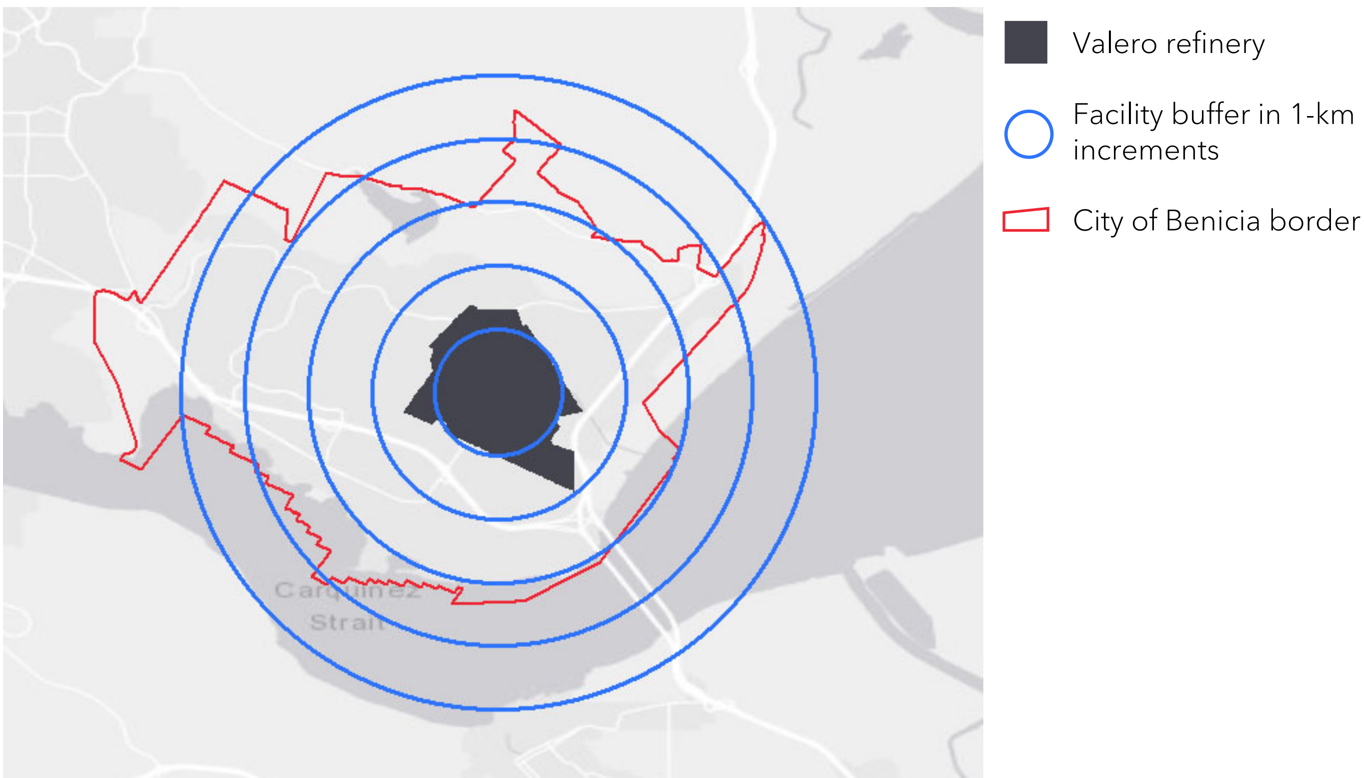
Appendix B – Site Analysis for the Valero Refinery Community Air Monitoring Station

Study Area

As discussed in Section 2.2, a neighborhood-scale monitoring station located within a few kilometers of the refinery is most appropriate given the objectives of the Major Stationary Source Community Air Monitoring Program.

In Figure B-1 below, the property line of the Valero refinery is shown in gray with concentric buffers around the center of the property in 1 km increments. Portions of the buffers intersect unincorporated (and uninhabited) areas of Solano County, the Carquinez Strait, and a small piece of Contra Costa County. However, the majority of the buffers intersect the City of Benicia, which is outlined in red. Given this, the Air District's search for potential monitoring sites is limited to the Benicia city limits.

Figure B-1 – Location of the Valero Refinery



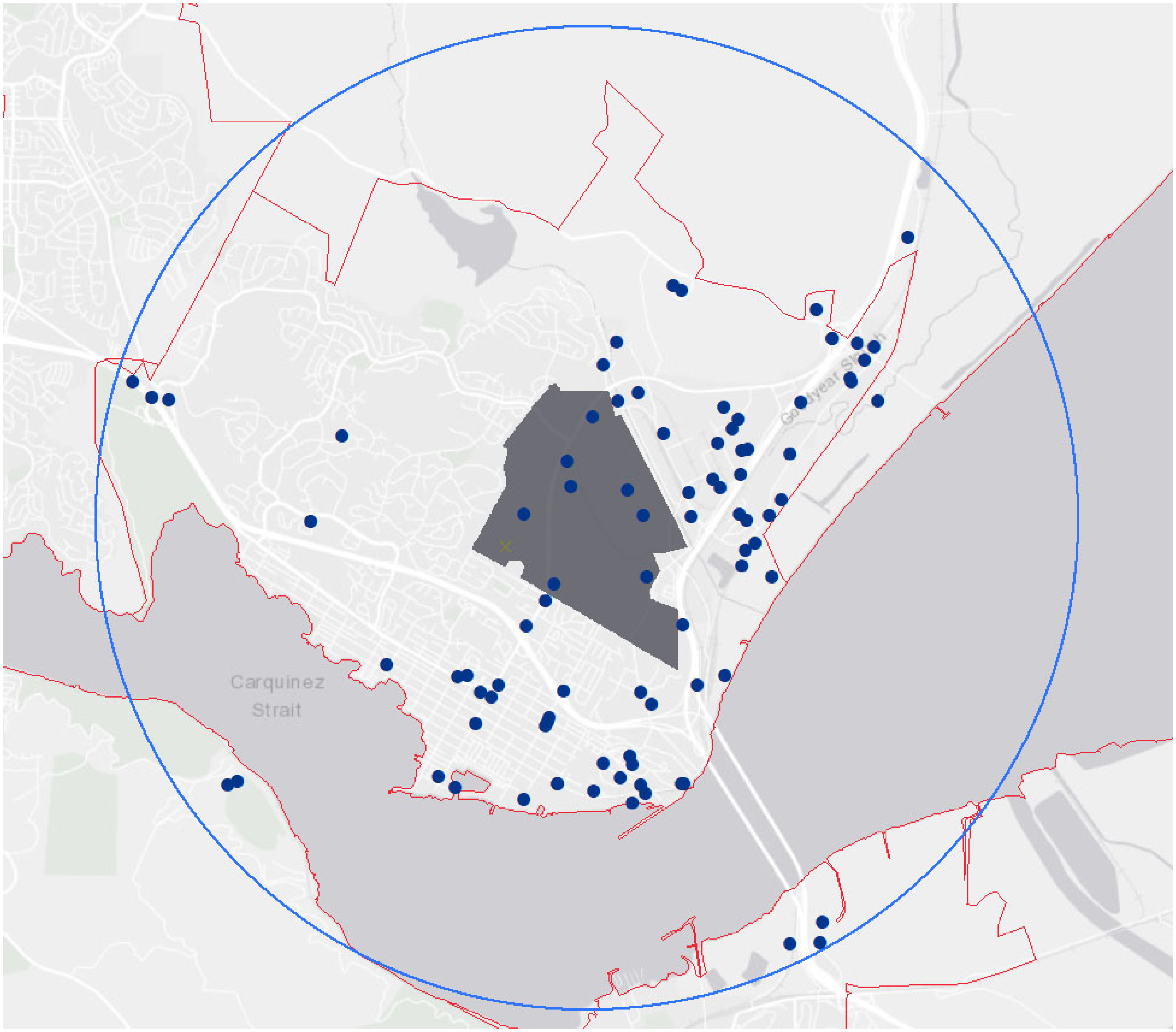
Population Centers

With approximately 28,000 residents (City of Benicia, 2019), The City of Benicia, California is located in southern Solano County on the north side of the Carquinez Strait. A zoning map from the City of Benicia Planning Division (2012) shows that the western and southern sections of the city are largely residential and/or commercial, while the eastern section is largely industrial.

Local Emissions Sources

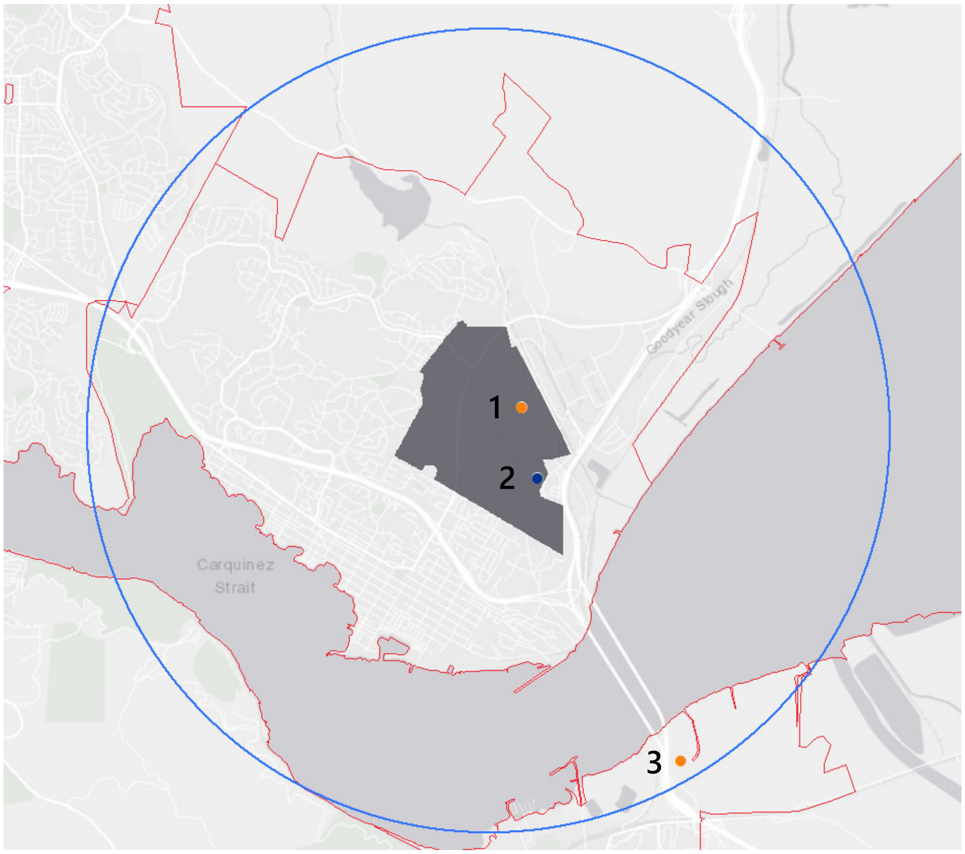
According to the Air District's database of regulated facilities, there are 89 permitted sources in Benicia (Figure B-2). However, the emissions from most of these facilities are relatively low.

Figure B-2 – Permitted Facilities Near the Valero Refinery



Located in the eastern part of the City, the Valero refinery is Benicia's largest stationary source of air pollution. As noted above, emissions from most of the permitted facilities in the Benicia area are relatively low. Aside from the refinery, sources with more than 20 tons per year of emissions of a single pollutant include the Valero Benicia Asphalt Plant and Eco Services Operations Corp. This subset of facilities is shown in Figure B-3, and their emissions are summarized in Table B-1. The Martinez Refining Company and Marathon refineries are also located just across the Carquinez Strait from Benicia (see Appendix D for the site analysis for those facilities). In addition to these stationary sources, other notable sources of pollution include Interstates 680 and 780, which pass through Benicia, as well as vessels associated with the Suisun Bay Reserve Fleet.

