3.2 AIR QUALITY

This section describes the existing physical affected environment and regulatory framework related to emissions of criteria air pollutants and hazardous air pollutants (HAPs) and discusses the potential effects of each of the EIS Alternatives as related to emissions of criteria air pollutants and HAPs.

3.2.1 Affected Environment

The existing SFVAMC Fort Miley Campus is located adjacent to the Richmond District in San Francisco, which is located within the San Francisco Bay Area Air Basin (SFBAAB). The SFBAAB, which consists of all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, and Santa Clara Counties; the southern portion of Sonoma County; and the southwestern portion of Solano County, is one of fifteen air basins in California. Each basin denotes a specific area within the State that is defined by its common geographical features and weather patterns, which correspond to similar air pollution burdens. About 19 percent of California's population resides in the San Francisco Bay Area, and pollution sources in the region account for about 15 percent of the total statewide emissions of criteria pollutants (ARB, 2009a).

Ambient concentrations of air pollutants are determined by the qualities and quantities of emissions released by sources and the atmosphere's ability to transport, dilute, and transform the emissions. Natural factors that affect transport, dilution, and transformation include terrain, wind, atmospheric stability, and sunlight. The combination of low wind speeds and restricted vertical mixing is referred to as stable, or inversion conditions, and generally produces the highest concentrations of air pollutants. Therefore, existing air quality conditions in an area are determined by natural factors, such as topography, meteorology, and climate, in addition to the sources and strengths of emissions, as discussed separately below.

Climate and Topography

The SFBAAB is characterized by complex terrain consisting of coastal mountain ranges, inland valleys, and bays that distort normal wind flow patterns. The Coast Ranges split, resulting in a western coast gap, the Golden Gate, and an eastern coast gap, the Carquinez Strait, which allow air to flow in and out of the SFBAAB and the Central Valley. The greatest distortions occur when low-level inversions are present and the air beneath the inversion flows independently of air above the inversion, a condition that is common in the summertime. During the summer, winds flowing from the northwest are drawn inland through the Golden Gate and over the lower portions of the San Francisco Peninsula. Immediately south of Mount Tamalpais, the northwesterly winds accelerate considerably and come more directly from the west as they stream through the Golden Gate (BAAQMD, 2011a).

The climate is dominated by the strength and location of a semipermanent, subtropical high-pressure cell. During the summer, the Pacific high-pressure cell is centered over the northeastern Pacific Ocean, resulting in stable meteorological conditions and a steady northwesterly wind flow. Upwelling of cold ocean water from below to the surface as a result of the northwesterly flow produces a band of cold water off the California coast. The cool and moisture-laden air approaching the coast from the Pacific Ocean is further cooled by the presence of the cold water band, resulting in condensation and the presence of fog and stratus clouds along the Northern California coast (BAAQMD, 2011a).

In the winter, the Pacific high-pressure cell weakens and shifts southward, resulting in wind flow offshore, the absence of upwelling, and the occurrence of storms. Weak inversions coupled with moderate winds result in a low air pollution potential. The Pacific high-pressure cell does periodically become dominant, bringing strong inversions, light winds, and high pollution potential (BAAQMD, 2011a).

The local meteorology of the existing SFVAMC Fort Miley Campus and the Mission Bay area is represented by measurements recorded at the Arkansas Street and San Francisco and Oakland International Airport stations. The normal annual precipitation, which occurs primarily from November through March, is approximately 20 inches. Normal January temperatures range from a minimum of 44 degrees Fahrenheit (°F) to a maximum of 58°F, and September temperatures range from a minimum of 54°F to a maximum of 66°F (WRCC, 2010a). The predominant wind direction and speed, measured at the San Francisco International Airport station, is from the west at approximately 10.6 miles per hour (WRCC, 2010b; NCDC, 2010).

Properties, Effects, and Sources of Criteria Pollutants

The U.S. Environmental Protection Agency (EPA) currently focuses on the following air pollutants as indicators of ambient air quality: ozone, carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter (PM), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health and extensive health-effects criteria documents are available, they are commonly referred to as *criteria air pollutants*.

The federal Clean Air Act (CAA) requires EPA to set outdoor air quality standards for the nation. EPA has established primary and secondary national ambient air quality standards (NAAQS) for the following criteria pollutants: ozone, CO, NO_2, SO_2, respirable particulate matter (PM_{10}), fine particulate matter ($PM_{2.5}$), and lead. The primary standards protect the public health and the secondary standards protect public welfare. EPA also permits states to adopt additional or more protective air quality standards if needed. Therefore, the California Air Resources Board (ARB) has established California ambient air quality standards (CAAQS) for sulfates, hydrogen sulfide, vinyl chloride, and visibility-reducing particulate matter, in addition to the above-mentioned criteria pollutants. In most cases the CAAQS are more stringent than the NAAQS. Differences in the standards are generally explained by the health-effects studies considered during the standard-setting process and the interpretation of the studies. Lastly, the CAAQS incorporate an additional margin of safety to protect sensitive receptors, particularly children and infants (ARB, 2010a). The NAAQS and CAAQS as discussed above are listed in Table 3.2-1, and health effects are described in Table 3.2-2. Sulfur dioxide and lead are not discussed further because all counties in the Bay Area meet the standards for these pollutants.

Ozone

Ozone is a photochemical oxidant, a highly reactive gas, and even at low concentrations it is irritating and toxic. Ozone is the primary component of smog and is not emitted directly into the air, but formed through complex chemical reactions between precursor emissions of reactive organic gases (ROG) and oxides of nitrogen (NO_X) in the presence of sunlight. ROG are volatile organic compounds that are emitted from natural sources (such as plants), incomplete fossil fuel combustion, and the evaporation of chemical solvents and fuels. NO_X are a group of gaseous compounds of nitrogen and oxygen that result from the combustion of fuels.

Table 3.2-1: Summary of Ambient Air Quality Standards and Attainment Designations

Pollutant	Averaging Time	California Standards[2,3]	California Attainment Status (San Francisco County)[4]	National Standards[1] Primary[3,5]	National Standards[1] Secondary[3,6]	National Standards[1] Attainment Status (San Francisco County)[7]
Ozone	1-hour	0.09 ppm (180 μg/m³)	N (Serious)	–	–	–
	8-hour	0.070 ppm (137 μg/m³)	N	0.075 ppm (147 μg/m³)	Same as Primary Standard	N (Marginal)
Carbon monoxide (CO)	1-hour	20 ppm (23 mg/m³)	A	35 ppm (40 mg/m³)	None	U/A
	8-hour	9.0 ppm (10 mg/m³)		9 ppm (10 mg/m³)		
Nitrogen dioxide (NO_2)	Annual Arithmetic Mean	0.030 ppm (57 μg/m³)	A	0.053 ppm (100 μg/m³)	Same as Primary Standard	U/A
	1-hour	0.18 ppm (339 μg/m³)	A	0.100 ppm	None	U/A
Respirable particulate matter (PM_{10})	Annual Arithmetic Mean	20 μg/m³	N	–	Same as Primary Standard	U
	24-hour	50 μg/m³		150 μg/m³		
Fine particulate matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 μg/m³	N	15 μg/m³	Same as Primary Standard	A
	24-hour	No Separate State Standard		35 μg/m³	Same as Primary Standard	N

Notes: ppm = parts per million; μg/m³ = micrograms per cubic meter; mg/m³ = milligrams per cubic meter

1 National standards (other than ozone, particulate matter, and those standards based on annual averages or annual arithmetic mean) are not to be exceeded more than once a year. The ozone standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. The PM_{10} 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 μg/m³ is equal to or less than 1 day. For $PM_{2.5}$, the 24-hour standard is attained when 98 percent of the daily concentrations, averaged over 3 years, are equal to or less than the standard. The NO_2 standard is attained when the 3-year average of the 98th percentile of the daily maximum 1-hour average at each monitor within an area does not exceed 0.100 ppm (effective January 22, 2010).

