entire county shows that the Portside Community area has the highest overall risk in the county. The tabulated data for the 14 highest ranking census tracts is shown in Table 2-1. Specific factors driving the elevated scores in the census tracts included diesel particulate matter (DPM), which is a known carcinogen and has the greatest toxic air pollutant risk factor in the County. Eleven of the twelve census tracts within the communities (over 45,000 people) have an exposure risk greater than the 95th percentile. Four of the census tracts (over 15,000 people) are in the 99th percentile for DPM. There are also significant environmental effects indicators, including groundwater threats, hazardous waste, solid waste, and impaired water bodies. Several of the census tracts have pollution effects in the 95th+ percentile.

Table 2-1: Summary of All CalEnviroScreen 3.0 Factors for the Portside Communities Area

Census Tracts 6073005000 (SD Rank 1); 6073004900 (SD Rank 2); 6073003902 (SD Rank 3); 6073003601 (SD Rank 4); 6073003901 (SD Rank 5); 6073005100 (SD Rank 6); 6073003603 (SD Rank 7); 6073004000 (SD Rank 8); 6073003502 (SD Rank 9); 6073021900 (SD Rank 12); 6073004700 (SD Rank 13); 6073011602 (SD Rank 14)

SD Rank	1	2	3	4	5	6	7	8	9	12	13	14
CA Rank	47	80	84	102	305	335	773	819	909	988	1054	1079
Total Pop.	2227	5028	4927	3250	4241	7140	4228	5160	4946	6816	1858	3228
Zip code	92113	92113	92113	92113	92113	92113	92113	92102	92113	91950	92102	91950
CES 3.0 Score	70.91	68.27	67.79	66.76	59.42	58.65	51.41	50.87	49.67	48.70	47.99	47.62
CES 3.0 Pctl	99.42	99.00	98.95	98.73	96.17	95.79	90.26	89.68	88.55	87.55	86.72	86.40
CES 3.0 Pctl Range	96-100%	96-100%	96-100%	96-100%	96-100%	96-100%	91-95%	86-90%	86-90%	86-90%	86-90%	86-90%
O3 Pctl	22.34	22.34	22.34	22.34	22.34	22.34	22.34	22.34	22.34	25.87	22.34	25.87
PM 2.5 Pctl	66.23	66.23	66.23	66.23	66.23	66.23	66.23	66.23	66.23	69.14	66.23	66.23
Diesel PM Pctl	99.65	99.65	97.08	94.52	97.98	99.65	97.24	98.56	87.28	95.49	99.65	97.24
Drinking Water Pctl	22.24	22.24	22.24	22.24	22.24	22.24	34.03	22.24	22.24	27.09	22.24	27.09
Pes. Pctl	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tox. Release Pctl	61.84	53.75	78.14	58.76	56.14	44.49	55.70	50.19	50.09	56.50	44.16	52.81
Traffic Pctl	73.37	84.33	75.47	86.82	54.52	70.61	84.30	50.11	53.35	80.42	82.63	36.01
Clean up Sites Pctl	89.49	81.78	53.92	45.15	27.62	86.92	6.33	2.72	39.78	98.10	56.79	61.42
Groundwater Threats Pctl	96.79	96.24	80.80	94.36	74.91	99.55	90.75	79.18	39.42	99.67	96.97	41.19
Haz. Waste Pctl	97.37	95.92	98.37	95.27	82.35	95.48	46.52	57.13	90.70	85.19	92.40	65.56
Imp. Water Bodies Pctl	97.26	71.61	95.64	89.54	80.63	76.39	80.63	29.25	48.80	63.17	15.26	29.25
Solid Waste Pctl	93.61	92.38	96.39	84.51	84.77	73.54	73.54	75.64	52.84	91.70	65.24	70.29
Poll. Burden Pctl	95.81	94.19	94.49	92.50	81.28	91.28	82.04	70.30	69.66	94.66	81.54	63.91
Asthma Pctl	97.23	97.23	97.23	97.08	93.62	81.00	94.07	90.13	97.23	13.76	88.57	85.04
Low Birth Weight Pctl	63.17	68.47	51.34	70.24	83.21	93.13	26.44	84.06	24.98	83.21	50.72	82.81
Cardio Disease Pctl	70.78	70.78	70.78	69.53	50.80	44.11	55.75	49.35	70.78	56.84	45.01	77.04
Edu Pctl	90.79	96.14	98.20	97.12	97.45	66.19	91.16	93.05	97.72	45.60	90.95	86.35
Ling. Iso. Pctl	96.29	93.15	97.03	86.72	95.13	58.23	95.45	88.80	91.92	83.22	77.34	84.60
Poverty Pctl	99.02	94.70	97.25	95.90	97.57	91.41	85.72	95.84	97.49	84.34	87.59	87.94
Unemp Pctl	90.84	82.80	96.19	89.91	97.33	95.91	87.12	62.53	94.29	54.39	36.77	54.39
Housing Burden Pctl	97.68	95.71	91.18	96.89	98.07	92.36	90.42	96.99	91.50	81.70	97.30	73.17
Pop Char Pctl	97.39	97.23	96.63	97.45	97.63	89.42	86.29	93.68	92.23	65.82	79.57	92.24

The high ratings for DPM strongly correspond to the asthma percentile ratings, and pollution burden and solid waste factors are high in some of the census tracts as well. Socio-economic factors are also high in most of the census tracts as well. Residents in seven of the census tracts within the Portside Communities (30,000 people) are in the 95th percentile for poverty. The high poverty rate prevents residents from purchasing goods and services that would minimize pollution burdens. Ten of the census tracts (40,000+ residents) are in the 90th percentile for housing burden. With significant poverty levels and much of their limited income going towards housing, their ability to protect themselves (health care, home filtration systems) from pollution exposure is greatly limited.

The CES3.0 scores played a significant role in the District's nomination of the Portside Communities to be included in the first round of AB 617 community monitoring. The CES3.0 scores illustrate why it was so important to begin work in these communities.

2.2.3 SB 535 Disadvantaged Communities

Senate Bill 535 also addresses Disadvantaged Communities in California (updated in June 2017). Disadvantaged communities in California are specifically targeted for investment of proceeds from the State's cap-and-trade program. These investments are aimed at improving public health, quality of life and economic opportunity in California's most burdened communities at the same time reducing pollution that causes climate change.

Authorized by the California Global Warming Solutions Act of 2006 (AB 32), the cap-and-trade program is one of several strategies that California uses to reduce greenhouse gas emissions that cause climate change. The funds must be used for programs that further reduce emissions of greenhouse gases.

The Portside Communities are is also considered disadvantaged per SB 535 and another state bill, AB 1550 (AB 1550 was designed to build on the successes of SB 535 and direct 25 percent of Greenhouse Gas Reduction Fund (GGRF) investments to benefit disadvantaged communities, and an additional 25 percent of GGRF investments to benefit low-income households.).

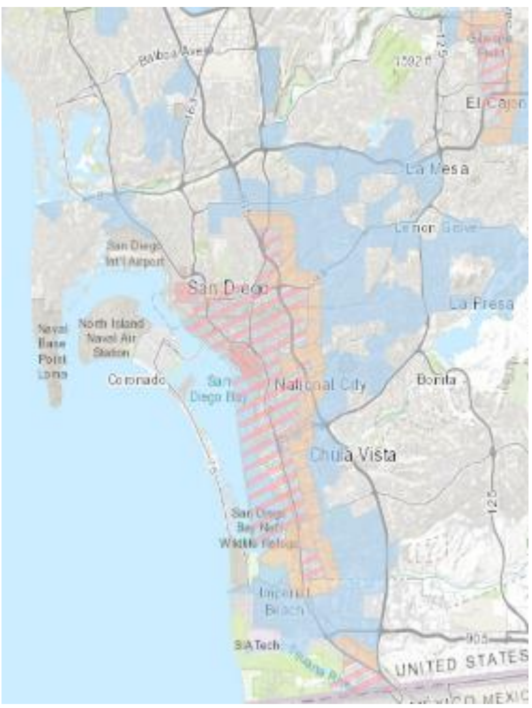


Figure 2-8: Map of the Portside Communities Showing SB 535 and AB 1550 Boundaries

Legend

- SB 535 Communities
- AB 1550 Low Income Communities
- AB 1550 and SB 535
- AB 1550 Communities within ½ mile of SB 535 Community

2.2.4 Environmental Justice Screening Method Score

Table 2-2 contains CARB-supplied data and shows that the San Diego nominated communities also score high on the Environmental Justice Screening Method (EJSM) Score and the California Healthy Places Index (see Section 2.2.5). The data below points out that these communities have high populations and high population densities. It also emphasizes what has already been discussed, which is that these communities have significant pollution burden and have very sensitive population characteristics.

Table 2-2: Summary of CARB-Supplied Disadvantaged Communities*

City/Area	Nominated	SB 535 DAC List CES3.0	CES 3.0 Score (percentile)	CA Healthy Places Index (percentile)	EJSM Score (percentile)	Total Population	Density (pop. per square mile)	PM2.5 (percentile)	Diesel PM (percentile)	Ozone (percentile)	Toxic risk (percentile)	Traffic (percentile)	Mobile (percentile)	Stationary (percentile)	Large stationary source(count)	Area-wide (percentile)	Schools	Day cares	Hospitals	Asthma (percentile)	Low birth rate (percentile)	Cardiovascular disease (percentile)	Poverty (percentile)	Unemployment (percentile)
Chula Vista	X	yes	88	94	77	226,267	4,995	95	82	26	70	95	84	100	5	94	78	113	6	77	88	61	96	95
El Cajon	X	yes	88	96	77	157,190	2,456	69	58	69	38	85	84	100	3	89	64	52	11	71	97	74	98	97
National City	X	yes	88	90	77	61,994	6,467	69	97	26	56	94	83	99	0	74	21	37	6	85	89	77	93	93
San Diego	X	yes	99	98	84	1,225,676	4,215	95	100	53	78	100	95	100	29	99	380	553	34	97	100	74	99	98
San Ysidro	X	yes	77	90	77	27,196	9,232	95	46	17	59	100	69	99	0	46	6	11	0	69	69	70	94	97

*Please note: Additional information regarding population sensitivity was provided by the County of San Diego Health and Human Services.

2.2.5 California Healthy Place Index

The California Healthy Places Index (HPI) is a screening tool developed by the Public Health Alliance of Southern California, to assist in exploring local factors that predict life expectancy and comparing community conditions across the state. The HPI provides overall scores and detailed data on specific policy action areas that shape health outcomes, such as housing, transportation, education, and more. A summary of the results for the census tracts in the Portside Communities is provided below.

- Food security—proxy food deserts, 2015 Data
  - All specified census tracts for Barrio Logan were low income tracts.
  - 06073003502, 06073003601, 06073003603, 06073004000, and 06073021900 were low income tracts with at least 500 people, or 33 percent of the population, living more than ½ mile (urban areas) from the nearest supermarket, supercenter, or large grocery store.
  - 06073003502, 06073003601, 06073003603, 06073004000, and 06073021900 were urban tracts with at least 500 people, or 33 percent of the population, living more than ½ mile from the nearest supermarket, supercenter, or large grocery store.
  - Information in Table 2-3 shows low percentages of preventative prescription drugs were used even though health risks were high.
  - Source: United States Department of Agriculture: Economic Research Service (May 2017). *Food Access Research Atlas, 2015.* Retrieved from https://www.ers.usda.gov/data-products/food-access-research-atlas/download-the-data/.

Table 2-3: Summary of Health Statistics for the Portside Census Tracts

Census Tract	2017 Smoked cigarettes in last 12 months (%)	2017 Used prescription drug for asthma (%)	2017 Used prescription drug for high blood pressure (%)	2017 Used prescription drug for high cholesterol (%)
6073004800	23.22%	4.79%	10.72%	10.82%
6073005100	24.88%	2.78%	9.50%	8.45%
6073003902	17.47%	5.23%	9.34%	10.72%
6073003901	14.14%	5.18%	8.99%	10.91%
6073003601	14.17%	5.18%	8.99%	10.93%
6073005000	26.34%	5.42%	10.26%	10.14%
6073011602	16.08%	3.39%	9.96%	12.04%
6073021900	18.56%	3.16%	10.60%	12.11%
6073004900	14.16%	5.19%	9.00%	10.93%
6073003603	14.16%	5.19%	9.01%	10.90%
6073004000	14.16%	5.18%	9.01%	10.92%
6073003502	16.39%	4.88%	10.33%	11.31%
6073004700	30.73%	8.55%	13.26%	8.18%

Recently, a major portion of the Portside Community was designated as one of 22 federally-designated Promise Zones in the United States, and one of only four in California. These zones are identified as disadvantaged and underserved communities. The San Diego Promise Zone (SDPZ) covers a 6.4-square-mile targeted area that spans East Village and Barrio Logan east to Encanto and Emerald Hills and is home to the City's most disadvantaged and underserved communities (see Figure 2-9).

Figure 2-9: Map of the San Diego Promise Zone

More than 77,000 San Diegans live in the SDPZ. Unemployment is high (15.61 percent), and poverty is concentrated (39.06 percent). The area struggles with low educational attainment, insufficient access to healthcare and healthy foods, high crime rates, and low housing affordability.

Through the Promise Zone initiative, federal government partners work with local leaders to streamline resources across agencies and deliver comprehensive support. Leading the effort, the City has partnered with numerous local organizations and agencies to develop programs and initiatives in six Working Group goal areas to improve quality of life and accelerate revitalization in the SDPZ. The Promise Zone designation lasts for 10 years.

2.2.6 Historical Air Quality Data in the Portside Communities

The APCD has conducted air quality monitoring in and around the Portside Communities for many decades. The monitoring stations have primarily been long-term and focused on measuring criteria pollutants. These stations and associated site information is included in Table 2-4. A map showing the locations of the monitoring stations in the Portside Communities is shown in Figure 2-10 (station abbreviations used by District staff (STN ID) are included in Table 2-4).

Table 2-4: List of Air Quality Monitoring Stations in and Around the Portside Communities

STN ID	Station Name	Address	AQS Site No.	Start Date	End Date
UNS	Union Street (CO Only)	1133 Union Street	06-073-0007	February 13, 1981	April 30, 2008
DTN	Downtown San Diego	330 12th Avenue	06-073-1007	June 23, 1989	July 12, 2005
SDL	San Diego Logan (Memorial Academy School)	2850 Logan Avenue	06-073-1009	October 21, 1999	February 28, 2001
PES	Perkins Elementary School	1110 Beardsley Street	06-073-1010	July 15, 2005	October 24, 2016
SES	Sherman Elementary School	450 24th Street	06-073-1026	March 2019	In Operation
CVA	Chula Vista	80 E J Street	06-073-0001	January 21, 1972	In Operation

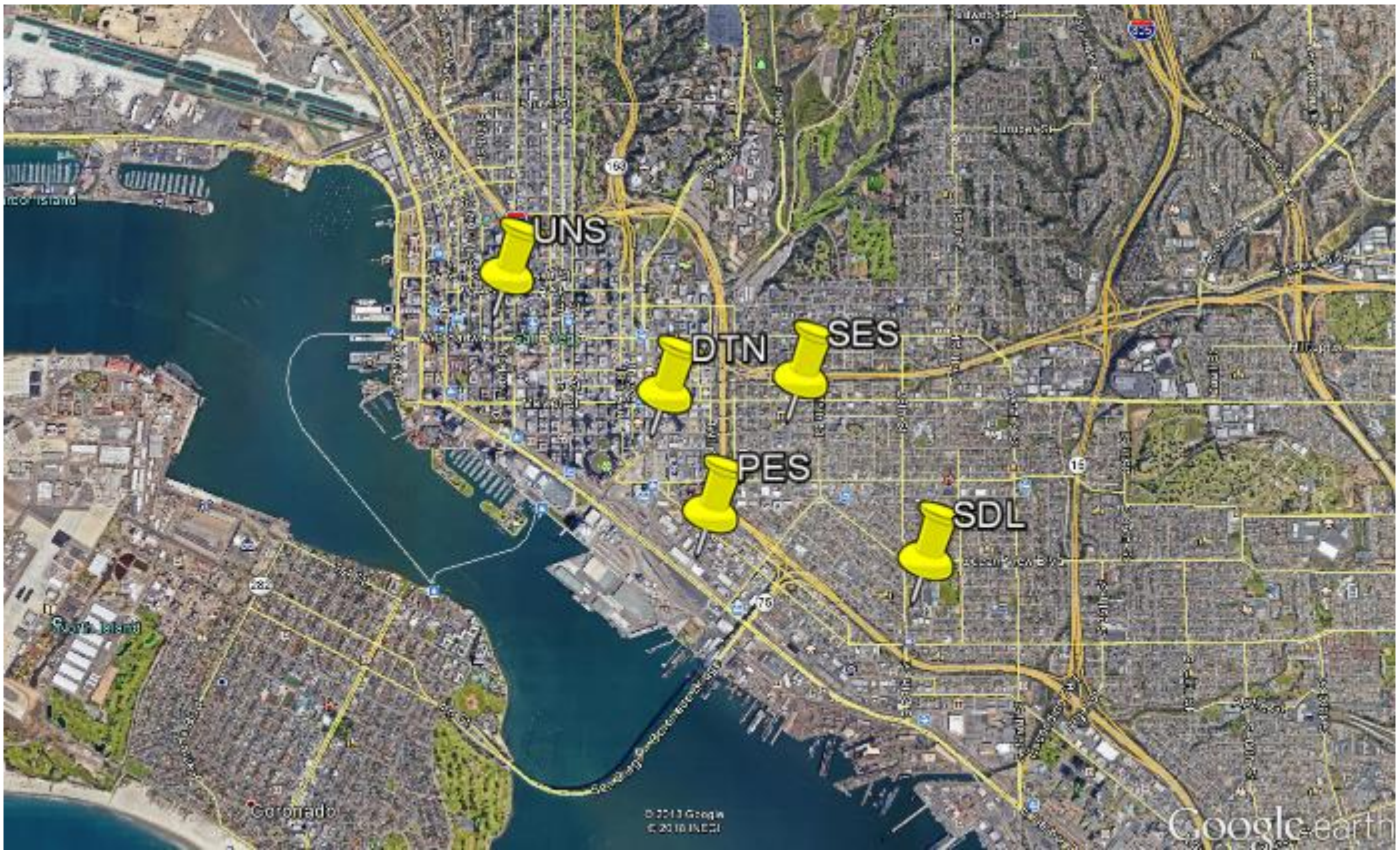


Figure 2-10: Map of Air Quality Monitoring Stations in and Around the Portside Communities

Table 2-4 includes the Chula Vista (CVA) monitoring station. Although CVA is not located within the boundaries of the Portside Communities, it is downwind of the San Diego Bay, shipyards, and transportation corridors, and shares similarities in geography and meteorology. CVA is located approximately 7 miles south-southeast of PES. A map showing the relative location of CVA to the Portside Community sites included in Table 2-4 is shown in Figure 2-11.

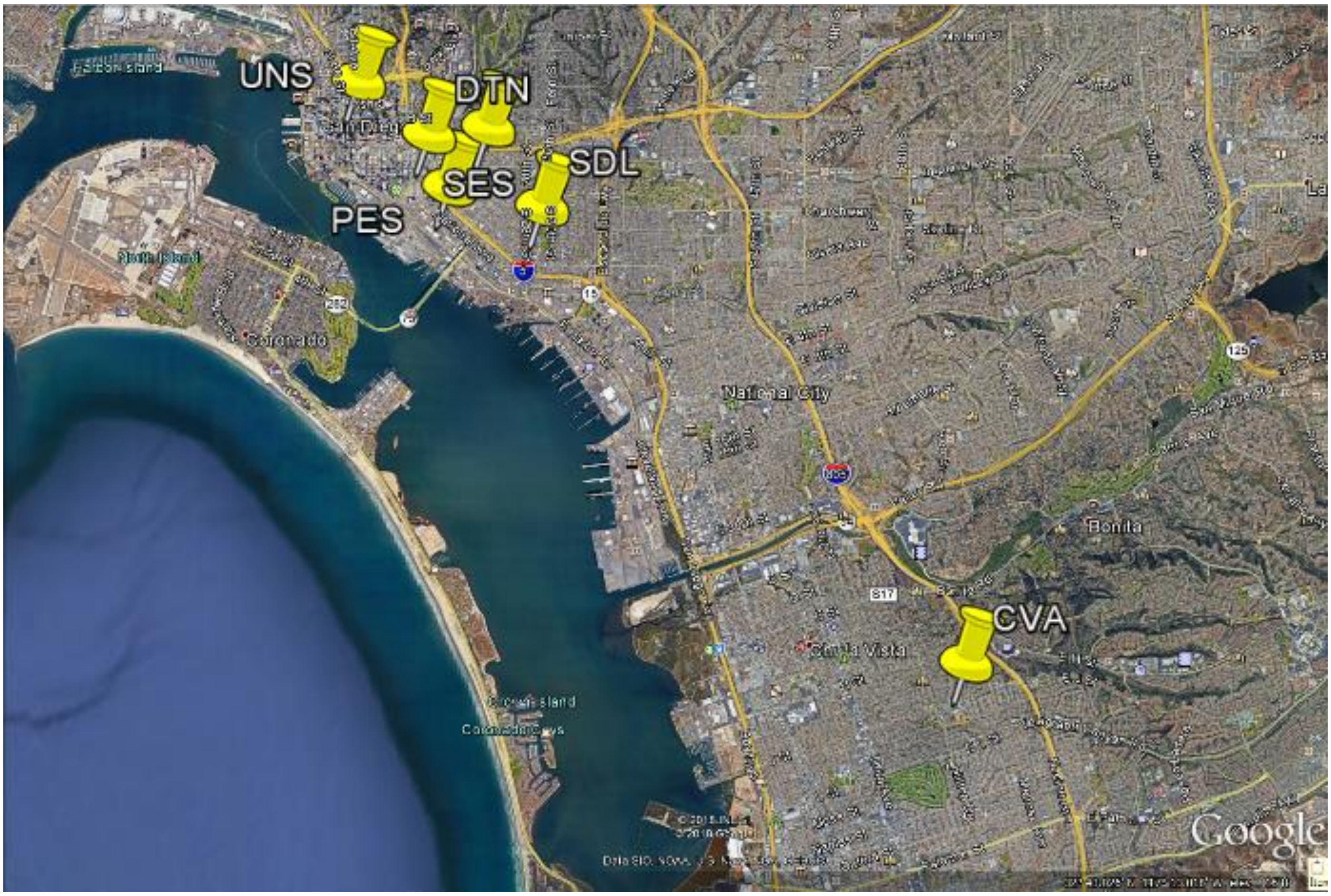


Figure 2-11: Map Showing the Chula Vista Air Monitoring Station in Relation to the Air Quality Monitoring Stations in and Around the Portside Communities

A brief, historical discussion of these sites is included below.

The Union Street station (UNS) was a carbon monoxide (CO) site located in the "urban canyon" of downtown San Diego. Operated for over 25 years, the site documented reductions in CO concentrations as air pollution control devices reduced CO emissions from vehicles. The site was decommissioned after numerous years of data were well below the NAAQS for CO.

The Downtown San Diego site (DTN) was the first long-term "urban core" site operated in the downtown area (other, shorter-term sites were operated previously in and around the downtown area). A full complement of criteria pollutants was monitored at this location. This site was operated from June 1989 through July 2005, when a relocation was necessitated due to construction of a baseball field for the San Diego Padres in the downtown area.

Air quality in the Barrio Logan area was the focus of study conducted by the District and CARB from October 1999 through February 2001. This study included numerous locations to monitor for hexavalent chrome (Cr^{+6}) in areas where there were chrome plating operations on Boston Avenue, an air monitoring station operated at Memorial Academy school (SDL) by the District using CARB equipment, and a specialized tracer study to document flow patterns and atmospheric dispersion characteristics in the Barrio Logan area. A detailed emissions inventory was also completed for the Barrio Logan area as part of this study. This updated emissions inventory was later used by CARB in air quality modeling for the local area as part of a statewide initiative.

When the District was informed that we would need to vacate the DTN monitoring site location to make way for construction of the baseball facility, we negotiated with the San Diego Unified School District to construct and operate and air monitoring station at Perkins Elementary School. As shown in Figure 2-1, this location (marked by the red star) is centrally located in the Barrio Logan community and is surrounded by a wide-variety of air pollution sources. Air quality monitoring began at this location in July 2005. A full complement of criteria pollutants was measured at this location, along with toxic-VOCs, toxic-carbonyls, and toxic-metals. Due to planned construction at the Perkins Elementary School campus, the San Diego Unified School District informed the District that we would need to vacate the site. Air monitoring at PES was discontinued in October 2016.

After decommissioning the PES monitoring station, the District worked with the San Diego Unified School District to find another location representative of the Barrio Logan/Logan Heights area. We eventually agreed on the Sherman Elementary School (SES) location. A new Temporary Encroachment Permit was negotiated with the San Diego Unified School District and the Sherman Elementary School Principal. A new monitoring shelter and fencing has been installed near the northeast corner of the Sherman Elementary School property, and a new deck and meteorological tower are in the process of being installed. Ground-based sampling equipment began data collection in March 2019, and the station should be fully operational by early summer 2019. The SES site will serve as a regional air monitoring station (criteria pollutants) and as an "anchor site," which will monitor black carbon, elemental carbon, toxic-metals, toxic-VOCs, toxic-carbonyls, and PAMS-VOCs (C2-C6 compounds) in the Portside Communities.

We have included the Chula Vista site (CVA) in the list of nearby air monitoring stations (Table 2-4). Started in January 1972, CVA is the oldest continuously operating monitoring station in San Diego's entire air monitoring network. Originally sited to address concerns over emissions from the now decommissioned South Bay Power Plant, this site measures criteria pollutants, toxic metals, and VOCs. CVA will provide important historic data trends, and it will be an important site for comparing data collected in the Portside Communities.

The parameters measured at each of the air monitoring station described above are listed in Table 2-5. For Sherman Elementary School (SES), the parameters listed show the planned set of parameters for regional monitoring and for AB 617. This table shows that a large dataset of air quality parameters has been collected in the Portside Communities over the last twenty-plus years. A brief overview of air quality measurements in the Portside Communities is provided below.

Since the vast majority of APCD air monitoring stations measure for criteria pollutants, we'll look at how the Portside Communities compare to other areas in the county for these pollutants. Since 2015 was the last year of complete data for the Perkins Elementary School site (PES), we'll use the 5-year summaries generated for the year ending in 2015 for comparisons of criteria pollutants. 5-year summaries for the latest year of record are available on the District's website at:

https://www.sdapcd.org/content/dam/sdc/apcd/monitoring/5-Year_Air_Quality.pdf

Early air pollution control efforts throughout the nation focused on reducing ozone (O_3) concentrations. Ozone is a photochemical pollutant (produced by chemical reactions in the presence of sunlight), so control strategies for reducing ozone are focused on reducing the photochemical precursors to ozone formation. Ozone precursors fall into the broad categories of NO_x (nitric oxide (NO) and nitrogen dioxide (NO_2)) and volatile organic compounds (VOCs). Nitric oxide is directly emitted into the atmosphere by combustion processes. Nitric oxide then converts to nitrogen dioxide through chemical reactions. Ozone is formed by photochemical processes between nitrogen dioxide and VOCs, which act as a catalyst (the photochemical processes for ozone formation are actually very complex, but NO_2 and VOCs are the primary photochemical reactants).

Table 2-5: List of Parameters Measured at Air Quality Monitoring Stations in and Around the Portside Communities

Site	O_3	NO_2*	CO	SO_2	$PM_{2.5}$ (Filter)	$PM_{2.5}$ (Continuous)	PM_{10}	OC/EC	Carbonyls	VOCs	Metals	Meteorology	Black Carbon**	Ions**
UNS			X											
DTN	X	X	X	X	X		X			X		X		
SDL	X	X	X			X	X		X	X	X	X		
PES	X	X	X	X	X	X	X	X	X	X	X	X		
SES	X	X			X	X			X	X	X	X	X	X
CVA	X	X			X		X		X	X	X	X		

* $NO/NO_2/NO_x$

** Planned

The 5-year 1-hour ozone summary ending in 2015 is shown in Figure 2.2.6-3. This shows that there were zero state (state standard is 0.09 ppm) or federal (federal standard is 0.12 ppm) 1-hour ozone exceedances in the Downtown San Diego area during the years 2011 through 2015. In fact, the last federal 1-hour ozone exceedance in the downtown area was in 1995, and the last state 1-hour exceedance in the downtown area was in 2001. This 1-hour ozone summary also shows that the highest annual ozone concentrations in the downtown area are measured in the spring or fall, when air pollutants are transported offshore and return to the coast on sea breeze circulations.

Ozone control strategies have resulted in the coastal region of San Diego county being in attainment for ozone. The Alpine site (ALP) in the foothills to the east of the Portside Communities remains the area with the highest ozone concentrations. This is primarily due to the usual westerly sea breeze winds that blow pollutants emitted in the populated western portion of the county eastward, where they are trapped by the rising terrain under a persistent, elevated subsidence inversion. Strong sunlight and this trapping of air pollutants result in high ozone concentrations in the foothills in eastern San Diego county.

The 5-year 8-hour ozone summary ending in 2015 is shown in Figure 2-12. This shows that there were two state 8-hour exceedances (2014 – state standard is 0.070 ppm) and zero federal 8-hour ozone exceedances (2008 Standard Revision – 0.075 ppm) in the Downtown San Diego area during the years 2011 through 2015. The Portside Communities are in attainment for all current 1- and 8-hour ozone standards.

Ozone

Number of Days Exceeding Federal and State 1-Hour Ozone Standards
San Diego County 2011-2015

Station	Number of Days Exceeding Previous Federal 1-Hour Standard: Concentration > 12 pphm (See note below)					Number of Days Exceeding State 1-Hour Standard: Concentration >or equals 9.5 pphm					Maximum 1-Hour Concentration (pphm)					Date of Maximum 1-Hour Concentration				
	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15
Chula Vista	0	0	0	0	0	0	0	0	0	0	8	9	7	9	9	9/8	9/15	5/13	10/24	9/20
El Cajon	0	0	0	0	0	1	0	0	0	0	11	9	9	8	8	4/16	9/22	9/15	10/4	8/16
Kearny Mesa/Kearny Villa Rd.	0	0	0	0	0	1	1	0	1	0	10	10	8	10	8	4/16	10/1	5/13	10/4	4/4
Del Mar	0	0	0	0	0	0	0	0	1	1	9	9	8	10	10	9/6	10/17	10/26	5/15	10/9
Escondido***	0	0	0	0	0	1	0	0	1	0	10	8	8	10	8	4/16	10/1	5/13	9/14	4/29
Alpine	0	0	0	0	0	4	1	2	0	2	11	10	10	9	10	4/16	8/7	6/29	8/30	8/28
Downtown San Diego	0	0	0	0	0	0	0	0	0	0	8	7	6	9	9	5/3	9/15	9/29	10/4	9/20
Camp Pendleton	0	0	0	0	0	0	0	0	1	0	9	9	8	10	9	9/6	9/14	8/25	5/15	9/20
Otay Mesa*	0	0	0	0	-	1	0	0	0	-	10	8	7	6	-	10/13	9/22	9/29	5/2	-
Donovan**	-	-	-	0	0	-	-	-	0	0	-	-	-	8	9	-	-	-	10/5	9/20
Basinwide	0	0	0	0	0	5	2	2	3	3	11	10	10	10	10	4/16	8/7	6/29	5/15	10/9

*Monitoring discontinued in September 2014.
**Monitoring began in September 2014.
***Monitoring temporarily suspended August 2015.

Note: The federal 1-hour standard of 12 pphm was in effect from 1979 through June 15, 2005. Because this benchmark has been employed for such a long period, and is addressed in State Implementation Plans, we continue to reference the revoked standard for historical perspective.

Figure 2-12: Year Summary of 1 Hour Ozone Concentrations in San Diego County – 2015

Ozone reduction strategies in San Diego county have been successful in reducing ozone concentrations throughout the air basin. The last Stage 2 Smog Alert was measured in 1979. The last State 1 Smog Alert was measured in 1991, and the last ozone Health Advisory in 1998. The San Diego Air Basin attained the Federal 1-hour ozone standard in 2003, and the 1997 Federal 8-hour ozone standard (0.08 ppm) in 2011. The Federal 8-hour ozone standard has been revised downward two time: 2008 (0.075 ppm) and 2015 (0.070 ppm). The District continues its efforts to meet these standards throughout the air basin.