Figure B-3 – Specific Sources of Air Pollution in and Around Benicia, CA



1 – Valero Refining Company[1]
2 – Valero Benicia Asphalt Plant
3 – Eco Services Operations Corp[1]

Notes: (1) Valero Refining Company and Eco Services Operations Corp have paid fees for Major Stationary Source Community Air Monitoring under Regulation 3, Schedule X

Table B-1 – Annual Emissions from Selected Sources Near the Valero Refinery

Facility (CEIDARS ID)	Annual Emissions (tons/year)[1]					
	CO	NOx	PM_{10}	$PM_{2.5}$	ROG	SOx
Valero Refining Co (12626)	423	955	174	174	413	47
Eco Services Operations Corp (22789)	4.4	17.4	9.3	6	1	173
Valero Benicia Asphalt Plant (13193)	20.7	11.9	1.9	1.8	6.7	0.2

Notes: (1) Criteria pollutant emissions are for the 2019 reporting year

Wind Climatology and Topography

The movement of air has a significant effect on the fate and concentration of pollutants in the atmosphere. When identifying potential locations for an air monitoring station, it is necessary to consider historical wind patterns in the area. It is also necessary to consider topographical features in the area as they also influence local circulation patterns. In this case, the Air District performed a multi-year (2013 – 2017) analysis of wind data from three nearby meteorological stations. Two of those stations are operated by the Valero refinery and the third is a National Oceanic and Atmospheric Administration (NOAA) station on the Martinez-Amorco Pier, located just across the Carquinez Strait from Benicia.

Typical year-round wind patterns are summarized by the wind roses in Figure B-4. A wind rose shows the general wind direction and speed for a particular sampling period. The circular structure of the wind rose shows the direction the winds blew from, and the length of each "spoke" around the circle shows how often the wind blew from that direction. The different colors of each spoke provide details on the wind speed.

As shown in Figure B-4, winds at all three stations are predominantly from the northwest, west, and southwest, with occasional periods of easterly or northeasterly winds. Some local variation in the wind patterns is caused as air flow is channeled through the Carquinez Strait. The Martinez-Amorco Pier, for example, shows somewhat stronger winds overall (less frictional drag over water) and it shows a more northerly than easterly component, roughly following the geography of the Carquinez Strait.

In general, the dominant westerly component is due to persistent onshore flow (from ocean to land) for most of the year. This is especially true in spring (Figure B-5a) and summer (Figure B-5b) when onshore flow is typically maximized. Thus, for most of the time, emissions from the industrial eastern side of Benicia are blown out into the Carquinez Strait, and away from the residential western and southern portions of the city. Exceptions to this pattern are most likely to occur in the fall (Figure B-6a) and especially in the winter (Figure B-6b) when there is a more frequent offshore wind pattern. It is during these periods that residential sections of Benicia (particularly in the southwest portion of the city) may be downwind of emissions from the facility.

Observed winds were light (under 2.5 m/s) about 15% of the time at the two Valero-operated stations (varying from 6,000 to 8,000 hours over the five-year period depending on the monitor in question). Calm or light winds from variable directions can limit dispersion and allow pollutants to build-up in the local area. Light winds are more common in the cool season and during the overnight hours but can occur at any time of day or year.

Figure B-4 – Year-round Prevailing Winds at Nearby Meteorological Stations

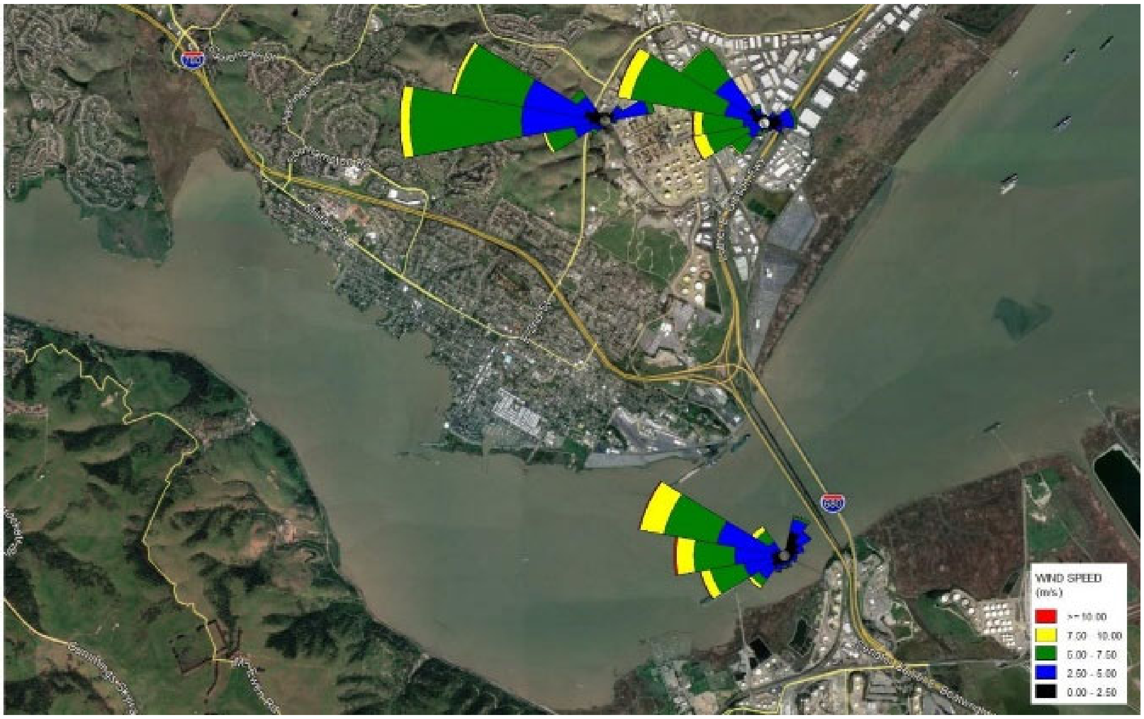


Figure B-5 – Prevailing Winds in Spring and Summer

(a) March-April-May

(b) June-July-August

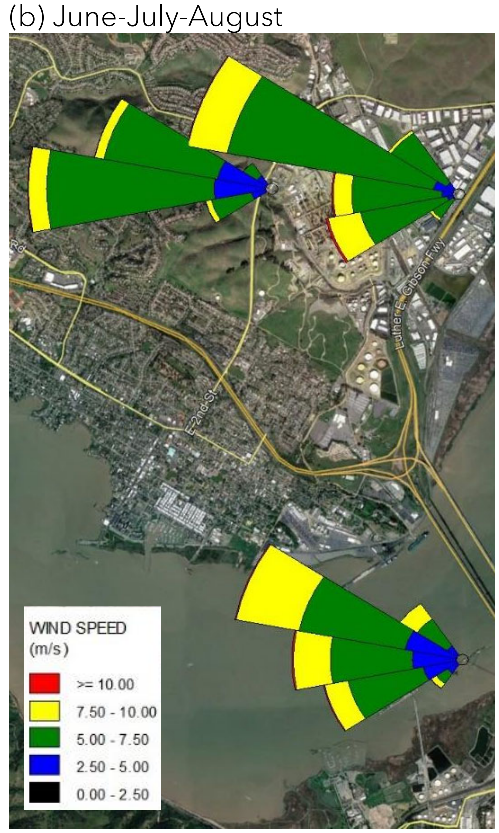
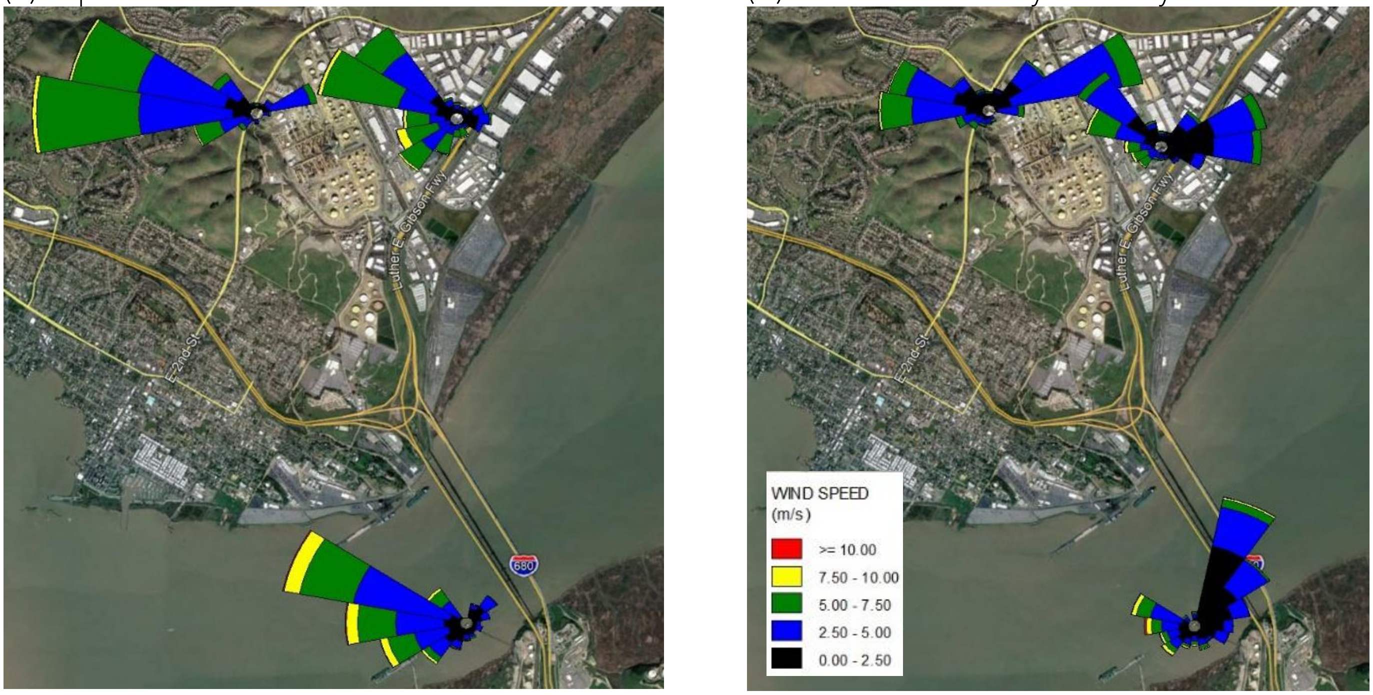


Figure B-6 – Prevailing Winds in Fall and Winter

(a) September-October-November (b) December-January-February



While some wind patterns are driven by global or regional phenomena, topography can drive additional circulation at the local level, which may impact the dispersion and transport of pollution; the nature and degree of this impact depends on the specific arrangement of physical features in the area.

As shown in the shaded relief map in Figure B-7, the most prominent topographic feature in the area is a ridge that runs diagonally through the city in a southeast to northwest direction. The contour map in Figure B-8 shows a 50-foot contour line near the shore where the Benicia-Martinez Bridge connects to the city. From there the elevation increases in a northwest direction to a maximum elevation of around 500 feet.

When the wind blows from the northeast as depicted in Figure B-6b, the hill will generally cause lower level winds to be squeezed over the top and around the southern side where the elevation is lower. In this case, winds are likely to be accelerated on the upwind side of the hill, and on the leeward side they are likely to be slower and more turbulent. That turbulence is likely to result in better mixing and dispersion of emissions from the facility. In addition, on hill tops and other exposed areas, moderate winds will typically promote further dispersion. In contrast, in lower lying areas where it is harder for the wind to penetrate, the air may not circulate as freely and pollutant concentrations may be higher.

For all of these reasons, we may expect typical pollutant concentrations to be higher in the southwest quadrant of the city compared to the northwest quadrant where the elevation is higher and the land is more exposed. As a result, topographic considerations would favor placing the community monitor in the southwestern portion of the city, as indicated in Figure B-9.