2 California standards for ozone, CO (except Lake Tahoe), NO_2, and particulate matter are not to be exceeded. All others are not to be equaled or exceeded.

3 Concentrations are expressed first in units in which they were issued (i.e., ppm or μg/m³). Equivalent units given in parentheses are based on a reference temperature of 25° Celsius and a reference pressure of 760 torr. Most measurements of air quality are to be corrected to a reference temperature of 25° Celsius and a reference pressure of 760 torr; ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

4 Unclassified (U): The data are incomplete and do not support a designation of attainment or nonattainment.
Attainment (A): The State standard for that pollutant was not violated at any site in the area during a 3-year period.
Nonattainment (N): There was at least one violation of a State standard for that pollutant in the area.

5 National Primary Standards: The levels of air quality necessary, with an adequate margin of safety, to protect the public health.

Table 3.2-1: Summary of Ambient Air Quality Standards and Attainment Designations

Pollutant	Averaging Time	California		National Standards[1]		
		Standards[2,3]	Attainment Status (San Francisco County)[4]	Primary[3,5]	Secondary[3,6]	Attainment Status (San Francisco County)[7]

6 National Secondary Standards: The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

7 Nonattainment (N): Any area that does not meet (or that contributes to ambient air quality in a nearby area that does not meet) the national primary or secondary ambient air quality standard for the pollutant.
Attainment (A): Any area that meets the national primary or secondary ambient air quality standard for the pollutant.
Unclassifiable (U): Any area that cannot be classified on the basis of available information as meeting or not meeting the national primary or secondary ambient air quality standard for the pollutant.

Sources: ARB, 2010a; ARB 2012; EPA 2010a; BAAQMD 2010a.

Table 3.2-2: Health Effects of Criteria Air Pollutants

Pollutant	Acute[1] Health Effects			Chronic[2] Health Effects		
	Concentration	Averaging Time	Symptoms	Concentration	Averaging Time	Symptoms
Ozone	0.10 to 0.40 ppm	1–2 hours	Increased respiration and pulmonary resistance; cough, pain, shortness of breath	–	Long/lifetime	Permeability of respiratory epithelia, possibility of permanent lung impairment
	<= 0.12 ppm	6-8 hours	Lung inflammation			
Carbon monoxide (CO)	70–400 ppm	< 3 hours	Headache, dizziness, fatigue, nausea, vomiting	–	After acute exposure not resulting in death	Permanent heart and brain damage
	> 800 ppm	2–3 hours	Death			
Nitrogen dioxide (NO_2)	10–20 ppm	Short	Coughing, difficulty breathing, vomiting, headache, eye irritation	–	Severe intoxication after acute exposure	Chronic bronchitis, decreased lung function
	–	4–12 hours	Chemical pneumonitis or pulmonary edema; breathing abnormalities, cough, cyanosis, chest pain, rapid heartbeat			
	> 150 ppm	Hours	Death			
Respirable particulate matter (PM_{10}), Fine particulate matter ($PM_{2.5}$)	Dependent on particle size, composition, number	–	Breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, premature death	Dependent on particle size, composition, number	Long/lifetime	Alterations to the immune system, carcinogenesis

Notes: ppm = parts per million
1 “Acute” refers to effects of short-term exposures to criteria air pollutants, usually at fairly high concentrations.
2 “Chronic” refers to effects of long-term exposures to criteria air pollutants, usually at lower, ambient concentrations.
Sources: Godish, 2004; NHDES, 2007; USOTA, 1989; EPA 2010b; EPA, 2010c

ROG and NO_X are not themselves criteria pollutants (with the exception of NO_2), but are controlled through federal, State, regional, and local regulations, programs, and rules to limit ozone formation. For simplicity, ROG and NO_X will be referred to as criteria pollutants in this EIS, even though they are technically ozone precursors.

Ozone located in the upper atmosphere (stratosphere) shields the earth from harmful ultraviolet radiation that is emitted by the sun. However, ozone located in the lower atmosphere (troposphere) is a major health and environmental concern. Meteorology and terrain play a major role in ozone formation. Generally, low wind speeds and stagnant air coupled with warm temperatures and sunlight provide the optimum conditions for formation. As a result, summer is generally the peak ozone season. Because of the reaction time involved, peak ozone concentrations often occur downwind of the precursor emissions, making ozone a regional pollutant that can affect large areas. In general, ozone concentrations over or near urban and rural areas reflect an interplay of emissions of ozone precursors, transport, meteorology, and atmospheric chemistry (ARB, 2009a; Godish, 2004).

The adverse health effects associated with exposure to ozone pertain primarily to the respiratory system. Scientific evidence indicates that ambient levels of ozone affect not only sensitive receptors, such as asthmatics and children, but also healthy adults. Exposure to ambient levels of ozone ranging from 0.10 to 0.40 part per million (ppm) for 1 or 2 hours has been found to significantly alter lung functions by increasing respiratory rates and pulmonary resistance, decreasing tidal volumes, and impairing respiratory mechanics. Ambient levels of ozone above 0.12 ppm are linked to symptomatic responses that include such symptoms as throat dryness, chest tightness, headache, and nausea. In addition to the above adverse health effects, evidence also exists relating ozone exposure to an increase in the permeability of respiratory epithelia, which can inhibit the immune system's ability to defend against infection (Godish, 2004).

In 1997 EPA promulgated a new 8-hour standard in recognition of impacts resulting from daylong exposure. On April 15, 2004, EPA designated areas of the country that exceed the 8-hour standard ozone standard as nonattainment. The designations were in place as of February 2009. These designations have triggered new planning requirements for the 8-hour standard.

More stringent mobile-source emission standards and cleaner burning fuels have largely contributed to a decline in NO_X emissions in the past 30 years (ARB, 2009a). ROG emissions have been decreasing significantly for the last 30 years, because of more stringent motor vehicle standards and new rules for control of ROG from various industrial coating and solvent operations (ARB, 2009a). Consequently, peak 1-hour and 8-hour indicators have declined in the SFBAAB by nearly 18 percent during the last 20 years. The number of days when State and national standards are exceeded show a similar trend (ARB, 2009a).

Although the long-term trends indicate improving air quality, since 2000 the peak indicators have been relatively flat. This may be attributable to changes in the mix and reactivity of precursor emissions in the SFBAAB. Additionally, meteorology can cause ozone and ozone precursor emissions to be transported from one air basin to another. ARB has identified the SFBAAB as a transport contributor to the following six areas: the Sacramento region, the Mountain Counties Air Basin, the North Central Coast Air Basin, the North Coast Air Basin, the San Joaquin Valley Air Basin, and the South Central Coast Air Basin. To the extent that the Bay Area continues to reduce ozone precursor emissions, the transport impact on downwind areas should also decrease (ARB, 2009a).

Carbon Monoxide

CO is a colorless, odorless, and poisonous gas produced by incomplete combustion of carbon in fuels, primarily from mobile (transportation) sources, which composed 80 percent of the statewide CO emissions in 2008. The remaining 20 percent of CO is emitted primarily from wood-burning stoves, managed burning, and incineration (ARB, 2009a).

CO enters the bloodstream through the lungs by combining with hemoglobin, which normally supplies oxygen to the cells. However, CO combines with hemoglobin much more readily than oxygen does, resulting in a drastic reduction in the amount of oxygen available to the cells. Adverse health effects associated with exposure to CO include dizziness, headaches, fatigue, and at higher concentrations, death (EPA, 2010b; NHDES, 2007). CO exposure is especially harmful to individuals who suffer from cardiovascular and respiratory diseases (EPA, 2010c).