Ozone

Number of Days Exceeding Federal and State 8-Hour Ozone Standards
San Diego County 2011-2015

Station	Number of Days Exceeding Federal 8-Hour Standard: Concentration > 7.5 pphm					Number of Days Exceeding State 8-Hour Standard: Concentration > 7.0 pphm					Maximum 8-Hour Concentration (pphm)					Date of Maximum 8-Hour Concentration				
	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15
Chula Vista	0	1	0	0	0	0	1	0	1	0	6	8	6	6	7	9/6	9/15	9/15	9/15	11/1
El Cajon	1	0	1	0	0	1	1	3	2	0	9	7	8	8	7	4/16	10/1	5/13	9/13	4/15
Kearny Mesa/Kearny Villa Rd.	1	1	0	1	0	3	3	1	4	0	9	8	7	8	7	4/16	10/1	5/3	10/4	4/29
Del Mar	0	2	0	2	1	1	2	0	5	2	7	8	7	9	8	9/6	9/15	10/26	5/15	10/9
Escondido***	2	0	0	5	0	2	2	4	8	3	9	7	7	8	7	4/16	10/1	5/3	5/2	4/4
Alpine	10	7	6	10	11	30	22	27	30	31	9	8	8	8	8	4/16	8/7	8/14	5/2	6/19
Downtown San Diego	0	0	0	0	0	0	0	0	2	0	6	7	5	7	7	4/27	9/15	9/23	5/2	9/20
Camp Pendleton	0	1	0	1	1	2	1	0	5	3	7	8	7	8	8	9/6	9/15	5/12	5/15	9/20
Otay Mesa*	1	0	0	0	-	1	0	0	0	-	8	6	6	5	-	4/16	9/22	5/3	5/2	-
Donovan**	-	-	-	0	0	-	-	-	1	2	-	-	-	8	7	-	-	-	10/4	9/20
Basinwide	10	10	7	12	13	33	25	28	35	36	9	8	8	9	8	4/16	8/7	8/14	5/15	6/19

*Monitoring discontinued in September 2014.
**Monitoring began in September 2014.
***Monitoring temporarily suspended August 2015.

Figure 2-13: 5 Year Summary of 8 Hour Ozone Concentrations in San Diego County – 2015

The 5-year summary ending in 2015 for nitrogen dioxide (NO_2) is shown in Figure 2-14. This summary shows that the highest NO_2 concentrations were historically measured at the Otay Mesa site, which was located near the Otay Mesa Port-of-Entry (POE). This site was discontinued in September 2014. The replacement site for Otay Mesa is the Donovan monitoring station, located at the Donovan State Prison in Otay Mesa. In 2015, the highest 1-hour NO_2 concentration was measured at the Downtown site (0.062 ppm), with Donovan a close second (0.061 ppm), and Camp Pendleton a close third (0.060 ppm). It is important to note that the highest 1-hour NO_2 concentrations at all sites are measured in the fall or winter months, when atmospheric stability is high, allowing surface concentrations of local emissions to build up due to limited vertical mixing.

The San Diego Air Basin attained the Federal annual arithmetic average standard for NO_2 (0.053 ppm) in 1981, and the State Standards (1-hour of 0.18 ppm and annual arithmetic average of 0.030 ppm) in 1992. The Federal Standard was revised in 2010 to include a maximum 1-hour concentration of 100 ppb (0.100 ppm). The San Diego remains in attainment for all NO_2 air quality standards.

The 5-year summary ending in 2015 for carbon monoxide (CO) is shown in Figure 2-15. This summary shows that the highest CO concentrations were measured in Escondido, followed by Downtown San Diego, the Carmel Mountain Ranch near-road monitor, and the El Cajon site. The higher CO concentrations in Escondido are partially due to the topography (valley) and resulting high atmospheric stability during winter months. Indeed, the highest CO concentrations are measured on New Year's Day, when atmospheric stability is high and there is additional, late-night traffic and fireplace usage in local residences. The highest CO concentrations measured at all sites occur in the fall and winter months due to strong atmospheric stability.

Nitrogen Dioxide

Annual Average and Maximum 1-Hour Concentration
San Diego County 2011-2015

Station	Annual Average (ppm) Federal Standard: 0.053 ppm State Standard: 0.030 ppm					Maximum 1-Hour Concentration (ppm) Federal Standard: 0.100 ppm State Standard: 0.18 ppm					Date of Maximum 1-Hour Concentration				
	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15
Chula Vista	.012	.011	.010	.010	.010	.057	.057	.057	.055	.049	10/12	11/15	11/13	11/7	11/19
El Cajon	.012	.012	.012	.013	.010	.049	.059	.051	.057	.059	1/17	11/15	12/17	11/6	12/9
Kearny Mesa/Kearny Villa Rd.	.012	.011	.010	.009	.009	.073	.057	.067	.051	.051	10/12	10/17	11/13	1/2	12/9
Escondido****	.013	.012	.012	.011	.010	.062	.062	.061	.063	.048	10/31	10/17	11/13	10/3	3/6
Alpine	.005	.006	.005	.005	.004	.040	.047	.040	.030	.048	1/18	1/20	12/17	12/22	1/9
Downtown San Diego	.014	.013	.014	.013	.013	.067	.065	.072	.075	.062	10/13	10/2	11/13	1/16	1/7
Camp Pendleton	.007	.007	.007	.007	.006	.066	.061	.081	.060	.060	12/28	11/13	11/13	1/17	11/19
Otay Mesa*	.020	.020	.019	.017	-	.100	.077	.091	.087	-	10/12	10/3	11/12	1/29	-
Donovan**	-	-	-	.010	.008	-	-	-	.064	.061	-	-	-	10/3	2/6
Carmel Mt. Ranch***	-	-	-	-	.016	-	-	-	-	.054	-	-	-	-	11/20

*Monitoring discontinued in September 2014.
**Monitoring began in September 2014.
***Monitoring began in March 2015.
****Monitoring temporarily suspended August 2015.

Figure 2-14: 5 Year Summary of Nitrogen Dioxide Concentrations in San Diego County – 2015

The San Diego Air Basin was designated as attainment of the State standards for CO (1-hour of 20 ppm and 8-hour of 9.0 ppm) in 1995, and the Federal Standards (1971: 1-hour of 35 ppm and 8-hour of 9 ppm) in 1998. The Federal Standards have been retained, without revision in 1985, 1994, and 2011. The San Diego Air Basin remains in attainment for all CO standards.

The 5-year summary ending in 2015 for sulfur dioxide (SO_2) is shown in Figure 2-16. This summary shows that very low concentrations of SO_2 are measured in San Diego county. The San Diego Air Basin has never exceeded any State or Federal air quality standard for SO_2.

Carbon Monoxide

Maximum 1-Hour and 8-Hour Average Concentrations
San Diego County 2011-2015

Station	Maximum 1-Hour Concentration (ppm) Federal Standard: 35 ppm State Standard: 20 ppm					Date of Maximum 1-Hour Concentration					Maximum 8-Hour Concentration (ppm) Federal Standard: 9 ppm State Standard: 9.0 ppm					Date of Maximum 8-Hour Concentration				
	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15
El Cajon	1.8	2.3	1.9	2.0	1.4	11/29	1/1	3/12	11/26	1/7	1.3	1.9	1.2	1.8	1.1	1/13	1/1	1/9	11/26	1/5
Escondido*	3.5	4.4	3.2	3.8	3.1	1/26	1/1	1/1	1/1	1/6	2.3	3.8	2.6	3.1	2.0	1/1	1/1	1/1	1/1	1/1
Downtown San Diego	2.8	2.6	3.0	2.7	2.6	12/9	1/4	1/18	1/6	12/5	2.4	1.9	2.1	1.9	1.9	12/10	10/29	1/19	1/11	11/21
Carmel Mt. Ranch**	-	-	-	-	2.4	-	-	-	-	12/9	-	-	-	-	1.4	-	-	-	-	12/7

*Monitoring temporarily suspended August 2015.
**Monitoring began April 2015.

Figure 2-15: 5 Year Summary of Carbon Monoxide Concentrations in San Diego County – 2015

Sulfur Dioxide

Annual Average and Maximum 1-Hour and 24-Hour Concentrations
San Diego County 2011-2015

Station	Annual Average (ppm) Federal Standard: 0.030 ppm***					Maximum 24-Hour Concentration (ppm) State Standard: 0.04 ppm					Maximum 1-Hour Concentration (ppm) State Standard: 0.25 ppm Federal Standard: 0.75 ppm**					Date of Maximum 1-Hour Concentration				
	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15
Chula Vista*	0.001	-	-	-	-	0.001	-	-	-	-	0.004	-	-	-	-	1/20	-	-	-	-
El Cajon	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.001	0.002	0.007	0.001	0.001	1/19	9/5	2/28	11/26	9/19
Downtown San Diego*	0.001	-	-	-	-	0.002	-	-	-	-	0.013	-	-	-	-	1/21	-	-	-	-
Otay Mesa*	0.002	-	-	-	-	0.006	-	-	-	-	0.018	-	-	-	-	1/12	-	-	-	-

*Monitoring discontinued in 2011.
**Federal 1-hour Standard is based on the 3-year average of the 99th percentile of 1-hour daily maximum concentrations.

Figure 2-16: 5 Year Summary of Sulfur Dioxide Concentrations in San Diego County – 2015

The 5-year summary ending in 2015 for particulate matter of 2.5 micrometers and less in diameter ($PM_{2.5}$) is shown in Figure 2-17. This summary shows that annual average $PM_{2.5}$ concentrations do not vary widely between sites, and that the trend is downward over time. This shows that efforts to reduce direct emissions of $PM_{2.5}$ (primary particulates) and $PM_{2.5}$ precursors (some $PM_{2.5}$ is formed by chemical reactions and are known as secondary particulates) have been effective at reducing ambient $PM_{2.5}$ concentrations.

Looking at Figure 2-17 more closely we can see that at the end of 2015, the Downtown monitor had the highest annual concentration in three of the five years (2011, 2012, and 2015) shown, and the highest 24-hour value in two of the five years (2011 and 2014). The inland valley sites of El Cajon and Escondido also had two of the highest annual average (El Cajon in 2013 and 2014) and two of the highest 24-hour averages (Escondido for 2012 and 2013). The Chula Vista site (near the Portside Communities, as noted above) had the highest 24-hour average concentration in 2015.

Particulate Matter (PM2.5)

Annual Average and Maximum 24-Hour Sample
San Diego County 2011-2015

Station	Annual Average Federal Standard: 12.0 micrograms/m^3 State Standard: 12 micrograms/m^3					Maximum 24-Hour Sample* Federal Standard: 35 micrograms/m^3					Date of Maximum 24-Hour Sample				
	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15
Chula Vista	9.8	10.2	9.4	9.2	8.3	28	34	21.9	26.5	33.5	11/17	12/8	10/25	1/11	2/6
El Cajon	10.5	10.5	10.6	10.3	8.2	30	38	23.1	35.7	24.7	11/17	1/1	1/1	1/1	1/21
Kearny Mesa/Kearny Villa Rd.	8.9	8.7	8.3	8.2	7.2	30	20	22.0	20.2	25.7	11/17	12/8	10/25	1/11	1/21
Escondido**	10.4	10.5	10.5	9.5	8.6	27	71	56.3	30.4	29.4	11/17	1/1	1/1	12/31	1/3
Downtown San Diego	10.8	11.0	10.3	10.1	9.3	35	40	37.4	36.7	33.4	11/17	12/9	10/26	1/1	2/5

* Concentrations are averaged over a 24-hour period.
**Monitoring temporarily suspended August 2015.

Figure 2-17: 5 Year Summary of PM2.5 Concentrations in San Diego County – 2015

There are a few additional factors to consider when looking at these annual statistics. The first item of note is that the Federal Reference Method (FRM) for $PM_{2.5}$ measurements is filter-based (24-hour integrated samples), and the sampling schedule is not the same at all sites. The actual sampling schedules are documented in the District's Annual Network Plan. A link to the current Network Plan (the year is for the previous, completed year of monitoring) is provided below:

https://www.sdapcd.org/content/dam/sdc/apcd/monitoring/2017_Network_Plan.pdf

Clicking this link will take the user to the 2017 Annual Network Plan. Currently, the 2015 and 2016 Plans are also available. To get these Plans, simply click the link above, and then change the 2017 to 2015, or 2016, and the Plan for those years will be displayed and can be saved.

In 2015, the Downtown (DTN) and Perkins Elementary School (PES) sites ran FRM samples every day of the year (known as a 1:1 schedule). The Chula Vista (CVA), El Cajon (then at Floyd Smith Drive (FSD) due to Lexington School construction), and Kearny Villa Road (KVR) sites all ran FRM samples on the same schedule every third day (known as a 1:3 schedule). This difference in schedules and the total number of samples can account for some differences in the annual statistics.

Another factor in the $PM_{2.5}$ statistics in Figure 2-17 is the date of the annual maximum 24-hour sample (far right grouping). All the maximum 24-hour days occur in late fall and early winter, when atmospheric stability is strongest due to longer nights and strong radiative cooling at the surface (creates low-level, surface-based temperature inversions which limit vertical dispersion of pollutants, especially in the inland valley locations). It is interesting to note that in three of the five years the maximum 24-hour concentration occurred on New Year's Day. This is primarily due to residents burning their fireplaces late into the night and the fires then smolder into the early morning hours. There is also additional vehicular traffic associated with New Year's revelers returning home in the early morning hours, which also contribute to the higher $PM_{2.5}$ concentrations.

The FRM filters are an integrated, 24-hour sample that do not provide information regarding the timing of $PM_{2.5}$ concentrations. To gain information about emission patterns and timing, the District also operates a network of Beta Attenuation Monitors (BAM) run in non-FEM mode that produce hourly $PM_{2.5}$ concentrations. Although not as accurate as the FRM method, the BAM units do allow us to see $PM_{2.5}$ concentrations throughout our monitoring network in real-time on all days of the year at multiple locations.

The day of the year grouping in Figure 2-17 also shows that the date of the maximum 24-hour sample can be very close (e.g., 2012, 2013, 2014) or on the exact same date (see 2011). This shows that atmospheric conditions are very important in how high $PM_{2.5}$ concentrations build up, not just local emissions. This is further evidence by the daily 24-hour average $PM_{2.5}$ concentrations measured by BAM units in February 2015 shown in Figure 2-18. Here it is easy to see how $PM_{2.5}$ concentrations go up and down throughout the county, reflecting changes in meteorological conditions (e.g., atmospheric stability and winds). The sites abbreviations on Figure 2-18 include Alpine (ALP), Downtown San Diego (DTN), El Cajon (ECA – no data during February 2015), Escondido (ESC – no data during February 2015), Donovan (DVN), Camp Pendleton (CMP), and San Ysidro (SAY) Port-of-Entry.

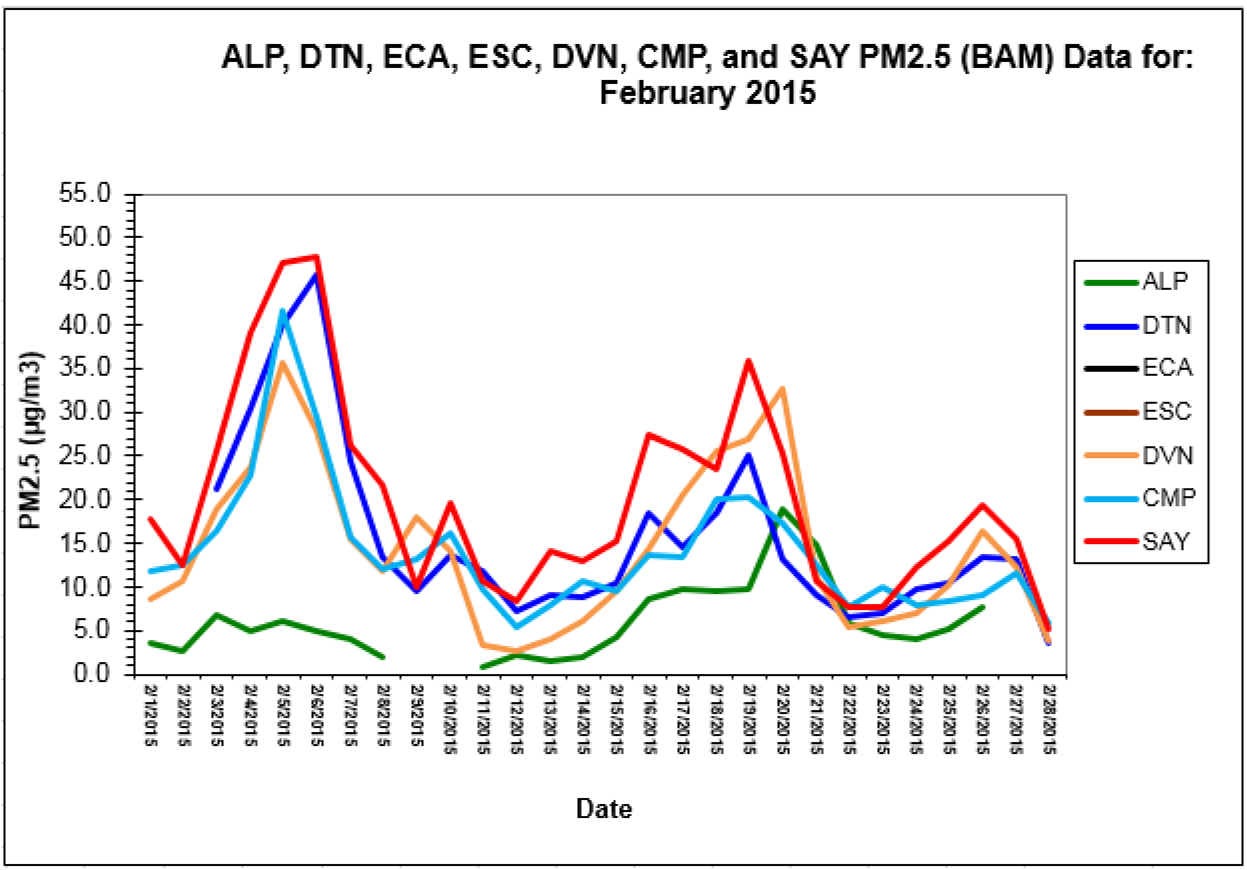


Figure 2-18: Daily BAM PM2.5 Concentrations in San Diego County – February 2015

The original National Ambient Air Quality Standards for $PM_{2.5}$ were established in 1997, with a 24-hour standard of 65 micro grams per cubic meter ($\mu g/m^3$), and an annual standard of 15.0 $\mu g/m^3$. The 24-hour standard was revised in 2006 to 35 µg/m^3, and the annual standard was revised in 2013 to 12.0 µg/m^3. The State annual standard is 12 µg/m^3 (there is no State 24-hour standard). The San Diego Air Basin attained the federal and state $PM_{2.5}$ standards in 2006 and continues to meet the revised standards.

The 5-year summary ending in 2015 for particulate matter of 10 micrometers and less in diameter (PM_{10}) is shown in Figure 2-19. This data summary shows that the highest annual PM_{10} averages through 2015 were all at the Donovan site near Otay Mesa. This area is impacted by emissions from Tijuana, Mexico. PM_{10} concentrations are consistently higher in the border region due to less controls on emissions and the large number of unpaved roads south of the border. Four of the five years listed also had the highest 24-hour concentrations, with the Downtown San Diego site (DTN) having the highest value in 2013. A look at the dates of maximum 24-hour samples show that unlike $PM_{2.5}$ and some gaseous pollutants, elevated PM_{10} concentrations occur throughout the year. These occurrences can be related to local conditions and windblown dust on a regional scale.

Particulate Matter (PM10)

Annual Average and Maximum 24-Hour Sample
San Diego County 2011-2015

Station	Annual Average Federal Standard 50 micrograms/m^3* State Standard 20 micrograms/m^3					Maximum 24-Hour Sample** Federal Standard 150 micrograms/m^3 State Standard 50 micrograms/m^3					Date of Maximum 24-Hour Sample				
	11	12	13	14	15	11	12	13	14	15	11	12	13	14	15
Chula Vista	21.5	21.0	22.0	22.5	19.7	45	37	38	37	46	4/15	6/8	6/21	3/18	9/9
El Cajon	23.5	23.0	24.2	23.9	21.9	42	48	41	48	48	12/2	1/1	5/4	1/11	9/9
Kearny Mesa/Kearny Villa Rd.	20.2	16.0	19.9	19.4	17.0	47	35	39	39	39	4/15	6/8	6/21	5/11	9/9
Escondido***	18.8	18.0	23.1	21.6	19.4	40	33	80	43	30	4/15	12/11	2/27	1/11	1/18
Downtown San Diego	23.3	21.8	24.9	23.1	22.9	48	45	90	40	53	11/29	1/4	5/22	5/11	12/8
Donovan	26.0	24.4	25.2	30.1	34.8	56	53	65	59	136	4/15	9/30	11/12	10/2	12/8

* Federal annual standard revoked December 17, 2006 (Data are shown for continuity with previous reports).
** Concentrations are averaged over a 24-hour period.
***Monitoring temporarily suspended August 2015.

Figure 2-19: 5 Year Summary of PM10 Concentrations in San Diego County – 2015

Table 2-5 shows the non-criteria pollutants measured at District air monitoring stations. These include toxic-VOCs and metals. The carbonyl compounds include formaldehyde, which is one of the higher risk drivers nationwide. Formaldehyde in the environment comes from a variety of natural and anthropogenic sources. Natural sources include biomass combustion such as forest and brush fires. Anthropogenic sources include fuel combustion from industrial and mobile sources. It is also produced worldwide in the manufacture of resins, as a disinfectant and fixative, or as a preservative in consumer products.

Carbonyl compounds were measured at the Perkins Elementary School station from 2012 through 2015. The annual average formaldehyde concentrations measured at PES are shown in comparison to the statewide average for those years in Figure 2-20. This chart shows that annual average formaldehyde concentrations at PES were below the statewide averages for all years where we have data. As with many air contaminants, formaldehyde concentrations have higher monthly averages during winter months due to increased atmospheric stability.

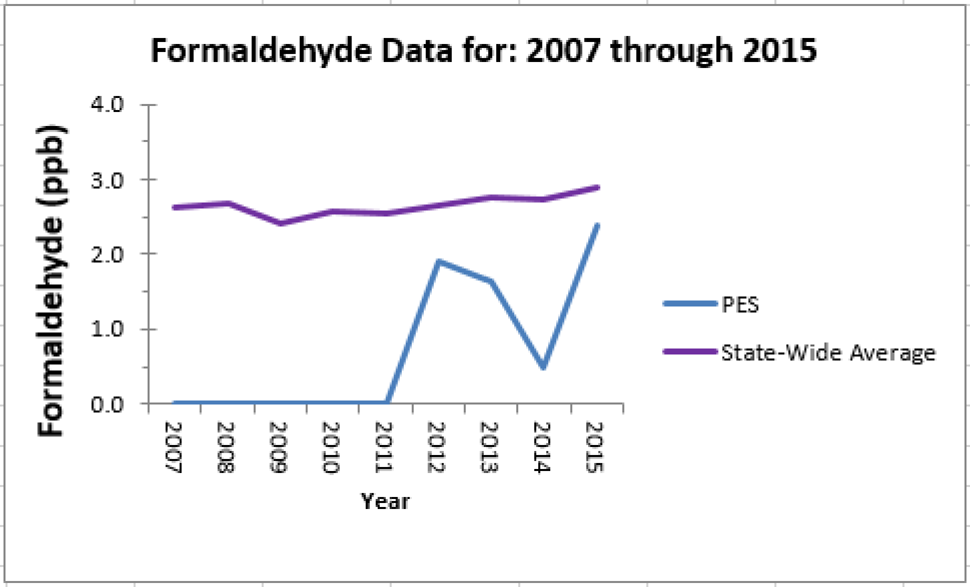


Figure 2-20: Annual Formaldehyde Concentrations for Perkins Elementary School Compared to Statewide Averages for 2013 to 2015

Another toxic compound of interest in the Portside Communities is acrolein, which is present in cooked foods and in the environment. It is formed from carbohydrates, vegetable oils and animal fats, amino acids during heating of foods, and by combustion of petroleum fuels, including diesel and biodiesel. The annual average acrolein concentrations measured at PES are shown in comparison to the statewide average for those years in Figure 2-21. This chart shows that annual average acrolein concentrations at PES were below the statewide averages for all years where we have data.

Airborne metals are also a contaminant of concern in the Portside Communities. Metals data from Perkins Elementary School (PES) have only recently become available due to the need for method development at the APCD laboratory. Annual averages of airborne nickel concentrations for PES, Memorial Academy (SDL), and statewide averages (SWA) are shown in Figure 2-22. This chart shows that the annual averages collected at SDL (Note: the year 2000 is the only year with a full year of data at SDL.). were slightly higher than the statewide averages, and that the Perkins Elementary School averages are lower than the statewide averages.

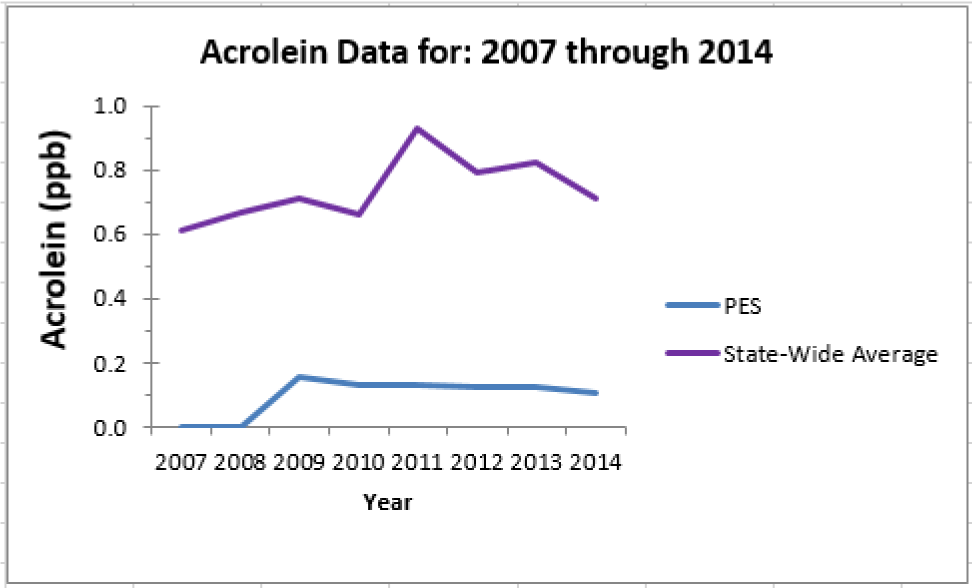


Figure 2-21: Annual Acrolein Concentrations for Perkins Elementary School Compared to Statewide Averages for 2007 to 2014

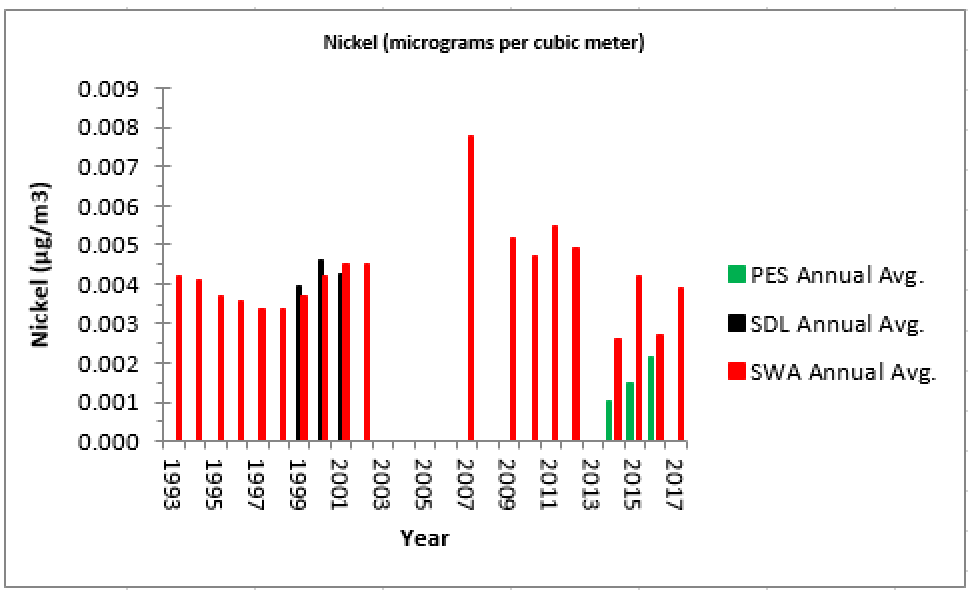


Figure 2-22: Annual Nickel Concentrations for Perkins Elementary School Compared to Memorial Academy and Statewide Averages for 1993 to 2017

The criteria pollutant data comparisons and graphs of selected toxic compounds and metals illustrate some of the challenges we face with air pollution in the Portside Communities. Although there are numerous air pollution sources in and around the Portside Communities, the meteorology (e.g., sea breeze circulation during the day) and topography help to keep concentrations of pollutants from building up to high concentrations as compared to other areas in the county.

As mentioned above, the APCD and CARB jointly worked on a special study in the Barrio Logan/Logan Heights area from late 1999 through early 2001. Data collected during this study were independently analyzed by Sonoma Technology, Inc. (STI), who presented and issued a data analysis report (Analysis of Air Toxics Data Collected In Barrio Logan, California From October 1999 Through March 2000, Final Report: STI-900800-2004-FR, March 22, 2001) to the APCD and the community. Conclusions from this study were as follows:

- Barrio Logan pollutant mean concentrations were more than one standard deviation lower than concentrations measured at Chula Vista from October 1999 through March 2000 for copper, chloroform, and methylene chloride.

- Barrio Logan pollutant mean concentrations were more than one standard deviation lower than concentrations measured at El Cajon from October 1999 through March 2000 for methyl chloroform and methylene chloride.

- Barrio Logan pollutant mean concentrations were more than one standard deviation lower than concentrations measured statewide for methylene chloride, ortho-dichlorobenzene, para-dichlorobenzene, methyl chloroform, and cobalt.

- Barrio Logan pollutant mean concentrations were more than one standard deviation higher than concentrations measured statewide for molybdenum, nickel, antimony, and tin.

- Barrio Logan pollutant mean concentrations were more than one standard deviation lower than concentrations measured in Los Angeles for acetaldehyde, formaldehyde, benzene, 1,3-butadiene, carbon tetrachloride, methylene chloride, ortho-dichlorobenzene, para-dichlorobenzene, perchloroethylene, trichloroethylene, methyl chloroform, cobalt, and copper.

- Barrio Logan pollutant mean concentrations were more than one standard deviation higher than concentrations measured in Los Angeles for molybdenum, antimony, and tin.

A table showing results from the STI report is shown in Figure 2-23. This table illustrates other challenges associated with understanding air quality data for a given location. To have a data report available before the project was completely over (This was by design – in case preliminary results showed a problem that needed further investigation, the analysis needed to get started early. The analysis did include the winter months when higher levels of toxic compounds are expected due to greater atmospheric stability.) the analysis did not include the entire dataset collected, yet there was still a large volume of data included in the analysis.

Table 5-1. Summary of Barrio Logan TAC mean concentrations compared to mean concentrations at Chula Vista and El Cajon for October 1999-March 2000 and mean concentrations statewide and in Los Angeles for October 1996-March 1997, October 1997-March 1998, and October 1998-March 1999. When the mean concentration at Barrio Logan differed by one standard deviation or more, the symbol is marked with an asterisk.

Page 1 of 2

	Barrio Logan +,–, =			
TACs	Chula Vista	El Cajon	Statewide Average	Los Angeles
Acetaldehyde	–	–	–	–*
Formaldehyde	–	+	–	–*
MEK	–	–	–	–
MTBE	+	–	+	–
Benzo(a)pyrene	+	–	–	+
Benzo(b)fluoranthene	+	–	–	+
Benzo(g,h,i)perylene	+	+	+	–
Benzo(k)fluoranthene	+	–	–	+
Dibenz(a,h)anthracene	+	–	+	+
Indeno(1,2,3-cd)pyrene	+	–	–	+
Benzene	+	+	=	–*
1,3-Butadiene	+	+	=	–*
Ethyl Benzene	+	–	–	–
meta/para-Xylene	+	–	+	–
ortho-Xylene	+	–	+	–
Styrene	+	–	+	–
Toluene	+	–	+	–
Carbon Tetrachloride	–	–	–	–*
Chloroform	–*	–	=	–
Methylene Chloride	–*	–*	–*	–*
ortho-Dichlorobenzene	=	–	–*	–*
para-Dichlorobenzene	=	=	–*	–*
Perchloroethylene	–	–	–	–*
Trichloroethylene	–	=	=	–*
Methyl Chloroform	–	–*	–*	–*
Cobalt	=	=	–*	–*
Chromium	+	+	+	+
Hexavalent Chromium	=	+	–	–
Copper	–*	–	–	–*
Iron	+	+	–	–
Manganese	+	+	+	+
Molybdenum	=	=	+*	+*
Nickel	+	+	+*	+

5-2

Figure 2-23: Table 5-1 from STI Report (2001)

Table 5-1. Summary of Barrio Logan TAC mean concentrations compared to mean concentrations at Chula Vista and El Cajon for October 1999-March 2000 and mean concentrations statewide and in Los Angeles for October 1996-March 1997, October 1997-March 1998, and October 1998-March 1999. When the mean concentration at Barrio Logan differed by one standard deviation or more, the symbol is marked with an asterisk.