Figure B-7 – Topography Around the Valero Refinery

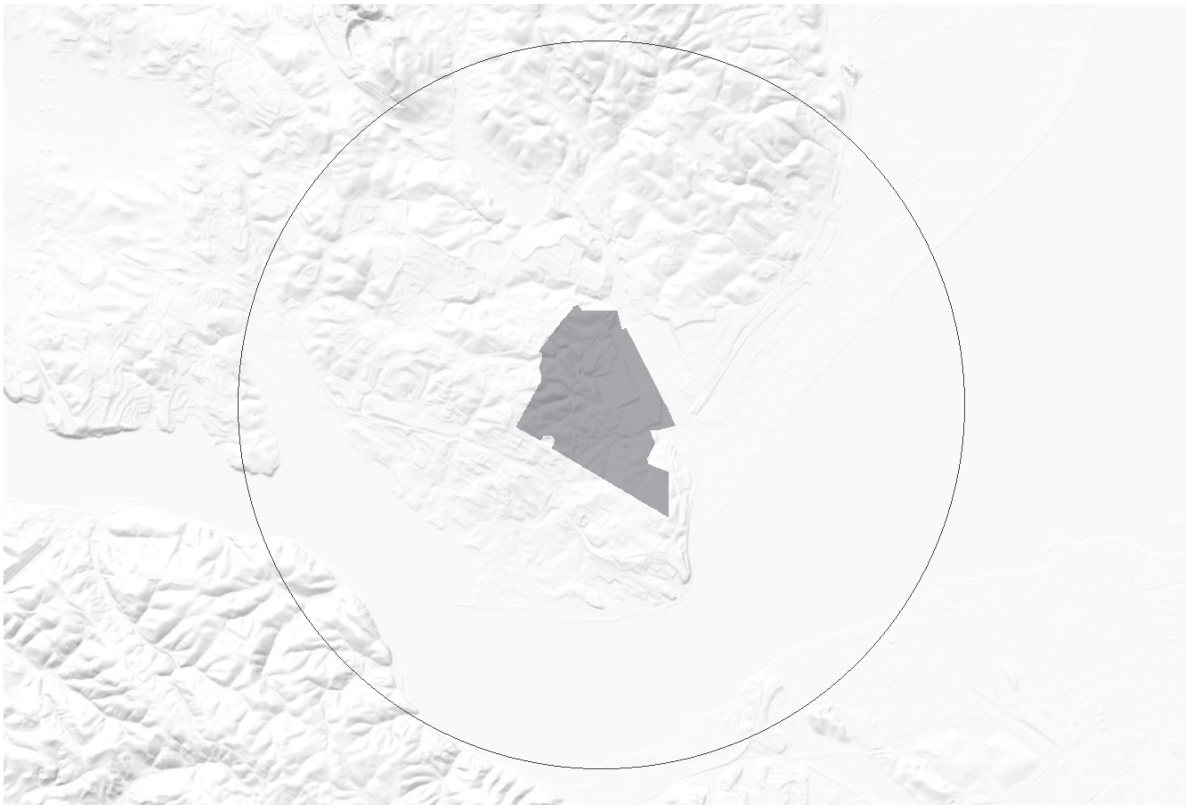
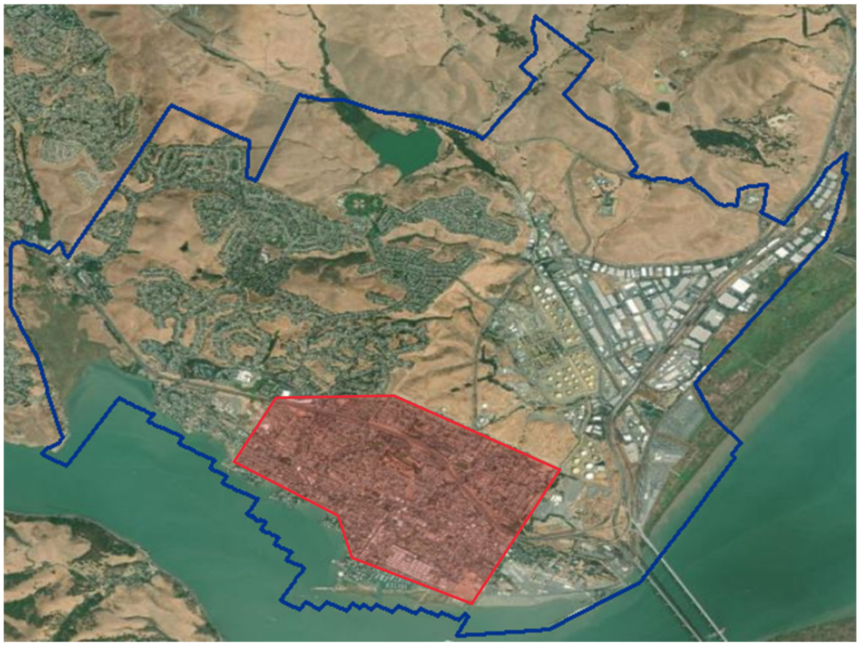


Figure B-8 – Elevations Around the Valero Refinery

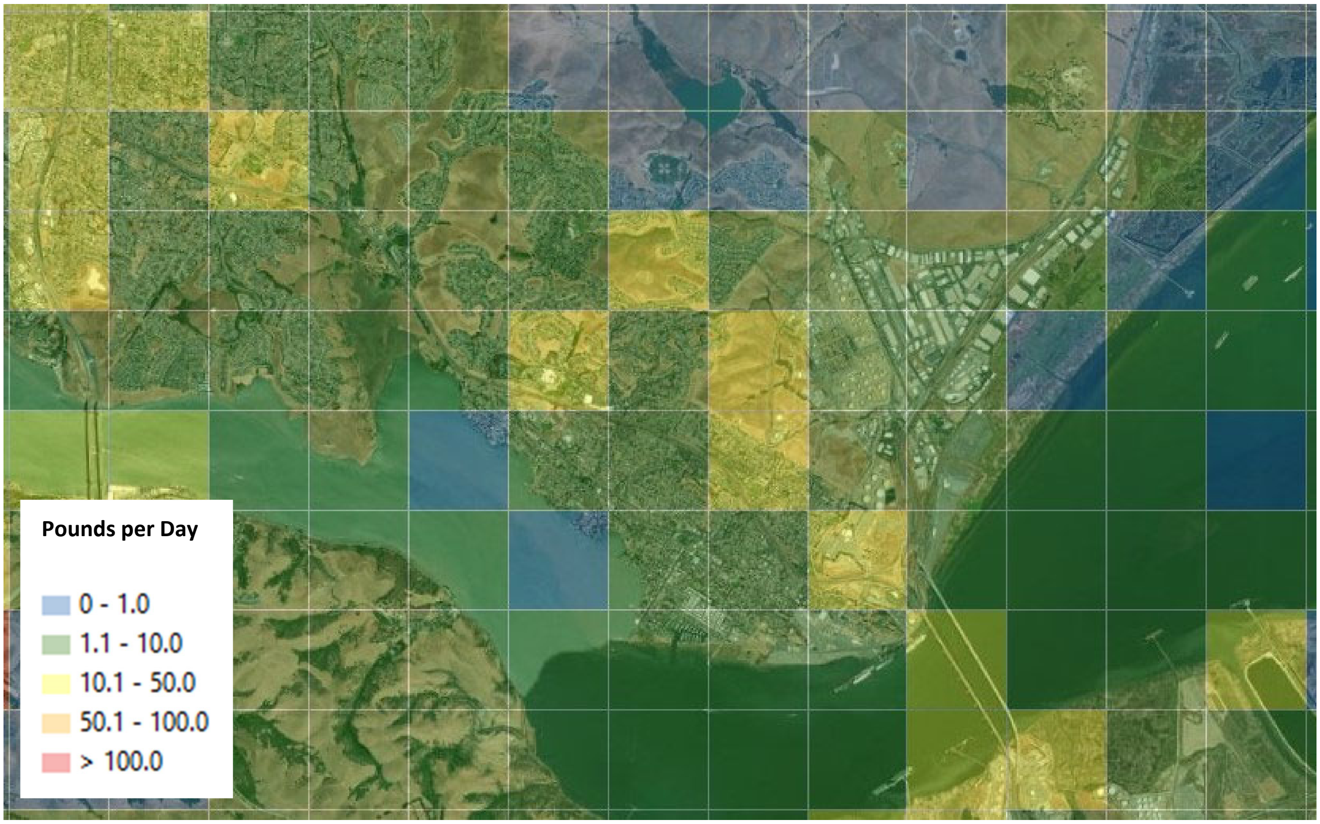
Figure B-9 – Suggested Area for Monitoring Station Based on Wind Climatology, Topography, and Land Use



Health Risk Data, Sensitive Populations, and Environmental Justice Considerations

In an analysis for the Air District's Community Air Risk Evaluation (CARE) project, estimated emissions of certain toxic air contaminants (TACs) from permitted stationary sources, on-road mobile sources, and distributed area sources in 2015 were allocated to a grid of cells with a spatial resolution of 1-km for use in cancer-risk modeling. This modeling effort found that five compounds (diesel PM, acetaldehyde, benzene, 1,3-butadiene, and formaldehyde) were responsible for more than 90% of the cancer risk attributed to emissions. The estimated combined TAC emissions of these compounds for the area near the Valero refinery are shown in Figure B-10. The greatest estimated emissions of TACs in the area lie south and west of the refinery and generally follow the Interstate 780 corridor.

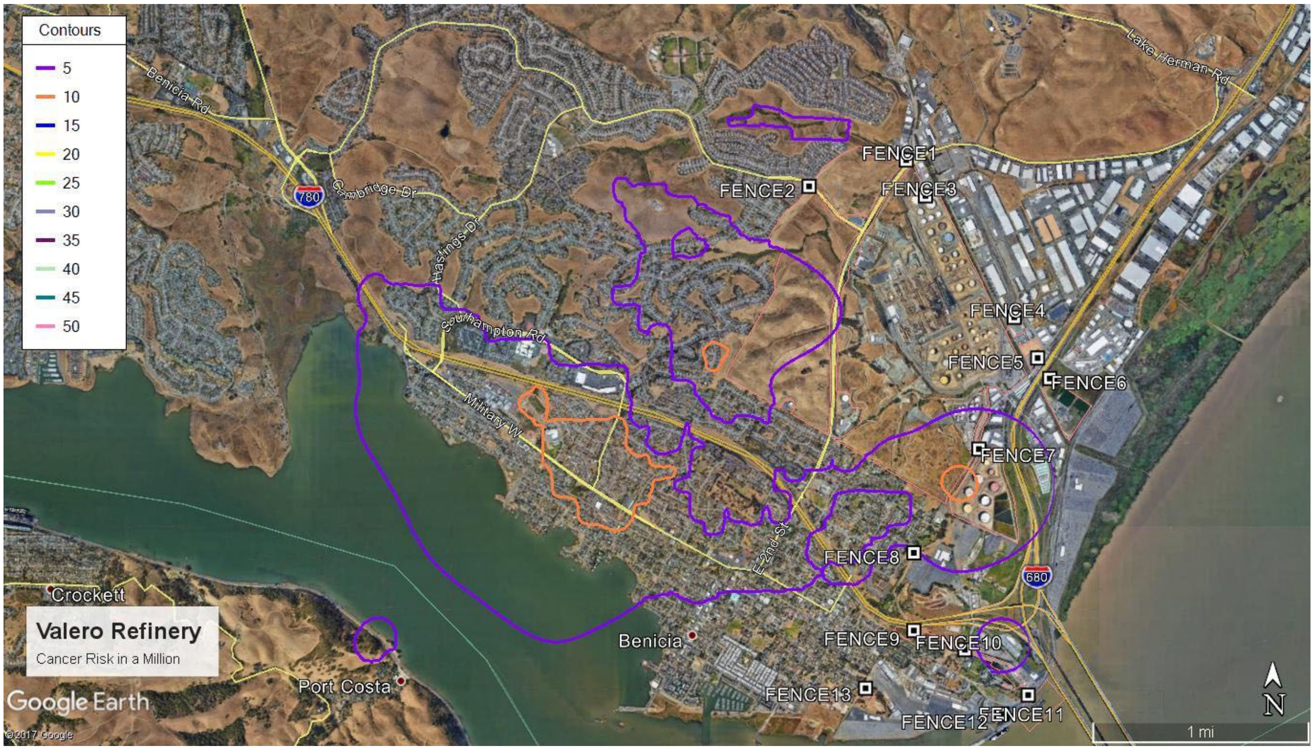
Figure B-10 – Estimated Total Emissions of Diesel PM, Acetaldehyde, Benzene, 1,3-butadiene, and Formaldehyde Near the Valero Refinery (2015)



In a separate analysis, the Air District estimated health impacts from air contaminants by reviewing a Health Risk Screening Assessment (HRSA) from 2015 for the areas around the Valero refinery using toxic emissions inventories provided by Bay Area refineries and meteorological data generated through AERMOD. The Air District will be conducting a new air toxics evaluation for Valero under Rule 11-18. That work will begin in 2023, but we do not expect it to impact the general results of this analysis for the community air monitoring station. Figure B-11 shows the estimated cancer risk (in a million) for Benicia due to emissions from Valero refinery. The largest area of estimated elevated residential cancer risk (>10 in a million) is in the western half of Benicia. This corroborates observational wind data discussed previously, as this area of Benicia is downwind of the refinery during periods of east-northeasterly winds that are common during the winter season.