The highest CO concentrations are generally associated with cold, stagnant weather conditions that occur during the winter. In contrast to ozone, a regional pollutant, CO tends to cause localized problems, such as the formation of "hotspots" when large numbers of mobile sources idle at congested intersections.

On-road motor vehicles and other mobile sources are by far the largest contributors to CO emissions. As in other areas of the state, CO concentrations in the SFBAAB have declined substantially over the last 20 years. The peak 8-hour indicator value during 2007 is 32 percent of what it was during 1988 and neither the State nor the national standards have been exceeded in this area since 1991 (ARB, 2009a).

Nitrogen Dioxide

NO_2 is a brownish, highly reactive gas that is present in all urban environments. The major human-made sources of NO_2 are combustion devices, such as boilers, gas turbines, and mobile and stationary reciprocating internal-combustion engines. Combustion devices emit primarily nitric oxide (NO), which oxidizes in the atmosphere to form NO_2 (EPA, 2010b). The combined emissions of NO and NO_2 are referred to as NO_X, which are reported as equivalent NO_2. Because NO_2 is formed and depleted by reactions associated with photochemical smog (ozone), the NO_2 concentration in a particular geographical area may not be representative of the local NO_X emission sources. In California, NO_X is emitted primarily by mobile sources, which account for 86 percent of the total state NO_X emissions (ARB, 2009a).

Inhalation is the most common route of exposure to NO_2. Because NO_2 has relatively low solubility in water, the principal site of toxicity is in the lower respiratory tract. The severity of the adverse health effects depends primarily on the concentration inhaled rather than the duration of exposure. An individual may experience a variety of acute symptoms, including coughing, difficulty with breathing, vomiting, headache, and eye irritation, during or shortly after exposure (OEHHA, 2008:209–216). After a period of approximately 4–12 hours, an exposed individual may experience chemical pneumonitis or pulmonary edema with breathing abnormalities, cough, cyanosis, chest pain, and rapid heartbeat. Severe, symptomatic NO_2 intoxication after acute exposure has been linked on occasion with prolonged respiratory impairment, with such symptoms as chronic bronchitis and decreased lung functions (OEHHA, 2008).

As mentioned previously, more stringent mobile-source emission standards and cleaner burning fuels have largely contributed to a decline in NO_X emissions (ARB, 2009a). The SFBAAB has attained both the State and national

NO_2 standards for more than 20 years. During this time period, there have been no concentrations that exceeded the level of the State 1-hour or the national annual standard. Ambient concentrations continue to be well below the level of both standards. The peak 1-hour indicator has declined by 56 percent since 1988 and this downward trend is expected to continue (ARB, 2009a).

Particulate Matter

Respirable PM with an aerodynamic diameter of 10 microns or less is referred to as PM_{10}. The major fraction of PM_{10} by mass consists of coarse particulate matter emitted directly into the air, such as mechanically generated dust, soot, and smoke from mobile sources, stationary sources, and fires. $PM_{2.5}$ is subgroup of PM_{10} composed of finer particles that have an aerodynamic diameter of 2.5 microns or less, generally formed by secondary processes, such as condensation of combustion gases or transformation of ambient SO_2, NO_X, and ROG (EPA, 2010b).

The adverse health effects associated with PM_{10} depend on the specific composition of the particulate matter. For example, adverse health effects may be associated with adsorption of metals, polycyclic aromatic hydrocarbons, and other toxic substances onto fine PM ("piggybacking"), or with fine dust particles of silica or asbestos. Generally, adverse health effects associated with PM_{10} may result from both short-term and long-term exposure to elevated concentrations and may include breathing and respiratory symptoms, aggravation of existing respiratory and cardiovascular diseases, alterations to the immune system, carcinogenesis, and premature death (EPA 2010b). $PM_{2.5}$ poses an increased health risk because the particles can deposit deep in the lungs and contain substances that are particularly harmful to human health.

The largest sources of $PM_{2.5}$ and PM_{10} in San Francisco County are areawide sources, such as residential fuel combustion, construction and demolition, and road dust; other substantial sources of $PM_{2.5}$ and PM_{10} are ocean-going vessels (ARB, 2009b).

Direct emissions of PM_{10} have been increasing in the SFBAAB in the past 30 years, primarily from areawide sources such as paved road dust, which increases proportionally with vehicle miles traveled (ARB, 2010a). Direct emissions of $PM_{2.5}$ have been fairly stable over the same time period. Statewide programs aimed at reducing ozone and diesel PM will also help to reduce public exposure to both direct and secondary (formed in the atmosphere) PM. Additionally, measures adopted as part of Senate Bill 656 (which requires ARB and air districts to adopt and implement control measures to reduce $PM_{2.5}$ and PM_{10} from stationary, area, and mobile sources, and to make progress toward attainment of State and federal PM standards) will help in reducing public exposure to $PM_{2.5}$ in this region (ARB, 2009a).

State and national maximum 24-hour concentrations of PM_{10} have improved in the SFBAAB in the past 20 years. During the period for which data are available, the 3-year average of the statewide annual average decreased by 23 percent. Calculated exceedance days for the State 24-hour standard dropped from a high of 76 days during 1989 to 24 days during 2007. The national 24-hour standard was last exceeded in 1991 (ARB, 2009a).

National annual average $PM_{2.5}$ concentrations in the SFBAAB have decreased in the last 9 years. The 98th percentile of 24-hour $PM_{2.5}$ concentrations also declined during the last 9-year period. The statewide annual average concentration trend, however, remained relatively constant during the last 8 years, because of differences in State and national monitoring methods. Similar to PM_{10}, year-to-year changes in meteorology can mask the impacts of emission control programs (ARB, 2009a).

Local Air Basin Attainment Status

The determination of whether a region's air quality is healthful or unhealthful is made by comparing contaminant levels in ambient air samples to the CAAQS and NAAQS. Both EPA and ARB use ambient air quality monitoring data to designate areas according to their attainment status for criteria pollutants. The purpose of these designations is to identify the areas with air quality problems and initiate planning efforts for improvement. The three basic designation categories are attainment, nonattainment, and unclassified.

An *attainment* designation for an area signifies that pollutant concentrations did not exceed the established standard. In most cases, areas designated or redesignated as attainment must develop and implement maintenance plans, which are designed to assure continued compliance with the standard.

In contrast to attainment, a *nonattainment* designation indicates that a pollutant concentration has exceeded the established standard. Nonattainment may differ in severity. To identify the severity of the problem and the extent of planning and actions required to meet the standard, nonattainment areas are sometimes assigned a classification that is commensurate with the severity of their air quality problem (e.g., moderate, serious, severe, extreme).

Finally, an *unclassified* designation indicates that there are insufficient data for determining attainment or nonattainment. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment.

Because it does not meet the air quality standards for ozone, San Francisco County, as part of the larger SFBAAB, is designated a marginal nonattainment area for the federal 8-hour ozone standard, a nonattainment area for the State 8-hour ozone standard, and a "serious" nonattainment area for the state 1-hour ozone standard (Table 3.2-1).

The SFBAAB is in attainment for the State and federal CO standards, for the State 1-hour NO_2 standard, and for the federal annual arithmetic mean NO_2 standard; it is unclassifiable for the federal 1-hour NO_2 standard.

The SFBAAB is currently designated as nonattainment for the State $PM_{2.5}$ and PM_{10} standards; it is designated as unclassifiable for the federal PM_{10} 24-hour standard, in attainment for the federal $PM_{2.5}$ annual standard, and in nonattainment for the federal $PM_{2.5}$ 24-hour standard.