Page 2 of 2

	Barrio Logan +,–, =			
TACs	Chula Vista	El Cajon	Statewide Average	Los Angeles
Lead	+	+	+	+
Antimony	=	=	+*	+*
Tin	–	+	+*	+*
Strontium	+	+	–	–
Zinc	+	+	+	+
LTP PM_{10} Mass	+	+	=	Not provided
PM_{10} Ammonium	–	+	Not provided	Not provided
PM_{10} Chloride	+	+	Not provided	Not provided
PM_{10} Mass	+	+	Not provided	Not provided
PM_{10} Nitrate	+	+	Not provided	Not provided
PM_{10} Potassium	+	–	Not provided	Not provided
PM_{10} Sulfate	–	+	Not provided	Not provided
PM_{10} Total Carbon	+	+	Not provided	Not provided

Figure 2-24: Table 5-1 from STI Report (2001) (Concluded)

As illustrated in the text, charts, and tables above, presenting air quality results in an easy to understand format is also a challenge. This will remain a challenge throughout the AB 617 work. The APCD and CARB are both working on how best to process, display, and report the data.

When the APCD learned that we would have to move the Downtown air monitoring station, we immediately began a search within the Barrio Logan area to continue the work begun during the APCD/CARB study. The Perkins Elementary School site began monitoring operations in July 2005 and continued through October 2016. During this period of over a decade of air quality measurements the APCD closely monitored the results from this monitoring station. Despite the central location and proximity to air pollution sources, data from the site were in line with findings from the APCD/CARB study at Memorial Academy (i.e., data were not significantly higher in the Barrio Logan area than in other areas of the county or when compared to statewide averages).

Herein lies the challenge and the opportunity of AB 617-funded air monitoring in the Portside Communities in San Diego. For the first time ever, we will be able to conduct simultaneous air monitoring at numerous locations in the community. The density of measurements will allow us to see gradients of pollutants across the community and determine how various air pollutants move through the neighborhoods. We will also be able to identify if there are air pollution "hot spots" within the communities, identify the source(s), and work to make significant reductions in emissions to improve air quality in the Portside Communities and throughout the county.

The air pollutants to be measured as part of this effort are determined by the known sources of emissions in and around the Portside Communities, and for the known health effects of those pollutants. The air pollutants to be measured, the equipment to be used, and sampling schedules are described in Section 4 of this document.

2.2.7 Modeling Programs to Estimate Health Risks

A major limitation of air quality monitoring is that the measurements are generally at a fixed, specific location, and resources limit the number of sites that can be operated simultaneously. Mathematical modeling is often used to fill in the gaps and make estimates of air pollutant concentrations in areas where actual measurements do not exist. The accuracy of these models depends on numerous factors, including emissions inventories and release rates, meteorological data, and the complexity of the model in general.

Since the models attempt to replicate the real world, assumptions, or parameterizations need to be included to reduce the computations requirements such that the model can be efficiently run without taking excessive time to complete. Grid spacing (horizontal and vertical resolution), time steps (how detailed in time) dispersion characteristics in the vicinity (in reality it varies over scales that are smaller than the grid spacing), initial conditions (input data at the start of the modeling run), boundary conditions (conditions at the edges of the modeling domain), etc., are all factors that affect how accurate the model is and its efficiency (i.e., how long the model takes to run). For example, as the grid spacing shrinks (higher resolution), the number of computations required to run the model increase significantly, and the model takes longer to run.

Modeling work was included in the previously mentioned APCD/CARB study in the Barrio Logan area. Detailed emissions inventory work in the Barrio Logan area was conducted by APCD and CARB staff, and a special micro-dispersion study using tracer gas was conducted in the Barrio Logan area by the College of Engineering - Center for Environmental Research and Technology (CE-CERT) operated out of the University of California, Riverside (UCR). This effort was designed to provide additional information regarding atmospheric dispersion parameterization in the models to increase model accuracy.

CARB formed and led the Community Health Modeling Working Group to meet and discuss modeling procedures for conducting cumulative assessments and neighborhood-scale monitoring and modeling. The group consisted of over 40 participants from government agencies (including the APCD), universities, industry, and environmental groups. The Working Group was part of CARB's Community Health Neighborhood Assessment Program (NAP).

The Working Group evaluated CARB's initial modeling analysis in Barrio Logan, which was used to assess the cumulative impacts of air pollution at the neighborhood-scale. The lessons learned from this study were applied to the next generation of NAP studies, including in the Wilmington area (in the Los Angeles area).

Documents from this Working Group can be found at:

https://www.arb.ca.gov/ch/modeling.htm

Results from the EPA's Community Multiscale Air Quality Modeling System (CMAQ – also known as Models 3) for the Barrio Logan area included:

- Predicted annual averages were $\pm$50% of observations for benzene, toluene, formaldehyde, and acetaldehyde.

- Model performance was comparable with other studies (e.g., Multiple Air Toxics Exposure Study (MATES II) in the South Coast Air Basin).

- Ozone performance was as good or better than a previous annual ozone modeling study.

- Three species contributed over 90% of the estimated inhalation risk (Diesel Particulate Matter, benzene, and 1,3-butadiene) over the modeling domain.

- There was poor performance for some species (e.g., vinyl chloride, ethylene oxide, some particulate matter components, and xylenes. However, these species were a minor contributor of the overall inhalation risk.).

- In Barrio Logan, the models were not sensitive to double counting (<1%).

In the years since this initial modeling for Barrio Logan, improvements to the models and computation power have been made, opening the way for improved modeling for the Portside Communities. A more accurate and detailed emissions inventory for the Portside Communities will be crucial for improving model performance and giving more accurate results. The APCD and CARB will be working together to establish this more accurate and detailed emissions inventory, including emissions from mobile sources, and CARB will lead the modeling effort. CARB modelers have already identified the need for a newer base year for modeling, as well as the need for a review of emissions from Mexico (Tijuana).

The air quality monitoring and modeling efforts of AB 617 will lead to a better understanding of air pollution issues in the Portside Communities. These efforts will be used to help formulate air pollution control strategies in the Portside Communities and the county, that will ultimately lead to emissions reductions and cleaner air for everyone.

2.3 Alternative Approaches to Air Quality Monitoring

Traditionally, air quality monitoring has been performed on regional or neighborhood scales. By design, siting of the traditional air quality monitoring station avoided localized emissions such as roadways. Notable exceptions to traditional monitoring in San Diego county include our current efforts at near-road monitoring, the previously mentioned hexavalent chrome monitoring in Barrio Logan, $PM_{2.5}$ monitoring at the San Ysidro Port-of-Entry, and near mineral extraction/processing facilities, to name a few.

For the AB 617 air monitoring effort, there will be a focus on monitoring in areas where emissions occur or accumulate, so some of the siting criteria used for traditional monitoring will not be used to prevent siting in these locations. The number of air monitoring locations needed for complete coverage in the Portside Communities also necessitates alternatives to traditional monitoring station siting and equipment selection.

Our typical air monitoring station requires: a relatively large footprint for the small office-style trailer that houses reference method air monitoring and quality control equipment; dedicated access for station operators, calibration and audit vans; room for a deck for additional samplers (e.g., particulate matter samplers); a 10-meter meteorological tower; a readily available and dedicated source of electrical power; and, away from direct sources of air pollution, such as large and busy roadways. The large investment in time and site preparation necessitates putting air monitoring stations in locations where we can get a commitment to stay for many years, if not decades. Additionally, staying at a fixed location over many years is needed to establish background concentrations and to measure trends, which are important to verify the effectiveness of our air pollution control strategies.

The District reviewed numerous and various technologies to address air monitoring needs in the Portside Communities. The primary issue to be resolved was what air pollutants to monitor. In collaboration with community members, it was determined that diesel emissions (i.e., diesel particulate matter), toxics, and metals were the primary categories of pollutants of concern.

The emphasis on these pollutants helped narrow the field of available monitoring strategies. The District focused on analyzer/samplers with established track records and sophistication to provide reliable and defensible results. This determination essentially ruled out the use of low-cost sensors as they are not accurate enough and they do not have established quality assurance/quality control (QA/QC) protocols to ensure defensible data collection. The instruments also need to be standalone (i.e., not require a separate shelter to protect them from the elements – reduces the size of the footprint needed at each monitoring location) and operate on standard electrical power (battery-operated equipment would be too labor intensive due to frequent battery swap-outs needed and solar-powered equipment was not available or would not supply adequate power to draw sufficient air volumes to collect detectable levels of pollutants).

The types of air pollutants to be monitored and the available alternatives for equipment options (including pros and cons of each) were presented to the Steering Committee in the following presentations:

October 25, 2018 Steering Committee Presentation:
https://www.sdapcd.org/content/dam/sdc/apcd/PDF/AB_617/STEERING%20COMMITTEE%20MEETING%2010%2025%2018.pdf

November 27, 2018 Steering Committee Presentation:
https://www.sdapcd.org/content/dam/sdc/apcd/PDF/AB_617/AB-617%20MTS%2011-27-2018%20V1.pdf

December 17, 2018 Steering Committee Presentation:
https://www.sdapcd.org/content/dam/sdc/apcd/PDF/AB_617/AB-617%20MTS%2012-17-2018%20V1.pdf

The monitoring equipment chosen for use in the Portside Communities are described in Section 4 of this document. The next phase of project planning was to determine where to set up and operate air monitoring equipment. The District sought input from the community and breakout sessions at Steering Committee meetings focused on locations of interest within the Portside Communities. The list of potential sites that resulted from numerous meetings can be accessed by the link below.

https://www.sdapcd.org/content/dam/sdc/apcd/PDF/AB_617/AB_617_Monitoring_Location_Worksheet.pdf

Understandably, the number of potential monitoring locations far exceeds the number of sites that can be realistically be established and operated under this program. Many of the areas of concern identified by the Steering Committee include areas impacted by heavy vehicular traffic, especially from heavy-duty diesel trucks. The idea of using mobile monitoring as a screening tool was discussed as early as the November 27, 2018 meeting, and at the December 17, 2018 meeting it was agreed to pursue soliciting for and awarding a contract for a contractor to conduct mobile monitoring throughout the Portside Communities and some additional census tracts within San Diego county. A contract for mobile monitoring was awarded to Aclima, Inc., on April 12, 2019. Additional details on the mobile monitoring effort is included in Section 5 of this document.

Discussions with the Steering Committee have also shown the need to better understand the types and numbers of vehicles on the streets of the Portside Communities, especially heavy-duty diesel trucks. The District is therefore moving forward with procuring, siting, and operating video cameras that will include options for vehicle license reader (VLR) technology. This will provide information about the engine size and age of vehicles operating in and around the Portside Communities. This information will be critical for estimating emissions from vehicular traffic.

The District is conducting additional inspections at stationary sources in the community and additional mobile source inspections in the area including checking for truck idling in the neighborhoods where such activity has been a reported problem in the past. Bilingual District inspectors have presented to residents how to report air quality complaints to the District. Additionally, a Spanish version of a mobile app to submit complaints is nearing completion. Joint inspections were also conducted with the Department of Environmental Health at facilities regulated by both agencies and will continue as necessary.

The District is also seeking incentive emission reduction projects in the community. Outreach is occurring on a frequent basis and is proving successful as evidenced by the over 200 applications received for 2017-18 incentive funding. Requests for funds far surpassed the amount funding received from the State.

In addition to the District air monitoring efforts, the Environmental Health Coalition (EHC) has installed several low-cost sensors in the community. In combination with the data collected by the District, this information will help assess air quality impacts on residents of the community. The District will assist EHC with their monitoring by providing expert support, including data interpretation and collocating an EHC sensor at the Sherman Heights Elementary School. Data collected by EHC will potentially be useful in identifying locations in need of additional community monitoring or further action by the District.

Monitoring Plan Element 3: SCOPE OF ACTIONS

As described in Section 2, the APCD has conducted air quality monitoring in the Portside Communities area for many years. The air monitoring to be conducted under AB 617 represents an opportunity to measure air pollutants simultaneously across the Portside Communities. Under this program we will also be able to conduct specialized measurements of pollutants of interest, many of which we were unable to measure previously (e.g., real-time black carbon).

The Portside Communities have historically been under increased scrutiny by the APCD. For example, major sources in the Portside Communities are inspected quarterly, instead of annually. There has also been additional focus on permit conditions, emissions inventories, and increased enforcement of heavy-duty diesel truck idling rules and operations in the area.

Historic data collected in and around the Portside Communities have not identified significant differences in pollutant levels as compared to other areas of the county or the state. The number of monitoring locations and types of measurements to be conducted under AB 617 will provide a clearer picture of air pollutant sources (i.e., stationary or mobile) and locations in the Portside Communities. This new insight will dictate future actions to reduce emissions in the community.

For example, if air pollutants measured indicate impacts from stationary sources, the APCD will review existing air pollution permit conditions and air pollution control rules to see if they need to be revised, or if new rules need to be written and enacted. On the other hand, if elevated concentrations of pollutants are found that are linked to mobile sources, other measures will need to be considered. The planned enhanced emissions inventory work, along with the vehicle license reader work associated with AB 617 will help determine whether there are options for reducing mobile emissions in the Portside Communities.

If the enhanced emissions inventory work determines that emissions associated with local drayage are contributing a large portion of mobile emission in the Portside Communities, then additional incentives money could be needed to further reduce emissions. If the planned enhanced emissions inventory work and vehicle license reader projects determine that a large percentage of emissions are from vehicles outside the community (e.g., deliveries to local businesses), then additional truck routes in and around the Portside Communities may need to be considered, and additional incentives money could be required. Any initiatives related to vehicle routing would need to be coordinated with the City of San Diego and/or CALTRANS.

Until we have air pollution data collected under the AB 617 program, we cannot elaborate on further actions other than those mentioned above. The District is, however, committed to collecting air pollution data in multiple locations throughout the Portside Communities, establishing baselines, measuring trends, and determining if further air pollution control measures are needed to reduce emissions. We are also committed to implementing additional incentives aimed at reducing emissions in the Portside Communities. The AB 617 air monitoring network will remain in place to measure the effectiveness of emissions reductions implemented as part of the APCD's existing rules, rule revisions, and emissions reduction incentives programs.

Monitoring Plan Element 4: AIR MONITORING OBJECTIVES AND METHODS

This Section lays out the air monitoring objectives and methods to be used to measure air pollution concentrations in the Portside Communities. Since air monitoring results could potentially be used to require additional air pollution control measures, the APCD has elected to use air sampling equipment and methods designed to high quality, accurate, and defensible data at District-operated monitoring locations. The air monitoring equipment described below are designed to answer community concerns over diesel particulate matter, air toxics, and airborne metals.

4.1 Air Monitoring Objectives to Address Community-Specific Concerns

Within the Portside Community, residents have identified areas where they believe there are disproportionate air pollution burdens. The District's air monitoring objectives are designed to address these concerns.

- Input from the Steering Committee (which includes residents and community groups) has identified areas of interest for AB 617 air monitoring. These concerns include air pollutants from stationary and mobile sources, with emphasis placed on emissions from heavy-duty diesel truck traffic.
    - Because air pollution disproportionately impacts the very young and the elderly, the Steering Committee expressed interest in sampling locations at or near schools, senior centers, parks, and other areas of public usage.
- Several streets and intersections near freeway access points and streets leading to businesses that use heavy-duty trucks have been identified by the Steering Committee.
- Many heavy-duty diesel trucks traverse the streets in the Portside Community. There are limited direct emission control technologies the District can impose on the trucks, but by using emissions data that is cross-referenced to traffic patterns, the District can work with local law enforcement to enforce City ordinances specifying pre-established truck routes in and around of the Portside Communities.

4.2 Community Air Monitoring Program Design

Details of the air monitoring program design and implementation plans are provided in the subsections below.

4.2.1 Types of Data Needed

Information needed to support community concerns over air pollution will require measurements for diesel particulate matter (or surrogate, such as black carbon), and airborne toxics and metals. The APCD is establishing a traditional, regional air monitoring station at Sherman Elementary School (SES). Located in the northwestern portion of the Portside Communities, this station will monitor criteria pollutants as well as a full complement of air pollutants specific to the AB 617 program. Data from this monitoring station will be used for comparison to all other data collected under the AB 617 program. These comparisons will be useful to see spatial and temporal patterns of air pollutants as they are emitted and move through the community. Data from the combined sites will also allow for measurements of pollutant gradients and residence times across the community.

The airborne toxics and metals sampling will be made with 24-hour integrated samples (i.e., samples collected over an entire 24-hour period – from midnight to midnight). Integrated samples allow for accurate measurements of small concentrations of pollutants, but do not provide any information regarding the time, or times of day which contribute most to the measured concentrations. Real-time measurements of some pollutants provide the diurnal distribution of emissions, which will provide information regarding the source(s) of the pollutant. For example, higher levels of nitric oxide/nitrogen dioxide in the morning hours would indicate fresh emissions from mobile sources. If these same times are also marked by higher black carbon values, then we can surmise that diesel-powered vehicles were included in the morning traffic.

The District has planned for a broad-range of integrated and continuous measurements to address the community's concerns over air pollutants emitted in and around the Portside Communities. The planned measurements are also designed to determine whether stationary sources or mobile sources are contributing the greater percentage of emissions impacting air quality. The air quality parameters to be measured are described in the Section 4.2.2.

4.2.2 Air Quality Measurements in the Portside Communities

This Section discusses the actual pollutants to be measured in the Portside Communities for the AB 617 program. These measurements are designed to determine the concentrations of airborne pollutants and toxics throughout the community, and determine the source, or sources that contribute most to the air pollution burden. This information will also be valuable for developing strategies for reducing air pollutants in the community and throughout the county.

As indicated in Section 2.3, the District acquired the services a contractor to conduct mobile monitoring in and around the Portside Communities. The primary focus of the mobile monitoring effort was to help decide the locations for fixed air monitoring. Although the Steering Committee had recommended specific areas for air monitoring, it was agreed that mobile monitoring would represent a screening tool to make sure that potential "hot spots" are not overlooked.

The mobile monitoring contract required that each street and roadway in the Portside Communities was driven by an instrumented vehicle a minimum of twenty times, with legs of the monitoring occurring at different times of the day and on different days of the week. Additional areas of the county were also included in the contract to provide comparison data and to see if additional neighborhoods should be considered for future measurements. The instrumented vehicle is equipped to measure the following parameters:

- Black Carbon
- $PM_{2.5}$
- Oxides of Nitrogen
- Carbon Monoxide
- Carbon Dioxide

The mobile monitoring contractor presented preliminary results at the April 23, 2019 meeting. These preliminary results included maps of average black carbon concentrations after the instrumented vehicle had traversed the roadways for approximately one third of the required runs. A map showing the southern portion of San Diego county, including the Portside Communities is shown in Figure 4-1.

Figure 4-1: Preliminary Average Black Carbon from Mobile Monitoring Project in the Southern Portion of San Diego County

Although the map only represents roughly a third of schedule traverses of the roadways, some patterns are already evident. For example, areas of downtown San Diego, with high density traffic appears as red. As do some areas of the Portside Communities and some roadway segments. A more detailed map of the Portside Communities is shown in Figure 4-2. Here again, roadways in some areas clearly have higher black carbon concentrations than other, less traveled roadway segments. It is interesting to note that the central and eastern portions of the Barrio Logan area appear to have higher black carbon concentrations than the area just to the west. This may prove to correlate with actual traffic counts, or it may be partially due to the meteorology in the area as well. Additional measurements and comparison to traffic counts and other pollutants measured will provide more definitive answers in the future.

In the meantime, the District is moving ahead with siting several air pollution monitoring locations that will collect a variety of air pollutants, toxics, and metals. It is necessary to locate and negotiate use of these locations now, before the completion of the mobile monitoring project so that other AB 617 monitoring requirements can be met. Areas of interest include schools, areas near heavily traveled roadways, upwind and downwind of Port facilities, and areas frequented by large numbers of people (e.g., Chicano Park). One permanent/regional air monitoring location in the northeast portion of the Portside Community. Results from the mobile monitoring project or additional input from the Steering Committee may require additional monitoring locations. The District has not made a final determination on the final number of monitoring locations, or the actual locations to be considered/included.

Figure 4-2: Preliminary Average Black Carbon from Mobile Monitoring Project in and Around the Portside Communities

Analytes that will be measured at APCD air monitoring sites in the Portside Communities can be separated into two Tiers (I and II). Tier I analytes are those that will be measured throughout the Portside community. Tier II analytes will be measured at the Sherman Elementary School (permanent/ regional air monitoring) location in support of the source apportionment study and regional monitoring.

Tier I analytes of interest are:

- Black Carbon
- Organic and Elemental Carbon
- Toxics-VOCs
- Toxics-Metals

Tier II analytes and supporting parameters include:

- Black Carbon
- Organic and Elemental Carbon
- Toxics-VOCs
- Toxics-Metals
- Ions
- Meteorological parameters

Additional details on the air pollutant measurements to be conducted in the Portside Communities is provided in the following subsections.

4.2.2.1 Airborne Carbon

The health effects of airborne particulate have been known for decades and research has shown that the smaller particles are of greater concern as they can penetrate deeply into the respiratory system. Airborne particulate matter standards have evolved to reflect these health-based concerns. The first National Ambient Air Quality Standards (NAAQS) for particulate matter was for Total Suspended Particulates (TSP), which became effective in 1971. The NAAQS for particulate matter of 10 micrometers and less in diameter (PM_{10}) became effective in 1987, and the first NAAQS for particulate matter of 2.5 micrometers and less in diameter ($PM_{2.5}$) was enacted in 1997.

The APCD has nearly two decades of $PM_{2.5}$ data, and the San Diego Air Basin is in attainment of the NAAQS for $PM_{2.5}$. $PM_{2.5}$ measurements in the San Diego Air Basin have been focused primarily on the total mass of $PM_{2.5}$ particulates. The health effects of $PM_{2.5}$ are not limited to just the mass of airborne particles. The composition of the particulates is also a concern, especially those from the combustion of diesel fuel (known as diesel particulate matter).

Measurements of diesel particulate matter have been a technical challenge for many years. Carbon in the atmosphere is composed of organic carbon (OC) and elemental carbon (EC), and we have limited, and inconclusive measurements for the San Diego Air Basin. It is the EC fraction that is generally associated with diesel particulate matter. The term black carbon (BC) is often used interchangeably with EC.

For the AB 617 program the APCD will be measuring OC/EC concentrations using two different methods in the Portside Communities. A manual, filter-method sampler will be operated to collect the most accurate measurements, where the filters will be analyzed in a laboratory. The filters will be 24-hour integrated samples, so we will not be able to discern diurnal patterns from the data. To collect data for diurnal patterns (and therefore emissions), a continuous black carbon analyzer will be used in the AB 617 air monitoring network.

Additional information on the sampling equipment to be used and the laboratory procedures for analysis are described in Section 7. A list of speciated fractions for carbon analysis from the manual, filter-based sampler and laboratory analysis are presented in Table 4-1.

Table 4-1: List of Speciated Fractions for Carbon Analysis

CARBON			
1	Total Carbon	6	Total Organic Carbon
2	Total Elemental Carbon	7	OC1
3	EC1	8	OC2
4	EC2	9	OC3
5	EC3	10	OC4
		11	Pyrolyzed OC

4.2.2.2 Ions

The analysis of ions from filter-based samples will support source apportionment work in the Portside Communities. For example, if sulfates are found on the filter samples, the sulfates would originate from more distant, offshore emissions from ships burning fuel containing sulfur. That is because chemical conversions to sulfates take enough time to rule out localized emissions. Other properties of the speciated ion concentrations will similarly be used in the source apportionment analysis. The list of cations and anions that will be analyzed from Sherman Elementary School samples are provided in Table 4-2.

Table 4-2: List of Speciated Ions for Analysis

Ions*			
	Cations (+)		Anions (-)
1	Sodium ion (Na^+)	1	Chloride ion (Cl^-)
2	Ammonium ion (NH_4^+)	2	Nitrate ion (NO_3^-)
3	Potassium ion (K^+)	3	Sulfate ion (SO_4^{2-})

*Initially these ions will only be measured at Sherman Elementary School. Additional sites may be added if preliminary results indicate the need for additional data.

4.2.2.3 Toxics-Volatile Organic Compound Analysis

A wide variety of volatile organic compounds (VOCs) are emitted by petroleum-based products, including fuels, paints, solvents, and coatings used in manufacturing and industrial processes. Many individual VOCs are known to be harmful to human health and are known as Toxics-VOCs. The APCD sampled for Toxics-VOCs at the Perkins Elementary School monitoring station for several years, as well as elsewhere in the county. We will expand the Toxics-VOCs monitoring to several sites within the Portside Communities during this AB 617 monitoring program.

Toxics-VOCs are sampled by pumping ambient air into special evacuated canisters at a constant rate over a fixed time period. For this program all samples will initially be for 24-hour durations. Shorter time durations can be sampled if compounds of interest are found in the air that may be emitted from a specific location or time-frame by an industrial process or facility.

A list of the 57 Toxics-VOCs that will be analyzed in the laboratory for the AB 617 monitoring program are provided in Table 4-3. Additional information on the sampling equipment to be used and the laboratory procedures for analysis are described in Section 7.

Table 4-3: List of Speciated Compounds from the Toxics-VOCs Analysis

TOXICS-VOCs			
1	1,1,1-trichloroethane	30	cis-1,2-dichloroethene
2	1,1,2,2-tetrachloroethane	31	cis-1,3-dichloropropene
3	1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113)	32	dichlorodifluoromethane (F-12)
4	1,1,2-trichloroethane	33	ethyl acetate
5	1,1-dichloroethane	34	ethyl benzene
6	1,1-dichloroethene	35	hexachloro-1,3-butadiene
7	1,2,4-trichlorobenzene	36	isoprene
8	1,2,4-trimethylbenzene	37	o-xylene
9	1,2-dibromoethane	38	m-xylene
10	1,2-dichloroethane	39	p-xylene
11	1,2-dichloropropane	40	m-dichlorobenzene
12	1,2-dichlorotetrafluoroethane (F-114)	41	methyl methacrylate
13	1,3,5-trimethylbenzene	42	methyl tertiary butyl ether (MTBE)
14	1,3-butadiene	43	methylene chloride (dichloromethane)
15	2-butanone (MEK)	44	naphthalene
16	4-ethyltoluene	45	n-hexane
17	4-methyl-2-pentanone (MIBK)	46	o-dichlorobenzene
18	acetone	47	p-dichlorobenzene
19	acetonitrile	48	styrene
20	acrolein	49	tetrachloroethylene
21	acrylonitrile	50	tetrachloromethane
22	benzene	51	toluene
23	benzyl chloride	52	trans-1,2-dichloroethene
24	bromoform	53	trans-1,3-dichloropropene
25	bromomethane (methyl bromide)	54	trichloroethylene
26	chlorobenzene	55	trichlorofluoromethane (F-11)
27	chloroethane	56	vinyl acetate
28	chloroform	57	vinyl chloride
29	chloromethane		

4.2.2.4 Airborne Metals

Some airborne metals are known to be harmful to human health and are known as Toxics-Metals. The APCD sampled for Toxics-Metals at the Perkins Elementary School monitoring station for several years, as well as elsewhere in the county. We will expand the Toxics-metals monitoring to several sites within the Portside Communities during this AB 617 monitoring program. Potential sources of Toxics-Metals in the Portside Communities include welding and grinding operations associated with shipyards and autobody shops.

Toxics-Metals are sampled by drawing air through special filters, which are later analyzed in the laboratory. Since Toxics-Metals are normally found in small concentrations, sampling periods of 24-hour durations are needed to gather enough material for detection.

A list of the Toxics-Metals that will be analyzed in the laboratory for the AB 617 monitoring program are provided in Table 4-4. Additional information on the sampling equipment to be used and the laboratory procedures for analysis are described in Section 7.

Table 4-4: List of Speciated Compounds from the Toxics-Metals Program

TOXICS-METALS & ELEMENTS			
TIER I		**TIER II***	
1	Antimony	1	Aluminum
2	Arsenic	2	Calcium
3	Beryllium	3	Copper
4	Cadmium	4	Iron
5	Cobalt	5	Magnesium
6	Lead	6	Potassium
7	Manganese	7	Sodium
8	Nickel	8	Strontium
9	Selenium	9	Titanium
10	Chromium	10	Zinc
11	Barium		
12	Molybdenum		
13	Tin		
14	Vanadium		

* Tier II metals will only be analyzed for the Sherman Elementary School site.

4.2.2.5 Video Monitoring

Emissions from mobile sources is one of the areas that will be investigated during this program to improve the emissions inventory in the Portside Communities. It is therefore important to know the actual numbers and types of vehicles that use the roadways in the community.

The APCD will be setting up and operating six video cameras at various intersections and roadway segments to assist in this effort. The video files will be screened by Automated License Plate Reader (ALPR) software that will determine the make, model, and year of each vehicle that passes past the video camera. This information will be used to determine the engine type and age of each vehicle. These are important data points to determine the emissions associated with each vehicle. No personal information will be collected in this effort, and no information will be used for the enforcement of rules of the road.

The APCD is currently acquiring the equipment needed for this effort. Student workers from San Diego State University (SDSU) will be trained and used to operate the video cameras and collect ancillary data.

4.2.2.6 Meteorology

Meteorological information is an important factor for data analysis of air quality data. Wind speed and wind direction data are especially important for determining the location, or locations, of pollution sources that impact a given location. The APCD installs 10-meter meteorological towers at all regional air pollution monitoring stations, including the Sherman Elementary School site. Meteorological data is routinely collected at nearby locations such as San Diego International Airport (SAN – also known as Lindbergh Field) and Naval Air Station North Island (NZY).

Wind sensors will be installed at a limited number of air monitoring stations operated in the Portside Communities. Due to siting limitations, these additional sensors will not be operated at the routine 10-meter height, and other wind sensor siting criteria may not be achievable at all locations.

There is demand for 3-dimensional wind data (includes vertical-component of the wind) for modeling applications. The APCD is planning to operate a 3-dimensional wind system on the 10-meter tower at Sherman Elementary School. At this time, no additional 10-meter towers are planned in the Portside Communities monitoring network

4.2.3 Duration of Monitoring

As stated in the National Air Toxics Trends Station (NATTS) and Chemical Speciation Network (CSN) technical guidance documents, five years of data collection is the minimum duration needed to establish a higher degree of confidence in the data for trends analyses (based on a 1:6 sampling frequency). The District will be operating the Sherman Elementary School site on a permanent basis, which will serve as a trends site regardless of how long other air monitoring locations in the Portside Communities are operated. Continued operation of the other air monitoring sites in the Portside Communities network will depend on several factors. An important factor in continued air monitoring in the Portside Communities will be the determination of the value of the data collected in a specific location. This will be determined by trends developed over time and discussed by the Steering Committee. Some important timelines for the proposed air monitoring in the Portside Communities is provided below:

- Establish monitoring by July 2019
- After 1-year of data collection, evaluate the Portside sampling locations by comparing data collected to:
  - ✓ To health standards, when applicable.
  - ✓ To other Portside Community sites.
  - ✓ To non-Portside sites, but still in San Diego County.
  - ✓ To statewide averages.
  - ✓ Use data to determine if additional pollutants need to be monitored at a given site.
  - ✓ Is there a need for additional air monitoring sites in the Community?
  - ✓ Discuss results with Steering Committee.
- After 3-years, evaluate the continued viability of Portside sampling locations for:
  - ✓ Expand 1-year comparisons to the 3-years of data collected.
  - ✓ Evaluate redundancy (are the data being collected adding value to our understanding of air quality in the Portside Communities?)
  - ✓ Check data closely to see if there has been a reduction in air pollutant emissions, traffic/truck counts, or measured air pollution concentrations.
  - ✓ Discuss results with Steering Committee.
- After 5-years, evaluate the Portside sampling locations for:
  - ✓ Expand 3-year comparisons to the 5-years of data collected.
  - ✓ Determine if reductions in air pollutant emissions are permanent.
  - ✓ Determine if any air monitoring sites can be decommissioned.
    - ➢ If so, in what order are the sites decommissioned?
    - ➢ Are some sites to remain operational; if so, which ones and why?
    - ➢ If not, how much longer are they to remain operational?
- Discuss results with Steering Committee. Make determinations on continued air monitoring efforts in the Portside Communities.