When considering the health impacts from air pollution, it is also instructive to consider biological traits, health status, or other community characteristics that can result in increased vulnerability to pollution. A number of these population characteristics have been incorporated into the CalEnviroScreen (CES) model, which identifies California communities by census tract that are disproportionately burdened by, and vulnerable to, multiple sources of pollution. CalEnviroScreen uses 21 statewide indicators to characterize pollution burden and population characteristics. Individual indicator scores are provided along with composite scores based on a specified formula. The population characteristics used by CalEnviroScreen are: emergency department visits associated with asthma, cardiovascular disease (emergency department visits for heart attacks), low birth-weight infants, educational attainment, housing-burdened low-income households, linguistic isolation, poverty, and unemployment. The percentiles for the seven census tracts that substantially intersect the 5 km buffer around the Valero Refinery are summarized below in Figure B-12 and Table B-2. The percentiles for each indicator represent a relative score compared to all other census tracts in the state. Higher percentiles represent relatively less favorable conditions compared to other areas.

Figure B-11 – Estimated Cancer Risk from a 2015 Health Risk Assessment of Emissions from the Valero Refinery



With respect to asthma and cardiovascular disease, Figure B-12 and Table B-2 show little variation across the City of Benicia. Census tract 1 (in the far northwest corner of the city) has the most favorable ranking for both indicators, while all of the remaining tracts fall in the 60 to 70 percentile range for asthma and 50 to 60 percentile range for cardiovascular disease.

For all of the remaining indicators (composite score, education, housing burden, linguistic isolation, low birth weight, poverty, and unemployment), Table B-2 makes it particularly clear that tracts 5, 6, and 7 (in southern and eastern Benicia) consistently rank less favorably than the western and northwestern portions of the city.

Figure B-12 – Percentiles for CES Composite Score and Selected CES Indicators in Census Tracts Near the Valero Refinery

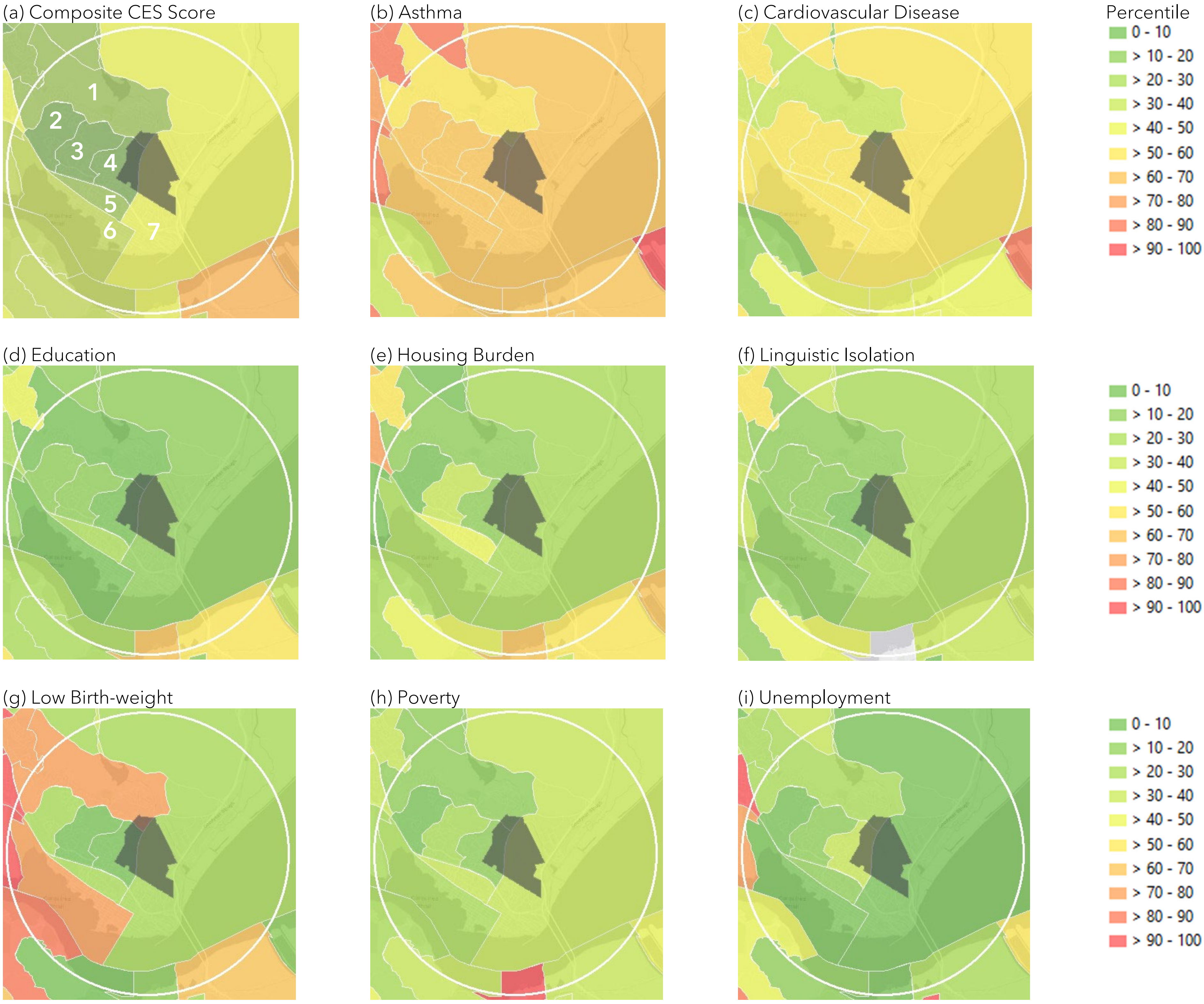


Table B-2 - Percentiles for CES Composite Score and Selected CES Indicators in Census Tracts Near the Valero Refinery

	Indicator								
	Composite CES Score	Asthma	Cardiovascular Disease	Education	Housing Burden	Linguistic Isolation	Low Birth-weight	Poverty	Unemployment
Tract 1	20-30	50-60	30-40	0-10	10-20	10-20	70-80	10-20	20-30
Tract 2	10-20	60-70	50-60	10-20	0-10	10-20	20-30	0-10	0-10
Tract 3	10-20	60-70	50-60	10-20	10-20	10-20	0-10	20-30	10-20
Tract 4	10-20	60-70	50-60	0-10	10-20	0-10	0-10	10-20	30-40
Tract 5	20-30	60-70	50-60	20-30	40-50	10-20	20-30	30-40	10-20
Tract 6	30-40	60-70	50-60	0-10	20-30	10-20	70-80	20-30	0-10
Tract 7	40-50	60-70	50-60	10-20	20-30	20-30	20-30	30-40	0-10

Historic Monitoring Stations & Monitoring Data

As discussed in Section 2.4, it is relevant to consider the location of existing monitors and existing monitoring data when establishing new monitoring sites.

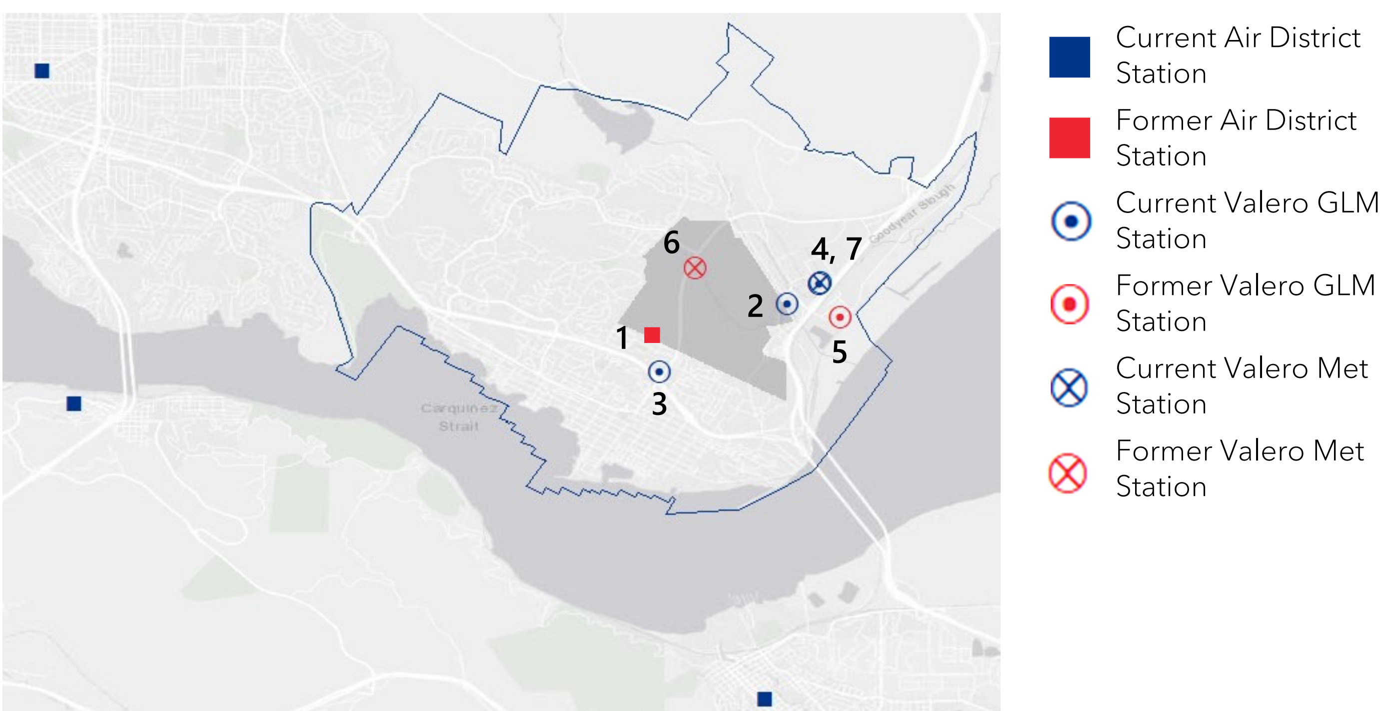
Table B-3 summarizes the recent history of air monitoring in Benicia and Figure B-13 shows the location of the relevant monitoring stations.

Table B-3 – Current and Recent Air Quality Monitoring near the Valero Refinery

Station [map label]	Operator	Parameters Measured
Benicia Special Study Station (Apr 2007 – Dec 2008) [1]	Air District	CO, NO, NO_2, O_3, SO_2, $PM_{2.5}$, PM_{10}, Air Toxics
Valero East Garage [2]	Valero refinery	H_2S, SO_2
Valero Gas Station [3]	Valero refinery	H_2S, SO_2
Valero Warehouse [4]	Valero refinery	H_2S, SO_2
Valero Wastewater(1) [5]	Valero refinery	H_2S, SO_2
Valero Admin Met(2) [6]	Valero refinery	Meteorology
Valero Warehouse Met [7]	Valero refinery	Meteorology

Notes: (1) In 2019 the Valero Wastewater station was relocated and renamed East Garage; (2) The Valero Admin Met station stopped operating in January 2021

Figure B-13 – Location of Current and Recent Monitoring Stations Near the Valero Refinery(1)



Notes: (1) See Table B-3 for the names corresponding to the numbered labels

The Valero refinery began measuring hourly SO_2 and H_2S readings in 1996, and then 1-minute readings in 2013 as part of its Ground-Level Monitoring (GLM) network. This type of monitoring is required at all five Bay Area refineries by Air District Regulation 9, Rule 1 and Regulation 9, Rule 2. The Air District oversees the monitoring conducted by the refineries, including conducting site evaluations and performance audits of the monitors. Measurements in excess of rule limits are reviewed by meteorologists and investigated by Compliance and Enforcement staff. Currently, the Valero refinery operates three stations that monitor SO_2 and H_2S (East Garage, Gas Station, and Warehouse), one of which also has meteorological monitoring (Warehouse). Until January 2021, a fourth station (Admin Met) had only meteorological monitoring. However, this station is no longer operational. Valero has established an additional meteorological monitoring station although at the time this analysis was being performed, the Air District was not routinely receiving data from it and it is therefore not displayed on the map. As of November 2021, the Air District is now receiving data from this station on a regular basis.

A review of historical hourly SO_2 and H_2S measurements from the GLM stations around the Valero refinery over a period of 84 months from 2012 through 2018 shows that concentrations have been consistently low. The Warehouse station had a median concentration of 1.50 ppb and the Gas Station and Wastewater stations had median concentrations of 2.07 ppb and 2.16 ppb, respectively.