Existing Emissions of Criteria Pollutants

San Francisco County Criteria Pollutant Emissions Inventory

The emissions inventory for criteria air pollutants within San Francisco County for various source categories is shown in Table 3.2-3. Mobile sources are the largest contributor to emissions of ROG, CO, NO_X, and SO_X, accounting for approximately 54 percent, 96 percent, 94 percent, and 99 percent, respectively, of the total inventory. Areawide sources (e.g., solvent evaporation, residential fuel combustion, construction and road dust, fires) account for approximately 68 percent and 38 percent of San Francisco County's PM_{10} and $PM_{2.5}$ emissions, respectively.

Table 3.2-3: Summary of 2008 Estimated Emissions Inventory for Criteria Air Pollutants and Precursors (San Francisco County)

Source Type/Category	Estimated Annual Average Emissions (tons/day)					
	ROG	CO	NO_X	SO_X	PM_{10}	$PM_{2.5}$
Stationary Sources						
Fuel Combustion	0.18	1.75	2.67	0.09	0.30	0.30
Waste Disposal	0.03	0.00	0.00	0.00	0.00	0.00
Cleaning and Surface Coating	3.99	0.00	0.00	–	–	–
Petroleum Production and Marketing	1.43	–	0.00		–	–
Industrial Processes	0.73	0.00	0.01	0.00	0.35	0.21
Subtotal (Stationary Sources)	6.35	1.75	2.69	0.09	0.65	0.51
Areawide Sources						
Solvent Evaporation	8.30	–	–	–	–	–
Miscellaneous Processes	0.66	4.06	2.01	0.08	11.29	2.83
Subtotal (Areawide Sources)	8.97	4.06	2.01	0.08	11.29	2.83
Mobile Sources						
On-Road Motor Vehicles	8.74	81.27	14.95	0.07	0.69	0.47
Other Mobile Sources	9.43	60.40	59.24	14.88	3.87	3.65
Subtotal (Mobile Sources)	18.17	141.67	74.19	14.95	4.56	4.12
Total for San Francisco County	**33.49**	**147.48**	**78.89**	**15.12**	**16.50**	**7.45**

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter; $PM_{2.5}$ = fine particulate matter; ROG = reactive organic gases; SO_X = oxides of sulfur
Totals in table may not add exactly because of rounding.
Source: ARB, 2009b

San Francisco Bay Area Air Basin Monitoring Station Data

Criteria air pollutants are monitored at several monitoring stations within the SFBAAB. The monitoring station nearest the project sites for the Proposed Action is at 10 Arkansas Street in San Francisco. This monitoring station measures ozone, NO_2, CO, PM_{10}, $PM_{2.5}$, and toxics (including hexavalent chromium). In general, the ambient air-quality measurements from this station are representative of the air quality in the vicinity of the existing SFVAMC Fort Miley Campus and within the Mission Bay area. Table 3.2-4 summarizes the air quality data from the most recent 3 years for which data were available (2007–2009).

During this period, there were no measured violations of the State 1-hour or 8-hour ozone standards. The State CO and NO_2 standards were also not exceeded in any of the last 3 years. The State 24-hour PM_{10} standard and the national 24-hour $PM_{2.5}$ standard were exceeded on multiple days in 2007 only; however, 24-hour $PM_{2.5}$ data from the Arkansas Street station were incomplete or missing for 2008 and 2009.

Table 3.2-4: Summary of Annual Ambient Air Quality Data (2007–2009)[1]

	2009	2010	2011
Ozone			
Maximum concentration (1-hour/8-hour, ppm)	0.072/0.057	0.079/0.051	0.070/0.054
Number of days State standard exceeded (1-hour/8-hour)	0/0	0/0	0/0
Number of days national standard exceeded (8-hour)	0	0	0
Carbon Monoxide (CO)			
Maximum concentration (1-hour/8-hour, ppm)	4.3/2.86		
Number of days State standard exceeded (8-hour)	0		
Number of days national standard exceeded (1-hour/8-hour)	0/0		
Nitrogen Dioxide (NO_2)			
Maximum concentration (1-hour, ppm)	0.059		
Number of days State standard exceeded	0		
Annual average (ppm)	0.015		
Fine Particulate Matter ($PM_{2.5}$)			
Maximum concentration ($\mu g/m^3$) (National/California[2])	35.5/49.8	45.3/–	47.5/–
Number of days national standard exceeded	–	3.2	2.0
Annual average ($\mu g/m^3$) (National/California)	–/–	10.5/–	9.5/–
Respirable Particulate Matter (PM_{10})			
Maximum concentration ($\mu g/m^3$) (National/California[2])	35.3/36.0	38.6/39.7	43.7/45.6
Number of days standard exceeded (National/California)	0/0	0/–	0/0
Annual average ($\mu g/m^3$) (California)	18.6	–	19.5

Notes:
$\mu g/m^3$ = micrograms per cubic meter; ppm = parts per million; – = data not available
1 Measurements were recorded at the Arkansas Street monitoring station.
2 State and national statistics may differ for the following reasons: State statistics are based on California-approved samplers, whereas national statistics are based on samplers using federal reference or equivalent methods. State and national statistics may therefore be based on different samplers. State statistics are based on local conditions while national statistics are based on standard conditions. State criteria for ensuring that data are sufficiently complete for calculating valid annual averages are more stringent than the national criteria.
Sources: ARB 2012a, 2010b; EPA 2009

Existing Sources of Criteria Pollutants

As shown in Table 3.2-3, sources of criteria pollutants in San Francisco County and the project areas for the Proposed Action include area, stationary, and mobile sources. Mobile sources are the greatest contributors of CO, NOx, and $PM_{2.5}$ in San Francisco County, and contribute about half of the ROG emissions. Stationary and areawide sources are also substantial contributors of ROG emissions (from solvent cleaning, consumer products, and architectural coatings), while areawide and mobile sources are the greatest contributors of PM_{10} (from construction and demolition, paved road dust, and cooking) (ARB, 2009b).

Areawide Sources

The major areawide sources of ROG emissions in San Francisco County are solvent evaporation from consumer products and application of architectural coatings. Residential fuel combustion, construction and demolition, paved road dust, and cooking processes are the major areawide sources of PM in San Francisco County (ARB, 2009b).

Stationary Sources

San Francisco County

ARB and EPA databases were searched for permitted stationary sources of criteria pollutants, toxics, and odors within the vicinity of San Francisco (ARB, 2010d, 2010e; EPA, 2010a); the Bay Area Air Quality Management District (BAAQMD) also provided a summary of permitted stationary sources in San Francisco (BAAQMD, 2011b).

Most stationary sources of criteria pollutant emissions in San Francisco are minor sources, and include hospitals, small electrical producers and cogeneration facilities, and light commercial and industrial processes (i.e., wrecking/demolition, food processing with and without cogeneration) (ARB, 2010d, 2010e; EPA, 2009; BAAQMD, 2011b). Within the greater county area, the other noteworthy stationary source is San Francisco International Airport.

Existing SFVAMC Fort Miley Campus

Permitted stationary sources of criteria pollutants, HAPs (see subsequent section), and odors associated with the existing SFVAMC Fort Miley Campus are shown in Figure 3.2-1. There are no permitted stationary sources of criteria pollutants or toxics within 1,000 feet of the Campus, except the Campus itself.

The existing SFVAMC Fort Miley Campus is a stationary source of criteria pollutants. Emissions of criteria air pollutants associated with operation of the existing SFVAMC facilities were modeled using URBEMIS. The Campus currently generates about 1 ton/year of ROG, NO_X, and CO from natural gas combustion for heating as well as gasoline combustion associated with landscaping equipment.