4.2.4 Use of Air Monitoring Data to Inform the Public on Air Quality and Actions Taken to Reduce Air Pollution in the Community

The APCD is responsible for developing enforceable state and local implementation plans to meet and maintain air quality standards. The APCD works with CARB and the EPA to develop these State Implementation Plans.

- The APCD's Vision is: Clean Air for All.

- The APCD's Mission Statement is: Improve Air Quality to Protect Public Health and the Environment.

For the AB 617 program, the APCD's Mission Statement was amended to include:

- To Improve Air Quality and Public Health in San Diego Disadvantaged Communities.

Additionally, for the AB 617 program the APCD adopted the following Guiding Principles:

1. Pursue community-involved actions to reduce air pollution that improves public health.
2. Form a collaborative process that is diverse and inclusive.
3. Be transparent, accessible, accountable, proven, effective, adaptive, and defined.
4. Make science-based decisions.
5. Leverage resources.
6. Share information and lessons learned with other communities.
7. Promote accelerated deployment of clean technology,
8. Be aligned with other programs, including local climate action plans.

The air monitoring portion of the AB 617 program is designed to provide the information on current conditions in the Portside Communities. The monitoring strategy is designed to determine air pollutant sources impacting air quality and to develop air pollution control strategies to reduce emissions and improve air quality in the local community and throughout the county.

Monitoring Plan Element 5: ROLES AND RESPONSIBILITIES

This Section identifies the parties responsible for major aspects and phases of the District's air monitoring program. The AB 617 program has created the need for some re-engineering and reorganization of certain Sections within the APCD. Although the roles of key players have already been identified, and these individuals are noted below.

5.1 APCD Roles and Responsibilities

The re-engineering and reorganization of the Monitoring and Technical Services Division is still in progress. A rough organizational chart for the major aspects of the District's roles in the AB 617 program is shown in Figure 5-1. Key individuals in each of the new and reorganized Sections are identified below.

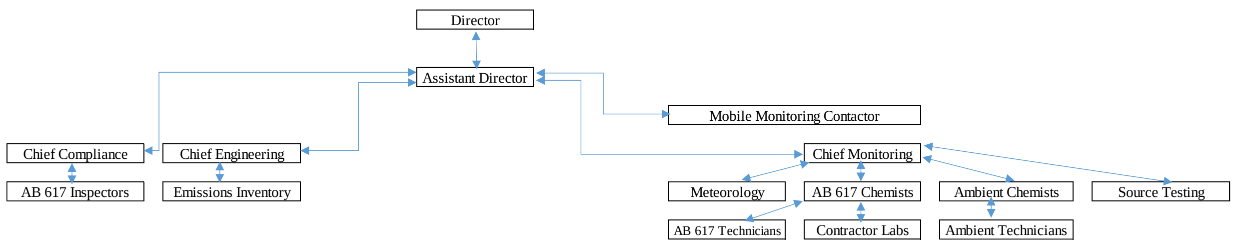


Figure 5-1: Flow chart of the AB 617 Command Structure

- **CONTACT INFORMATION**:
  - Lead Contact
    Jon Adams – Assistant Director; Jon.Adams@sdcounty.ca.gov; (858) 586-2653

- **Subject Matter Experts**:
  - Inspections and Public Complaints
    Mahiany Luther – Chief, Compliance Division; Mahiany.Luther@sdcounty.ca.gov; (858) 586-2725
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5.2 Group Roles and Training Requirements

All technical work at APCD-operated air monitoring sites will be conducted by District personnel. All work will be conducted by staff who are trained and familiar with the Standard Operating Procedures for the equipment they are operating. Specific roles and responsibilities are described below.

5.2.1 District Staff Roles and Responsibilities

- Daily operations, maintenance, and data review (2 to 3 technicians).
  - ✓ Technicians will receive peer training and will be supervised by an experienced, Supervising Technician.
  - ✓ Selected District staff will receive manufacturer training, when offered, and relay this information to other staff.
  - ✓ They will also receive other training from the EPA, CARB, California Air Pollution Control Officers Association (CAPCOA), etc., when offered.
  - ✓ Duties
    - Special Projects Technician 1 (AB 617 sites 1 to 5): collect and load canisters, equipment maintenance, equipment QC checks, and Level 1 data review (Data Review procedures are discussed in Section 10.3).
    - Special Projects Technician 2 (AB 617 sites 6 to 10): collect and load canisters, equipment maintenance, equipment QC checks, and Level 1 data review.
    - Special Projects Technician 3 (additional sites): the sites' responsibilities will be divided among these three Technician positions.
    - Air Pollution Control Aides will assist the AB 617 Technicians as directed by the Special Projects Supervising Technician. General responsibilities will include maintaining parts and consumable inventories and assisting with shipping & receiving duties.
- Calibrations, audits, and data review: 1 to 2 chemists.
  - ✓ Training
    - Chemists will receive peer training for Toxics-VOCs and Toxics-Metals and will be supervised by a Senior Chemist.
    - They will receive manufacturer training, when offered.
    - They will receive CAPCOA training, when offered.
    - They will join the National Association of Clean Air Agencies (NACAA), CAPCOA, Toxics, and $PM_{2.5}$ CSN EPA workgroups.
    - If possible, they will receive specialized Elemental Carbon training from the laboratory (e.g., Desert Research Institute).
  - ✓ Duties
    - Chemist 1: Review Toxics-VOCs data, Level 2 data review, discern patterns/trends, issue preliminary and final reports, quality control (QC) sampler calibrations, sampler QA for Toxics-Metals and the Carbon samplers and analyzers, and meet with public as needed. Run actual District Toxics-VOCs analyses periodically. Be the point-of-contact for the contract laboratory. Participate in troubleshooting teleconferences with the contract laboratory.
    - Chemist 2: Review Toxics Metals and Ions data, Level 2 data review, discern patterns/trends, issue preliminary and final reports, quality control (QC) sampler (sampler checks), sampler

through-the-probe quality assurance (QA) for Toxics-VOCs samplers, and meet with public as needed. Run actual District Toxics-Metals analyses periodically. Be the point-of-contact for the contract laboratory. Participate in troubleshooting teleconferences with the contract laboratory.

- Senior Chemist: Review Black Carbon data, Level 2 data review, discern patterns/trends, issue preliminary and final reports, QC sampler (sampler checks), and meet with public, as needed.
- Associate Meteorologist: District Meteorologists review all continuous air quality and meteorological data daily. These data are used in daily air quality reports and forecasts, as well as open burn decisions for the San Diego Air Basin. In this role, the Meteorologists are often the first to notice when equipment malfunctions or are reporting spurious data. When problems are noted, they relay these observations to the Supervising Technicians and Station Technicians for troubleshooting and repair. District Meteorologist will continue this role for continuous AB 617 data, as well as analyzing all datasets compiled for this program.

5.2.2 Contractor Roles and Responsibilities

The District will be contracting out some work associated with the AB 617 air monitoring program. This includes laboratory work for speciated black carbon, Toxic-VOCs, and Toxic-Metals analysis, as well as mobile monitoring. Contractor roles and responsibilities are discussed below.

- Laboratory
  - ✓ The roles and responsibilities of the laboratories contracted by the District will report directly to the District's Contracting Officer Representative (District staff in charge of managing each contract). Each laboratory will:
    - Follow EPA-approved and/or accepted laboratory analysis methodologies, as defined by the District.
    - Engage in troubleshooting measures with District AB 617 personnel when there are QA/QC and/or data discrepancies.
    - Adjust laboratory practices based on these measures.
      - Report the data to the AB 617 Chemist on a District-defined schedule.
      - Participate in EPA and/or CARB laboratory Performance Evaluations, when offered.

- Mobile Monitoring
  - ✓ The roles and responsibilities for the Mobile Monitoring contractor include:
    - Supplying the vehicles and equipment needed for air monitoring.
    - Performing all database and data analysis work.
    - Creating data displays and reporting results.
    - Maintaining database for public access for a defined time duration.

Monitoring Plan Element 6: DATA OBJECTIVES

The air monitoring program in the Portside Communities will be collecting a large volume of data over the course of the project. This Element describes the data objectives set for this program.

6.1 Performance and Acceptance Criteria for Data

The collection of valid and high-quality data is essential for documenting the current air quality in the Portside Communities and for the development of emissions reduction strategies to improve the air quality.

The monitoring objectives for this program are:

- Obtain detailed air pollution levels throughout the communities
- Determine areas in the community with the highest risk from air pollution levels
- Quantify sources of air pollution within the communities
- Develop emission reduction strategies to reduce air pollution
- To monitor the effectiveness of emission strategies (rules, incentive reductions)

The three types of data to be collected are air pollutants (diesel particulate, VOCs, metals), traffic counts, and meteorological conditions. Air pollution data collected will be real-time and batch (i.e., analyzed in the laboratory). The meteorology data will be used to better understand the air pollution patterns observed and to aid in the source apportionment process.

The Data Quality Objective (DQO) process provides a general framework for ensuring that data collected meet established criteria. The DQO process establishes the link between the data collection process, the data quantity/quality needed to meet program requirements, and how the data will be used by the air quality community.

The District AB 617 network is designed to collect high-quality ambient air pollutant concentrations in the Portside Communities. This monitoring information will be used to:

- Determine air pollution concentrations in the Portside Communities.
- Characterize spatial and temporal patterns and gradients of measured pollutants in the Portside Communities.
- Catalog and characterize vehicular traffic and contributions to air pollution concentrations.
- Data collected will support the ensuing source apportionment analyses.

The success of the DQOs relies on numerous factors. In addition to the monitoring results, other inputs to decision-making for this project include, but are not limited to the following:

- List of target compounds
- Ambient air sampling methods and analytical techniques
- Ambient monitoring data
- Meteorological monitoring data
- Health effects information
- Community concerns

- Historical monitoring (i.e., trends), modeling, health risk assessments, etc., for the community

To ensure data quality, specified control limits need to be defined for all monitored parameters. When control limits are not met or exceeded, this triggers automatic responses such as instrument adjustments, recalibrations, data adjustments, or data invalidations. Parameter-specific limits and tolerances are listed in Table 6-1. These limits are used to guide field activities (e.g., instrument maintenance, adjustments, calibrations, etc.) and the data validation process (e.g., data adjustment, data qualification, data invalidation).

> NOTE: the laboratory-based programs have separate limits and guidelines outlined by the EPA and these are incorporated into their respective Technical Assistance Documents (TADs), Inorganic Compounds methods (IOs), Toxics Organics methods (TOs), and/or Standard Operation Procedures (SOPs). The reader is referred to guidance documents listed for specific information regarding laboratory-method data validation.

To quantify air pollution in the Portside Communities, monitoring will be conducted at select locations throughout the area. Monitoring at these locations will measure several different types of air pollution. Each pollutant monitoring system has its own sets of equipment specifications, Method Detection Limits (MDLs), operating temperatures, sampling times, and flow rates, etc. Meeting or exceeding these specifications is needed for the collection of valid environmental data. If the data meets all the requirements of Table 6-1, the data will be classified as valid, defensible, and certified to represent environmental conditions in the Portside community.

Table 6-1: Measurement Quality Objectives (MQOs) for Field Equipment

Parameter	Task	Frequency	Acceptance Criteria
Black Carbon*	Flow Verification	Bi-monthly	≤±4% of transfer std ≤±5% of design flow
	Pressure Verification	Bi-monthly	≤±10 mmHg
	Temperature Verification	Bi-monthly	≤±2°C
	Leak Test	Bi-monthly	< 1.0 Lpm
	Run-time	Over 24-hrs	≥ 75% (18) hourly avgs
	Flow rate audit	Bi-annually	≤±4% of transfer std ≤±5% of design flow
	Pressure Verification	Bi-annually	≤±10 mmHg
	Temperature Verification	Bi-annually	≤±2°C
	Flow rate Multi-point Verification/Calibration	Bi-annually	≤±2% of design flow
	Pressure Calibration	Bi-annually	≤±10 mmHg
	Temperature Calibration	Bi-annually	≤±2°C
Filter Sampler: analyzed for OC/EC, Metals, and Ions (integrated/filter)	Flow Verification	Monthly	≤±4% of transfer std ≤±5% of design flow
	Pressure Verification	Monthly	≤±10 mmHg
	Temperature Verification	Monthly	≤±2°C
	Leak Test	Monthly	
	Flow CV	Each run	≤±2%
	Run-time	Each run	24-hrs ±1-hr
	Flow	Each run	≤±5% of design flow
	Flow rate audit	Bi-annually	≤±4% of transfer std ≤±5% of design flow
	Pressure Verification	Bi-annually	≤±10 mmHg
	Temperature Verification	Bi-annually	≤±2°C
	Flow rate Multi-point Verification/Calibration	Bi-annually	≤±2% of design flow
	Precision collocated	1:12	CV ≤± 10% & >3 $\mu g/m^3$
Toxic-VOCs	Through-the-probe Leak	25%/year	0 sccm
	Canister Verification	Annually	Blank Hold Tests ≤ 3x MDL or ≤ 200 pptv, whichever is lower
	Canister Leak	Each run	$\Delta p \leq 0.1$ psi/15 min
	Through-the-probe Audit	25%/year	85% ≤ Recovery ≤ 115%

* The District does not yet have a black carbon-continuous analyzer. There is no EPA or CARB guidance documentation regarding this instrument. The requirements from this section are extrapolated from our experience with $PM_{2.5}$-continuous analyzers; therefore, these MQOs are subject to change.

6.2 Data precision, bias, accuracy, sensitivity, and data completeness

High quality data is an important factor in air quality monitoring. The District is committed to collecting data of sufficient quantity and quality to properly characterize the air quality in and around the Portside Communities. Project goals for data precision, bias, accuracy, sensitivity, and data completeness are described in the following sub-sections.

6.2.1 Toxics-VOCs

- Toxics-VOCs sample analysis for AB 617 will be performed by contract laboratories. The framework for the analysis of Toxics-VOCs is EPA Air Method, Toxic Organics - 15 (TO-15): Determination of Volatile Organic Compounds (VOCs) in Air Collected in specially prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS)[1]. At a minimum, NATTS protocols listed in the NATTS Technical Assistance Document Revision 3 (TAD)[2] will be followed for this project.
- All laboratory requirements listed in TO-15 and the TAD will be followed by the contract laboratory, except for acrolein analysis. Acrolein has been shown in many previous studies to be a problematic compound (not cited here). Therefore, the MDL for this compound will be higher than what is specified in the TAD. All other QA/QC procedures will be followed for this compound.
- All field requirements listed in TO-15 and the TAD will be followed by field personnel.
- Precision

  Precision is a measure of agreement among repeated measurements of the same property under identical, of substantially similar, conditions; expressed generally in terms of the standard deviation. Reproducibility is a key component of ensuring concentration results at one site are comparable to those at other sites and are comparable over time.

  For the NATTS Program, precision of field and laboratory activities (inclusive of extraction and analysis) may be assessed by collection of collocated and/or duplicate field samples; the precision of laboratory handling and analysis may be estimated by the subdivision of a collected sample into preparation duplicates which are separately taken through all laboratory procedures and includes instances in which target analytes may be added to a subsample to prepare matrix spike duplicates; and analytical precision is assessed by the replicate analysis of a sample. A summary of potential precision assessments is shown in Table 6-2. The network MQO is based on an evaluation of at least an entire year's data. In all cases a coefficient of variation (CV) between the primary and collocated samples of ≤ 15% must be met (TAD Section 2.1.3)[2]. QA requirements for the Toxics-VOCs program are included in Table 6-3.

Table 6-2: Potential Assessments of Precision through Field and Laboratory Activities

HAP Class	Collocation	Field Duplicates	Replicate Analysis
VOCs	Yes	Yes	Yes

Table 6-3: List of QA Requirements

Parameter	Description and Details	Required Frequency	Acceptance Criteria	Reference
Duplicate Sample	Field sample collected through the same inlet probe as the primary sample	10% of primary samples for sites performing duplicate sample collection (as prescribed in workplan)[2]	Precision ≤ 25% RPD of primary sample for concentrations ≥ 5x MDL[2]	TAD Sections 4.2.4; 4.2.4.1
Collocated Sample	Field sample collected through a separate inlet probe from the primary sample	10% of primary samples for sites performing collocated sample collection (as prescribed in workplan)[2]	Precision ≤ 25% RPD of primary sample for concentrations ≥ 5x MDL[2]	TAD Sections 4.2.4 and 4.2.4.1
Replicate Analysis	Replicate analysis of a field-collected sample (chosen by analyst)	Once with every analysis sequence (as prescribed in workplan)	Precision ≤ 25% RPD for target VOCs with concentrations ≥ 5x MDL	TAD Section 4.2.10.5.2.5 TO-15 Section 11.1.1

[1] https://www.epa.gov/sites/production/files/2015-07/documents/epa-to-15_0.pdf
[2] https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf

- Bias and Accuracy
  Bias is the systematic or persistent distortion of a measurement process that causes errors in one direction (i.e., the expected sample measurement is different from the sample's true value). Accuracy is a measure of the overall agreement of a measurement to a known value. Accuracy includes a combination of random error (precision) and systematic error (bias) components that are due to sampling and analytical operations; EPA recommends using the terms "*precision*" and "*bias*" rather than "accuracy," to convey the information usually associated with accuracy.
  Bias is the difference of a measurement from a true or accepted value and can be negative or positive. As much as possible, bias should be minimized as biased data may result in incorrect conclusions. Bias may originate within the sample collection and analysis steps. Sources of sample collection bias include but are not limited to incorrectly calibrated flows or out-of-calibration sampling instruments, elevated and unaccounted for background on collection media, poorly maintained (dirty) sampling inlets and flow paths, and poor sample handling techniques resulting in contamination or loss of analyte. Sources of sample analysis bias include but are not limited to poor sanitary conditions or technique in sample preparation, incorrectly calibrated or out of tolerance equipment used for standard materials preparation and analysis, and infrequent or inappropriate instrument maintenance leading to enhanced or degraded analyte responses. Minimum NATTS protocols listed in the previously referenced TAD will be followed for Bias and Accuracy

  ✓ Assessing Laboratory Bias and Accuracy
    - Proficiency Testing
      The contract laboratory analyzing samples collected at AB 617 sites must participate in the previously cited NATTS proficiency testing (PT) program. PT samples for VOCs are generated at a frequency determined by the EPA Office of Air Quality Planning and Standards (OAQPS), typically twice annually. Participating laboratories analyze samples that are "spiked" using methods and procedures identical to those employed for field-collected air samples. These "blind" tests are compared to the known concentration for bias.

      The laboratory's PT results, on an analyte-by-analyte basis, must be within ± 25% of the assigned target value, defined as the NATTS laboratory average, excluding outliers. In the event there is a problem with the contract laboratory average (such as a contamination issue), the assigned target value may be changed to the nominal concentration or referee laboratory average, as applicable, and will be detailed in the PT results. If the contract laboratory fails to meet the bias acceptance criterion on an analyte-by-analyte basis, they must identify the root cause of the bias for the failed analyte, take corrective action, as appropriate, to eliminate the cause of the bias. They must also evaluate the potential for bias in reported field sample data going back to last acceptable PT result. In the event of two consecutive failed PT's for a given analyte, the laboratory must qualify field collected sample results as estimated when reported to AQS. EPA recognizes that the NATTS MQO bias criterion of ± 25% established through the DQO process is narrower than the bias criteria for some of the analytical methods, namely TO-15 and TO-13A. For the main NATTS DQO to be met, the bias MQO criterion must be achieved.

    - Calibration Verifications
      The contract laboratory analyzing samples collected at AB 617 sites must analyze a Secondary Source Calibration Verification (SSCV) sample, a Laboratory Control Standard (LCS), and a Continuing Calibration Verification (CCV) for every run, including a

calibration run, as specified by the previously cited TAD. Additionally, an Internal Standard (IS) must be injected with every sample (field, laboratory controls, blanks, etc.). The thresholds and details for these are listed in Table 6-4.

Table 6-4: List of QC Requirements for Calibration Verification

Parameter	Description and Details	Required Frequency	Acceptance Criteria
Secondary Source Calibration Verification (SSCV)	Analysis of a secondary source standard at the mid-range of the calibration curve to verify ICAL accuracy	Each Run	Recovery within ± 30% of nominal or RRF within ±30% of the mean ICAL RRF (Relative Retention Factor)
Continuing Calibration Verification (CCV)	Analysis of a known standard at the mid-range of the calibration curve to verify ongoing instrument calibration	Following each daily BFB tune check and every 24 hours of analysis; recommended after each ten field sample injections and to conclude each sequence	Recovery within ± 30% of nominal or RRF within ±30% of the mean ICAL RRF
Laboratory Control Sample (LCS)	Canister spiked with known amount of target analyte at approximately the lower third of the calibration curve	One with every analysis batch of 20 or fewer field-collected samples.	Each target VOC's recovery must be 70 to 130% of its nominal spiked amount.
Internal Standards (IS)	Deuterated or not naturally occurring compounds co-analyzed with samples to monitor instrument response and assess matrix effects	Added to all calibration standards, QC samples, and field-collected samples	Area response for each IS compound within ± 40% of the average response of the Initial Calibration (ICAL)

Additionally, standards used to prepare the calibration standards are to be tracked and NIST-traceable.

- ✓ Assessing Field Bias and Accuracy
  VOC collection methods involve drawing ambient air into sample canisters. The flow rate accuracy is of less importance and does not directly correlate to errors in measured concentrations. Rather, it is important that the flow rate into the canister be constant over the entire 24-hour collection period to best characterize the average level of VOCs over the entire sampling duration.

  Sampling bias for VOCs is characterized by evaluating sample media collected by providing analyte-free zero air to the sampling unit (zero checking) and by providing a known concentration analyte stream to VOCs sampling units (known standard check). This is known as a Through-the-Probe (TTP) audit and is discussed in other sections of this document and in the previously cited TAD.

- Sensitivity
  Sensitivity is the capability of a method or instrument to discriminate between measurement responses representing different levels of a variable of interest.

  - ✓ Minimum NATTS protocols listed in NATTS Technical Assistance Document (TAD) will be followed for Sensitivity.

  - ✓ In order to ensure that analysis methods are sufficiently sensitive, MDL MQOs have been established which prescribe the maximum allowable MDL for each required analyte. As concentrations for Hazardous Air Pollutants (HAPs) decrease in the ambient atmosphere and are measured closer to or below the MDL, this results in a decrease in the accuracy (decrease in precision and increase in bias) based upon percent change estimates.

The MDL and sample quantitation limit (SQL), which is defined as 3.18 times the MDL concentration, provides information on the concentration at which both positive identification and accurate quantification is expected. While all measured concentrations (even those less than the MDL) must be reported to AQS, the confidence associated with each reported concentration is correlated to its relationship to the corresponding MDL and SQL.

- ✓ The SQL is equivalent to ten times the standard deviation of seven measurements of MDL samples, which was defined in draft EPA guidance as the minimum level (ML). The 3.18 factor in the SQL was derived by dividing 10 standard deviations by 3.14 (the student t-test value for 7 replicates). The MDL process in 40 Code of Federal Regulations (CFR) Part 136 Appendix B is protective against reporting false positives such that 99% of the measurements made at the determined MDL value are positively detected (determined to be different from the detectors response in the absence of the analyte), but does not attempt to characterize precision or address accuracy at the determined MDL concentration. The SQL (or ML) concentration provides more confidence to the accuracy of the measurement with precision that is well-characterized.

- ✓ MDL MQOs that must be met for NATTS Tier I core analytes and the concentrations that correspond to one in a million (10^{-6}) cancer risk levels, to noncancer risk hazard quotients (HQs) of 0.1, and to MDL MQOs are listed in Table 6-5 (Note the previous discussion on acrolein in this document).

Table 6-5: Concentrations of the NATTS Core (Tier I) Analytes Corresponding to a 10-6 Cancer Risk, a Noncancer Risk at a HQ of 0.1, the MDL MQO, and the contract laboratory MDL for each compound

Core Analyte (name)	**Cancer Risk 10^{-6}** ($\mu g/m^3$)	**Non-Cancer Risk At HQ= 0.1** ($\mu g/m^3$)	**MDL MQO** ($\mu g/m^3$)	**MDL MQO** (ppb_v)	**Contract Lab MDL** (ppb_v)
Acrolein	---	0.0020	0.090	0.039	0.066
Benzene	0.13	3.0	0.13	0.041	0.013
1,3-Butadiene	0.030	.20	0.10	0.050	0.028
Carbon tetrachloride	0.170	19	0.17	0.027	0.013
Chloroform	---	9.8	0.50	0.10	0.016
Tetrachloroethylene	3.8	4.0	0.17	0.25	0.011
Trichloroethylene	0.21	0.20	0.20	0.37	0.021
Vinyl chloride	0.11	10	0.11	0.043	0.030

- Completeness
  Completeness is a measure of the amount of valid data obtained from a measurement system.
  - ✓ Minimum NATTS protocols listed in the previously cited NATTS TAD will be followed for Completeness.

  - ✓ Comparison of concentration data across sites and over time requires that a minimum number of samples be collected over the course of each calendar year. The MQO for completeness prescribes that 85% or more of the annual air samples must be valid.

- Representativeness
  Representativeness is the measure of the degree to which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition.
  - ✓ Minimum NATTS protocols listed in previously cited NATTS TAD will be followed for Representativeness.

  - ✓ To adequately characterize the ambient air toxics concentrations over the course of a year, sample collection must occur once every six days per the national USEPA sampling calendar for a 24-hour period, beginning and ending at midnight local standard time. This sample collection duration and frequency provides enough data points to ensure that the collected data are representative of the annual average daily concentration at a given site. Collection methods are designed to efficiently capture airborne HAPs over this time period.

6.2.2 Carbon: Organic and Elemental

AB 617 Organic/ Elemental Carbon sample analysis will be performed by an outside/contract laboratory. The framework for the analysis of Organic and Elemental Carbon is IMPROVE_A Thermal Optical Carbon Analysis. This method link can be found at http://vista.cira.colostate.edu/improve/wp-content/uploads/2016/07/IMPROVEA_Model2015_2-226r1_20160125final.pdf.

- Precision
  - ✓ All laboratory QA/QC requirements listed in the IMPROVE_A Thermal Optical Carbon Analysis method will be followed by the contract laboratory.

  - ✓ The contract laboratory must include the replicate analysis criterion shown in Table 6-6.

Table 6-6: Summary of Organic and Elemental Laboratory Replicate Analysis Checks

Requirement	Frequency	Acceptance Criteria	Corrective Action
Sample Replicates (on the same or a different analyzer)	Every 10 analyses	±10% when OC and TC >10 µg C/cm^2 ±20% when EC > 10µg C/cm^2 or <±1 µg/cm^2 when OC and TC <10 µg C/cm^2 <±2 µg/cm2 when EC <10µg C/cm^2	Investigate instrument and sample anomalies and rerun replicate

- Bias and Accuracy
  - ✓ For Elemental Carbon, there are no means to spike samples to ensure accuracy. Uncertainty is a function of insufficient filter loading which can be a result of high variations in the flow. All field instrumentation will follow EPA SOP at a minimum at https://www3.epa.gov/ttn/amtic/files/ambient/pm25/spec/metone.pdf and in the refined District Operational SOP.

  - ✓ For Total Carbon, it is possible to spike a filter with a known amount of a carbonaceous compound and determine the percent recovery. The contract laboratory must include the following calibration checks as shown in Table 6-7.

Table 6-7: Summary of Organic and Elemental Carbon Laboratory Calibration Checks

QA/QC Activity	Calibration Standard and Range	Frequency	Acceptance Criteria	Corrective Action
Sucrose Calibration Check	10μL of 1800 ppm C KHP standard; 18 μg C	3 times/week	17.1-18.9 μg C/filter	Troubleshoot and correct system before analyzing samples.
Potassium Hydrogen Phthalate (KHP) Calibration Check	10μL of 1800 ppm C KHP standard; 18 μg C	3 times/week	17.1-18.9 μg C/filter	Troubleshoot and correct system before analyzing samples.

- ✓ In addition to the spike analyses, the contract laboratory must also include the continuing calibration verifications shown in Table 6-8.

Table 6-8: Summary of Organic and Elemental Carbon Laboratory Calibration Verifications

QA/QC Activity	Calibration Standard and Range	Frequency	Acceptance Criteria	Corrective Action
System Blank Check	N/A	1 time/week	<0.2 μg C/cm^2	<0.2 μg C/cm^2 Check instrument
End-of-Run Internal Calibration Peak Area Check	NIST 5% CH_4/He gas standard; 20 μg C (6-port valve injection loop, 1000 μl)	Every analysis	Typical counts 14,000-25,000 and 90-110% of average calibration peak area of the previous day.	Check instrument and filter punch; re-bake
Auto-Calibration Check	NIST 5% CH_4/He gas standard; 20 μg C (Carle valve injection loop, 1000 μl)	Alternating beginning or end of each analysis day	Relative standard deviation of the three injection peaks <10%.	Troubleshoot and correct system before analyzing samples.
Manual Gas Injection Calibration	NIST 5% CO_2/He gas standards; 20 μg C (Certified gas-tight syringe, 1000 μl)	4 times/week	±5% of calculated standards based on individual tank specifications	Troubleshoot and correct system before analyzing samples.

- ✓ Assessing Laboratory Bias - Proficiency Testing
  No such services are offered by EPA, CARB, Academia, nor outside contractors at this time. However, if such a service comes available, the contracting laboratory will need to participate in the proficiency testing program.

- ✓ Assessing Field Bias
  Unlike VOC field sampling, there is no way to access field bias in a manner such as a through-the-probe check. The only way to achieve uniform measurements is to maintain accurate flow measurements. This is achieved via flow audits. All field instrumentation will follow, at a minimum, EPA QA/QC SOPs. EPA requirements can be found at:

https://www3.epa.gov/ttnamti1/files/spectraining/MetOneSASSFOM.pdf and refined in the District SOPs.

- SuperSASS Calibration SOP
- SuperSASS Audit SOP

- Completeness
  Completeness is a measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct, normal conditions. Data completeness requirements are included in the reference methods. The minimum acceptable data completeness rate is 75% as defined by the EPA in the Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites. These can be found at:

  https://www3.epa.gov/ttn/amtic/files/ambient/pm25/spec/CSN_QAPP_v120_05-2012.pdf

- Representativeness
  Representativeness is a measure of the degree which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition from the EPA in the Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites. These can be found at:
  https://www3.epa.gov/ttn/amtic/files/ambient/pm25/spec/CSN_QAPP_v120_05-2012.pdf

6.2.3 Black Carbon – Continuous

- Precision
  There is no EPA or CARB guidance regarding this instrument. Therefore, the District will follow the manufacturer specifications for QA/QC until an internal SOP is developed by the District based upon the experience we gain working with this instrument.

- Accuracy and Bias
  - ✓ For Black Carbon, there are no means to create samples to ensure accuracy. Uncertainty is a function of insufficient filter loading which can be a result of high variations in the flow. All field instrumentation will follow the manufacturer guidance.

  - ✓ Unlike VOC field sampling, there is no way to access field bias in a manner such as a through-the-probe check. The only way to achieve uniform measurements is to maintain accurate flow measurements. This is achieved via flow audits. All field instrumentation will follow, at a minimum, the EPA SOP. The EPA requirements can be found at:

  https://www3.epa.gov/ttnamti1/files/spectraining/MetOneSASSFOM.pdf

- Completeness
  Completeness is the measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct, normal conditions. Data completeness requirements are included in the reference methods. The minimum acceptable data for completeness rate is 75% as defined by the EPA in the Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites. These can be found at:

https://www3.epa.gov/ttn/amtic/files/ambient/pm25/spec/CSN_QAPP_v120_05-2012.pdf

- Representativeness
  Representativeness is a measure of the degree which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition from the EPA in the Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites. These can be found at:

  https://www3.epa.gov/ttn/amtic/files/ambient/pm25/spec/CSN_QAPP_v120_05-2012.pdf

6.2.4 Ions - Cations and Anions

Samples from the Sherman Elementary School will be analyzed by a third-party contractor and they will follow EPA methodologies. The basic framework for the analysis of cations and anions can be found at:

https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/pm25cationsop.pdf, and
https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/pm25anionsop.pdf

- Precision
  All laboratory QA/QC requirements listed in the SOP for Cations and Anions in the CSN network will be followed by the contract laboratory.