Table B-4 – Summary Statistics for Hourly SO_2 Concentrations at Monitoring Stations Near the Valero Refinery (2012 – 2018)

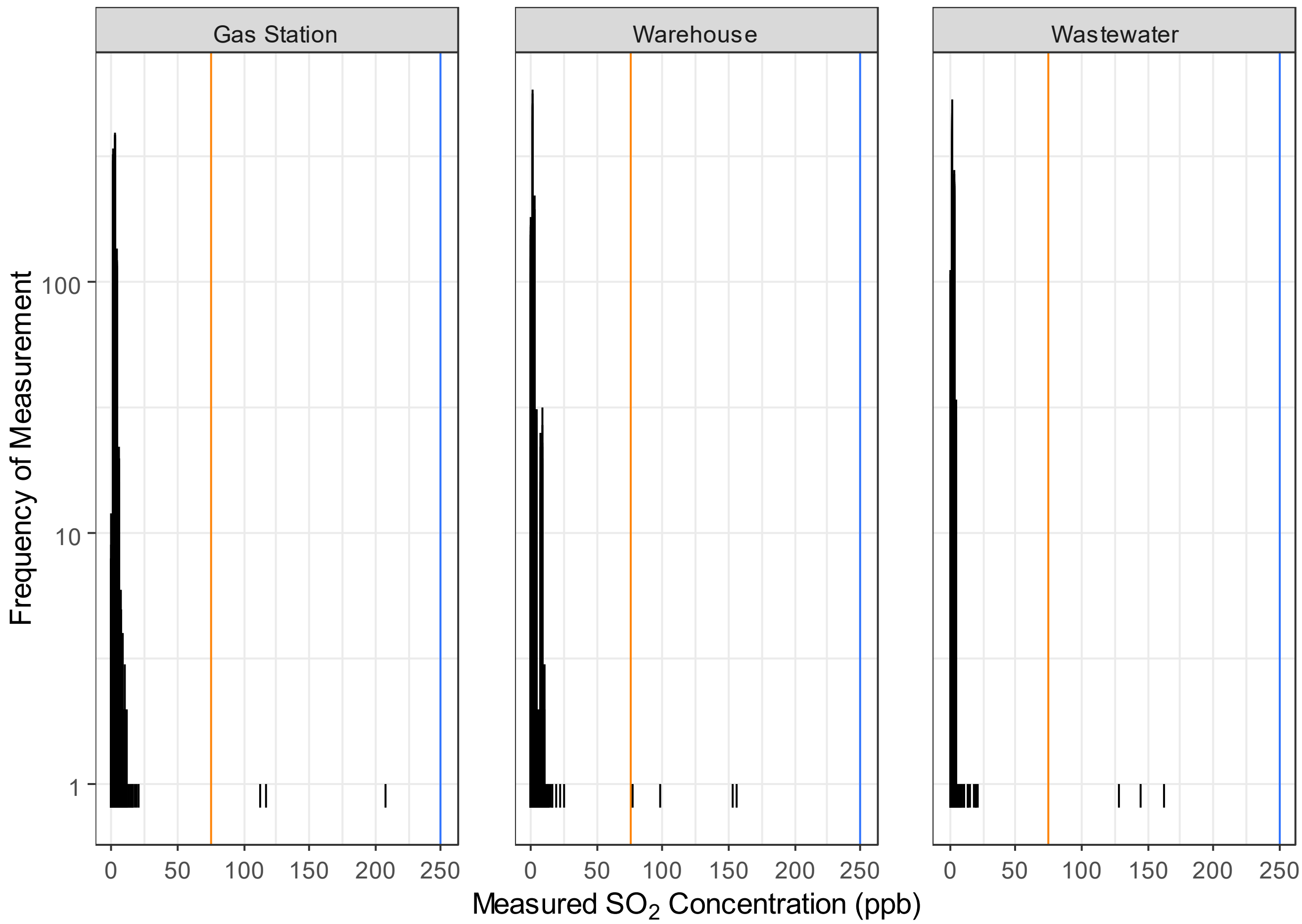
Monitoring Station	Median Concentration (ppb)	Median Absolute Deviation (ppb)
Gas Station	2.07	0.80
Warehouse	1.50	0.80
Wastewater	2.16	0.52

Figure B-14 shows the distribution of measured hourly SO_2 concentrations over the same study period. The horizontal (x) axis represents various measured concentrations, and the vertical (y) axis represents the number of times a given concentration was measured over time (note that this axis is displayed on a logarithmic scale). Data are shown separately for each of the GLM stations but the East Garage station has been excluded since it only began operating in 2019. The orange vertical line represents the 1-hour National Ambient Air Quality Standard for SO_2 of 0.075 ppm (75 ppb), while the blue line represents the 1-hour California Ambient Air Quality Standard for SO_2 of 0.25 ppm (250 ppb). Figure B-15 is a companion to Figure B-14, and it shows the cumulative distribution of measured values.

It is evident in Figure B-14 that the majority of measurements at all three stations had concentrations of just a few ppb and the frequency drops sharply as the concentration goes up. In fact, as shown in Figure B-16, 99% of all measured hourly SO_2 concentrations at the Warehouse GLM station are below 8.3 ppb, 99% of concentrations at the Gas Station GLM station are below 5.3 ppb, and 99% of the concentrations at the Wastewater GLM station are below 4.1 ppb.

It is also clear from Figure B-14 that hourly SO_2 concentrations at the Warehouse exceeded the 1-hour NAAQS for SO_2 on four occasions while the Gas Station and Wastewater sites exceeded the standard on three occasions each. None of the stations measured concentrations over the California 1-hour standard for SO_2 over the seven-year period.

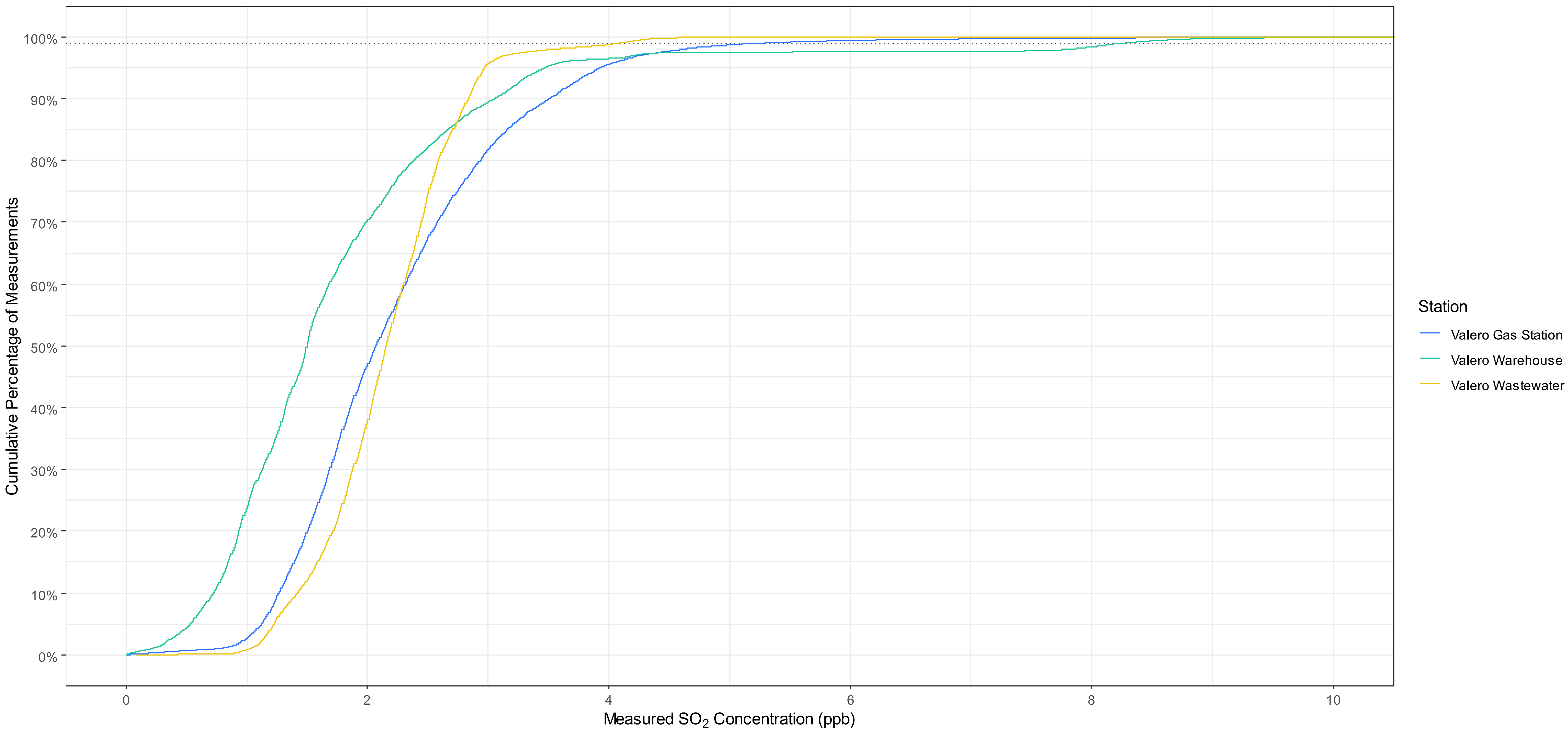
Figure B-14 – Distribution of Measured Hourly SO_2 Concentrations at Selected Valero GLM Stations (2012 - 2018)



1-hour California Ambient Air Quality Standard for SO_2

1-hour National Ambient Air Quality Standard for SO_2

Figure B-15 – Cumulative Distribution of Measured Hourly SO_2 Concentrations at Ambient Air Monitoring Stations Near the Valero Refinery (2012 – 2018)



Measured hourly concentrations of H_2S at the three Valero GLM stations exhibit the same general pattern as the SO_2 concentrations in that there are numerous measurements of just a few ppb and the frequency of measurements drops off sharply as the concentration increases. In this case, 99% of the measured concentrations were below 3.6 ppb at the Wastewater station, 3.5 ppb at the Gas Station, and 3.3 ppb at the Warehouse station (Figure B-17).

Table B-5 – Summary Statistics for Hourly H_2S Concentrations at Monitoring Stations Near the Valero Refinery (2012 – 2018)

Monitoring Station	Median Concentration (ppb)	Median Absolute Deviation (ppb)
Gas Station	1.1	0.4
Warehouse	1.6	0.7
Wastewater	1.5	0.6

While there is no National Ambient Air Quality Standard for H_2S, there is a 1-hour California standard of 30 ppb. Figure B-16 shows hourly concentrations exceeded that level on three occasions at the Gas Station GLM, once at the Warehouse GLM, and twice at the Wastewater GLM. It is worth noting that the odor threshold for H_2S (the point at which a rotten egg smell is first noticeable to people) is around 10 ppb (OSHA, n.d. -a). As a result, individual community members may notice odors even though ambient concentrations are not near the 1-hour California standard of 30 ppb.

Given that hourly SO_2 and H_2S concentrations at all three stations exhibit the same general pattern, the data do not provide compelling evidence to place the Air District's Major Stationary Source Community Air Monitoring station at one location or another. The data are, however, useful reference points for comparison once the Air District's monitor begins collecting data.