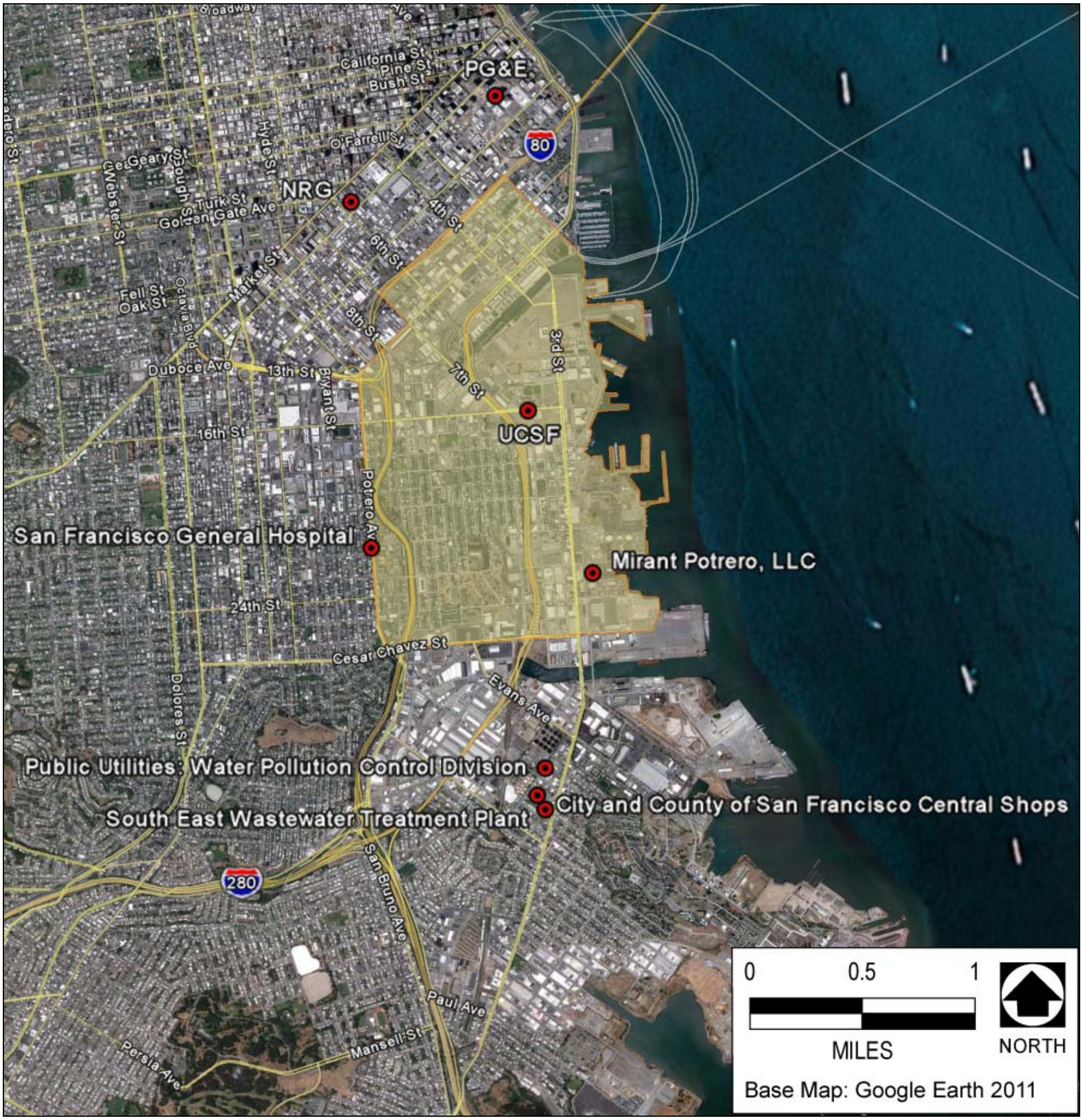
The SFVAMC Fort Miley Campus also contains permitted stationary combustion sources that may generate criteria pollutants and toxic air contaminants (TACs) (14 permitted sources, six of which are exempt; see Appendix B for details).

Potential New SFVAMC Mission Bay Campus

Permitted stationary sources of criteria pollutants, HAPs (see subsequent section), and odors associated with the Mission Bay area are shown in Figure 3.2-2. Numerous permitted sources operate within 1,000 feet of the Mission Bay area.

Source: BAAQMD 2011b

Figure 3.2-1: Permitted Sources of Criteria Pollutants, Hazardous Air Pollutants, and Odors near the Existing SFVAMC Fort Miley Campus



Source: BAAQMD 2011b

Figure 3.2-2: Permitted Sources of Criteria Pollutants, Hazardous Air Pollutants, and Odors near the Mission Bay Area

The only large sources of criteria pollutants (and several HAPs) in the general vicinity of the Mission Bay area are the City and County of San Francisco Central Shops and Mirant Potrero, LLC (electric services); smaller sources of criteria pollutants and HAPs in the area are Pacific Gas and Electric Company; NRG (electric and combined services); the San Francisco South East Wastewater Treatment Plant; the Water Pollution Control Division of the Public Utilities; the University of California, San Francisco; and San Francisco General Hospital (Figure 3.2-2). Odor sources in the vicinity of this area include the San Francisco South East Wastewater Treatment Plant (Figure 3.2-2).

Mobile Sources

San Francisco County

On-road and other mobile sources are the largest contributors of ROG, CO, and NO_X in San Francisco County. On-road sources consist of passenger vehicles, trucks, buses, and motorcycles, while off-road vehicles and other mobile sources consist of heavy-duty equipment, boats, aircraft, trains, recreational vehicles, and farm equipment.

The majority of NO_X emissions are attributable to mobile sources (94 percent). Within the mobile-source category, oceangoing vessels and commercial harbor craft contribute 57 percent of NO_X emissions, while on-road vehicles contribute 20 percent and off-road vehicles contribute 21 percent.

$PM_{2.5}$ from mobile sources is emitted primarily by oceangoing vessels, commercial harbor craft, and off-road equipment; the remainder of $PM_{2.5}$ emissions are generated mostly by area sources (residential fuel combustion, construction and demolition, paved road dust, and cooking).

Existing SFVAMC Fort Miley Campus

There are no major roadways near the existing SFVAMC Fort Miley Campus (i.e., more than 10,000 vehicles/day, per BAAQMD guidance). The sum of average daily traffic volumes in the area south of the current SFVAMC site (i.e., Clement Street) is approximately 1250 vehicles/day (CEHIB, 2011). Consequently, there is little to no potential for CO hotspots associated with the operation of the current SFVAMC facilities; daily traffic volumes near the hospital are low (see above), and the hospital generated about 4,369 vehicle trips per day in 2011 (~437 peak-hour trips), which is far below the number that could result in a CO hotspot at a nearby intersection (~44,000 per hour) (AECOM, 2012; BAAQMD, 2011a).

There are few heavy truck trips or other mobile sources of diesel PM associated with current operation of the SFVAMC; delivery truck trips to the SFVAMC (which could be medium-duty or heavy duty trucks) are approximately two per day (SFVAMC, 2011).

Potential New SFVAMC Mission Bay Campus

Freeways near the potential new SFVAMC Mission Bay Campus include Interstate 80 (I-80) and Interstate 280 (I-280) as well as U.S. Highway 101 (U.S. 101). Other major roads include Third Street, Fourth Street, Sixth Street, Seventh Street, Brannan Street, and Potrero Avenue, among others (CEHIB, 2011). Average daily traffic volumes on the freeways in the area are on the order of 50,000 vehicles/day on I-280, 100,000 vehicles/day on I-80, and 200,000 vehicles/day on U.S. 101 (Caltrans, 2009). Truck traffic near the junction of I-80 and U.S. 101 is about 2 percent of the annual average daily traffic (AADT). Near the junction of U.S. 101 and I-280, truck traffic is about 2.5 to 4 percent of the AADT, and near I-280 and Third Street, truck traffic is about 4.5 percent of the AADT (Caltrans, 2010).