- Accuracy and Bias
  All laboratory QA/QC requirements listed in the SOP for Cations and Anions in the CSN network will be followed by the contract laboratory.

- Completeness
  Completeness is the measure of the amount of valid data obtained from a measurement system compared to the amount that was expected to be obtained under correct, normal conditions. Data completeness requirements are included in the reference methods. The minimum acceptable data completeness rate is 75% as defined by the EPA in the Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites. These can be found at:

  https://www3.epa.gov/ttn/amtic/files/ambient/pm25/spec/CSN_QAPP_v120_05-2012.pdf

- Representativeness
  A measure of the degree which data accurately and precisely represent a characteristic of a population, parameter variations at a sampling point, a process condition, or an environmental condition from the EPA in the Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites. These can be found at:

  https://www3.epa.gov/ttn/amtic/files/ambient/pm25/spec/CSN_QAPP_v120_05-2012.pdf

6.2.5 Toxics-Metals

- Precision
  - ✓ All laboratory requirements listed in Inorganic (IO) Compendium 3.5 will be followed by the contract laboratory. IO 3.5 can be found at:

    https://www.epa.gov/sites/production/files/2015-07/documents/epa-io-3.5.pdf

  - ✓ Minimum NATTS protocols are listed in the NATTS Technical Assistance Document (TAD) will be followed for precision and can be found at:
  - ✓

    https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf

  - ✓ Reproducibility is a key component of ensuring that concentration results at one site are comparable to those at other sites and are comparable over time. For the NATTS Program, precision of field and laboratory activities (inclusive of extraction and analysis) may be assessed by collection of collocated and/or duplicate field samples; the precision of laboratory handling and analysis may be estimated by the subdivision of a collected sample into preparation duplicates which are separately taken through all laboratory procedures (digestion or extraction and analysis) and includes instances in which target analytes may be added to a subsample to prepare matrix spike duplicates; and analytical precision is assessed by the replicate analysis of a sample or sample extract/digestate. Note that the previous revision of this TAD required that collocated and duplicate samples be analyzed in replicate. This has been modified to permit replicate analysis on any sample chosen by the laboratory. A summary of possible precision assessments is shown in Table 6-9. The network MQO is based on an evaluation of at least an entire year's data. In all cases a coefficient of variance (CV) of ≤ 15% must be met.

Table 6-9: Assessments of Precision through Field and Laboratory Activities

HAP Class	Collocation*	Duplicate Field Samples	Preparation (Digestion/ Extraction) Duplicate	Matrix Spike Duplicate	Analysis Replicate
PM_{10} Metals (Lo-Vol)	Yes	No	No	No	Yes

* Collection of collocated and duplicate field samples is highly desired, but not required.

- Accuracy

  Minimum NATTS protocols listed in NATTS Technical Assistance Document (TAD) will be followed for Accuracy. These can be found at:

  https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf

- Bias

  Bias is the difference of a measurement from a true or accepted value and can be negative or positive. As much as possible, bias should be minimized as biased data may result in incorrect conclusions. Bias may originate within the sample collection and analysis steps. Sources of sample collection bias include but are not limited to: incorrectly calibrated flows or out-of-calibration sampling instruments; elevated and unaccounted for background on collection media; poorly maintained (dirty) sampling inlets and flow paths; and poor sample handling techniques resulting in contamination or loss of analyte. Sources of sample analysis bias include but are not limited to: poor sanitary conditions or technique in sample preparation; incorrectly calibrated or out of tolerance equipment used for standard materials preparation and analysis; and infrequent or inappropriate instrument maintenance leading to enhanced or degraded analyte responses. Minimum NATTS protocols listed in NATTS Technical Assistance Document (TAD) found at:

https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf will be followed for Bias.

- ✓ Assessing Laboratory Bias - Proficiency Testing.
  The contract laboratory analyzing samples collected at AB 617 sites must participate in the NATTS proficiency testing (PT) program, if offered. PT samples for Metals are generated at a frequency determined by EPA Office of Air Quality Planning and Standards (OAQPS), typically twice annually for each class. Participating laboratories are blind to the spiked concentrations and analyze the PT samples via methods and procedures identical to those employed for field-collected samples.

  The laboratory's PT results, on an analyte-by-analyte basis, must be within ± 25% of the assigned target value, defined as the NATTS laboratory average, excluding outliers. In the event there is a problem with the contract laboratory average, such as a contamination issue, the assigned target value may be changed to the nominal concentration or referee laboratory average, as applicable, and will be detailed in the PT results. If the contract laboratory fails to meet the bias acceptance criterion on an analyte-by-analyte basis, they must identify the root cause of the bias for the failed analyte, take corrective action, as appropriate, to eliminate the cause of the bias. They must also evaluate the potential for bias in reported field sample data going back to last acceptable PT result. In the event of two consecutive failed PTs for a given analyte, the laboratory must qualify field-collected sample results when reported to AQS. EPA recognizes that the NATTS MQO bias criterion of ± 25% established through the DQO process is narrower than the bias criteria for some of the analytical methods, namely TO-15 and TO-13A. For the main NATTS DQO to be achieved, the bias MQO criterion must be achieved.

- ✓ Assessing Field Bias
  Flow rate bias in PM_{10} metals samplers is opposite the bias in the reported concentrations. In other words, flow rates which are biased low result in overestimation of air concentrations, whereas flow rates which are biased high result in underestimation of air concentrations. The indicated flow rate for the low volume PM_{10} metals method must be within ± 4% of the flow transfer standard and within ± 5% of the design flow rate. Failure to meet these criteria must result in corrective action including, but not limited to, recalibration of the sampling unit flow or resetting of flow linear regression response, where possible. Sampling units which cannot meet these flow accuracy specifications must not be utilized for sample collection. Additionally, following a failing calibration or calibration check, agencies must evaluate sample data collected since the last acceptable calibration or calibration check, and such data may be subject to invalidation. Corrective action is recommended for flow calibration checks which indicate flows approaching, but not exceeding the appropriate flow acceptance criterion. Calibration flow checks must be performed at minimum quarterly; however, to minimize risk of invalidation of data, monthly flow calibration checks are recommended.

- Sensitivity
  Minimum protocols listed in NATTS Technical Assistance Document (TAD) for sensitivity will be followed and can be found at:

  https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf

  ✓ To ensure that analysis methods are sufficiently sensitive, MDL MQOs have been established which prescribe the maximum allowable MDL for each required analyte. As concentrations for HAPs decrease in the ambient atmosphere and are measured closer to the MDL or below the MDL, this results in a decrease in the accuracy (decrease in precision and increase in bias) of the percent change estimate for evaluating a trend.

  The MDL and sample quantitation limit (SQL), which is defined as 3.18 times the MDL concentration provide information on the concentration at which both positive identification and accurate quantification is expected, respectively. While all measured concentrations (even those less than the MDL) must be reported to AQS, the confidence associated with each reported concentration is correlated to its relationship to the corresponding MDL and SQL.

  ✓ The SQL is equivalent to ten times the standard deviation of seven measurements of MDL samples, which was defined in draft EPA guidance in 19946 as the minimum level (ML). The 3.18 factor in the SQL was derived by dividing 10 standard deviations by 3.14 (the student-T value for 7 replicates). The MDL process in 40 Code of Federal Regulations (CFR) Part 136 Appendix B is protective against reporting false positives such that 99% of the measurements made at the determined MDL value are positively detected (determined to be different from the detectors response in the absence of the analyte), but does not attempt to characterize precision or address accuracy at the determined MDL concentration. The SQL (ML) concentration provides more confidence to the accuracy of the measurement with precision that is well-characterized.

  ✓ MDL MQOs that must be met for NATTS Tier I core analytes and the concentrations that correspond to one in a million (10^{-6}) cancer risk levels, to noncancer risk hazard quotients (HQs) of 0.1, and to MDL MQOs are listed in Table 6-10.

Table 6-10: Concentrations of the NATTS Core Analytes Corresponding to 10-6 Cancer Risk

Core Analyte (name)	**Cancer Risk 10^{-6}** ($\mu g/m^3$)	**Non-Cancer Risk At HQ= 0.1** ($\mu g/m^3$)	**MDL MQO** ($\mu g/m^3$)	(ppb$_v$)
Arsenic (PM_{10})	0.00023	0.0030	0.00023	N/A
Beryllium (PM_{10})	0.00042	0.0020	0.00042	N/A
Cadmium (PM_{10})	0.00056	0.0020	0.00056	NF/A
Lead (PM_{10})	---	0.015	0.015	N/A
Manganese (PM_{10})	---	0.0050	0.0050	N/A
Nickel (PM_{10})	0.0021	0.00081	0.0021	N/A

- Completeness
  Minimum protocols for completeness listed in the NATTS Technical Assistance Document (TAD) will be followed and can be found at:

https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf

Comparison of concentration data across sites and over time requires that a minimum number of samples be collected over the course of each calendar year. The MQO for completeness prescribes that ≥ 85% of the annual air samples must be valid, equivalent to 52 of the annual 61 expected samples (51 during years when there are only 60 collection events).

- Representativeness
  Minimum protocols for representativeness listed in NATTS Technical Assistance Document (TAD) will be followed and can be found at:

  https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf

To adequately characterize the ambient air toxics concentrations over the course of a year, sample collection must occur every six days per the national sampling calendar for a 24-hour period beginning and ending at midnight local standard time (without correction for daylight savings time, if applicable). This sample collection duration and frequency provides a sufficient number of data points to ensure that the collected data are representative of the annual average daily concentration at a given site. Collection methods are designed to efficiently capture airborne HAPs over this time period in order to measure concentrations representative of the ambient air during sample collection.

6.3 Temporal and Spatial Representativeness of the Instruments

According to the NATTS TAD, to adequately characterize ambient air toxics concentrations over the course of a year, 24-hour sample duration collection must occur every six days per the national sampling calendar, beginning and ending at midnight local standard time. This sample collection duration and frequency provides enough data points to ensure that the collected data are representative of the annual average daily concentration as well as day-of-week representation at a given site. The District's sampling schedule will meet or exceed the NATTS requirements.

Elemental Carbon and Black Carbon have $PM_{2.5}$ HAP components (although not addressed in the NATTS TAD). The District will apply both the NATTS (1:6 sampling) and $PM_{2.5}$ (1:3 sampling) characterizations for temporal and spatial representativeness to the AB 617 Carbon program. All other conditions for both programs overlap. The District sampling schedule will meet or exceed the NATTS requirements.

The District's sampling methods and schedules are summarized below:

- Toxics-VOCs
  - ✓ Equipment: Xonteck 911 in coated Summa™ canisters
  - ✓ Analysis: GC/MS
  - ✓ Sample frequency: 1 day in 6 for an integrated 24-hour sample from midnight to midnight.

- Toxic-Metals
  - ✓ Equipment: Met One E-Sequential sampler on Teflon filters
  - ✓ Analysis: ICP/MS
  - ✓ Sample frequency: 1 day in 6 for an integrated 24-hour sample from midnight to midnight.

- Elemental Carbon
  - ✓ Equipment: Met One SuperSASS on various type filters, depending on the analysis type
  - ✓ Analysis: DRI 2001A
  - ✓ Sample frequency: 1 day in 6 for an integrated 24-hour sample from midnight to midnight.

- Black Carbon
  - ✓ Equipment: Met One BC-1060
  - ✓ Analysis: in-situ optical
  - ✓ Sample frequency: Continuous

The spatial and temporal representativeness of air quality data is also important to determine pollutant concentrations, gradients across the area, and potential sources. Prior to setting up numerous fixed air monitoring sites in the Portside Communities, the District will engage the services of a contractor to undertake additional sampling in the form of mobile mapping of the entire Portside community (Note: mobile monitoring will be conducted on roadways that are accessible to the general public.). As stated in 4.2, the contractor will measure for:

- Black Carbon
- $PM_{2.5}$ (fine particulates)
- Nitric Oxide
- Nitrogen Dioxide
- Carbon Monoxide
- Carbon Dioxide

The mobile monitoring measurements will aid in the identification of hotspots, areas where sampling where would be redundant, and to validate current projected sampling locations. The District may adjust sampling locations based on the data collected and reported by the mobile monitoring contractor. Using historical siting methods, the prospective sampling locations will be sited for temporal and spatial representativeness.

Monitoring Plan Element 7: MONITORING METHODS AND EQUIPMENT

This Element describes the monitoring methods and the equipment that the District has proposed to use for air monitoring in the Portside Communities. The District will be collecting data that are scientifically valid, representative, and defensible (i.e., meeting defined QA/QC criteria).

7.1 Methods and Equipment Selected

The methods and equipment selected by District staff for use in the program are presented in the sub-sections below by type.

7.1.1 Toxics-VOCs

- Laboratory
  Samples from AB 617 Toxics-VOCs sites will be analyzed by a third-party contractor that will follow EPA methodologies. The basic framework for the analysis of Toxics-VOCs is EPA Air Method, Toxic Organics - 15 (TO-15): Determination of Volatile Organic Compounds (VOCs) in Air Collected in specially prepared Canisters and Analyzed by Gas Chromatography/Mass Spectrometry (GC/MS). The method link can be found at:

  https://www.epa.gov/sites/production/files/2015-07/documents/epa-to-15_0.pdf

- Field Samplers and Support Equipment
  - ✓ The Xonteck 911 sampling system (with SilcoNert (or equivalent) coated-flow paths) [http://xonteck.com/911.html] is based on the collection of ambient air samples into Summa™ (ceramic/glass coated for inertness) canisters, as outlined in USEPA TO-14A and TO-15 Methods. These samplers and support equipment meet or exceed all PAMs and TO-14A/TO-15 requirements, as described and cited previously. Note: all equipment, connections, tubing and collection media in which the sampled air contacts, will be coated with SilcoNert, Silonate, or equivalent for inertness.

  - ✓ The Xonteck instruments will initially undergo bench through-the-probe (TTP) audits and then yearly TTP audits for zero air and calibration standards as described in the NATTS TAD section 4.2.3.5 (previously cited) with the time for each check being three hours as opposed to the 24-hour runs specified to not waste standards and zero air.

7.1.2 Carbon

- Laboratory – Organic and Elemental Carbon
  Samples from AB 617 Carbon sites will be analyzed by a third-party contractor that will follow EPA methodologies. The basic framework for the analysis of Carbon is in the SOP DRI Model 2015 Multiple Wavelength Carbon Analysis (TOR/TOT) of Aerosol Filter Samples – Method IMPROVE_A. The method link can be found at:

  http://vista.cira.colostate.edu/improve/wp-content/uploads/2016/07/IMPROVEA_Model2015_2-226r1_20160125final.pdf

- Field Samplers and Support Equipment-Organic and Elemental Carbon
  Met One SuperSASS at https://metone.com/wp-content/uploads/pdfs/sass.pdf is based on the collection of air samples onto filter media housed in polished metal canisters with size cut inlets, as

needed. These samplers meet or exceed EPA specifications, as displayed on the EPA AMTIC website at:

https://www3.epa.gov/ttn/amtic/files/spectraining/MetOneSASSFOM.pdf

- Field Samplers and Support Equipment – Black Carbon (Continuous)
  The Met One BC-1060 is based on introduction of air samples onto filter media that is UV and IR illuminated. There are currently no EPA guidance documents regarding continuous black carbon analyzers. Information from the manufacturer can be found at:

  https://metone.com/wp-content/uploads/pdfs/bc-1060.pdf

7.1.3 Ions

- Laboratory – Cations and Anions
  Samples from the Sherman Elementary School will be analyzed by a third-party contractor that will follow EPA methodologies. The basic framework for the analysis of cations and anions can be found at:

  https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/pm25cationsop.pdf and
  https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/pm25anionsop.pdf

- Field Samplers and Support Equipment – Cations and Anions
  Met One SuperSASS at https://metone.com/wp-content/uploads/pdfs/sass.pdf is based on the collection of air samples onto filter media housed in polished metal canisters with size cut inlets, as needed. These samplers meet or exceed EPA specifications, as displayed on the EPA AMTIC website at:

  https://www3.epa.gov/ttn/amtic/files/spectraining/MetOneSASSFOM.pdf

7.1.4 Toxic-Metals

- Laboratory
  Samples from AB 617 Toxics-Metals sites will be analyzed by a third-party contractor that will follow EPA methodologies. The basic framework for the filter digestion is the NATTS TAD, which can be found at:

  https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf

  The basic framework for the analysis of Toxic-Metals is Inorganic Compendium Method IO-3.5 Determination of Metals in ambient particulate matter using inductively coupled plasma/mass spectrometry (ICP/MS). The method link can be found at:

  https://www3.epa.gov/ttn/amtic/files/ambient/inorganic/mthd-3-5.pdf

- Field Samplers and Support Equipment
  Met One E-sequential sampler with a PM_{10} inlet at:

  https://metone.com/wp-content/uploads/pdfs/e-seq-frm.pdf is based on the collection of PM_{10} particulate on filter media for eventual XRF analysis. This sampler has EPA FRM approval listed at:

https://www.epa.gov/sites/production/files/2018-12/documents/amtic_list_dec_2018_update_1.pdf

7.2 Suitability of Sampling Methods to Meet Level of Action Required by Monitoring Objectives

The sub-sections below discuss the sampling methods chosen by the District and discuss their use for meeting monitoring objectives.

7.2.1 Toxics-VOCs

To the best of the District's knowledge, there are no reliable and cost-effective real-time Toxics-VOCs analyzers/systems that can achieve the precision, accuracy, and analysis of the number of compounds analyzed for this program. For example, Envea makes a VOC72M analyzer, but the MDLs and precision cannot approximate what can be achieved with the manual, Summa™ canister-based methods. This leaves the manual methods as our chosen methodology. The EPA developed the Air Toxics program to support reduction of public exposure to hazardous air pollutants (HAPs). The EPA also codified established analysis methods for the quantification of VOCs and TO-15 is the EPA-approved method of analysis that air districts across the nation use.

By using this method, the District will be able to directly compare the AB 617 data to National Air Toxics Trends Stations (NATTS) data collected across the nation, in California (non-AB 617 sites), other California AB 617 sites (if available), other AB 617 sites within San Diego county, and other AB 617 sites in the Portside area.

The primary drawback to any manual method is the amount of time and labor involved:

- Using the typical 1:6 sampling frequency, it will take six times longer to gather the volume of data (vs. real-time).
- 24-hour integrated samples cannot capture diurnal patterns, traffic congestion patterns, and other factors that require a subset of a 24-hour period.
- Canister hold time constraints put time analysis pressure on laboratory personnel to complete all QA/QC functions quickly.
- Typical laboratory cost savings measures involve batch analyses, which can propagate unknown field issues (e.g., spikes in samples, dirty canisters, etc.) until the analysis is complete.

However, even with these "drawbacks", the manual TO-15 method has been shown to be robust (it has existed as the primary method for this analysis method from the EPA for decades), has significantly lower MDLs, and has a larger suite of target compounds than real-time instruments.

7.2.2 Carbon

7.2.2.1 Carbon-Elemental and Organic

Currently, the most accurate quantification method for diesel particulate matter is by laboratory analysis.

Research[3] has shown that different thermal optical temperature protocol greatly affects the differentiation of OC and EC. Thus, it is extremely difficult to compare results from one thermal optical protocol (i.e., IMPROVE_A) to other thermal optical protocols (NIOSH 5400, STN thermal optical protocol). The District's AB 617 elemental carbon protocol will utilize the IMPROVE_A thermal optical analysis as that analysis protocol is currently used by the national IMPROVE and STN networks. Thus, the data obtained within the Portside community will be directly comparable to the IMPROVE and STN stations across the country.

The IMPROVE_A protocol has also established that a subfraction of the measured total elemental carbon is primarily from diesel engines and not from other sources of elemental carbon. Research has shown a correlation between elemental carbon and total particulate matter from diesel engines. It is therefore possible to obtain the $PM_{2.5}$ contribution of diesel engines from the IMPROVE_A thermal optical analysis. The drawback of the manual method is time:

- Using the typical 1:6 sampling frequency, it will take six times longer to gather the volume of data (vs. real-time).
- 24-hour integrated samples cannot capture diurnal patterns, traffic congestion patterns, and other factors that require a subset of a 24-hour period.
- Typical laboratory cost savings measures involve batch analyses, further delaying the time between sampling and obtaining the results.

7.2.2.2 Black Carbon

The Steering Committee is very interested in obtaining real-time data for diesel emissions. There are currently no real-time instruments that directly measure diesel particulates. However, black carbon instruments can give real-time black carbon data that can be viewed as a surrogate for diesel particulate matter. Black carbon can form from the incomplete combustion of any carbonaceous fuel; diesel fuel, gasoline fuel, wood, forest fires, coal, etc. This instrument will be able to provide information regarding diurnal patterns, rush hours influences, and weekday versus weekend patterns.

The drawback of this instrument is that it cannot differentiate the different sources of black carbon. Thus, this instrument will be collocated with the Elemental Carbon 24-hour integrated filter sampler.

7.2.3 Cations and Anions

The cations and anions are being measured to support the source apportionment study. The models for source apportionment use 24-hour integrated filter samples which are then extracted, and the ions are analyzed by ion chromatography. This analytical sampling and analysis methods are used in the national STN program.

Drawbacks of the manual method are:

- Using the typical 1:6 sampling frequency, it will take six times longer to gather the volume of data (vs. real-time).
- 24-hour integrated samples cannot capture diurnal patterns, traffic congestion patterns, and other factors that require a subset of a 24-hour period.
- Typical laboratory cost savings measures involve batch analyses, further delaying the time between sampling and obtaining the results

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[3] Watson et al., Aerosol and Air Quality Research, Vol. 5, No.1, pp. 65-102, 2005

7.2.4 Toxic-Metals

There are no cost-effective real-time Toxic-Metals analyzers. This leaves manual methods as the only way to effectively measure airborne metals in the Portside Communities. The EPA developed the Air Toxics program to support reduction of public exposure to hazardous air pollutants (HAPs). Note: HAPs are comprised of organic and inorganic compounds. In this instance, the toxic compounds are inorganic compounds. The EPA also codified established analysis methods for the quantification of Metals and Inorganic Compendium Method IO-3.5 is the EPA-approved method of analysis that air districts across the nation use.

By using this method, the District will be able to directly compare the AB 617 data to National Air Toxics Trends Stations (NATTS) data collected across the nation, in California, and to other Toxic-Metals sites in the county. Drawbacks to manual methods are:

- Using the typical 1:6 sampling frequency, it will take six times longer to gather the volume of data (vs. real-time).
- 24-hour integrated samples cannot capture diurnal patterns, traffic congestion patterns, and other factors that require a subset of a 24-hour period.
- Canister hold time constraints put time analysis pressure on laboratory personnel to complete all QA/QC functions quickly.
- Typical laboratory cost savings measures involve batch analyses, which can propagate unknown field issues (e.g., spikes in samples, dirty canisters, etc.) until the analysis is complete.

7.3 Standard Operating Procedures for Laboratory and Field Work

The sub-sections below discuss the Standard Operating Procedures that will be used by contract laboratories and the District in the field.

7.3.1 Toxics-VOCs

- Laboratory
  The previously cited EPA TO-15 method will be utilized by the contract laboratory with the NATTS TAD being the guidance document for procedures.
- Field Samplers and Support Equipment
  Through-the-probe (TTP) audits will be performed by SDAPCD staff. SDAPCD currently performs prescribed field procedures for instrument checks, loading, and collection for its ambient network. TTP audits for Toxics-VOCs field instruments are also performed according to established procedures. Once the Toxics-VOCs Xontech 911 samplers are obtained, acceptance tested, and deployed, the District will write relevant SOPs for the AB 617 program by adapting SOPs used in our ambient air monitoring network.

7.3.2 Carbon

- Laboratory – Organic/Elemental Carbon
  The contract laboratory will follow the SOP titled: DRI Model 2015Multiwavelength Thermal/Optical Carbon Analysis (TOR/TOT) of Aerosol Filter Samples - Method IMPROVE_A for the analysis of organic and elemental carbon. The method link can be found at:

  http://vista.cira.colostate.edu/improve/wp-content/uploads/2016/07/IMPROVEA_Model2015_2-226r1_20160125final.pdf

- Field Samplers and Support Equipment – Organic and Elemental Carbon
  - ✓ SDAPCD staff will perform the prescribed field procedures for instrument checks, loading, collection, calibrating, auditing, and maintenance/repair according to established procedures. Adapted versions of these procedures will be utilized for this program.
- Field Samplers and Support Equipment – Black Carbon
  To date, the District does not have experience operating these analyzers. Therefore, the only available SOPs currently available are from the manufacturer. Tight tolerances on flow are paramount to achieving quality data, so at a minimum, the District will follow manufacturer recommendations and EPA recommendations regarding flow, as well as other parameters, listed in:

  https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/drispec.pdf

7.3.3 Cations and Anions

- Laboratory
  The contract laboratory will follow the SOP titled Standard Operating Procedure for $PM_{2.5}$ Cation Analysis and Standard Operating Procedure for $PM_{2.5}$ Anion Analysis. The method links can be found at:

  https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/pm25cationsop.pdf, and
  https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/pm25anionsop.pdf.

- Field Samplers and Support Equipment
  - ✓ Since the same field equipment will be utilized to collect the organic/elemental carbon and ion filters, the same field procedures will be utilized as those listed under the Field Samplers and Support Equipment-Organic and Elemental Carbon section listed above.

7.3.4 Toxics-Metals

- Laboratory
  The contract laboratory will follow the digestion method outlined in the NATTS TAD. The TAD can be found at:

  https://www3.epa.gov/ttnamti1/files/ambient/airtox/NATTS%20TAD%20Revision%203_FINAL%20October%202016.pdf

  The contract laboratory will follow the Inorganic Compendium Method IO-3.5 method titled Determination of Metals in ambient particulate matter using inductively coupled plasma/mass spectrometry (ICP/MS). The method link can be found at:

  https://www3.epa.gov/ttn/amtic/files/ambient/inorganic/mthd-3-5.pdf

- Field Samples and Support Equipment
  The District does not yet have the Met One E-Sequential sampler in operation. The SDAPCD staff will therefore perform the prescribed field procedures for instrument checks, loading, collection, calibrating, auditing, and maintenance/repair according to the manufacturer specifications for QA/QC until an internal SOP is developed with enhanced QA/QC guidelines. Tight tolerances on flow are paramount to achieving quality data, so at a minimum, the District will follow manufacturer recommendations and EPA recommendations regarding flow, as well as other parameters, listed in:

https://www3.epa.gov/ttnamti1/files/ambient/pm25/spec/drispec.pdf

Monitoring Plan Element 8: DETERMINING MONITORING AREAS

This Element discusses the siting criteria and process for determining locations for air monitoring stations in the Portside Communities for the AB 617 program. The selection of sites is still ongoing and the actual monitoring locations will potentially be in flux throughout the program (i.e., sites may be added or removed as measurement results are determined). A list of active air monitoring stations will be maintained on the District's AB 617 webpage.

8.1 Monitoring Site Criteria and Selection

District staff are actively working on securing air monitoring locations in the Portside Communities. The potential sites are located near the areas that the Steering Committee defined as areas of concern. Using the list of general areas of concern defined by the Steering Committee, the District has been seeking sites using the following criteria:

- Area of concern as expressed by the community
- Footprint needed
- Electric power available
- Equipment security
- Obstructions (nearby trees, buildings, etc.)
- Site access/permission

The District worked with the community and Steering Committee to obtain concurrence on potential sampling locations. General areas of interest that are moving forward in the site selection process include:

- A location upwind of stationary and mobile emissions sources to provide background pollutant levels coming into the community.
- Sites will be in areas potentially burdened by traffic or stationary sources.
- Sites will include schools that may be candidates for funding per AB 2453 (includes incentive funding for air filtration system upgrades or installation at schools).
- If the mobile monitoring shows hotspots not included in identified areas of interest, a re-evaluation will be undertaken to locate air sampling sites in the local area.
- If monitoring data shows elevated pollutant levels, the data will be analyzed to identify the source(s) of the emissions and develop strategies for emissions reductions will be devised.

A listing of the areas of concern identified by the Steering Committee are listed in Table 8-1. This list includes over 40 locations. Many of these are redundant due to proximity to: other requested sites, downwind of a recommend site, or unworkable because of lack of power, security, obstructions, and/or footprint size. The District is working to get air monitoring sites into the general areas of interest that will cover all areas of the Portside Communities.

As stated earlier, the community has voiced concerns that heavy-duty truck/mobile traffic is a major issue, as well as typical pollutant parameters associated with vehicular traffic. There is some concern from the stationary sources as well. To answer these concerns, metals, Toxics-VOCs, and carbon speciation sampling will be conducted at sampling locations within the Portside Communities, although resources will necessitate the Steering Committee and the District to prioritize whether individual sites monitor for all of these pollutant categories, or a subset.

Table 8-1: List of Locations Identified by the Steering Committee

	LOCATION	STEERING COMMITTEE COMMENTS	DISTRICT COMMENT(S)
1	Home near 29th and Boston	Close to freeway onramp; lots of truck traffic	Not enough space
2	SA Recycling	Metals and lots of truck traffic	Caltrans, City of SD property, and Navy are the best opportunities
3	Cesar Chavez Parkway - near Interstate 5	Near heavy freeway traffic; would be useful if equipped with camera; EHC supports site and suggests Chicano Park near handball court	Caltrans Property best opportunity & by apartments
4	Home in Logan Heights	Concerned homeowner	Not enough space
5	Praxair	APCD suggestion	One possible location lost to development
6	Logan Heights K-8 School	APCD suggestion	Marcy School would be better
7	Logan Heights Family Center	Steering Committee suggestion	School under remodel and construction
8	Memorial Scholars & Athletes, 2850 Logan	Steering Committee suggestion	Marcy School would be better
9	Emerson/Bandini Elementary 3510 Newton	Steering Committee suggestion	Good site; potentially pull power from a lighted sign
10	Balboa Elementary School 1844 S. 40th St.	APCD suggestion	Potentially pull power from a lighted sign
11	Baker Elementary School 4041 T St	APCD suggestion	Possibly on the 41st St. side of the school buildings we can fit the samplers
12	Caesar Chavez School 1404 S. 40th St	Steering Committee suggestion	Space is tight where there seems to be ready power; could work
13	Kimbrough Head Start, 321 Hoitt Street	APCD suggestion	Okay location; could work
14	Burbank School	APCD suggestion	Marcy School would be better
15	Perkins Elementary	Steering Committee suggestion	Monitored at location before; better to locate elsewhere
16	Sherman Heights Elementary School	APCD site	District feels it is a good community location; Regional monitor required by EPA
17	Mercado Head Start Center- 2001 Newton	Steering Committee suggestion	Not enough space
18	Barrio Logan Child Development Center	Steering Committee suggestion	Not enough space
19	Marcy School, 2716 Marcy Ave	APCD suggestion	Good location; right by freeway
20	Site on or near Navy housing	APCD suggestion	Good location. Working with Navy
21	NASSCO	Community suggestion	Fenceline; where?
22	BNSF	Community suggestion	Need more details about location; fenceline?
23	Chrome Plating Shop	Community suggestion	Fenceline? If we were to monitor, limit to metals.
24	Tenth Avenue Marine Terminal	APCD suggestion	Good upwind site. Working with Port
25	5th and Roosevelt	APCD suggestion; EHC low priority	A lot of truck traffic; good location for monitoring; will need City or Caltrans help.
26	Kimball Elementary	Community suggestion	Good downwind community location in National City; metals business across the street.
27	Home on Cleveland Avenue	Concerned homeowner	Not enough space for all equipment
28	Home on a block with auto body shops	Community suggestion	Need more details
29	Casa de Salud	Community suggestion	Not enough space
30	Saint Anthony's Church	Community suggestion	Nearby school would be better
31	D Street Football Field	Community suggestion	Nearby Olivewood School would be better
32	Mile of Cars	Community suggestion	Cleveland Street or train depot or Kimball would be a better location
33	Senior Villas (on National)	Community suggestion	Not enough space
34	Ramada Inn	Community suggestion	Will need City or Caltrans help
35	Southland Auto body	Community suggestion	Kimball School would be better location
36	Olivewood Gardens	Community suggestion	Olivewood School would be better location
37	Sweetwater High School	Community suggestion	Olivewood School would be better location
38	County of San Diego Building, 24th St	Community suggestion	Available space is surrounded by trees; power will be a problem
39A 39B	National City Self Storage; two locations (30th St and 33rd St)	Community suggestion	No area
40	Central Elementary	Community suggestion	Outside of Portside boundary; Otis Shool would be better
41	Train Depot @ 24th	Community suggestion	Power will be problematic, but many trucks
42	Civic Center, Access to Interstate 5	Community suggestion	Workable, but between Kimball and Train Depot
43	Chicano Park	Community suggestion	Caltrans Property best opportunity
44	Olivewood School	APCD suggestion	Good site; welding college across the street
45	Otis School	APCD suggestion	Outside of Portside boundary; available space and there appears to be power

Maps of the sites listed in Table 8-1 are shown by number in Figures 8-1 through 8-3. A map of the entire Portside Communities is shown in Figure 8-1. The northern portion is included in Figure 8-2, and the southern portion is included in Figure 8-3.