Figure B-16 – Distribution of Measured Hourly H_2S Concentrations at Selected Valero GLM Stations (2012 - 2018)

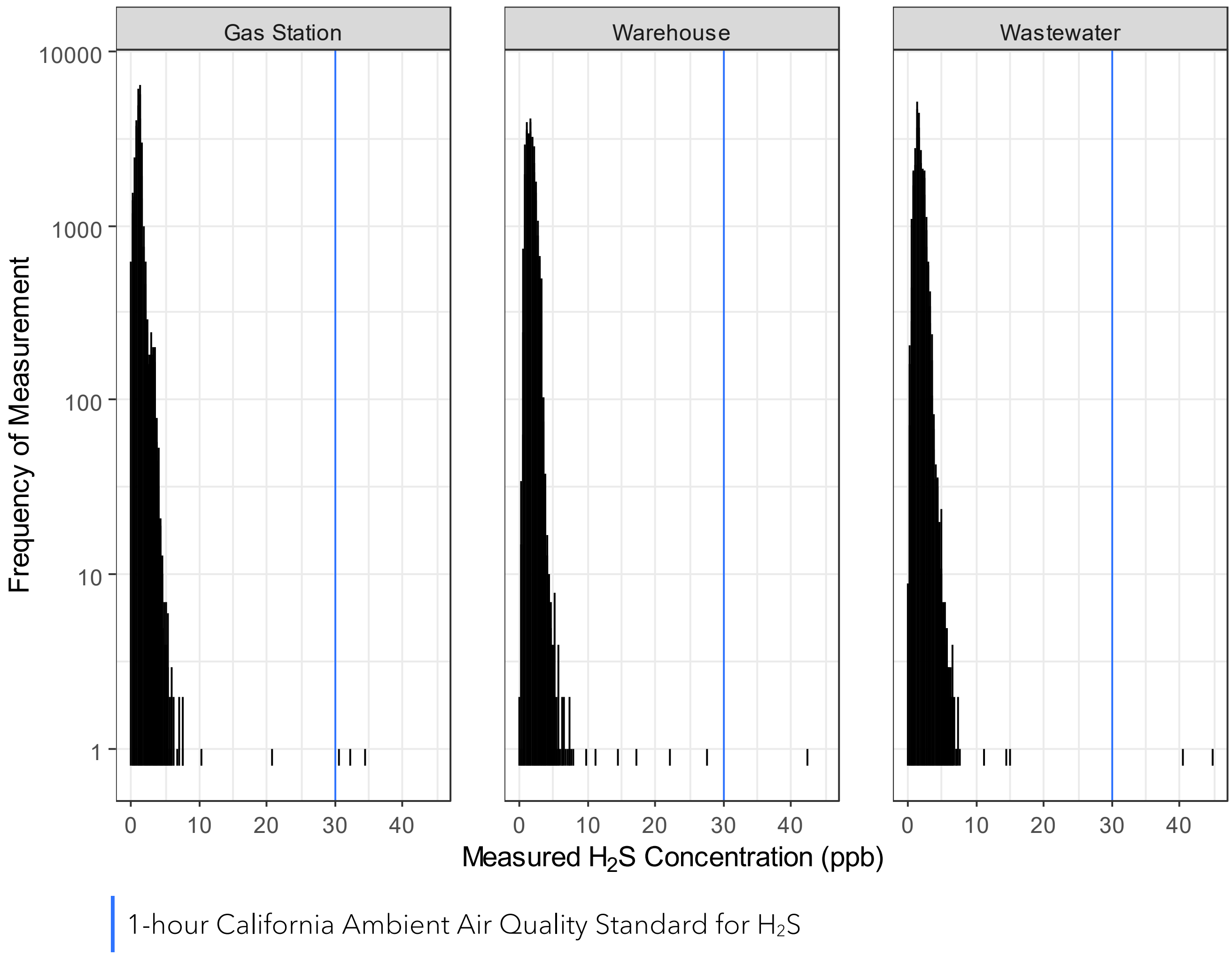
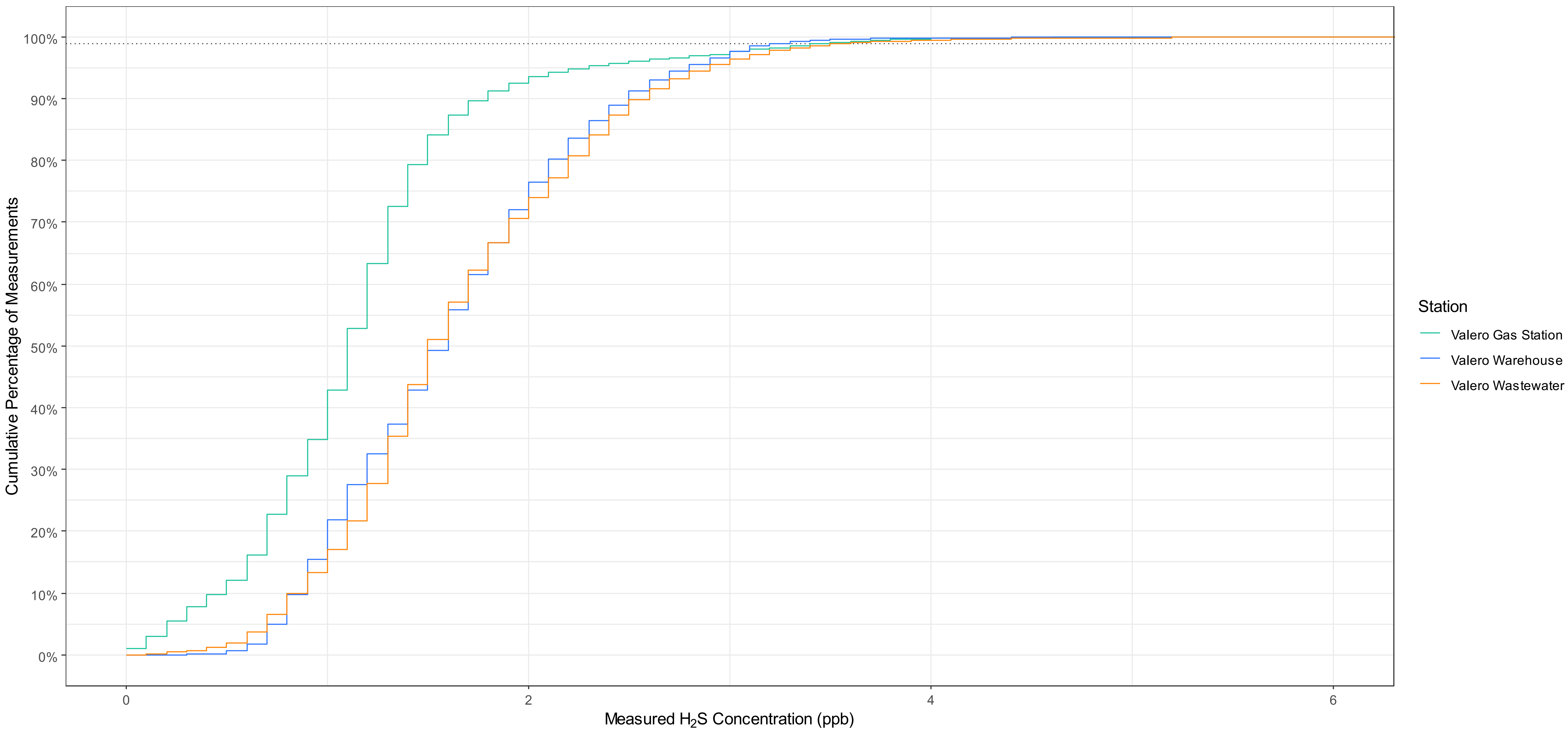
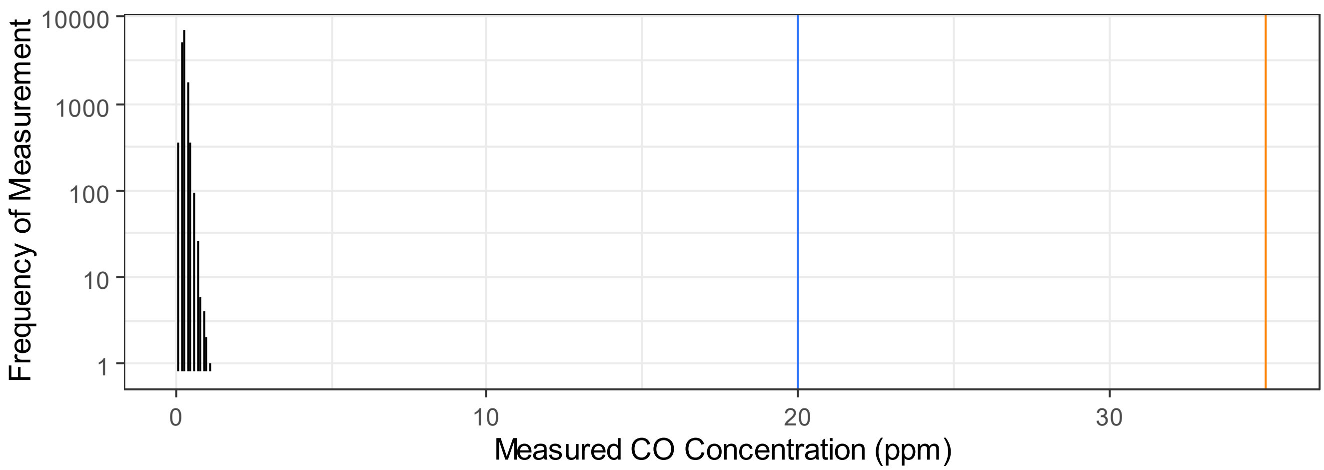


Figure B-17 – Cumulative Distribution of Measured Hourly H_2S Concentrations at Ambient Air Monitoring Stations Near the Valero Refinery (2012 – 2018)



In addition to the refinery GLM network, the Air District operated an air monitoring station in Benicia from April 2007 through December 2008. This station measured continuous ambient concentrations for CO, NO_2, O_3, $PM_{2.5}$, and SO_2; it measured PM_{10} concentrations once every six days; and it measured air toxics concentrations once every twelve days. The Air District station was located on the ridge between the Valero refinery and the southern residential and commercial areas of Benicia (see Figure B-13; also see figures B-7 and B-8). The next several figures show the distribution of measured concentrations for several of these pollutants.

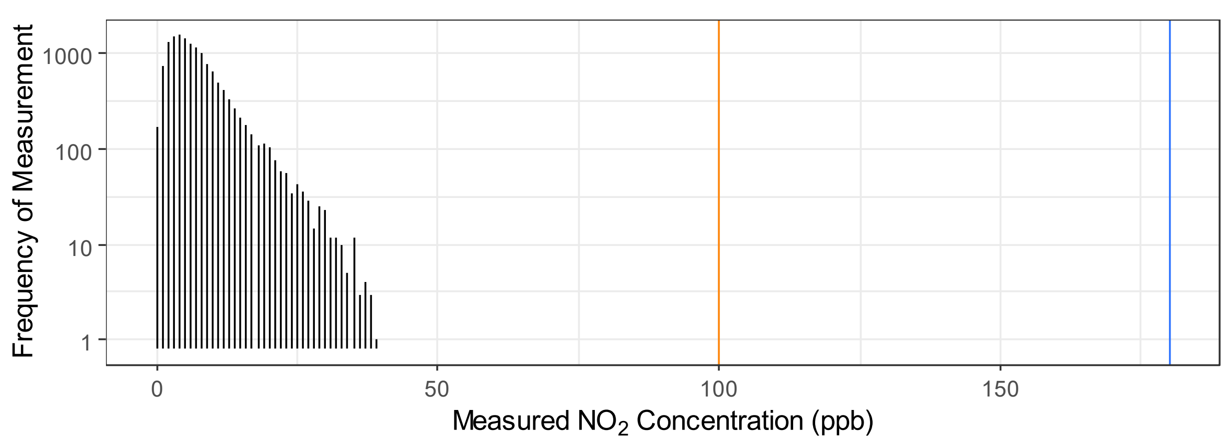
Figure B-18 – Distribution of Measured Hourly CO Concentrations at the Air District's Benicia Monitoring Station (April 2007 – December 2008)



1-hour California Ambient Air Quality Standard for CO

1-hour National Ambient Air Quality Standard for CO

Figure B-19 – Distribution of Measured Hourly NO_2 Concentrations at the Air District's Benicia Monitoring Station (April 2007 – December 2008)



1-hour California Ambient Air Quality Standard for NO_2

1-hour National Ambient Air Quality Standard for NO_2

Figure B-20 – Distribution of Measured Hourly O_3 Concentrations at the Air District's Benicia Monitoring Station (April 2007 – December 2008)