Surface street traffic in the vicinity of the potential new SFVAMC Mission Bay Campus varies, but is high in the vicinity of Third Street and Brannan Street, on the order of 10,000–20,000 ADT (SFMTA, 2010).

The Caltrain station is also in the vicinity of the potential new SFVAMC Mission Bay Campus, at Fourth and King Streets. Trains are diesel-electric and volumes are about 100 trains per day on weekdays, about 30 per day on weekends (Caltrain, 2010). The Caltrain station is also served by numerous Muni buses (diesel, electric, and hybrid electric), as well as taxis and passenger cars for passenger drop-offs and pick-ups.

Properties, Effects, and Sources of Hazardous Air Pollutants

Air quality regulations also focus on localized HAPs, which are also called TACs. As with criteria pollutants, TACs may be emitted by stationary, area, or mobile sources; unlike criteria pollutants, TACs may also originate from indoor, noncombustion sources (e.g., building materials and consumer products like pesticides and cleaning solvents). Common stationary sources of TAC (and $PM_{2.5}$) emissions include gasoline stations, dry cleaners, and diesel backup generators, which are subject to local air district permit requirements. The other, often more significant, sources of TACs (and $PM_{2.5}$) emissions are motor vehicles on freeways, high-volume roadways, or other areas with high numbers of diesel vehicles such as distribution centers; off-road mobile sources include construction equipment, ships, and trains.

TACs can be separated into carcinogens and noncarcinogens based on the nature of the effects associated with exposure to the pollutant. For regulatory purposes, carcinogens are assumed to have no safe threshold below which health impacts would not occur and cancer risk is expressed as excess cancer cases per 1 million exposed individuals. Noncarcinogens differ in that there is generally assumed to be a safe level of exposure below which no negative health impact is believed to occur. These levels are determined on a pollutant-by-pollutant basis. Acute and chronic exposure to noncarcinogens is expressed in using a Hazard Index (HI), which is the ratio of expected exposure levels to acceptable health-acceptable exposure levels.

EPA and ARB have ongoing programs to identify and regulate TACs. Among the many substances identified as TACs are asbestos, lead, and diesel exhaust particulates (which contain hundreds of TACs). The regulation of TACs is generally through statutes and rules that require the use of the maximum or best available control technology (MACT or BACT) to limit TAC emissions.

MACT/BACT for asbestos and lead have been identified for many years and there are established rules and procedures to prevent dispersion and inhalation of these substances. Asbestos is a naturally occurring mineral used up until the mid-1980s in building materials for thermal and acoustical insulation and fire resistance until a partial ban by EPA in 1989. Lead, which has a NAAQS, was used in paint for housing up until 1978 when lead-based paint was banned by EPA for use in housing. Asbestos and lead, when disturbed during building demolition, can become airborne as inhalable health hazard pollutants and therefore require abatement before demolition.

Particulate exhaust emissions from diesel-fueled engines (diesel PM) were identified as a TAC by ARB in 1998. EPA has since developed an extensive list of mobile-source TACs for both evaporative and exhaust emissions for many types of fuels (EPA 2006a). The control of diesel PM emissions is currently an active regulatory area. Federal and State efforts to reduce diesel PM emissions have focused on the use of improved fuels, adding particulate filters to engines, and requiring the production of new-technology engines that emit fewer exhaust particulates.

Of the TACs for which data are available in California, diesel PM, benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene pose the greatest existing ambient risks (ARB, 2009a). Diesel PM poses the greatest health risk among these 10 TACs, comprising 79 percent of the 2007 statewide health risk (ARB, 2009a). Health risks associated with diesel PM are expected to drop by the year 2020 with implementation of EPA's Highway Diesel Rule as well as ARB's heavy-duty vehicle regulations and *Diesel Risk Reduction Plan* (ARB, 2009a).

Existing Sources of Hazardous Air Pollutants

San Francisco Bay Area Air Basin

Diesel PM emissions are estimated to be 4,151 tons/year in the SFBAAB, which constitutes approximately 12 percent of the diesel PM emissions in the state (ARB, 2009a). Based on receptor modeling techniques, ARB estimated health risks from diesel PM exposure to be 480 excess cancer cases per million people in the SFBAAB in the year 2000 (ARB, 2009a). Although the health risk is higher than the statewide average, it represents a 36 percent drop between 1990 and 2000 (ARB, 2009a). Overall, levels of most TACs have decreased since 1990 in the SFBAAB (ARB, 2009a). Several stationary sources of TACs exist in San Francisco.

Existing SFVAMC Fort Miley Campus

The only stationary source of TACs in the vicinity of the existing SFVAMC Fort Miley Campus is the Campus itself, and there are few truck trips associated with deliveries to and from the campus that would generate diesel PM.

Potential New SFVAMC Mission Bay Campus

Sources of TACs in the vicinity of the Mission Bay area are listed above and shown in Figure 3.2-2.

Odors

Odor is considered an air quality issue in the context of NEPA, both at the local level (e.g., odor from wastewater treatment) and at the regional level (e.g., smoke from wildfires).

Odors are generally regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache).

The ability to detect odors varies considerably among the population and is subjective. Some individuals have the ability to smell minute quantities of specific substances while others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; an odor that is offensive to one person (e.g., from a fast-food restaurant or bakery) may be perfectly acceptable to another. Unfamiliar odors may be more easily detected and likely to cause complaints than familiar ones. This is because of the phenomenon known as odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

Several examples of common land use types that generate substantial odors include wastewater treatment plants, landfills, composting/green waste facilities, recycling facilities, petroleum refineries, chemical manufacturing plants, painting/coating operations, rendering plants, and food packaging plants.

Existing SFVAMC Fort Miley Campus

ARB and EPA databases were searched by SIC code for permitted stationary sources that could also generate odors (ARB 2010d, 2010e; EPA, 2010a). There are no known major odor sources near the existing SFVAMC Fort Miley Campus.

In addition to searching permitted stationary-source databases, odor complaints in San Francisco from January 1, 2009, to March 1, 2011, were obtained from BAAQMD and reviewed (see Appendix B for details). There are no odor sources in the vicinity of the SFVAMC Fort Miley Campus with any recorded complaints in the past several years.

Potential New SFVAMC Mission Bay Campus

Potential major odor sources in the general Mission Bay area include the following:

1. San Francisco South East Treatment Plant, 1700 Jerrold Avenue (wastewater treatment)
2. Darling International, 429 Amador Street, Pier 92, Islais Creek (animal rendering)
3. Central Shops/City & County of San Francisco, 1800 Jerrold Avenue (solvent use)

Within the Mission Bay area, there are numerous potential odor sources, but none having five or more confirmed complaints in the past several years. There are several smaller odor sources in this area with more than five unconfirmed complaints on record in the past several years, including:

1. Ritual Coffee Roasters (1050 Howard Street)
2. S&S Auto Collision (538 Bryant Street)

Existing Sensitive Receptors

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. These people include children, the elderly, persons with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Structures that house these persons or places where they gather are defined as sensitive receptors, and include residences, schools, daycare centers, playgrounds, and health care facilities (including hospitals and nursing homes).

Residential areas are considered sensitive to air pollution, because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposures to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise may be short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Commercial and industrial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public.

Existing SFVAMC Fort Miley Campus

There are sensitive receptors (residences) within 50 feet of the southern property line of the existing SFVAMC Fort Miley Campus, and the Campus itself is a source of sensitive receptors.

Potential New SFVAMC Mission Bay Campus

In the vicinity of the Mission Bay area, there are numerous sensitive receptors, including hospitals, clinics, residences, an elementary school, and recreation centers.