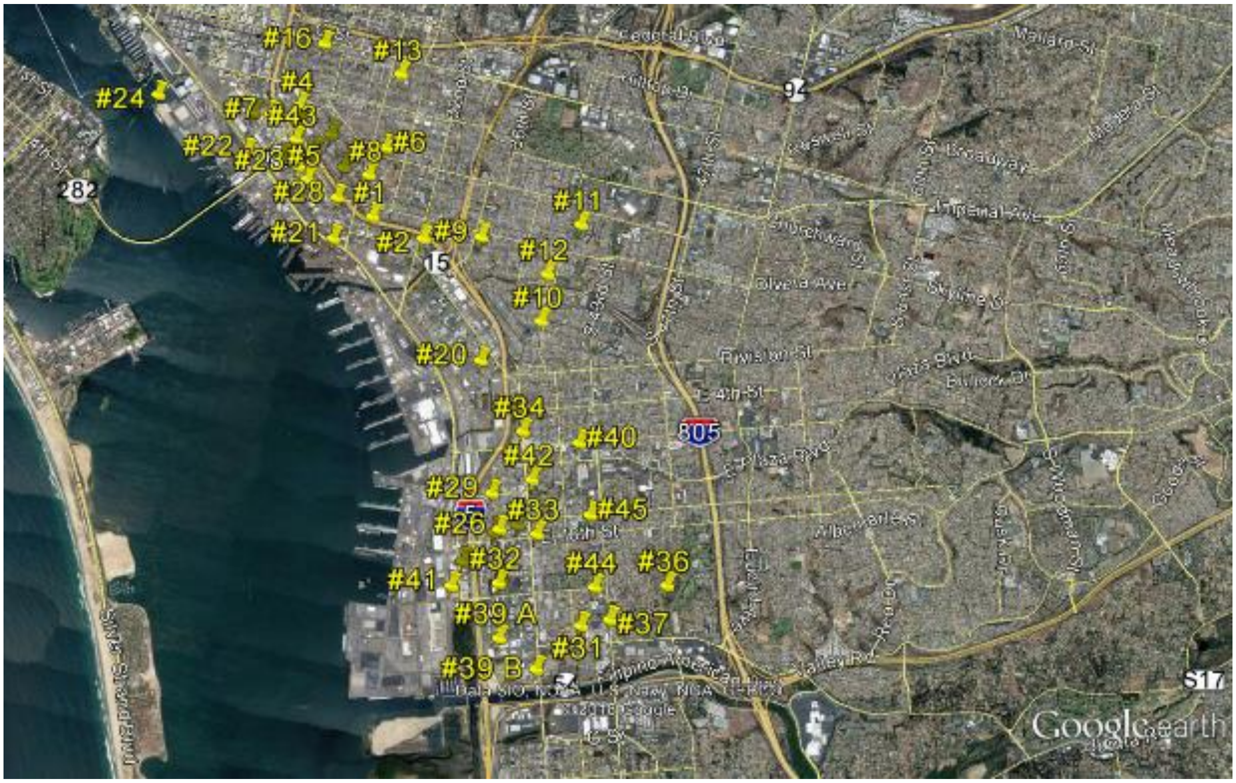

Figure 8-1: Portside Communities Map with Potential Sites 1 through 45 listed in Table 8-1

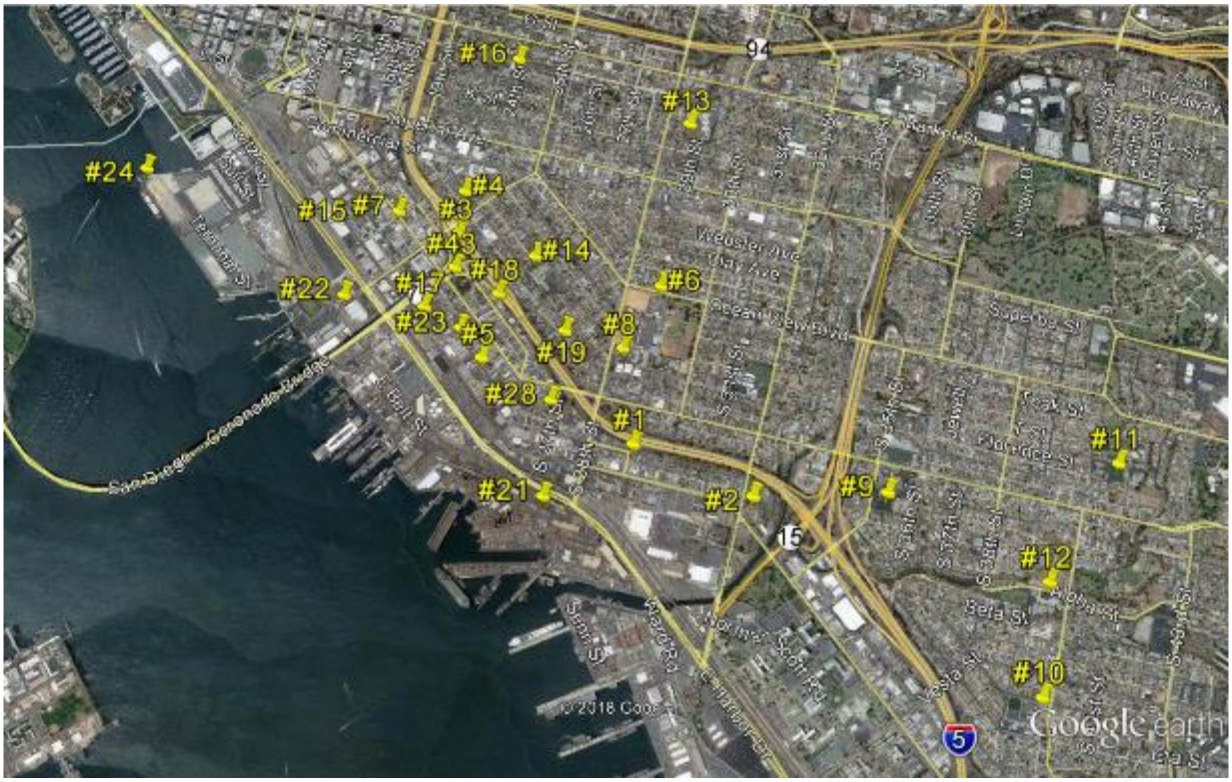

Figure 8-2: Northern Portion of the Portside Communities with Potential Sites listed in Table 8-1

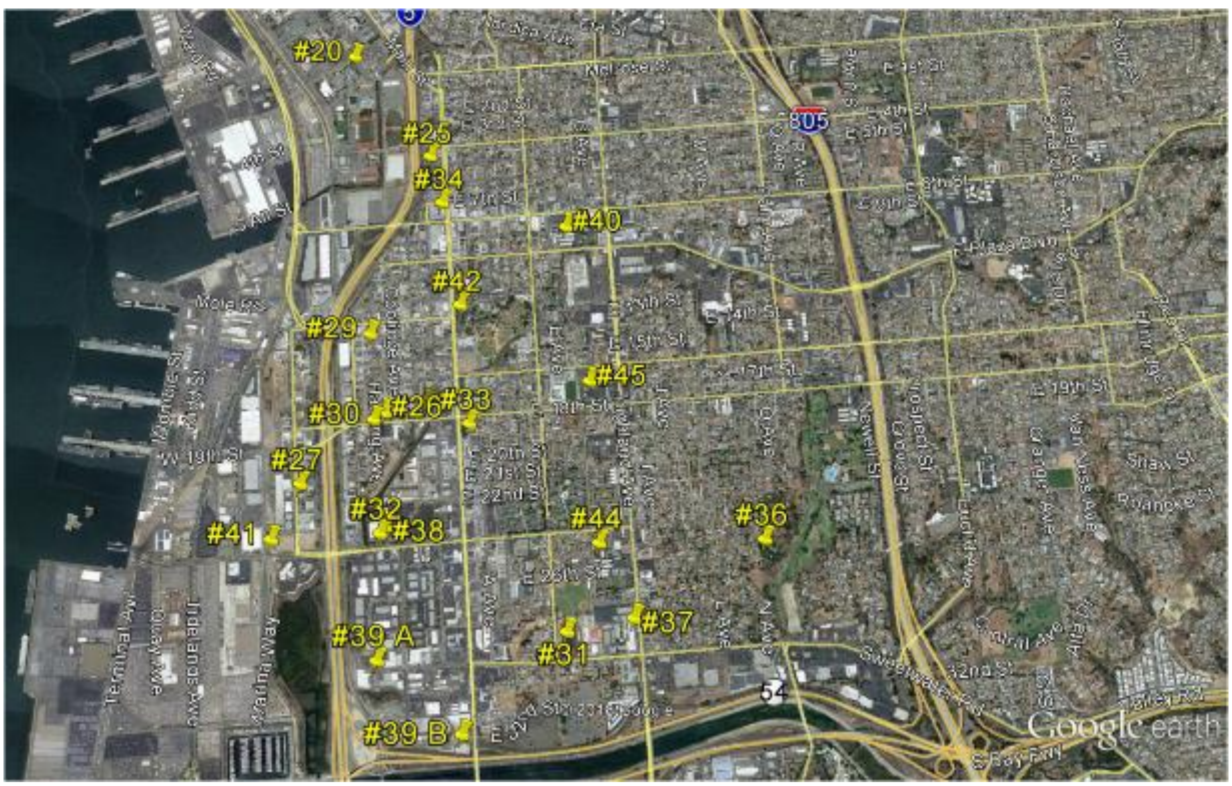

Figure 8-3: Southern Portion of the Portside Communities with Potential Sites listed in Table 8-1

8.2 Rationale and Considerations for Monitoring Area and Location Characteristics

The list of recommended site locations provided in Table 8-1 and shown in Figures 8-1 through 8-3 illustrates the numerous areas with air pollution concerns in the Portside Communities. This extensive list of areas of concern illustrates why the Steering Committee recommended that the mobile monitoring project be conducted before making final determination about final site selections. The mobile monitoring project will determine if there are “hot spots” in the Portside Communities that need additional scrutiny and measurements.

The areas of concern exceed the number of monitoring locations that can be monitored under this program. Characterization of air pollutant concentrations and gradients will require measurements spread across the Portside Communities, including upwind, central, and downwind locations. The District, in consultation with the Steering Committee is focusing siting efforts on some key areas within the Portside Communities. Due to the time required to locate and finalize use agreements with property owners, the District is further exploring key areas even before the results of the mobile monitoring project are known.

A refined list of sites that the District has been focusing on is shown in Table 8-2. Additional details on each site and the rationale and considerations is included below this table. This list of sites is not a final or definitive list. It simply shows the current status of the District’s search for suitable air monitoring locations.

Using the list from #8.1, the District recommends the sites below for possible sampling locations. As stated earlier, these locations may change, based on the mobile monitoring report. The list below gives a very brief synopsis as to why a location would not work or why another one would be better.

Table 8-2: Refined List of Sites Derived from Table 8-1

	LOCATION	STEERING COMMITTEE COMMENTS	DISTRICT COMMENT(S)
1	Home at 29th and Boston	Close to freeway onramp; lots of truck traffic	Not enough space. Try Caltrans Lot; will need to coordinate with Caltrans.
2	SA Recycling	Metals and lots of truck traffic	Caltrans, City of SD property, and Navy are the best opportunities.
3	Cesar Chavez Parkway - near Interstate 5	Near heavy freeway traffic; would be useful if equipped with camera. EHC supports site and suggests Chicano Park near handball court	Caltrans Property best opportunity & by apartments. Will need to coordinate with Caltrans.
4	Emerson/Bandini Elementary 3510 Newton	Steering Committee suggestion	Good site; potentially pull power from a lighted sign. SDUSD has a list of available schools; will need to coordinate with them. Fills the gap between Logan Heights and National City.
5	Sherman Heights Elementary School	APCD site	District feels it is a good community location; Regional monitor required by EPA
6	Navy Site downwind of the shipyards and upwind of National City	APCD suggestion	Good location (8th Street). Working with Navy.
7	Tenth Avenue Marine Terminal	APCD suggestion	Good upwind site. Working with Port. Working with Port Authorities now

8	National City Middle School	Community suggestion	Good downwind community location in National City; metals business across the street. Working with School District.
9	Train Depot @ 24th	Community suggestion	Many trucks on adjacent street. Use agreement signed.
10	Olivewood School	APCD suggestion	Good site; welding college across the street. Not viable.
11	Otis School	APCD suggestion	Outside of Portside boundary; available space and there appears to be power. Not viable.
12	Burbank School	APCD suggestion	Possibly in the Evans St. parking lot. SDUSD has a list of available schools; will need to coordinate with them
13	Schools (Upwind and Downwind)	Community suggestion	Yes
14	Sweetwater High School	Community suggestion.	Working with the School District.

Additional details of the sites listed in Table 8-2 are included below by site number. The biggest concern expressed by the community is pollution from heavy-duty trucks; therefore, many sampling locations are situated to capture mobile emissions, particularly near schools (another community concern).

1. Home near 29th Street and Boston Avenue
   - ✓ Private home: Footprint too small and the trees would cover the sampling area.
   - ❖ Best Option
     There is a Caltrans parking lot that could be used as a monitoring site. It appears that there is electrical power nearby. The District will need to get Caltrans approval. This will answer the community request for sampling near 29th Street and Boston Avenue. This location would be by the I-5 southbound onramp that is used by heavy-duty trucks and other vehicles accessing the freeway. The community expressed a strong interest in this location. It is street level with the cross-traffic and freeway on-ramp to capture mobile emissions.

2. SA Recycling
   - ✓ Boston Avenue and 32nd Street: To locate here will be extremely difficult. There is no apparent nearby power and the District would need to involve the City to use a parking spot.
   - ✓ To avoid the City, there may be space on Caltrans' right-of-way, but there still is no apparent nearby power.
   - ✓ Newton Avenue and 32nd Street: There may be power, but the District would have to involve the City to use a parking spot.
   - ❖ Best Option
     Main Street and 32nd Street: This location is on Navy property, and there are plans to build a gas dispensing facility there soon. This will probably preclude use of this location for air monitoring.

3. Cesar Chavez Parkway at Chicano Park
   - ✓ A Senior Center at Parkway and Logan Avenue: This is still under construction with an unknown completion date and there is no nearby power.
   - ✓ The handball courts at Parkway and Logan Avenue: Surrounded by cement and no obvious power source. We would have to cut into the cement for the fencing and possible power drop. All very expensive.

- ✓ In Chicano Park under the Coronado bridge: Possible nearby power, but better location just to the west.
    - o Mercado Apartments: Very small footprint. No ready power
- ❖ Best Option
  Caltrans building next to Mercado Apartments: Large footprint and ready power. This will answer the community request for sampling at Chicano Park, Mercado Apartments, Mercado Head Start, and Barrio Logan Child Development Center. The Caltrans facility is under the largest span portion of the bridge and is right by the Mercado Apartments, which house a large population and would measure mobile emissions. It is across the street from Chicano Park.

4. Emerson/Bandini Elementary School
   - ❖ Best Option.
     Several possible locations on the school. The best is by the lighted sign near the entrance (for power). This will address the communities request for sampling at Emerson/Bandini Elementary School, as well as for other schools in the area (e.g., St Jude and Balboa). This location is uniquely situated to measure emissions from both stationary and mobile sources (it is in between I-5 and I-15 and downwind of the bayside businesses).

5. Sherman Elementary School
   - ❖ Best Option.
     The District is in the process of establishing a full-time air monitoring station at this location. It is located between I-5 and SR-94 and is downwind of the Port and bayside businesses. It therefore has the potential to measure emissions from stationary and mobile sources.

6. Navy housing
   - ✓ The District is working with base authorities to find a location.
   - ✓ This location is downwind of bayside business for stationary emissions and accompanying truck traffic.
   - ❖ Best Option
     Long-term parking lot near 8t Street and Harbor Drive (in southern portion of Portside Communities). We are working with Base Authorities to obtain access.

7. 10th Ave Marine Terminal
   - ✓ The District is working with Port authorities to secure access and prepare the site (electrical power is available).
   - ✓ This location is upwind from the bayside businesses and transportation corridors. It will establish baseline pollution levels for the area.
   - ❖ Best Option
     District is working with Port Authorities to obtain access and prepare the site.

8. Kimball Elementary School
   - ✓ Downwind of the Port business and I-5. Across the street form a metals welding shop and heavy-duty trucks use the area behind the school for training. School District unable to commit to long-term use of the site.
   - ❖ Best Option
     District seeking other nearby locations.

9. National City Train Depot at 24th Street
   - ✓ This location would address the communities request for sampling near the Port and off Cleveland Street. It is downwind of the Port businesses, but upwind of I-5. This site would measure direct Port influences from the large volume of heavy-duty truck traffic.
   - ❖ Best Option
     Workable location identified and Use Permit signed with landowner. Working on getting electrical power outlets to operate equipment.

10. Olivewood School
    - ❖ Best Option
      Several possible locations and all appear to have ready power. This will answer the community request for sampling at: Sweetwater High School, the football field off D St., Mile of Cars, and Olivewood Gardens. Downwind of the Port businesses and I-5 and is across the street from a welding college.

11. Otis School
    - ❖ Best Option
      Several possible locations and all appear to have ready power. This will answer the community request for sampling at: Central Elementary school and National City Civic Center. Otis School is outside of the AB 617 Portside west boundary by about 600 meters. It is in between the north and south boundaries by about 350 meters. This site is in between two highly trafficked roadways, National City Blvd. and Highland Ave. This school is midway between two interstate highways (I-5 and I-805, about 1,300 meters from both).

12. Burbank School
    - ❖ Best Option
      Two possible locations. Both have available power and are workable. This will answer the community request for sampling at: Memorial Academy. This location is downwind of I-5 for mobile emissions and bayside businesses for stationary emissions.

13. Schools (upwind and downwind)
    - ✓ Upwind
      - o The District was at Perkins Elementary School for several years before eviction. There is enough data collected to not return to this location.
      - o The Mercado School can be served by the Caltrans site near the Mercado Apartments.
    - ✓ Downwind
      - o #4, #5, #8, #10, #11, #12 can all serve in this capacity.

Monitoring Plan Element 9: QUALITY CONTROL PROCEDURES

This Element addresses the quality control procedures that the District will conduct to ensure the collection of air pollution measurements in the Portside Communities that are high quality, representative of local conditions, and defensible. Specifics regarding the District's quality control procedures are described in the following subsections.

9.1 Quality Control Activities for Air Pollution Measurements

The subsections below describe the District's quality control procedures for each measurement program that will be used in the Portside Communities. These include the Toxics-VOCs program (Section 9.1.1), Organic and Elemental Carbon (Section 9.1.2), Black Carbon (Section 9.1.3), Cations and Anions (Section 9.1.4), and Toxics-Metals (Section 9.1.5).

9.1.1 Toxics-VOCs

- Laboratory QC Procedures
  The previously cited NATTS TAD will be the guiding document for laboratory QC procedures. The tables from Section 7.1 from this document details the procedures and are shown below in Table 9-1.

Table 9-1: Summary of NATTS TAD

Parameter	Description and Details	Required Frequency	Acceptance Criteria
Instrument Blank (IB)	Analysis of swept carrier gas through the preconcentrator to demonstrate the instrument is sufficiently clean to begin analysis	Prior to ICAL and daily beginning CCV	Each target VOC's concentration < 3x MDL or 0.2 ppb, whichever is lower
BFB Tune Check	50 ng injection of BFB for tune verification of quadrupole MS detector	Prior to initial calibration and every 24 hours of analysis thereafter	Abundance criteria listed in Table 4.2-2 (from TAD)
Initial Calibration (ICAL)	Analysis of a minimum of five calibration levels covering approximately 0.1 to 5 ppb	Initially, following failed BFB tune check, failed CCV, or when changes/maintenance to the instrument affect calibration response	Average RRF ≤ 30% RSD and each calibration level must be within ± 30% of nominal For quadratic or linear curves, r ≥ 0.995, each calibration level must be within ± 30% of nominal
Secondary Source Calibration Verification (SSCV)	Analysis of a secondary source standard at the mid-range of the calibration curve to verify ICAL accuracy	Immediately after each ICAL	Recovery within ± 30% of nominal or RRF within ±30% of the mean ICAL RRF
Continuing Calibration Verification (CCV)	Analysis of a known standard at the mid-range of the calibration curve to verify ongoing instrument calibration	Following each daily BFB tune check and every 24 hours of analysis; recommended after each ten sample injections and to conclude each sequence	Recovery within ± 30% of nominal or RRF within ±30% of the mean ICAL RRF
Canister Cleaning Batch Blank	A canister selected for analysis from a given batch of clean canisters to ensure acceptable	One canister from each batch of cleaned canisters – Canister chosen must represent no more than 10 total canisters.	Each target VOC's concentration < 3x MDL or 0.2 ppb, whichever is lower (All Tier I Core analytes must meet this criterion)

	background levels in the batch of cleaned canisters		
Internal Standards (IS)	Deuterated or not naturally occurring compounds co-analyzed with samples to monitor instrument response and assess matrix effects	Added to all calibration standards, QC samples, and field-collected samples	Area response for each IS compound within ± 40% of the average response of the ICAL
Preconcentrator Leak Check	Pressurizing or evacuating the canister connection to verify as leak-free	Each standard and sample canister connected to the instrument	< 0.2 psi change/minute or manufacturer recommendations
Method Blank (MB)	Canister filled with clean diluent gas	One with every analysis batch of 20 or fewer field-collected samples	Each target VOC's concentration < 3x MDL or 0.2 ppb, whichever is lower
Laboratory Control Sample (LCS)	Canister spiked with known amount of target analyte at approximately the lower third of the calibration curve	(Recommended) One with every analysis batch of 20 or fewer field-collected samples	Each target VOC's recovery must be 70 to 130% of its nominal spiked amount
Duplicate Sample	Field sample collected through the same inlet probe as the primary sample	10% of primary samples for sites performing duplicate sample collection (as prescribed in workplan)	Precision ≤ 25% RPD of primary sample for concentrations ≥ 5x MDL
Collocated Sample	Field sample collected through a separate inlet probe from the primary sample	10% of primary samples for sites performing collocated sample collection (as prescribed in workplan)	Precision ≤ 25% RPD of primary sample for concentrations ≥ 5x MDL
Replicate Analysis	Replicate analysis of a field-collected sample (chosen by analyst)	Once with every analysis sequence (as prescribed in workplan)	Precision ≤ 25% RPD for target VOCs with concentrations ≥ 5x MDL
Retention Time (RT)	RT of each target compound and internal standard	All qualitatively identified compounds and internal standards	Target VOCs within ± 0.06 RRT units of mean ICAL RRT IS compounds within ± 0.33 minutes of the mean ICAL RT
Canister Cleaning Batch Blank	Minimally one canister selected for analysis from a given batch of clean canisters to ensure acceptable background levels in the batch of cleaned canisters - must represent no more than 10 canisters	n/a	Each target VOC's concentration < 3x MDL or 0.2 ppb, whichever is lower
Canister Starting Pressure Determination	Each canister prior to collection of a field sample or preparation of a calibration standard or laboratory QC sample	n/a	Vacuum > 28" Hg as determined with calibrated pressure gauge or transducer
Compound Identification	Qualitative identification of each target VOC in each standard, blank, QC sample, and field-collected sample (including field QC samples)	n/a	Signal-to-noise ≥ 3:1 RT within prescribed window Ion abundances of at least one qualifier ion within 30% of ICAL mean Peak apexes co-maximized (within one scan for quadrupole MS) for quantitation and qualifier ions

Method Detection Limit	Determined initially and minimally annually thereafter and when method changes alter instrument sensitivity	n/a	MDL determined via 4.1 must be: Acrolein ≤ 0.09 µg/m3 Benzene ≤ 0.13 µg/m3 1,3-Butadiene ≤ 0.10 µg/m3 Carbon Tetrachloride ≤ 0.017 µg/m3 Chloroform ≤ 0.50 µg/m3 Tetrachloroethylene ≤ 0.17 µg/m3 Trichloroethylene ≤ 0.20 µg/m3 Vinyl Chloride ≤ 0.11 µg/m3 These MDL MQOs current as of October 2015. Refer to current workplan template for up to date MQOs.
Stock Standard Gases	Purchased stock standard gases for each target VOC All standards	n/a	Certified and accompanied by certificate of analysis Recertified or replaced annually unless a longer expiration is specified by the supplier
Proficiency Testing	Blind sample submitted to each laboratory to evaluate laboratory bias Two per calendar year	n/a	Each target compound within ± 25% of the assigned target value Failure of one PT must prompt corrective action. Failure of two consecutive PTs (for a specific core analyte) must prompt qualification of the analyte in field collected samples until return to conformance.
Canister Leak Test	Testing of the leak tightness of each canister in the agency fleet Annually, may be performed simultaneously with canister zero air check	n/a	Leak rate must be ≤ 0.1 psi/day
Canister Zero Check	Verification that a canister does not contribute to positive bias over an approximate 30-day period *Strongly Recommended:* Each canister in the agency fleet once annually (or as defined by agency policy) or after major maintenance such as replacement of valve	n/a	All Tier I core target compounds must be < 0.2 ppb or < 3x MDL, whichever is lower
Canister Known Standard Gas Check	Verification that a canister does not contribute to bias over an approximate 30-day period *Strongly Recommended:* Each canister in the agency fleet once annually (or as defined by agency policy) or after major maintenance such as replacement of valve	n/a	All Tier I core target compounds must be within ± 30% of nominal

9.1.2 Organic and Elemental Carbon

- Laboratory QC Procedures
  The previously cited IMPROVE_A SOP will be the guiding document for laboratory QA/QC procedures. Table 6-3 from Section 6.6 from that document details the procedures and is reproduced below in Table 9-2.

Table 9-2: Summary of QA/QC Activities for IMPROVE_A Analysis for Carbon[a]

QA/QC Activity	Calibration Standard and Range	Frequency	Acceptance Criteria
Laboratory Blank Check	NA[b]	Beginning of analysis day	<0.2 µg C/cm^2
Calibration Peak Area Check	NIST 5% CH4/He gas standard; 20 µg C (6-port valve injection loop, 1000 µl)	Every analysis	Counts >17,000 and 95-105% of average calibration peak area of the days
Auto-Calibration Check	NIST 5% CH_4/He gas standard; 20 µg C (Carle valve injection loop, 1000 µl)	Alternating beginning or end of each analysis day	95-105% recovery and calibration peak area 90-110% of weekly average
Manual Injection Calibration	NIST 5% CH_4/He or NIST 5% CO_2/He gas standards; 20 µg C (Certified gas-tight syringe, 1000 µl)	Four times a week (Sun., Tue., Thu., and Sat.)	95-105% recovery and calibration peak area 90-110% of weekly average
Sucrose Calibration Check	10µL of 1800 ppm C sucrose standard; 18 µg C	Thrice per week	17.1-18.9 µg C/filter
Potassium Hydrogen Phthalate (KHP) Calibration Check	10µL of 1800 ppm C KHP standard; 18 µg C	Twice per week (Tue. And Thu.)	17.1-18.9 µg C/filter
System Blank Check	NA[b]	Once per week	<0.2 µg C/cm^2
Multiple Point Calibrations	1800 ppm C Potassium hydrogen phthalate (KHP) and sucrose; NIST 5% CH_4/He, and NIST 5% CO_2/He gas standards; 9-36 µg C for KHP and sucrose; 2-30 µg C for CH_4 and CO_2	Every six months or after major instrument repair	All slopes ±5% of average
Sample Replicates (on the same or a different analyzer)	NA[b]	Every 10 analyses	±10% when OC and TC >10 µg C/cm^2 ±20% when EC > 10µg C/cm^2 or <±1 µg/cm^2 when OC and TC <10 µg C/cm^2 <±2 µg/cm^2 when EC <10µg C/cm^2
Temperature Calibrations	NIST-certified thermocouple[c]	Every six months, or whenever the thermocouple is replaced	Linear relationship between analyzer and NIST thermocouple values with R^2>0.99
Oxygen Level in Helium Atmosphere (using GC/MS)	Certified gas-tight syringe; 0-100 ppmv	Every six months	Less than the certified amount of He cylinder

[a] Assumes 24/7 operation
[b] Not Applicable
[c] Contract laboratory recently updated their SOP and for the temperature calibrations, they have switched from Tempilaq® calibrations to a NIST-certified thermocouple

- Field QC Procedures
  The EPA Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites will be the guiding document for field QA/QC procedures. Table 16-1 from Section 16 from that document details the procedures and is reproduced below in Table 9-3.

Table 9-3: Summary of QA/QC Activities for the Organic and Elemental Carbon Field Sampler

QA/QC Criteria	Frequency	Acceptance Criterion
Field Calibrations and Routine Checks		
One-point flow rate check at design flow rate	Monthly	±5% of transfer standard; and ±5% of design flow rate
External leak check(a)	Conducted with monthly flow check	≤ 0.1 L/min
Internal leak check	If external leak check fails, refer to manufacturer operating manual	≤ 0.1 L/min
One-point temperature check	Monthly	±2 °C of standard
Pressure verification	Monthly	±10 mmHg
Clock/timer verification	Monthly	1 min/month
Other calibrations as specified by manufacturer	Per manufacturer's SOP	per manufacturer's SOP
Quarterly Checks and Audits		
External leak check(a)	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	≤ 0.1 L/min
Internal leak check	If external leak check fails, refer to manufacturer operating manual	≤ 0.1 L/min
Temperature audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±2 °C
Pressure audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±10 mmHg
Flow rate audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±5% of audit standard ±5% of design flow rate
Initial Installation Calibration and recalibrations thereafter		
Temperature calibration	On installation, annually, or if verification/audit indicates drift or failure	±2°C of standard
Pressure calibration	On installation, then annually, or if verification/audit indicates drift or failure	±10 mmHg
Flow rate calibration	On installation, annual, or if verification/audit indicates drift or failure	±2% of transfer standard at each flow rate
Design flow rate adjustment	As needed	±2% of design flow rate

9.1.3 Black Carbon

The District does not currently have an operational Black Carbon analyzer. The QA/QC criteria below is based on the EPA Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites will be the guiding document for field QA/QC procedures. Table 16-1 from Section 16 of that document details the procedures and is reproduced below in Table 9-4. These criteria could change based on the manufacturer recommendation once the Black Carbon analyzer is brought into service by the District.

Table 9-4: Summary of QA/QC Activities for the Black Carbon Field Sampler

QA/QC Criteria	Frequency	Acceptance Criterion
Field Calibrations and Routine Checks		
One-point flow rate check at design flow rate	Monthly	±5% of transfer standard; and ±5% of design flow rate
External leak check(a)	Conducted with monthly flow check	≤ 0.1 L/min
Internal leak check	If external leak check fails, refer to manufacturer operating manual	≤ 0.1 L/min
One-point temperature check	Monthly	±2 °C of standard
Pressure verification	Monthly	±10 mmHg
Clock/timer verification	Monthly	1 min/month
Other calibrations as specified by manufacturer	Per manufacturer's SOP	per manufacturer's SOP
Quarterly Checks and Audits		
External leak check(a)	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	≤ 0.1 L/min
Internal leak check	If external leak check fails, refer to manufacturer operating manual	≤ 0.1 L/min
Temperature audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±2 °C
Pressure audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±10 mmHg
Flow rate audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±5% of audit standard ±5% of design flow rate
Initial Installation Calibration and recalibrations thereafter		
Temperature calibration	On installation, annually, or if verification/audit indicates drift or failure	±2°C of standard
Pressure calibration	On installation, then annually, or if verification/audit indicates drift or failure	±10 mmHg
Flow rate calibration	On installation, annual, or if verification/audit indicates drift or failure	±2% of transfer standard at each flow rate
Design flow rate adjustment	As needed	±2% of design flow rate

9.1.4 Cations and Anions

- Laboratory QC Procedures
  The EPA Quality Assurance Project Plan Chemical Speciation of PM2.5 Filter Samples will be the guiding document for laboratory QA/QC procedures. This document can be found at https://www3.epa.gov/ttn/amtic/files/ambient/pm25/spec/qapp.pdf. Table B.5.1 from Section B.5.2 of that document is reproduced below in Table 9-5.