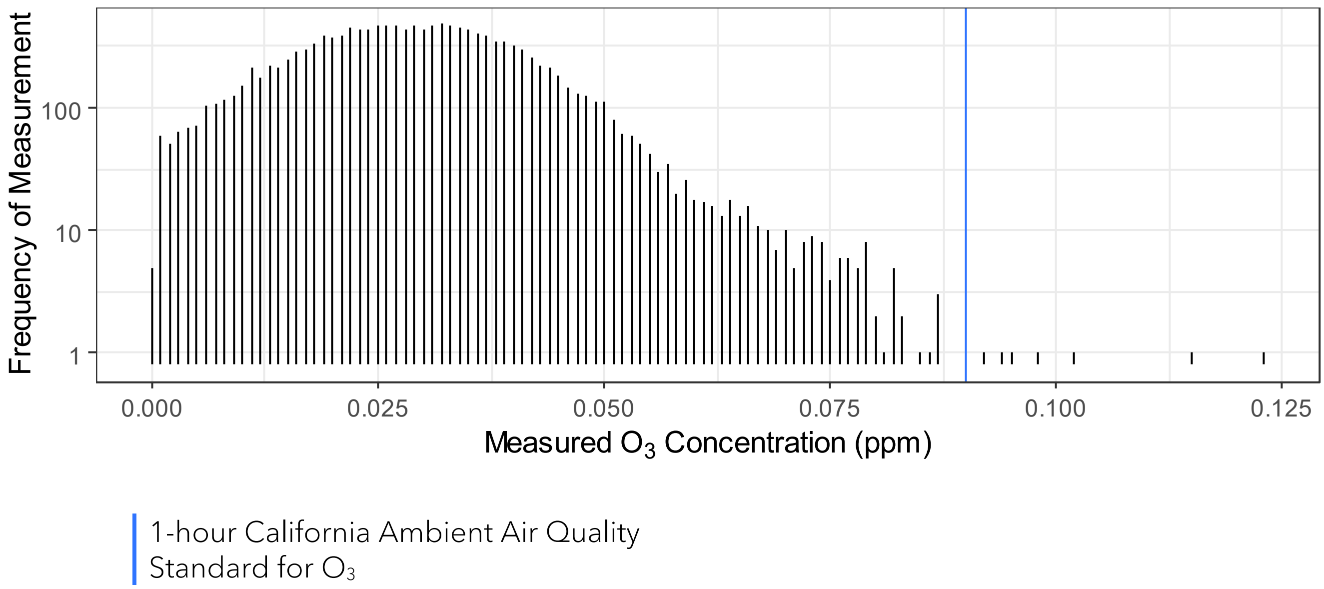
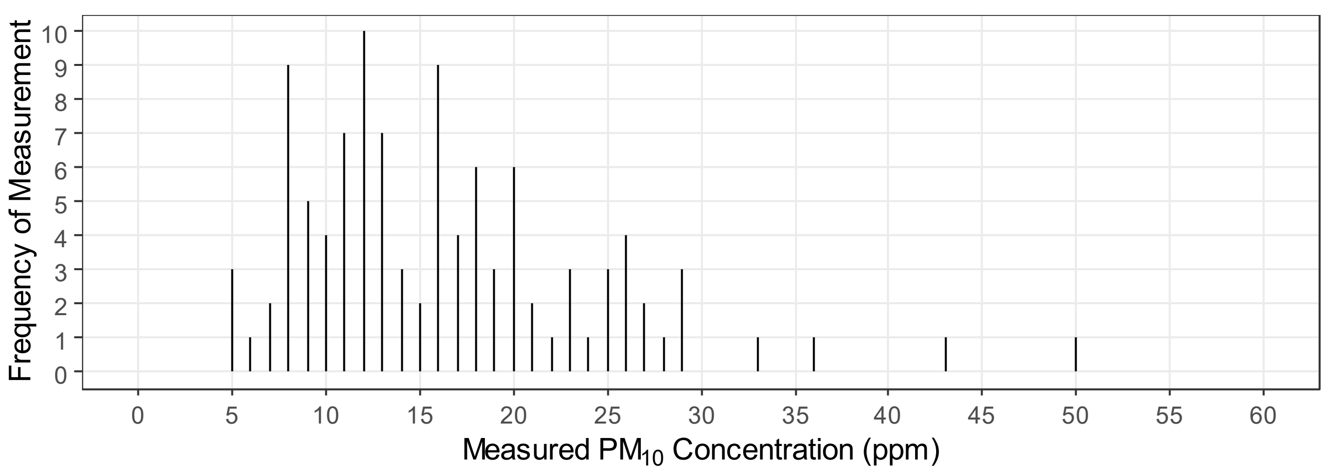
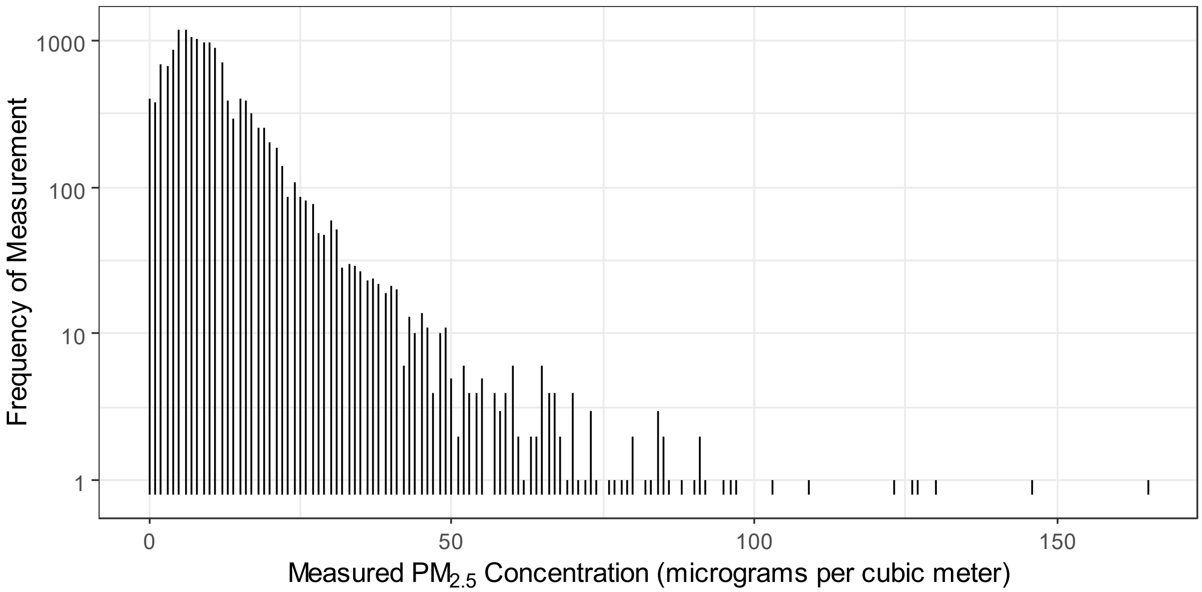


Figure B-21 – Distribution of Measured PM_{10} Concentrations at the Air District's Benicia Monitoring Station (April 2007 – December 2008)(1)



Notes: (1) PM_{10} concentrations at this station were measured at a frequency of once every six days

Figure B-22 – Distribution of Measured Hourly $PM_{2.5}$ Concentrations at the Air District's Benicia Monitoring Station (April 2007 – December 2008)



From June 20 to June 22, 2008, lightning strikes from a series of thunderstorms ignited numerous wildfires throughout northern and central California. At its peak, what became known as the Northern California Lightning Siege (or the Lightning Complex Fires) comprised thousands of wildfires in 26 counties and sent smoke throughout the western United States.

With thousands of individual fires (subsequently grouped into fire complexes) in 26 counties, the summer of 2008 was one of the most severe wildfire seasons in California history. Vast areas experienced smoke impacts, especially areas in northern California. The temporary monitoring station in Benicia captured these impacts as reflected by the unusually high levels of $PM_{2.5}$ shown in Figure B-22.

Figure B-23 – Distribution of Measured Hourly SO_2 Concentrations at the Air District's Benicia Monitoring Station (April 2007 – December 2008)

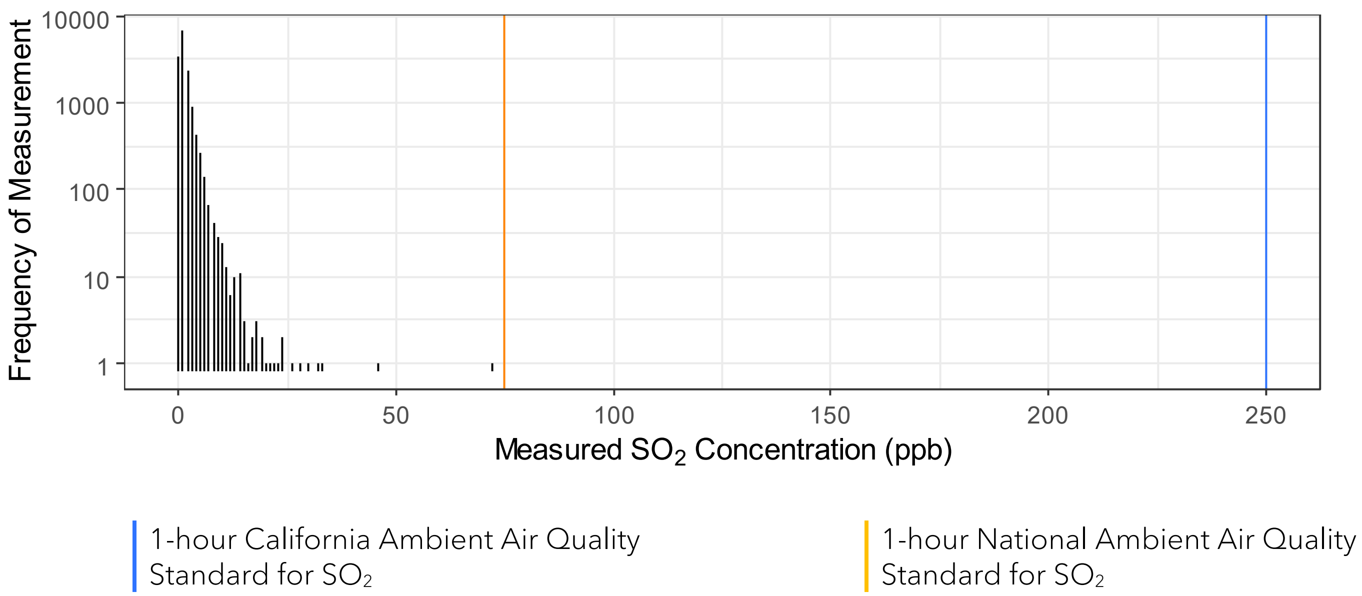
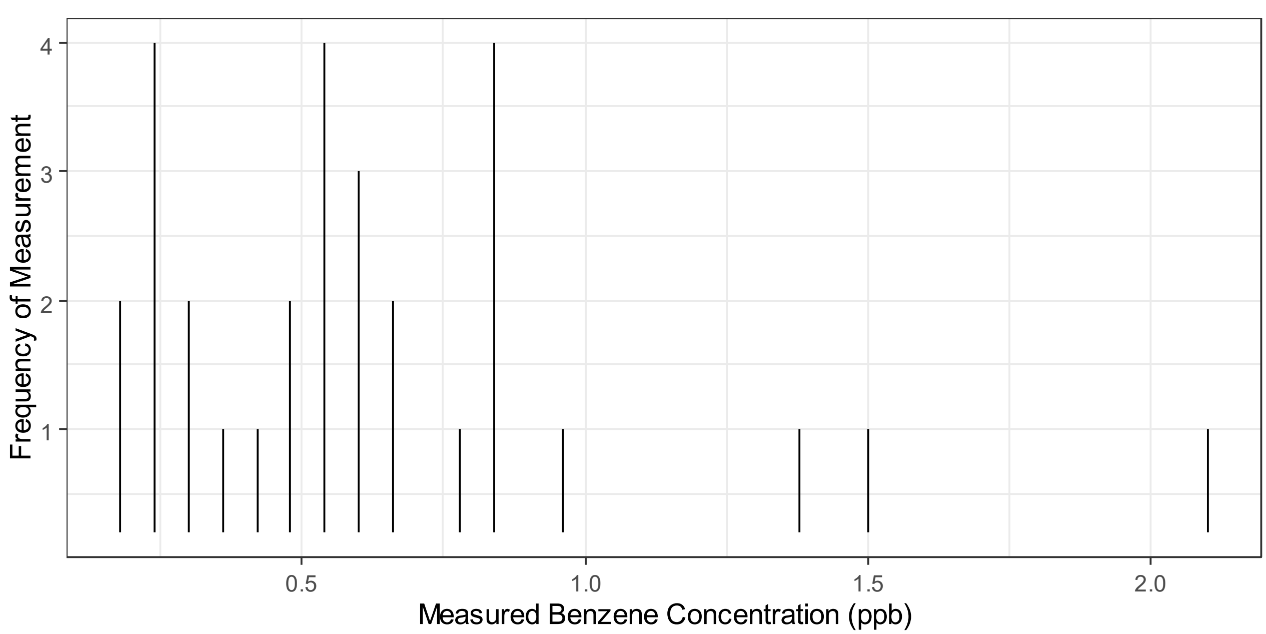


Figure B-24 – Distribution of Benzene Concentrations at the Air District's Benicia Monitoring Station (2008)(1)



Notes: (1) Benzene concentrations at this station were measured at a frequency of once every twelve days

Community Input

Figure B-25 shows suggested locations for future air monitoring as proposed by community members at a workshop held in Benicia in March 2018. Most of the suggested locations are in far northern Benicia, which is infrequently downwind of the Valero refinery and is less densely populated than southern Benicia.