3.2.2 Regulatory Framework

Air quality in the SFBAAB is regulated at the federal level by EPA, at the State level by ARB, and at the local level by BAAQMD. Each of these agencies develops rules, regulations, and policies to comply with applicable legislation. Although EPA regulations may not be superseded, both State and local regulations may be more stringent. Applicable regulations associated with emissions of criteria air pollutants, TACs, and odors are described in the following sections.

Clean Air Act and Clean Air Act Amendments

At the federal level, EPA has been charged with implementing national air quality programs. EPA's air quality mandates are drawn primarily from the federal CAA, which was enacted in 1970. The most recent major amendments made by Congress were in 1990.

The CAA required EPA to establish primary and secondary NAAQS (Table 3.2-1). The CAA also required each state to prepare an air quality control plan referred to as a state implementation plan (SIP). The federal Clean Air Act Amendments (CAAA) added requirements for states with nonattainment areas to revise their SIPs to incorporate additional control measures to reduce air pollution. The SIP is modified periodically to reflect the latest emissions inventories, planning documents, and rules and regulations of the air basins as reported by their jurisdictional agencies. EPA has responsibility for reviewing all SIPs to determine conformation to the mandates of the CAAA and determine whether implementation will achieve air quality goals. If EPA determines a SIP to be inadequate, a federal implementation plan (FIP) that imposes additional control measures may be prepared for the nonattainment area. Failure to submit an approvable SIP or to implement the plan within the mandated time frame may result in application of sanctions to transportation funding and stationary air pollution sources in the air basin.

Clean Air Act Amendments General Conformity Rule

In addition, general conformity requirements were adopted by Congress as part of the CAAA and were implemented by EPA regulations in the November 30, 1993 *Federal Register* (40 Code of Federal Regulations [CFR] Sections 6, 51, and 93: "Determining Conformity of General Federal Actions to State or Federal Implementation Plans; Final Rule"). General conformity requires that all federal actions conform to the SIP as approved or promulgated by EPA, by either determining that the action is exempt from the General Conformity Rule requirements, or subject to a formal conformity determination.

The purpose of the general conformity program is to ensure that actions taken by the federal government do not undermine state or local efforts to achieve and maintain NAAQS. Before a federal action is taken, it must be evaluated for conformity with the SIP. All reasonably foreseeable emissions, both direct and indirect, predicted to result from the action are taken into consideration and must be identified with respect to location and quantity. Direct emissions occur at the same time and place as the action. Indirect emissions are reasonably foreseeable emissions that may occur later in time and/or farther removed from the action; they are subject to conformity if the federal agency can practicably control them and maintain control through a continuing program responsibility. If it is found that the action would create emissions above *de minimis* threshold levels specified in EPA regulations, or if the activity is considered regionally significant because its emissions exceed 10 percent of an area's total emissions, the action cannot proceed unless mitigation measures are specified that would bring the project into conformance.

General conformity applies in both federal nonattainment and maintenance areas. Within these areas, it applies to any federal action not specifically exempted by the CAA or EPA regulations. General conformity does not apply to projects or actions that are covered by the transportation conformity rule. If a federal action falls under the general conformity rule, the federal agency responsible for the action is responsible for making the conformity determination. In some instances, a state will make the conformity determination under delegation from a federal agency. Private developers are not responsible for making a conformity determination, but can be directly affected by a determination.

The proposed LRDP would be implemented within the SFBAAB, which is a federal attainment/maintenance area for CO, and a nonattainment area for 8-hour ozone and 24-hour $PM_{2.5}$. Therefore, the General Conformity Rule is applicable for emissions of CO, ozone precursors (volatile organic compounds [VOC] and NO_X), and $PM_{2.5}$ from construction and operation of proposed projects in the SFBAAB. The applicable General Conformity *de minimis* thresholds and emissions inventory for the SFBAAB are shown in Table 3.2-5 for informational purposes; however, the final determination of general conformity with respect to the project will be determined as part of the record of decision.

Table 3.2-5: General Conformity *de Minimis* Thresholds for Projects in the San Francisco Bay Area Air Basin

Pollutant	Emission Threshold (tons/year)	SFBAAB 2005 Emissions Inventory (tons/day, tons/year[5])
CO	100[1]	2,080/759,200
NO_X	100[2]	518/189,070
VOC/ROG	50[2]	391/142,715
PM_{10}	-[3]	192/70,080
$PM_{2.5}$	100[4]	89/32,485

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; $PM_{2.5}$ = fine particulate matter; PM_{10} = respirable particulate matter; ROG = reactive organic gases; SFBAAB = San Francisco Bay Area Air Basin; VOC = volatile organic compound
1 Attainment/maintenance area for CO.
2 Marginal nonattainment area for 8-hour ozone precursors: NO_X and VOC.
3 SFBAAB is unclassifiable for PM_{10}.
4 Nonattainment area for $PM_{2.5}$ (EPA, 2006b).
5 Annual emissions based on 365 days per year, assuming average daily emissions.
Source: 40 CFR 93; BAAQMD, 2008

Title III of the Clean Air Act Amendments

EPA regulates TACs by requiring the use of the MACT and BACT to limit emissions from stationary sources; emission control strategies for area and mobile sources include generally available control technologies and reformulated fuels.

EPA has programs for identifying and regulating HAPs. Title III of the CAAA directed EPA to promulgate national emissions standards for HAPs (NESHAPs). The NESHAPs for major sources of HAPs may differ from those for area sources. Major sources are defined as stationary sources with potential to emit more than 10 tons per year (tpy) of any HAP or more than 25 tpy of any combination of HAPs; all other sources are considered area sources.

The CAAA called on EPA to promulgate emissions standards in two phases. In the first phase (1992–2000), EPA developed technology-based emissions standards designed to reduce emissions as much as feasible. These standards are generally referred to as requiring MACT. For area sources, the standards may be different, based on generally available control technology. In the second phase, EPA promulgated health risk–based emissions standards were deemed necessary to address risks remaining after implementation of the technology-based NESHAP standards.

Rule on Control of Hazardous Air Pollutants from Mobile Sources

In February 2007, EPA finalized a rule to reduce hazardous air pollutants from mobile sources (Control of Hazardous Air Pollutants from Mobile Sources, February 9, 2007). The rule limits the benzene content of gasoline and reduces toxic emissions from passenger vehicles and gas cans. EPA estimates that in 2030 this rule will reduce total emissions of mobile source air toxics by 330,000 tons and VOC emissions (precursors to ozone and $PM_{2.5}$) by more than 1 million tons.

Other recent and future milestones include the low-sulfur diesel fuel requirement, and tighter emissions standards for heavy-duty diesel trucks (2007) and off-road diesel equipment (2011) nationwide.

3.2.3 Environmental Consequences

Significance Criteria

A NEPA evaluation must consider the context and intensity of the environmental effects that would be caused by, or result from, the EIS Alternatives.

Criteria Pollutants

For evaluation of criteria pollutants, a NEPA air quality significance analysis differs from the General Conformity analysis in that all project emissions of criteria pollutants are considered; this would include attainment pollutants as well as nonattainment and maintenance pollutant emissions considered under General Conformity. Therefore, in the SFBAAB, attainment emissions of SO_2 and PM_{10} are considered for NEPA impact significance for air quality in addition to CO, VOCs, NO_X, and $PM_{2.5}$, which are required to be addressed under General Conformity.

An alternative would be considered to result in an adverse impact related to criteria pollutant emissions if it would:

- result in annual criteria pollutant emissions during construction or operation in excess of EPA General Conformity *de minimis* thresholds, as stated in Table 3.2-5 above.