Table 9-5: Summary of QA/QC Activities for Cations and Anions

QC Sample	Frequency	Acceptance Criteria
Multipoint calibration	Daily, before analysis of field samples	Acceptable agreement with previous calibration results plotted on a control chart
Method Detection Limit (MDL)	Annually or after major instrument change	Acceptable agreement with instrument manufacturer's specification
QC samples prepared with laboratory reagents at concentrations higher and lower than expected sample concentrations (one high, one low)	Daily, before analysis of field samples, and After every 10 field samples during a run	±10% of nominal value
Commercial, NIST- traceable standard solution	Daily, before analysis of field samples	±10% of nominal value
Reagent blanks	1) Daily, before analysis of field samples, and 2) After every 20 field samples during a run	(1 and 2) less than the MDL for each ion
Duplicates (of field samples)	After every 20 field samples during a run	Relative difference less than 10% for concentrations ≥10 times the MDL (less than 100% for concentrations at the MDL)
Spiked duplicates	One for every 20 field samples during a run	Spike recovery between 90% and 110%

- Field QC Procedures
  The EPA Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites will be the guiding document for Cation and Anion Field sampler field QA/QC procedures. Table 16-1 from Section 16 from that document details the procedures and is reproduced below in Table 9-6.

Table 9-6: Summary of QA/QC Activities for the Cation and Anion Field Sampler

QA/QC Criteria	Frequency	Acceptance Criterion
Field Calibrations and Routine Checks		
One-point flow rate check at design flow rate	Monthly	±5% of transfer standard and ±5% of design flow rate
External leak check(a)	Conducted with monthly flow check	≤ 0.1 L/min
Internal leak check	If external leak check fails, refer to manufacturer operating manual	≤ 0.1 L/min
One-point temperature check	Monthly	±2 °C of standard
Pressure verification	Monthly	±10 mmHg
Clock/timer verification	Monthly	1 min/month
Other calibrations as specified by manufacturer	Per manufacturer's SOP	per manufacturer's SOP
Quarterly Checks and Audits		
External leak check(a)	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	≤ 0.1 L/min
Internal leak check	If external leak check fails, refer to manufacturer operating manual	≤ 0.1 L/min
Temperature audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±2 °C
Pressure audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±10 mmHg
Flow rate audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±5% of audit standard ±5% of design flow rate
Initial Installation Calibration and recalibrations thereafter		
Temperature calibration	On installation, annually, or if verification/audit indicates drift or failure	±2°C of standard
Pressure calibration	On installation, then annually, or if verification/audit indicates drift or failure	±10 mmHg
Flow rate calibration	On installation, annual, or if verification/audit indicates drift or failure	±2% of transfer standard at each flow rate
Design flow rate adjustment	As needed	±2% of design flow rate

9.1.5 Toxics – Metals

- Laboratory QC Procedures
  The EPA IO 3.5 Method (previously cited) will be the guiding document for laboratory QA/QC procedures. Table 8 from that document details the procedures and is reproduced below in Table 9-7.

Table 9-7: Summary of QA/QC Activities for the Toxic – Metal Filter Sampler

QC procedure	Typical frequency	Criteria
Initial calibration (IC)	At the beginning of the analysis	$R^2 \geq 0.995$
Initial calibration verification (ICV)	Immediately after initial calibration	90%-110% of the actual concentration
Initial calibration blank (ICB)	Immediately after initial calibration verification	May be less than project detection limits (MDLs)
High standard verification (HSV)	Following the initial calibration blank analysis	95%-105% of the actual concentration
Interference check standard (ICS)	Following the high standard verification, every 8 hours, and at the end of a run	80%-120% of the actual concentration
Continuing calibration verification (CCV)	Analyzed before the first sample, after every 10 samples, and at the end of the run	90%-110% of the actual concentration
Continuing clarification blanks (CCBs)	Analyzed following each continuing calibration verification	Must be less than project detection limits (MDLs)
Reagent blank (RB) or Method blank (MB)	1 per 40 samples, a minimum of 1 per batch	Must be less than project detection limits (MDLs)
Laboratory control spike (LCS) or Laboratory fortified blanks (LFB)	1 per 20 samples, a minimum of 1 per batch	80%-120% recovery
Duplicate and/or spike duplicate	1 per sample batch	RPD <20%
Matrix spike (MS)	1 per 20 samples per sample batch	Percent recovery of 75%-125%
Serial dilution	1 per sample batch	90%-110% of undiluted sample
Sample dilution	Dilute sample beneath the upper calibration limit but no lower than at least 5X the MDL	As needed

- Field QC Procedures
  The EPA Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites will be the guiding document for Cation and Anion Field sampler field QA/QC procedures. Table 16-1 from Section 16 from that document details the procedures and is reproduced below in Table 9-8.

Table 9-8: Summary of QA/QC Activities for the Toxic – Metal Field Sampler

QA/QC Criteria	Frequency	Acceptance Criterion
Field Calibrations and Routine Checks		
One-point flow rate check at design flow rate	Monthly	±5% of transfer standard; and ±5% of design flow rate
External leak check(a)	Conducted with monthly flow check	≤ 0.1 L/min
Internal leak check	If external leak check fails, refer to manufacturer operating manual	≤ 0.1 L/min
One-point temperature check	Monthly	±2 °C of standard
Pressure verification	Monthly	±10 mmHg
Clock/timer verification	Monthly	1 min/month
Other calibrations as specified by manufacturer	Per manufacturer's SOP	per manufacturer's SOP
Quarterly Checks and Audits		
External leak check(a)	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	≤ 0.1 L/min
Internal leak check	If external leak check fails, refer to manufacturer operating manual	≤ 0.1 L/min
Temperature audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±2 °C
Pressure audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±10 mmHg
Flow rate audit	Semi-annual unless failed audit then at least quarterly until passes for 2 quarters	±5% of audit standard ±5% of design flow rate
Initial Installation Calibration and recalibrations thereafter		
Temperature calibration	On installation, annually, or if verification/audit indicates drift or failure	±2°C of standard
Pressure calibration	On installation, then annually, or if verification/audit indicates drift or failure	±10 mmHg
Flow rate calibration	On installation, annual, or if verification/audit indicates drift or failure	±2% of transfer standard at each flow rate
Design flow rate adjustment	As needed	±2% of design flow rate

9.2 Procedures for when Control Limits are Exceeded

High quality monitoring programs require defined protocols for how data are treated when quality control limits are exceeded. These protocols serve to ensure that the equipment and operated and maintained properly, and that data that don't meet monitoring criteria (and therefore suspect/invalid) do not become part of the database. The District's control limit protocols are expanded upon in the following subsections.

These include the Toxics-VOCs program (Section 9.2.1), Organic and Elemental Carbon (Section 9.2.2), Black Carbon (Section 9.2.3), Cations and Anions (Section 9.2.4), and Toxics-Metals (Section 9.2.5).

9.2.1 Toxics-VOCs

Details on procedures that will be followed when control limits for the Toxics-VOCs program are exceeded are presented in Tables 9-9 and 9-10. The current laboratory actions are based on SDAPCD criteria and will be adapted/amended for the contract laboratory. The current field actions will also be utilized for this project

Table 9-9: Toxics VOCs Laboratory QC Actions Based on a Failed Parameter

QC Measure	Fail Action
MS Tuning	Retune MS, recalibrate, and reanalyze samples.
System Monitoring Compound (SMC)	Retune MS, recalibrate, and reanalyze samples.
Non ISTD RT Difference	Flag samples, repair system, recalibrate.
ISTD RT Difference	Repair system, recalibrate, update RT.
Blank (system or canister)	System blank – repair system restart batch. Canister blank – flag canisters or clean canisters.
LCS	Flag samples, recalibrate
CCV	Batch is invalid, recalibrate, and reanalyze samples.
SSCV	Flag samples, repair system, or recertify standards.
Laboratory Replicate	Batch is invalid, repair system, recalibrate, and reanalyze samples.
ISTD Abundance	Batch is invalid, recalibrate, and reanalyze samples.
Collocated Sample	Calculate CV quarterly; if CV > 15%, flag samples.

Table 9-10: Toxics VOCs Field QC Actions Based on a Failed Parameter

QC Measure	Fail Action
Completeness	Collect makeups before next run or within the same month.
Leak Check	Check connections, repair system, inform laboratory
Canister run	Inform laboratory
Canister under/overfilled	Inform laboratory

9.2.2 Organic and Elemental Carbon

Below is a table detailing what procedures will be followed when the laboratory control limits for the Organic and Elemental Carbon program are exceeded are shown in Table 9-11. These criteria are based on the previously cited IMPROVE_A OC/EC SOP.

Table 9-11: Organic and Elemental Carbon Laboratory QC Actions Based on a Failed Parameter

QA/QC Activity	Corrective Action
Laboratory Blank Check	Check instrument and filter lots
Calibration Peak Area Check	Void analysis result; check flowrates, leak, and 6-port valve temperature; conduct an auto-calibration; and repeat analysis with second filter punch
Auto-Calibration Check	Troubleshoot and correct system before analyzing samples
Manual Injection Calibration	Troubleshoot and correct system before analyzing sample
Sucrose Calibration Check	Troubleshoot and correct system before analyzing samples
Potassium Hydrogen Phthalate (KHP) Calibration Check	Troubleshoot and correct system before analyzing samples
System Blank Check	Check instrument
Multiple Point Calibrations	Troubleshoot instrument and repeat calibration until results are within stated tolerances
Sample Replicates (on the same or a different analyzer)	Investigate instrument and sample anomalies and rerun replicate when difference is > ±10% (OC) or ±20% (EC)
Temperature Calibrations	Troubleshoot instrument and repeat calibration until results are within stated tolerances
Oxygen Level in Helium Atmosphere (using GC/MS)	Replace the He cylinder and/or O_2 scrubber

Details on procedures that will be followed when the field equipment control limits are exceeded are based EPA Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites will be the guiding document for field QA/QC procedures. Table 16-1 from Section 16 from that document details the procedures and is reproduced in Table 9-12.

Table 9-12: Organic and Elemental Carbon Field Sampler QC Actions Based on a Failed Parameter

QA/QC Criteria	Failed Action
Field Calibrations and Routine Checks	
One-point flow rate check at design flow rate	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels
External leak check(a)	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Internal leak check	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
One-point temperature check	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure verification	Troubleshoot and recalibrate or replace sensor
Clock/timer verification	Adjust Clock/ timer
Other calibrations as specified by manufacturer	per manufacturer's SOP
Quarterly Checks and Audits	
External leak check(a)	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Internal leak check	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Temperature audit	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure audit	Troubleshoot and recalibrate or replace sensor
Flow rate audit	Correct problems. Recalibrate the sampler, if needed. Applies to all flow channels
Initial Installation Calibration and recalibrations thereafter	
Temperature calibration	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure calibration	Troubleshoot and recalibrate or replace sensor
Flow rate calibration	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels
Design flow rate adjustment	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels

9.2.3 Black Carbon

The District does not currently have a Black Carbon analyzer. Below is a table detailing what procedures will be followed when field equipment control limits for the Black Carbon program are exceeded. These controls are based EPA Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites will be the guiding document for field QA/QC procedures. Table 16-1 from Section 16 of that document details the procedures and is reproduced below in Table 9-13. These criteria could change based on the manufacturer recommendation once the Black Carbon analyzer is received and acceptance tested by the District.

Table 9-13: Black Carbon Field Sampler QC Actions Based on a Failed Parameter

QA/QC Criteria	Failed Action
Field Calibrations and Routine Checks	
One-point flow rate check at design flow rate	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels
External leak check(a)	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Internal leak check	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
One-point temperature check	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure verification	Troubleshoot and recalibrate or replace sensor
Clock/timer verification	Adjust Clock/ timer
Other calibrations as specified by manufacturer	per manufacturer's SOP
Quarterly Checks and Audits	
External leak check(a)	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Internal leak check	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Temperature audit	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure audit	Troubleshoot and recalibrate or replace sensor
Flow rate audit	Correct problems. Recalibrate the sampler, if needed. Applies to all flow channels
Initial Installation Calibration and recalibrations thereafter	
Temperature calibration	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure calibration	Troubleshoot and recalibrate or replace sensor
Flow rate calibration	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels
Design flow rate adjustment	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels

9.2.4 Cations and Anions

Details on what procedures will be followed when the laboratory control limits for the Cations and Anions are exceeded, which are based on the EPA Method IO 3.5: Determination of Metals in Ambient Particulate Matter using Inductively Coupled Plasma/ Mass Spectrometry (ICP/MS) are shown in Table 9-14.

Table 9-14: Cations and Anions Laboratory QC Actions Based on a Failed Parameter

QC Sample	Failed Action
Multipoint calibration	Identify and correct the problem before analyzing field sample
Method Detection Limit (MDL)	Troubleshoot IC instrument
QC samples prepared with laboratory reagents at concentrations higher and lower than expected sample concentrations (one high, one low)	Identify and correct the problem before analyzing field samples, and Field samples not bracketed by acceptable QC samples must be reanalyzed after corrective actions
Commercial, NIST-traceable standard solution	Identify and correct the problem before analyzing field samples
Reagent blanks	Identify and correct the problem before analyzing field samples, and Field samples not bracketed by acceptable QC samples must be reanalyzed after corrective actions
Duplicates (of field samples)	Field samples not bracketed by acceptable QC samples must be reanalyzed after corrective actions
Spiked duplicates	Field samples not bracketed by acceptable QC samples must be reanalyzed after corrective actions have been taken

Details on what procedures will be followed when the field equipment control limits for the Cations and Anions program, based EPA Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites will be the guiding document for field QA/QC procedures. Table 16-1 from Section 16 of that document details the procedures and is reproduced below in Table 9-15.

Table 9-15: Cations and Anions Field Sampler QC Actions Based on a Failed Parameter

QA/QC Criteria	Failed Action
Field Calibrations and Routine Checks	
One-point flow rate check at design flow rate	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels
External leak check(a)	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Internal leak check	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
One-point temperature check	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure verification	Troubleshoot and recalibrate or replace sensor
Clock/timer verification	Adjust Clock/ timer
Other calibrations as specified by manufacturer	per manufacturer's SOP
Quarterly Checks and Audits	
External leak check(a)	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Internal leak check	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Temperature audit	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure audit	Troubleshoot and recalibrate or replace sensor
Flow rate audit	Correct problems. Recalibrate the sampler, if needed. Applies to all flow channels
Initial Installation Calibration and recalibrations thereafter	
Temperature calibration	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure calibration	Troubleshoot and recalibrate or replace sensor
Flow rate calibration	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels
Design flow rate adjustment	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels

9.2.5 Toxic – Metals

Details on what procedures will be followed when the laboratory analysis control limits for the Toxics-Metals program are based on the previously cited EPA Method IO 3.5 Determination of Metals in Particulate Matter utilizing Inductively Coupled Plasma/ Mass Spectrometry (ICP/MS), and are shown below in Table 9-16.

Table 9-16: Toxic Metals Laboratory QC Actions Based on a Failed Parameter

QC procedure	Failed Action
Initial calibration (IC)	Batch is aborted, repair system, and recalibrate
Initial calibration verification (ICV)	Batch is aborted, repair system, and recalibrate
Initial calibration blank (ICB)	Samples < 5x Blank are flagged
High standard verification (HSV)	Batch is aborted, repair system, and recalibrate
Interference check standard (ICS)	Batch is invalid, repair system, recalibrate, and reanalyze samples
Continuing calibration verification (CCV)	Batch is invalid, repair system, recalibrate, and reanalyze samples
Continuing clarification blanks (CCBs)	Samples < 5x Blank are flagged
Reagent blank (RB) or Method blank (MB)	Batch is flagged
Laboratory control spike (LCS) or Laboratory fortified blanks (LFB)	Batch is qualified
Duplicate and/or spike duplicate	Batch is invalid, repair system, recalibrate, and reanalyze samples
Matrix spike (MS)	Batch is invalid, repair system, recalibrate, and reanalyze samples
Serial dilution	Batch is invalid, repair system, recalibrate, and reanalyze samples

Details on what procedures will be followed when the field equipment control limits for the Toxic-Metals program, based on EPA Quality Assurance Guidance Document Quality Assurance Project Plan: $PM_{2.5}$ Chemical Speciation Sampling at Trends, NCore, Supplemental and Tribal Sites will be the guiding document for field QA/QC procedures. Table 16-1 from Section 16 of that document details the procedures and is reproduced below in Table 9-17.

Table 9-17: Toxic Metals Field Sampler QC Actions Based on a Failed Parameter

QA/QC Criteria	Failed Action
Field Calibrations and Routine Checks	
One-point flow rate check at design flow rate	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels
External leak check(a)	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Internal leak check	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
One-point temperature check	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure verification	Troubleshoot and recalibrate or replace sensor
Clock/timer verification	Adjust Clock/ timer
Other calibrations as specified by manufacturer	per manufacturer's SOP
Quarterly Checks and Audits	
External leak check(a)	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Internal leak check	Determine cause of leak and correct. Validate and/or calibrate the sampler flow rate. Applies to all flow channels
Temperature audit	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure audit	Troubleshoot and recalibrate or replace sensor
Flow rate audit	Correct problems. Recalibrate the sampler, if needed. Applies to all flow channels
Initial Installation Calibration and recalibrations thereafter	
Temperature calibration	Conduct a 3-point calibration to verify compliance. If failed 3-pt Cal, troubleshoot, and recalibrate
Pressure calibration	Troubleshoot and recalibrate or replace sensor
Flow rate calibration	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels
Design flow rate adjustment	Correct problems. Recalibrate the sampler if needed. Applies to all flow channels

Monitoring Plan Element 10: DATA MANAGEMENT

Data management is an essential part of a successful air monitoring program. This Element describes the District's data management system and how data are processed, validated, and reported to the EPA's Air Quality System (AQS).

10.1 Data Management System

The District uses an environmental database program known as AirVision from Agilaire LLC, based in Knoxville, Tennessee to handle its air quality and meteorological data acquisition, processing, validation, and storage tasks. The AirVision software is currently run off a server located at the District's offices. The District is currently in negotiations with Agilaire to host the AirVision software and the District's database in the cloud. When completed, this will have no effect on how the District's air monitoring data are collected, processed, validate, and reported.

10.1.1 Data Descriptors

The District will conduct the AB 617 air monitoring program and data handling procedures in the same way that it currently conducts its regional air quality monitoring programs. All air quality and meteorological parameters are referenced by EPA-defined parameter codes, with associated codes for units, collection durations, methods, and descriptors. Once the data are validated, additional codes for the data point validation/qualifier status are assigned to the data records.

The AQS data codes can be found at:

https://www.epa.gov/aqs/aqs-code-list.

All data collected for this program will follow AQS-defined codes.

10.1.2 Data Storage Attributes

The District's air quality database is stored both internally and externally. The AirVision database currently resides on a server located at the District's offices in San Diego. For continuous data, the AirVision software gathers "minute" data (one-minute averages of all parameters from the station datalogger), as well as hourly data continuously. The AirVision software is designed to automatically backfill any data missed due to communications problems (sites are accessed via wireless network) or system maintenance.

The AirVision database is also backed up to an offsite system in a nearly continuous basis. In addition, hourly data averages are automatically sent by AirVision to the EPA's AirNow and CARB's databases. Once the data have been fully processed and validated (Section 10.2), the data are uploaded to the EPA's AQS for permanent storage and archival.

10.2 Data Review and Flagging Procedures

The collection of quality data involves many aspects and the involvement of numerous individuals within the monitoring organization. The data's validity, representativeness, and defensibility results from a robust system of checks and cross-checks on the performance of the monitoring equipment as well as on the individuals performing the work. Each link in the chain is critical to the final product (i.e., valid data). In air quality monitoring, this final product will be used for research and for emission control and reduction strategies. It is therefore crucial that the data are of known and documentable validity and quality. The APCD's data processing and validation procedures are designed to produce data that meet these demands. District staff will follow the same guidelines and procedures for processing and validating the AB 617 air monitoring data as are used in our ambient air monitoring network. These processes are discussed in greater detail below.

The individual most immediately and intimately involved with the data collected at a monitoring site is the Station Operator. It is the responsibility of the Station Operator to operate all equipment as specified in applicable SOPs and to document all monitoring activities and complete all Chain-of-Custody (CoC) documents that accompany all field-collected data samples (e.g., particulate collection filters, gas collection canisters, etc.).

10.2.1 Data Validation of Field Data

- ✓ Each site will get a specific site name (based on the location) and identifying number based on AQS numbering system for site identification.
- ✓ Each piece of equipment will be identified by model number and serial number.
- ✓ All field activities will be recorded by the site instrument technician in site and instrument logbooks (e.g., who is at the site, times of the site visit and activities, repairs, replacements, flow checks, temperatures, calibrations, audits, etc.).
- ✓ All work done in the field will be signed and dated by the operator.
- ✓ Incorrect entries in the logbook are not be deleted. A separate entry must be made detailing the proper entry and an explanation for the correction.
- ✓ All work done in the field is subsequently reviewed by a supervisor.
- ✓ All field data will undergo data review and validation.
- ✓ Sampler QA/QC functions will be done on non-run days.
- ✓ Analyzer QA/QC functions will be taken off-line, so QA/QC data cannot be accidentally intermingled with ambient data. If an analyzer is not taken off-line and/or a lingering problem was detected by the QA/QC function, an AQDA will be generated and the data review command tree will be followed.
- ✓ All QA/QC field work (e.g., calibrations, audits, flow verifications, etc.) will be electronically signed and dated by the generator (site operator or the program chemist). These reports will be reviewed by the respective superior (Supervising Technician or Senior Chemist) and ranked as "PASS", "FAIL", or conditionally passing, along with comments, when applicable.
    - ➢ PASS means that the work was done correctly, and the data meets specified EPA limits.
    - ➢ FAIL means that the work was done incorrectly or that the data does not meet specified EPA limits.
        - o An investigation as to why there was a failure is conducted. The problem is corrected and then a QA/QC function is re-run to verify that the problem is corrected.
        - o The Level I data review process will determine if the data requires nullification, qualification, or is acceptable as is. This recommendation will be sent to the Level II reviewer for concurrence.
    - ➢ Conditional passing means that the work was done correctly, and the data meets EPA limits. The District has two internal limits (Check and Warning) that trigger different responses.
    - ➢ Check means that the work was done correctly, and that the data meets specified EPA limits, but that the instrument is trending towards failing EPA limits by exceeding District defined limit(s).

- An investigation as to why the instrument is trending towards a failure is started as soon as possible.
- The problem is identified and corrected (e.g., cleaning, repairing the equipment, etc.).
- The respective superior (Supervising Technician or Senior Chemist) determines if a calibration is required.
- A QA/QC (1-pt QC check or calibration or audit) function is re-run to verify that the problem is corrected.

➢ Warning means that the work was done correctly, and that the data meets specified EPA limits, but that the instrument MAY be trending towards failing EPA limits by exceeding District defined limit(s).
  - An investigation is conducted to see if the instrument is trending towards a possible failure.
  - The issue is identified. The supervisor then determines to correct the issue immediately or later.
  - Once the issue is reconciled, a QA/QC function (1-pt QC check or calibration or audit) is run to verify that the problem is corrected.

The data review process involves many individuals and steps to ensure that quality data are collected, validated, and report. The people involved and the steps everyone performs are detailed below.

The Station Operator reviews the results of nightly zero/spans for continuous instruments. This step confirms that the instrument and the calibration systems are operational, and the output data are checked to see if they are meeting defined tolerances or if the instrument is undergoing drift towards and unacceptable level. If the instrument or calibration system is displaying questionable performance, the Station Operator will troubleshoot the problem(s) immediately.

An example of a nightly Precision Check Report generated by AirVision is shown in Figure 10-1. This report shows the monitoring site name, the parameter (e.g., Ozone), the measured zero value, precision value, and span value, along with the difference (labeled as Error) and drift warning limits for each.

The data from the nightly zero/precision check/span checks are viewed by the Station Operator in graphic form to see the stability of the air quality monitor/calibration system. An example of the graphical report from a nightly zero/precision check/span check is shown in Figure 10-2.

If there is any indication that the instrument or calibration systems are not operating properly, the Station Operator will troubleshoot the problem(s) immediately to avoid the loss of data.

District Meteorologists look at and use the data collected in the air quality monitoring network for daily reporting and forecasting. This review looks at data on a site individual basis, as well as on a network basis. This extra set of eyes on the data is an important aspect of spotting data problems or issues before the problem becomes worse and could results in a loss of data.

The AirVision data are pasted into spreadsheets by the Meteorologists as part of their daily routines. The spreadsheets automatically provide graphic outputs showing individual parameters by site, and across the network. An example of the daily ozone data for the District's Alpine air monitoring site is shown in Figure 10-3. This graph shows the diurnal trends for ozone, $NO/NO_2/NO_x$, as well as the timing of the nightly zero/span checks (hours 0200 and 0300). The daily trends for ozone and $NO/NO_2/NO_x$ show expected values and trends, providing additional confidence that the instruments are operating properly. If data are suspect, the Meteorologists discuss the issue with the Station Operator, who will troubleshoot the instrumentation and solve the problem(s), further limiting the potential loss of data.

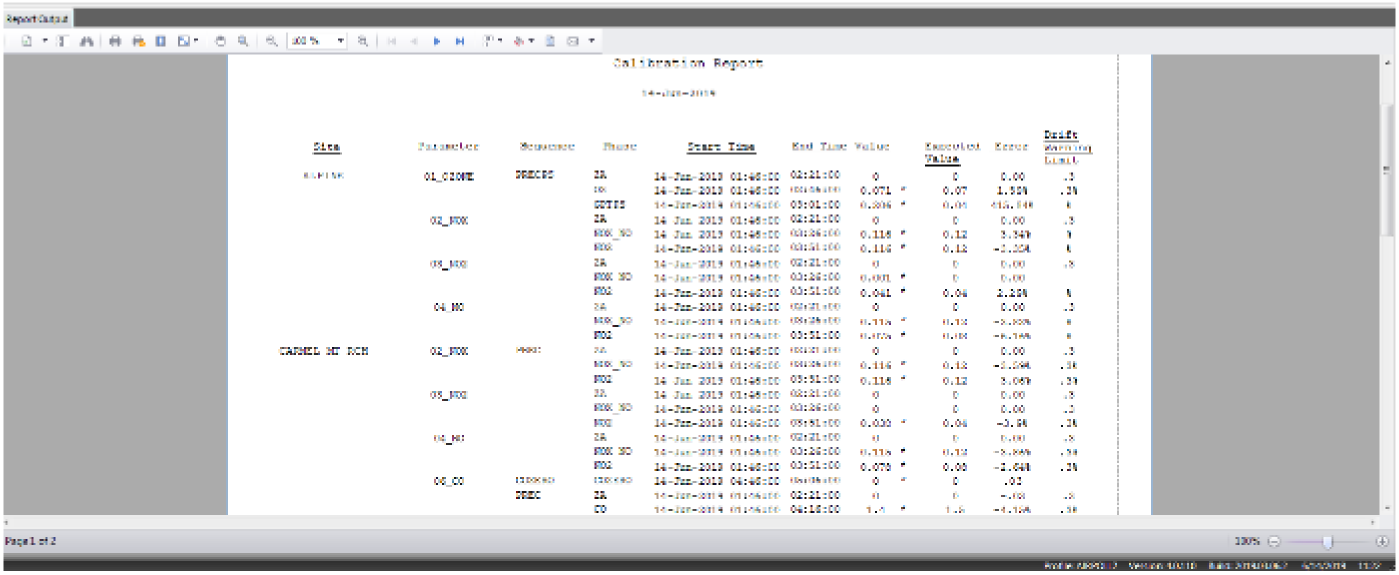

Figure 10-1: Example of a Nightly Precision Check Report Generated by AirVision

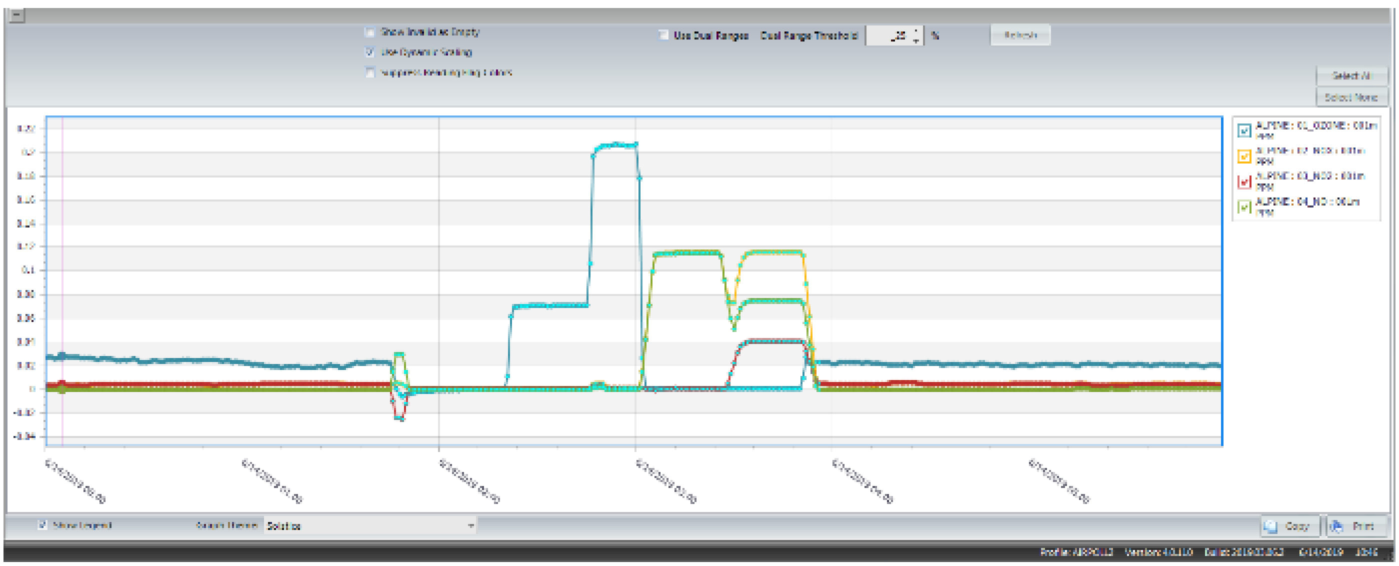

Figure 10-2: Example of a Nightly Zero/Precision Check/Span Check Report Generated by AirVision

The spreadsheets used by the District Meteorologists also sort the air pollutants by parameter so that the data can be compared across the entire network. An example of a diurnal plot of $PM_{2.5}$ concentrations for January 1, 2018, is shown in Figure 10-4. Higher $PM_{2.5}$ concentrations are expected during winter months due to greater atmospheric stability. We can also expect high $PM_{2.5}$ concentrations to be measured on New Year's Day due to individuals staying up till midnight and burning wood in their fireplaces, which then smolder into the early morning hours. The resulting $PM_{2.5}$ concentrations confirm this occurrence, providing additional confidence that the instruments are operating properly.

The work performed by the Station Operators and the Meteorologists can be considered as operational data checks, designed to quickly identify and correct problems to prevent or minimize data loss or invalidations.

Before the air monitoring data can be considered valid and reported to the EPA's AQS, all data most undergo more formal data validation procedures. The District routinely conducts Level I and Level II (II-plus) data validation procedures on all air monitoring data. These data validation procedures are detailed below in Sections 10.2.2 and 10.2.3.