The Air District collected additional community input during a public workshop in June 2020. This is discussed further below.

Figure B-25 – Monitoring Locations Suggested by Community Members in 2018

Recommended Priority Search Area for the Benicia Monitoring Site

No one fixed monitoring location will capture all of the emissions from a given facility. Variability in the meteorological conditions coupled with differences in the characteristics (e.g., temperature or height of emissions) mean that there is a chance that any area nearby could experience the impacts of the facility, particularly for short duration emissions or incidents. Our goal in siting monitors for the Major Stationary Source Community Air Monitoring Program is to select a location that will reflect typical conditions in impacted areas of the community based on a broad range of factors and the weight of available evidence associated with those factors, rather than characterize incident releases or demonstrate compliance. In this case, several key factors stand out:

- Historic wind data show a dominant westerly component, which would tend to transport emissions from the refinery and other nearby industrial facilities eastward toward the Carquinez Strait and away from the residential western and southern portions of the city. During the winter there is a more frequent offshore wind pattern with a predominant northeastern component and it is during these periods that residential sections of Benicia (particularly toward the southwest portion of the city) may be downwind of emissions from the facility. Observed winds were light (under 2.5 m/s) about 15% of the time at the two Valero-operated stations (varying from 6,000 to 8,000 hours over the five-year period depending on the monitor in question). Calm or light winds from variable directions can limit dispersion and allow pollutants to build-up in the local area. Light winds are more common in the cool season and during the overnight hours but can occur at any time of day or year.

- The Air District's 2015 Community Air Risk Evaluation (CARE) analysis of emissions of certain toxic air contaminants from permitted stationary sources, on-road mobile sources, and distributed area sources found that the greatest estimated emissions of five compounds in the area (diesel PM, acetaldehyde, benzene, 1,3-butadiene, and formaldehyde) lie south and west of the refinery and generally follow the Interstate 780 corridor.
- A 2015 health risk screening assessment shows the highest estimated cancer risk contours near the edge of the refinery property and in the southwest area of the city.
- Data from the CalEnviroScreen model (which identifies census tracts in California that are disproportionately burdened by pollution) show that the three census tracts in southern and eastern Benicia consistently rank less favorably than those in the western and northwestern portions of the city.

On balance, these factors support placement of a Major Stationary Source Community Air Monitoring Station in the southwest portion of Benicia, as indicated in Figure B-26 below.

Figure B-26 – Recommended Search Area for the Benicia Monitoring Site

Evaluation of Candidate Sites

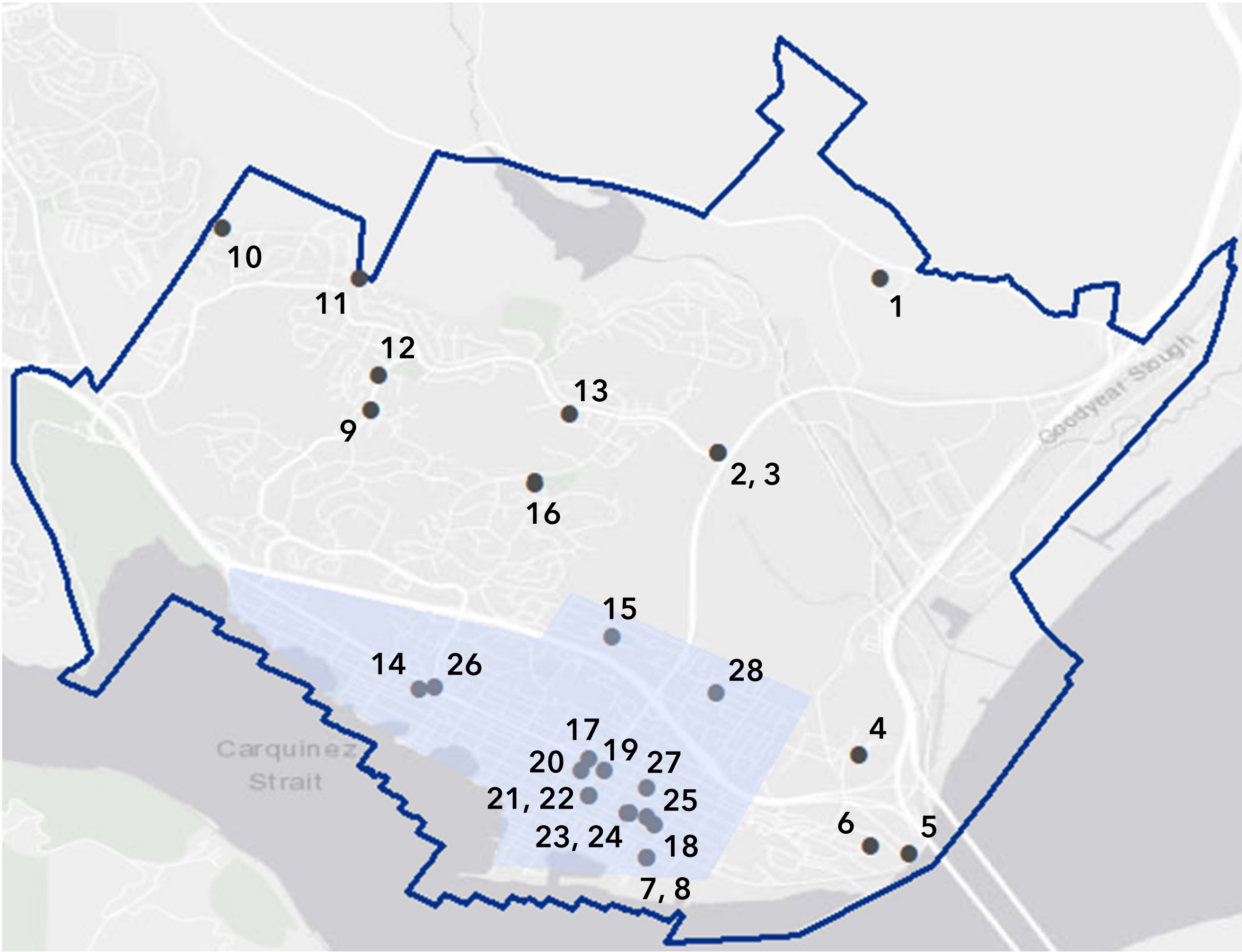
Having identified a general area near the refinery where the monitoring station should ideally be placed, Air District staff began in late 2018 to contact property owners in Benicia about the prospect of installing a monitoring station at specific locations in Benicia. In 2019, the Air District focused on finalizing logistics for a monitoring station at Robert Semple Elementary School at 2015 E 3rd St, but the property owners reconsidered their interest in hosting a monitoring station. Throughout 2020, Air District staff subsequently worked with the Benicia Fire Chief to identify twenty-eight alternate locations on City property. Those twenty-eight locations are shown below in Figure B-27 in relation to the priority search area (shaded in blue). In some instances, multiple locations on the same parcel of land were considered; those locations are listed separately in the figure.

As previously explained, because monitoring stations contain specialized equipment, potential sites must meet a number of specific requirements. Air District staff personally visited each of the twenty-eight sites above to perform a comprehensive site assessment based on the following factors:

- Site size
- Availability of power
- Known interferences or obstructions (e.g., buildings, trees, emissions from other sources, etc.)
- Distance to known interferents
- Distance to sensitive receptors
- Elevation
- Proximity to the refinery
- Potential longevity of the lease
- Secured access
- Safety

The Air District scored each site and ranked all of the sites based on the overall total scores. Because some of the factors are easier to address than others, the top-ranking sites are not necessarily the preferred choices at the end of the ranking process. For example, if a site does not have secured access, it may be possible to install a fence around the monitoring station. In many cases power lines can even be installed at a site that does not currently have electricity service. However, other features of a site typically cannot be changed such as the size of a site, its elevation, and the presence of nearby obstructions or interferents.

Figure B-27 – Candidate Sites for the Benicia Monitoring Station



1	Water Treatment Plant
2	City solar farm (1)
3	City solar farm (2)
4	Camel Road with Structure
5	Lot by AMPORTS
6	Clock Tower
7	Wastewater Treatment Plant (1)
8	Wastewater Treatment Plant (2)
9	Park Solano
10	Channing Circle Park
11	Gateway Park
12	Jack London Park
13	Frank Skilman Park
14	Willow Park
15	Overlook Park

16	Southampton Park
17	Benicia Public Library
18	Saint Dominic's Church
19	City Hall
20	Swim center
21	Benicia Fire Museum (1)
22	Benicia Fire Museum (2)
23	Casa De Vilarrasa (1)
24	Casa De Vilarrasa (2)
25	Maria Field
26	Pedestrian Walkway Military West & Alta Loma
27	Community Park
28	Duncan Graham Park

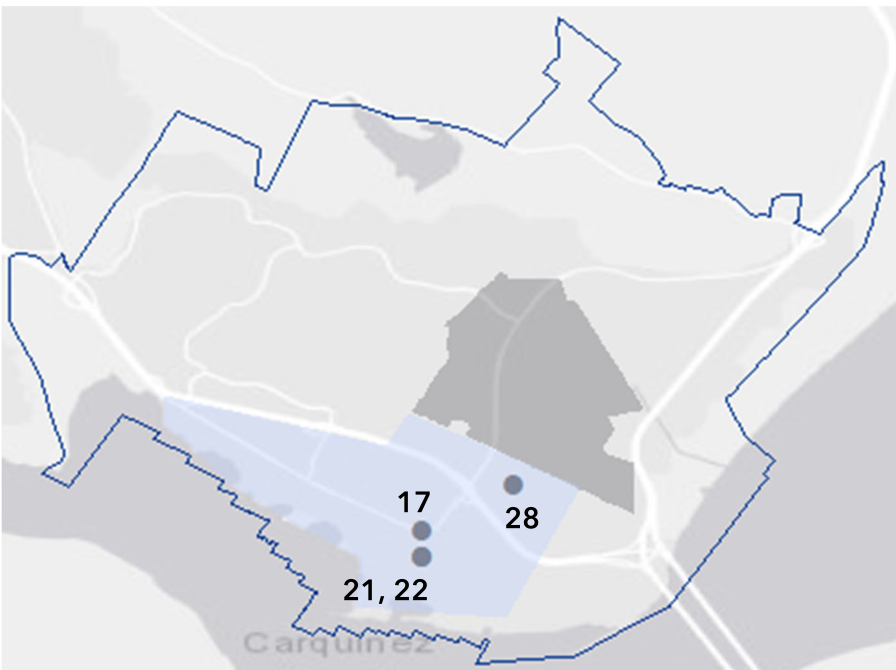
Preferred Location for the Benicia Monitoring Station

Based on the foregoing analysis, three sites emerged as the Air District's top candidates:

- Benicia Fire Museum
- Duncan Graham Park
- Benicia Public Library

Figure B-28 shows a map of those locations.

Figure B-28 – Top Candidates for the Benicia Monitoring Site



17	Benicia Public Library
21, 22	Benicia Fire Museum
28	Duncan Graham Park

On June 30, 2021, the Air District held a public workshop to gather community input on the top three sites. Participants were asked to rank the sites in a live poll during the workshop and all members of the public had an opportunity to submit comments, questions, and their preferred site during a two-week public comment period following the event. Among all members of the public who responded, the Benicia Fire Museum ranked the highest, followed by Duncan Graham Park, and then the Benicia Public Library. A written summary of the workshop is available on the Air District's website at https://www.baaqmd.gov/~/media/files/technical-services/benicia-monitoring-workshop/baaqmd_benicia_summary-pdf.pdf?la=en&rev=41f7e9dde0354ff29e4ec84462a9136c and a recording of the entire workshop is available at https://6cc5d331212b885bdbf1-27dda3432a9ef9992a30bfe1302f073d.ssl.cf2.rackcdn.com/2021_0630_benecia_air_monitoring_webcast_archive.mp4.

Based on the Air Districts assessment of each site, input from community members, and subsequent discussions with the City of Benicia, the Benicia Fire Museum is the preferred site for the Major Stationary Source Community Air Monitoring station in Benicia.

Monitored Pollutants, Monitoring Methods, and Equipment

[Section in development]