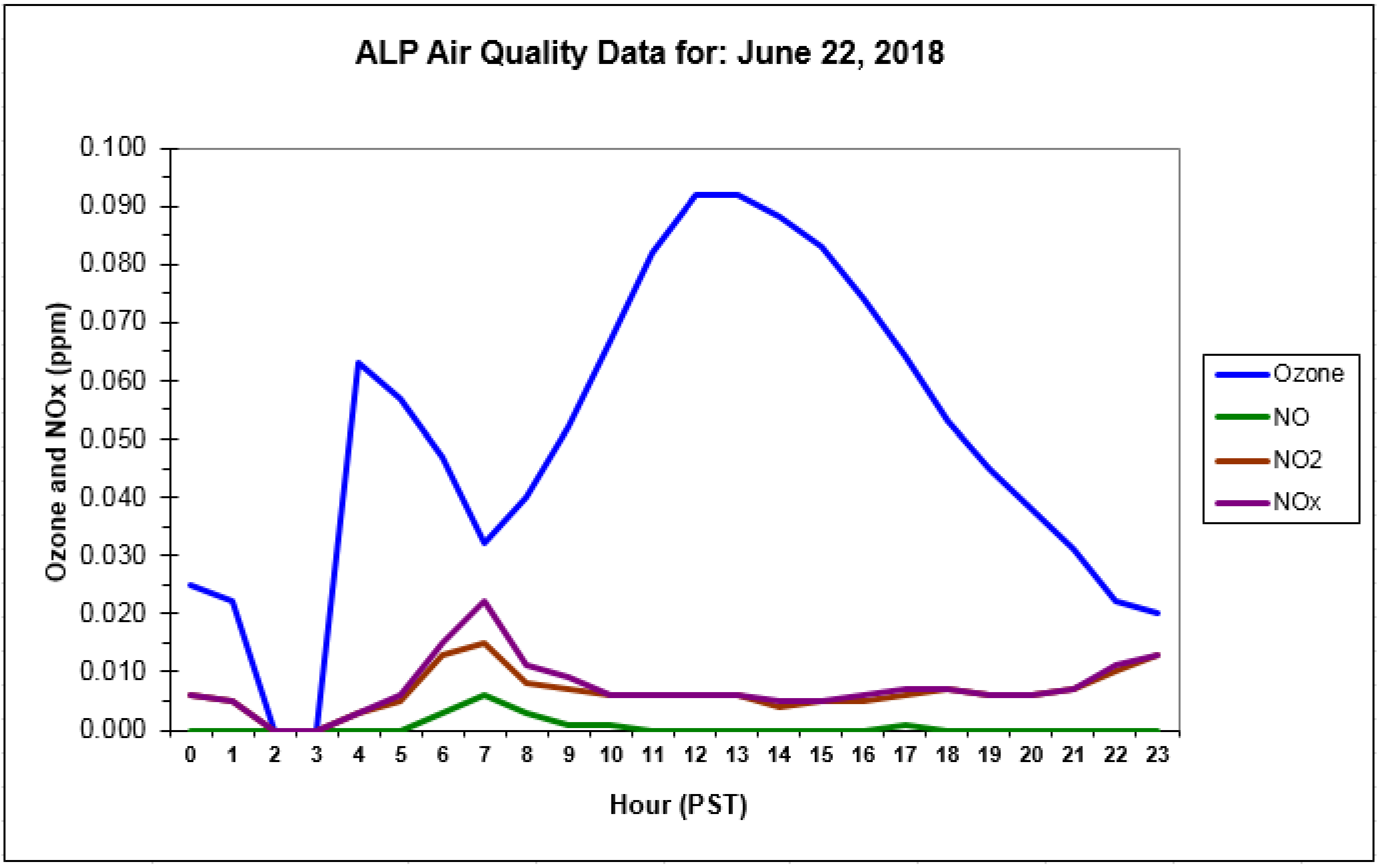

Figure 10-3: Example of a Graph of Ozone and NO/NO2/NOx from the Alpine Air Monitoring Station for June 22, 2018

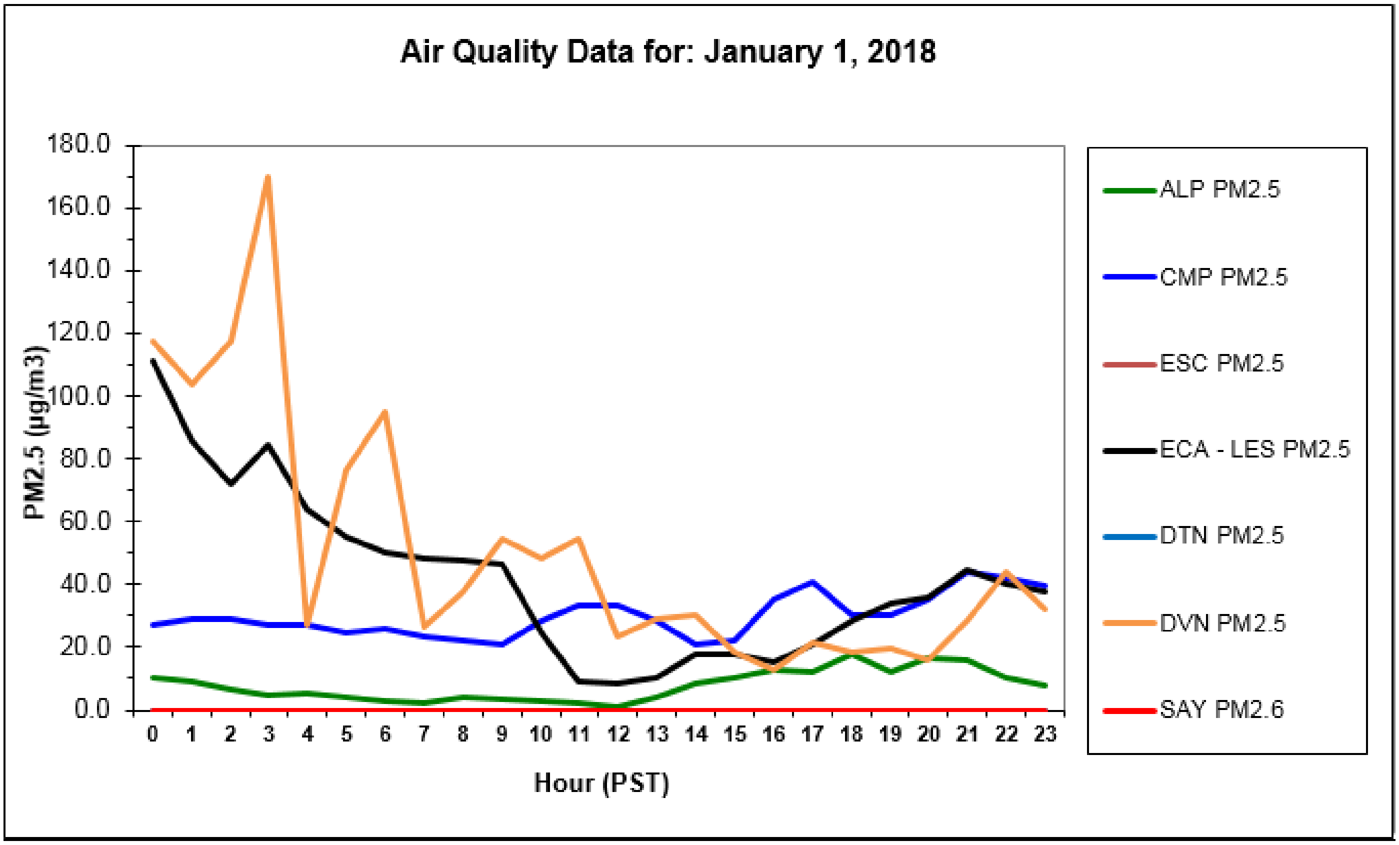

Figure 10-4: Example of a Graph of PM2.5 for the Air Quality Network for January 1, 2018

10.2.2 Level I Data Validation of Field Data

Level I data validation is the first step involved with formally reviewing the data for determining its accuracy and validity. Level I data validation is performed by a District Chemist, who reviews all site/instrument notes provided by the Station Operator, as well as all the QA/QC documentation collected during the month (Level I data validation is performed in monthly batches, although operational data validation activities are performed throughout the month (as noted above in 10.2.1)), CoC documents, etc.

The District Chemist performing the Level I data validation also uses screening tools and graphic programs in AirVision to look for odd or suspicious data. When data are identified by these screening tools, the Chemist will pull up minutes data to see if the problem is due to large positive or negative spikes caused by electrical surges or the introduction of span gases or zero air that are not properly flagged in the datalogger. In such cases, if a few minutes of data can be removed from averaging and 45 minutes or more of valid data remain, the hourly average can be re-calculated and edited in the database. Otherwise the hourly data point will need to be invalidated (and properly coded to explain the invalidation) or qualified (i.e., qualification code can be added to the data record). When the Chemist recommends that the data be qualified or invalidated, this recommendation is sent in an Air Quality Data Action (AQDA) Request to the Senior Chemist for review/concurrence.

When all Level I data review steps and documentation have been completed, the monthly data packet (includes Station Operator notes, QA/QC documentation, data investigation and resolution documentation, and all AQDA's to the Data Management Specialist for database editing.

Once the database editing has been performed following the instructions/documentation from the Level I data validation process, the data are ready for Level II data validation. The Data Management Specialist creates an AQS data formatted file, and this file is forwarded along with the monthly data packet (documentation) to the Level II data validation reviewer. Level II data validation procedures are described in Section 10.2.3.

10.2.3 Level II Data Validation of Field Data

The Level II data validation is performed by a staff member who is a data analysis expert but who is not immediately involved in the data monitoring, QA/QC, or Level I data validation process. Level II data validation begins with running the AQS file through additional screening programs that compare for outliers, blank or missing data, inter-parameter comparisons for dependent variables (e.g., $NO/NO_2/NO_x$ must all be present and valid for the same hour), and that create data summaries for easy comparison of data between sites.

The AQS data files are also used to create graphical data outputs that allow the reviewer to quickly and easily see data patterns for each site and across the network. A printout of each parameter for each site in the network is annotated to document the data checks and concurrence.

The Level II data validation process can require additional data checks of minutes data or comparison to other variables (e.g., large spikes of NOx should be accompanied by a corresponding decrease in ozone). If additional data validations or qualifications are required, these are documented on the printouts, which are returned to the Data Management Specialist for final edits. Once the have undergone final edits, an updated set of AQS-formatted files are generated through AirVision and are then uploaded to the EPA's AQS computer.

The same level of data validation will be performed on all continuous data collected for the AB 617 program in the Portside Communities. All District designed QA/QC reports and daily operations reports have been reviewed by the EPA (2017 TSA) and CARB (2018 NPAP audits) and have been approved.

10.2.4 Data Validation of Laboratory Data

- Laboratory (Toxics-VOCs, Elemental Carbon, Toxics-Metals)
  The District is in the process of purchasing a Laboratory Information Management System (LIMS). We are working towards purchase and implementation for mid-2020 to late 2020.

  ✓ All laboratory data will be recorded in a cloud-based LIMS once it is implemented. Until there is a fully functional LIMS system, all laboratory data will be stored on: the chemist's computer share drive (it is backed-up nightly).
    - Once we receive the raw data from the non-District laboratory, the raw data will be uploaded to the program chemist's computer share drive (eventually the LIMS).
    - Chain-of-Custody (CoC) sheets will be stored in a binder and subjected to the same records retention policy as the electronic laboratory data.

  ✓ All laboratory data will be reviewed like the field data.
    - Level I
      The initial review of the laboratory data by the contractor will be in accordance with the EPA QA/QC requirements set forth in the EPA methodologies and/or guidance documents identified in this document, e.g., Toxics-VOCs NATTS TAD. The contractor will not nullify nor qualify data. Any issues will be noted in the report sent to the AB 617 chemist for review.

- Level II data review.
  This entails reviewing data, the associated logbooks, CoC, and other site information (e.g., for elevated data – is there similar elevated data at nearby locations? If the reviewer recommends data be qualified or nullified, this recommendation is sent in an AQDA to the Senior Chemist for review.
- Level III data review.
  This level has two tracks:
  - Reviewing the AQDAs and validating or invalidating, accordingly.
  - Reviewing data in monthly batches for trends and noting outliers. This too entails reviewing data, the associated logbooks, and other site information (e.g., for elevated data – is there similar elevated data at the nearby locations? If it warrants, data is nullified or qualified by the Senior Chemist.

10.3 Accounting for Data Errors

As described in the data review procedures in 10.2, AQDAs will be the main tool used to account and document for errors in the field, laboratory, or other. The AQDAs will be maintained in the data record and made available for review by interested parties.

Monitoring Plan Element 11: WORK PLAN FOR CONDUCTING FIELD MEASUREMENTS

The District has several ambient air monitoring stations located throughout the county. The District follows EPA methodologies, as well as District procedures to operate these stations. The CARB audits the District annually to ascertain if these practices are being followed at our monitoring locations. The EPA likewise audits the District every three years at select monitoring locations and the laboratory to ensure that the District is following documented methodologies.

All field work for the AB 617 project will be conducted by trained District personnel. District personnel will follow established EPA protocols and District SOPs, such as completing equipment logbooks, calibrating equipment, etc., for the equipment where the District already has established calibration, audit, and field operations SOPs.

> Note: the field equipment proposed to be used at the AB 617 sites are new to the District (Met One E-SEQ-FRM for Metals sampling, Met One BC-1060 for real-time black carbon analysis, and the Xonteck 911 for VOCs sampling), therefore there are no current District SOPs. Furthermore, the District could not locate any EPA nor CARB guidance documents for the proposed equipment. In absence of these documents, at a minimum, the District will follow manufacturer recommendations until such time the SOPs can be written and formally approved. The only proposed equipment that the District has previously operated is the SuperSASS.

All District field operations personnel are trained on shipping procedures. District field staff already ship Summa™ canisters, filters, etc., to EPA, CARB, other Districts, and contract laboratories. The staff who perform the AB 617 work will follow routine District procedures. For example, all site visits must be entered into the site logbook (eventually electronic logbook). All field activities are entered into the logbook immediately. The chain-of-command/communication will be the same as for other District field activities. Field technicians report to the Supervising Electronic Technician and chemists report to a Senior Chemist. All work will be viewable by electronic logbook and the respective supervisors will review this work and approve it electronically.

11.1 Field Procedures and Materials Utilized for Conducting Air Monitoring

The proposed sampling and data review schedules for various parameters are shown in Table 11-1.

Table 11-1: Summary of the Timelines for Field Functions

	Sampling Frequency	Review Field Data	Calibration	Audit	Bias	Flow Checks	All Parameter Checks
VOCs	1:6	1:6	Yearly	Every 6 Months	25% per year	Every run	Monthly
Metals	1:6	1:6	Bi-annually	Bi-annually	n/a	Every run	Monthly
Elemental C	1:6	1:6	Bi-annually	Bi-annually	n/a	Every run	Monthly
Black C	Continuous	Daily*	Bi-annually	Bi-annually	n/a	Bi-weekly	Bi-weekly

*Not weekends or holidays; n/a= not applicable

11.2 Field Communication and Coordination

Timelines for staff and contractor meetings/teleconferences are provided in Table 11-2. The District will create and maintain a contact tree for the AB 617 project. This list will be maintained at the District and may be made available to authorized individuals/organizations.

Table 11-2: Summary of the Timelines of Staff and Contractor Meetings/Teleconferences

	Field Issues (All)	Lab Issues (Chemists)	Operations (Techs)
VOCs	Weekly	As needed	Twice a week
Metals	Weekly	As needed	Twice a week
Elemental C	Weekly	As needed	Twice a week
Black C	Weekly	n/a	Twice a week

n/a= not applicable

11.3 Timeline Denoting Air Monitoring Duration, Frequency, and Milestones

Timelines for reporting laboratory data and trends analyses are provided in Table 11-3.

Table 11-3: Summary of the Timelines for Reporting the Laboratory Data with Trends Analysis

	Receive Data	Review Lab Data	Post Lab Data	Discuss with Public	Report Lab Data to CARB
VOCs	Weekly	Quarterly	**Quarterly	**Quarterly	Bi-annually
Metals	Quarterly	Quarterly	**Quarterly	**Quarterly	Bi-annually
Elemental C	Quarterly	Quarterly	**Quarterly	**Quarterly	Bi-annually
Black C	Continuous	*Quarterly	**Quarterly	**Quarterly	Bi-annually

*BC data will be posted on our website continuously. Officially vetted data will be submitted quarterly.
**90 days after the conclusion of a quarter.

Monitoring Plan Element 12: PROCESS FOR EVALUATION OF PROGRAM EFFECTIVENESS

The goals of the air monitoring program are to document the air pollution levels in the Portside Communities and to document the effectiveness of emissions reduction strategies over time. This Element outlines the process for evaluating the effectiveness of the air monitoring program. Details for evaluating the effectiveness of the program are detailed in the following subsections.

12.1 Evaluation Process Used to Ensure that Air Monitoring Objectives Are Being Met

To establish a baseline, track trends, and measure the effects of emissions reduction actions, the air monitoring in the Portside Communities will be a multi-year endeavor. As stated in the NATTS and Chemical Speciation technical guidance documents, 5-years is the minimum duration, based on a 1:6 sampling frequency, to establish a high degree of confidence in the data for trends analyses. The District projects a minimum of 5-years to establish robust and reliable trends data for this program.

A list of monitoring project timelines is provided below:

- Establish monitoring by July 2019
- After 1-year, evaluate and compare the data collected at monitoring sites:
  - ✓ To other Portside sites.
  - ✓ To non-Portside sites, but still in the County.
  - ✓ To health standards, when applicable.
  - ✓ To traffic counts
  - ✓ Are there any reductions?
  - ✓ Is there a need for more coverage?
  - ✓ Is there a need for more parameters to be included?
- After 3-years, evaluate the continued viability of Portside sampling locations for:
  - ✓ Redundancy (can some sites be relocated)
  - ✓ Should a general area have more coverage, or less?
  - ✓ Should there be an expansion of the pollutant parameters?
  - ✓ Is there a reduction in concentrations and/or truck counts?

12.2 Description of how Issues will be Documented and Addressed

Air sampling issues that are left unresolved lead to suspect data at best and erroneous data at worst. It is the District's practice to not leave unresolved issues in the field. If monitoring equipment is near failing a QA check, it is immediately calibrated before the equipment fails and data is lost. The minimum frequency at which equipment must undergo QC and QA checks is shown in Table 12-1. In practice, this frequency is on a per run day/weekly cycle (i.e., station operators pay close attention to the monitoring equipment for issues that can affect the sampling data quality).

Table 12-1: Data Completeness Checks and Quality Control and Quality Assurance Functions

	Data Completeness	QC Issues	QA Issues
VOCs	Quarterly	Quarterly	Quarterly
Metals	Quarterly	Quarterly	Quarterly
Elemental C	Quarterly	Quarterly	Quarterly
Black C	Quarterly	Quarterly	Quarterly

n/a= not applicable

Any issues identified in these meetings will be investigated, a solution provided, and if data is affected, an AQDA is distributed.

12.3 Air Monitoring Decision Points

- As stated earlier, after 5-years, the sites will be evaluated for:
  - ✓ The same criteria as in the 3-year evaluation step above.
  - ✓ Are reductions permanent?
  - ✓ Can monitoring be decommissioned?
    - ➢ If not, how much longer are they to remain operational?
    - ➢ Are some sites to remain operational; if so, which ones and why?
      - o If not, in what order are the sites decommissioned?
    - ➢ If so, how can we ensure that emissions and truck counts don’t ramp up after decommissioning?
- After 6-years, if sites are still operational, they will be evaluated annually for
  - ✓ The same criteria as in the steps above.

Monitoring Plan Element 13: DATA ANALYSIS AND INTERPRETATION

Once data have been collected and validated, it is ready for analysis and interpretation. The large volumes of data that will be collected for this program will require many levels of analysis. It will also require data interpretation and presentation in ways that can be understood by a non-technical audience. This will necessitate, as a start, the use of summary statistics and graphical presentations.

13.1 Data Preparation Procedures

All validated data collected for this air monitoring program will be converted into the EPA's AQS format. An example of AQS-formatted data is shown in Figure 13-1. The AQS data format is an efficient way to store and share data. Data codes imbedded in the format are used to document information about the site, the parameter, the sample duration, the data units, the method used to collect the data, the date, the start time, the sample value, null code (if applicable), and various qualifier codes and limits.

```
# RD|Action Code|State Code|County Code|Site ID|Parameter|POC|Sample Duration|Unit|Method|Date|Start Time|Sample Value|Null Data Code|Sampling Frequency|Monitor Protocol (MP) ID|Qualifier - 1|Qualifier - 2|Qualifier - 3|Qualifier - 4|Qualifier - 5|Qualifier - 6|Qualifier - 7|Qualifier - 8|Qualifier - 9|Qualifier - 10|Alternate Method Detectable Limit|Uncertainty
RD|I|06|073|0001|42153|5|7|008|171|20020701|00:00|1.5||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20020713|00:00|1.4||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20020725|00:00|1.4||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20020806|00:00|1.7||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20020818|00:00|1.6||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20020830|00:00|1.6||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20020911|00:00|1.5||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20020923|00:00|1.4||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20021005|00:00|1.3||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20021017|00:00|1.1||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20021029|00:00|1||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20021110|00:00|1.2||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20021122|00:00|1||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20021204|00:00|1||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20021216|00:00|1.1||7||||||||||||.1|
RD|I|06|073|0001|42153|5|7|008|171|20021228|00:00|1||7||||||||||||.1|
```

Figure 13-1: Example of AQS Formatted Data

The District has in-house tools that convert AQS-formatted data into file formats that are ingested into Microsoft Access, Microsoft Excel, SYSTAT statistical software (Version 13), and other applications for further analysis and data displays. The District adds the day of week, the quarter of the calendar year, and Julian date to its data files as additional data columns. This information is useful during the analysis phase. The District can further run programs that merge all the AQS codes into Excel data files for use by outside parties who are not familiar with AQS-formatted data and associated codes.

13.2 Data Analysis to Support Air Monitoring

The air monitoring in the Portside Communities is being conducted to document the air pollutant levels in the community. The goal will be to develop emission reduction strategies to decrease air pollution levels in the Portside Communities and throughout the county. The air monitoring data will be used to determine the major sources(s) of air pollutants in and around the community. Data analysis will be key to making these determinations.

The District already has numerous data analysis tools used to analyze the data from its air monitoring network. These tools will be used to analyze the data collected in the Portside Communities. The following types of analyses will be used to help determine the source(s) of air pollutants in the Portside Communities:

- Diurnal patterns
- Day of week
- Time of year/season/quarter

- Correlation with wind direction/wind speed (when applicable)

An example of an Excel chart showing formaldehyde data organized by the day of the week and sample collection start time for the District's El Cajon air monitoring station is shown in Figure 13-2. This plot shows that formaldehyde concentrations are higher during the middle of the week and during the middle part of the day. This is due to emissions from mobile sources.

An example of notched box plots of acetaldehyde data from the District's Chula Vista air monitoring station is shown in Figure 13-3. These types of plots are a convenient method for showing statistical information for large datasets (the notch indicates the median value, the box represents where 50% of the values fall above and below the median, and high and low values). In this case, the statistical data from 1996 through 2015 are organized by calendar quarter and show that measurements of acetaldehyde are higher during winter months (Q1 and Q4) when the atmosphere is more stable, and lowest in summer months (Q2 and Q3) when the atmosphere is less stable.

These existing programs will be used for the data collected under the AB 617 program. The District's data review tools for $PM_{2.5}$ manual and continuous, PM_{10} manual, PAMS and Toxics-VOCs, PAMS and Toxics-Carbonyls, and Toxics-Metals have all been reviewed by the EPA and are routinely used by District staff for data analysis of air monitoring data.

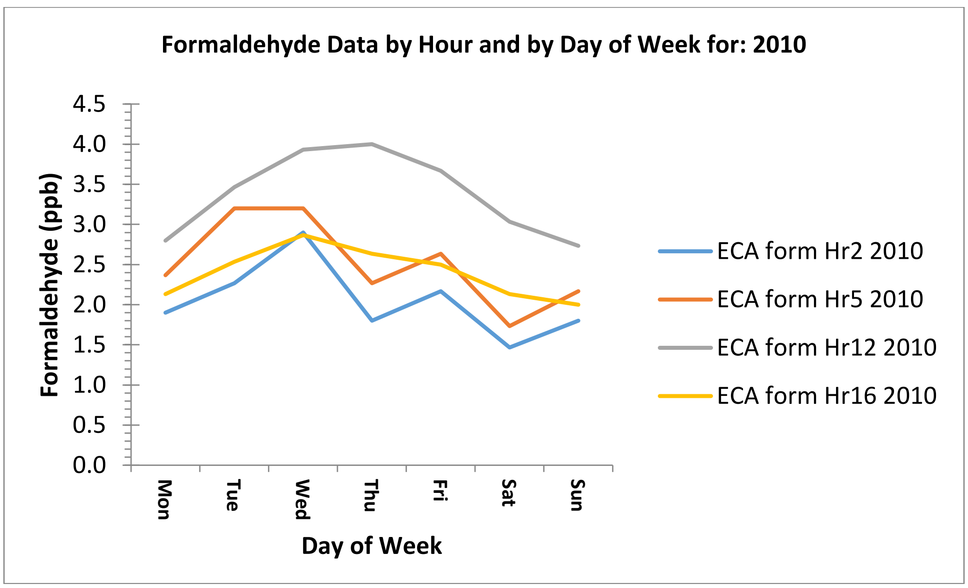

Figure 13-2: Example of Formaldehyde Data from El Cajon Station By Day of Week and Hour of the Day

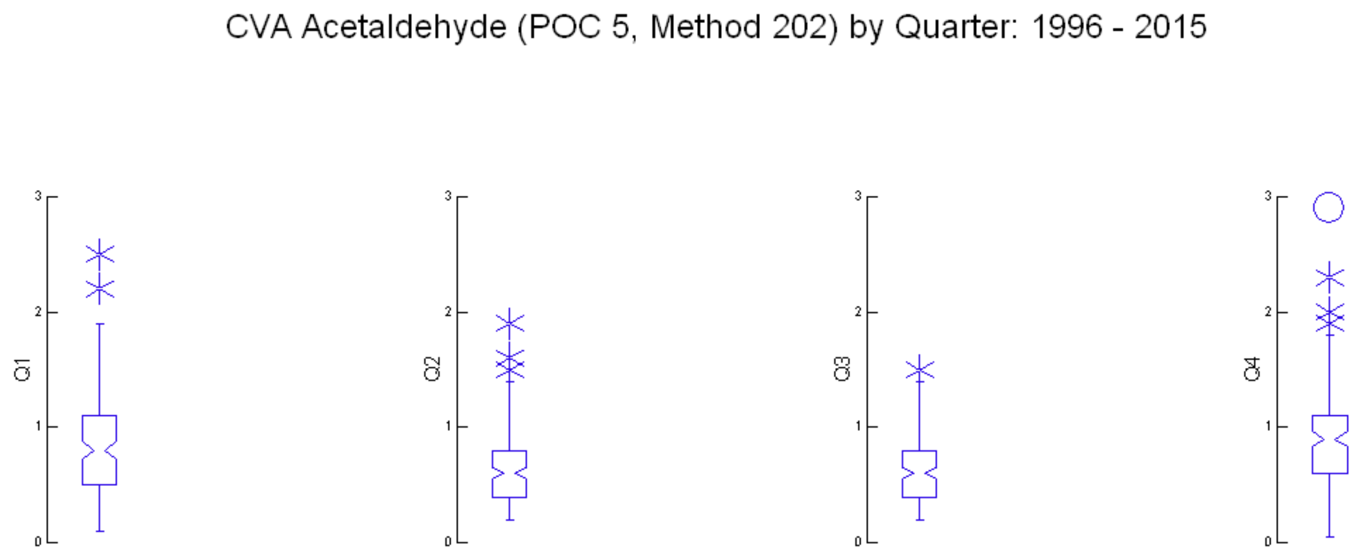

Figure 13-3: Example of Notched Box Plot of Acetaldehyde Data from Chula Vista Station

Monitoring Plan Element 14: COMMUNICATE RESULTS TO SUPPORT ACTION

The AB 617 air monitoring program in the Portside Communities is going to generate a large-volume of data. This will necessitate looking at summary statistics to interpret the data, especially when comparing data across the community. The District will not ignore peak values in the data analysis, but since these are included in the calculation of summary statistics, sites with higher measured concentrations will show higher summary statistics.

A major challenge to this air monitoring effort will be to communicate the results to the community, especially since many members of the community may not be familiar with air pollutant concentration data or statistical calculations. The District will make a concerted effort to communicate the results in terms that can be understood by the community. A key component to this effort will be to keep the community aware of the data collection process and to frequently update them on the preliminary results. Additional details on how the data will be communicated with the community are provided in the following subsections.

14.1 Information Sharing and Communication with Community

The District maintains a website that displays current information regarding air pollution. All ambient monitoring information has a dedicated link on the webpage. Similarly, AB 617 information has a dedicated link on the webpage. All real-time AB 617 monitoring information will have a dedicated link on the AB 617 page so the public can view the data.

The District will have quarterly community meetings to disseminate the monitoring data. Senior Monitoring staff will attend these meeting to explain and answer any questions regarding the air monitoring data.

14.2 How Results will be Delivered to Stakeholders

The District will communicate monitoring data and monitoring reports as follows:

- Raw, Black Carbon-continuous data in real-time will be available on the District website.
- Laboratory data and reports on the District website with a section devoted to AB 617 monitoring data (report to include the evaluation process from Element 12.1 of this document).
- Interpretation of the air monitoring data in English and Spanish.
- In quarterly community meetings.

As discussed in Element 12, the District plans to monitor the air in the Portside Communities for a minimum of five years. Assuming, all District criteria are met, as defined in Section 12, reports will be generated that include the following:

- Rationale for why monitoring was conducted in the Portside Communities.
- Summary of operational schedules for all sampling locations.
- An equipment inventory of equipment/air quality parameters at each location.
- Sampling frequency for the equipment at each location.
- Monitoring results for each location will be summarized by:
  - ✓ Diurnal patterns
  - ✓ Time-of-day patterns to traffic congestion (where and when possible)
  - ✓ Day-of-week
  - ✓ Time-of-year/season
  - ✓ Correlation with wind direction/wind speed

- ✓ Comparison of continuous BC to EC-manual integrated 24-hour samples
- Monitoring results from the entire Portside Communities network of sites will be evaluated for trends and pollutant concentration gradients across the network. This analysis will be used to document:
  - ✓ The relative impact from mobile versus stationary source pollutants in and around the Portside Communities
  - ✓ The cumulative impacts from emissions on air pollution concentrations in and around the Portside Communities
    - This will be used to determine if there are emission sources that are significantly impacting downwind areas with pollutants that could be reduced by additional emission control strategies
  - ✓ Air quality trends to document any reductions in measured air pollution concentrations that can be attributed to emission reduction measures undertaken in and around the Portside Communities over the course of the air monitoring program.

14.3 Information Provided on Webpages and Frequency of Updates

The District maintains webpages that make air monitoring data available to the public. Real-time (i.e., continuous (hourly) data that are preliminary (not validated)) monitoring data are available 24 hours per day, 365 days per year at:

http://airquality.sdapcd.org/air/data/web_report.htm

This page is updated hourly, roughly 10 minutes after the top of hour (Note: data are reported in Pacific Standard Time year-round.). These data are also sent to the CARB database on an hourly basis.

An archive of daily data reports going back multiple-years is also available on the District's website at:

http://jtimmer.cts.com/

Real-time, continuous data collected for the AB 617 air monitoring program will be included in these data files. These data will include the real-time black carbon and meteorological data.

Laboratory data will be posted to the District's website on a quarterly basis after the data have been analyzed at the laboratory and reviewed by District chemists.

CARB is also planning on developing a website which will be known as the AB 617 Community Air Quality Viewer (AQ-View). District data uploaded to CARB will also be available for viewing on this data portal. The CARB data portal will be designed to include real-time data collected from community-based low-cost sensors (there will be drop-down menus to display data of various types and reliability).

14.4 Report Generation and Schedules

Review of laboratory-based data takes longer to be made public due to laboratory procedures and cross-checks. The data from the EC-manual and Toxics-VOCs will be posted for public viewing in quarterly batches. For example, first quarter data will be reviewed for validity, as well as the trends analysis listed in Element 13; the results will be posted on the District's website at the end of the second quarter. A schedule of data reporting timelines for AB 617 data is provided in Table 14-1.

Table 14-1: Timelines for Reporting Laboratory Data

	Receive Data	**Review Lab Data**	**Post Lab Data**	**Discuss with Public**	**Report Lab Data to CARB**
VOCs	Weekly	Quarterly	**Quarterly	**Quarterly	Bi-annually
Metals	Quarterly	Quarterly	**Quarterly	**Quarterly	Bi-annually
Elemental C	Quarterly	Quarterly	**Quarterly	**Quarterly	Bi-annually
Black C	Continuous	*Quarterly	**Quarterly	**Quarterly	Bi-annually

*BC data will be posted on our website continuously. Officially vetted data will be reported quarterly.
**90 days after the conclusion of a quarter.