Direct emissions would result from construction activities, area operational sources (i.e., natural gas combustion and landscaping fuel combustion), and mobile operational sources. Indirect area-source emissions of criteria pollutants resulting from energy use (electricity and water use) are too speculative to evaluate, as it is unknown what proportion of electricity consumed by the alternatives is produced in the SFBAAB. Additionally, criteria pollutant emissions resulting from permitted sources of electricity production in the SFBAAB are presumably already included in the regional emissions budget and covered under the current SIP.

Localized Carbon Monoxide

In addition to regional CO emissions, localized operational CO emissions can be of concern. Vehicle traffic emissions can cause localized CO impacts. Severe vehicle congestion at major signalized intersections can generate elevated CO levels in excess of NAAQS and/or CAAQS, called “hotspots,” that can be hazardous to human receptors adjacent to the intersection. Severe vehicle congestion is determined by level of service (LOS) analysis for roadways and intersections. Localized CO impacts are typically of concern at signalized intersections of unacceptable LOS.

The local air district, BAAQMD, has developed a screening approach that will be used to determine whether the alternatives could generate high enough traffic volumes to cause or contribute to a CO hotspot (BAAQMD, 2011a:3-3–3-4).

Thus, an alternative would be considered to result in an adverse impact related to localized CO concentrations if it would:

- not be consistent with an applicable congestion management program established by the county congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans;
- result in increased traffic volumes at affected intersections that total more than 44,000 vehicles per hour; or
- result in increased traffic volumes at affected intersections that total more than 24,000 vehicles per hour where vertical and/or horizontal mixing is substantially limited (e.g., tunnel, parking garage, bridge underpass, natural or urban street canyon, below-grade roadway).

Localized TAC and PM Emissions

The thresholds for localized TAC and $PM_{2.5}$ impacts resulting from construction or operational activities are identical. Operational activities include siting new stationary sources or permanent mobile sources (such as a distribution center) of TACs and $PM_{2.5}$, or the siting of receptors to existing or new stationary or mobile sources of TACs and $PM_{2.5}$.

The thresholds of significance for localized TAC and $PM_{2.5}$ emissions is based on concentrations that produce risks of cancer at great than 10 cases in a million, non-cancer health effects with HIs greater than 1, and an ambient $PM_{2.5}$ annual average increase greater than 0.3 microgram per square meter ($\mu g/m^3$). The zone of influence is considered to be within 1,000 feet of the property line of the source or receptor.

For the evaluation of localized TAC and $PM_{2.5}$ impacts from mobile construction sources, BAAQMD Screening Tables for Air Toxics Evaluation During Construction is used (BAAQMD, 2010b).

Thus, an alternative would be considered to result in an adverse impact if it would:

- result in exposure[1] of sensitive receptors to TAC and $PM_{2.5}$ in a manner that causes excess cancer risk levels of more than 100 in 1 million or a chronic HI greater than 10 for TACs; or
- result in exposure of sensitive receptors to TAC and $PM_{2.5}$ in a manner that exceeds 0.8 $\mu g/m^3$ annual average $PM_{2.5}$.

Odors

BAAQMD threshold guidance for odor impacts was used to determine the significance of impacts (BAAQMD, 2011a:2-5–2-6). Thus, an alternative would be considered to result in an adverse impact related to odors if it would:

- result in siting a new odor source or a new receptor within the applicable screening distance shown in Table 3.2-6; or
- result in siting a sensitive receptor near[2] an odor source with five or more confirmed complaints per year averaged over 3 years.

[1] The aggregate total of all past, present, and foreseeable future sources within a 1,000 foot radius (or beyond where appropriate) from the fence line of a source, or from the location of a receptor, plus the contribution from an alternative.

Table 3.2-6: Project Screening Trigger Levels for Potential Odor Sources

Type of Operation	Project Screening Distance (miles)
Wastewater Treatment Plant	2
Wastewater Pumping Facilities	1
Sanitary Landfill	2
Transfer Station	1
Composting Facility	1
Petroleum Refinery	2
Asphalt Batch Plant	2
Chemical Manufacturing	2
Fiberglass Manufacturing	1
Painting/Coating Operations	1
Rendering Plant	2
Coffee Roaster	1
Food Processing Facility	1
Confined Animal Facility/Feed Lot/Dairy	1
Metal Smelting Plant	2

Source BAAQMD, 2011a

Assessment Methods

Construction Emissions

Construction emissions of criteria pollutants were modeled using URBEMIS 2007 (URBEMIS), Version 9.2.4 computer program (Rimpo, 2008). The equipment-specific load factors have been adjusted by one-third, consistent with ARB's recently released off-road mobile-source emission inventory model (OFFROAD 2011) and as recommended by BAAQMD. Phasing information was provided by SFVAMC. Assumptions regarding construction equipment (type and number) to be used on-site were determined based on URBEMIS defaults and reviewed by SFVAMC to take into consideration on-site spacing restrictions that would affect equipment types and numbers that could operate simultaneously within the boundaries of the site.

There would be no indirect construction emissions of criteria pollutants outside of those associated with incidental electricity use during project construction; however, emissions associated with grid-based power would already be accounted for within SFBAAB air quality plans and the SIP (discussed previously).

It should be noted that proposed parking garages were analyzed for construction-related emissions only, because operational mobile-source emissions associated with vehicles using the garages are accounted for in the trip generation and emissions calculations for the other campus medical facilities. Stationary indirect operational

[2] "Near" refers to the screening distances shown in Table 3.2-6. Note that not all types of odor sources with complaint histories have recommended screening distances, in which case the maximum distance of 2 miles will be utilized to determine the significance of the impact.

emissions would be limited to security lighting, which would indirectly generate minimal criteria pollutants (which are not considered for the reasons mentioned above).

Health Risk Assessment

A health risk assessment (HRA) was performed to evaluate the potential sensitive receptor exposure to the incremental increase in TACs (represented by $PM_{2.5}$) emitted during phased construction activities associated with the proposed LRDP. The HRA was performed in accordance with the BAAQMD Toxic Evaluation Section's 2005 Staff Report (BAAQMD 2005a) and consistent with BAAQMD's *Risk Evaluation Procedure and Risk Management Policy* (BAAQMD 2000) as well as methodologies presented in the Cal/EPA Air Toxics Hot Spots Program Risk Assessment Guidelines, *The Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments* (Cal/EPA 2003) and *Technical Support Document for Exposure Assessment and Stochastic Analysis* (Cal/EPA 2000).

As part of this HRA, excess lifetime cancer risks and chronic noncancer HIs were estimated. The estimated excess lifetime cancer risks and chronic noncancer HIs were compared to the thresholds for significance for TACs in the BAAQMD CEQA Guidelines for a maximally exposed individual at an existing residential receptor (MEIR) and maximally exposed individual at an existing occupational worker receptor (MEIW).

Screening Assessment

BAAQMD Screening Tables for Air Toxics Evaluation during Construction were used to evaluate the minimum distance required between the project boundary and nearby sensitive receptors to ensure that cancer and noncancer risks associated with proposed construction activities would be less than significant. Based on the screening assessment, refined dispersion modeling was completed to more accurately determine health risks to nearby workers and residential receptors during construction-related activities.

Dispersion Modeling

Atmospheric modeling was performed to analyze potential localized impacts on ambient air quality and health risk impacts associated with the generation of $PM_{2.5}$ during construction activities. Air dispersion modeling requires consideration and selection of the following parameters, which are described briefly below:

- Selection of the dispersion model
- Selection of appropriate dispersion coefficients based on land use
- Preparation of meteorological data
- Evaluation of potential terrain considerations
- Selection of receptor locations
- Identification of the source-specific release parameters, operational schedule, and averaging time periods

Model Selection

EPA's Industrial Source Complex (ISCST3) model (Version 02035) was used to model $PM_{2.5}$ emission impacts during construction. ISCST3 was applied with the regulatory default options, the rural modeling option (dispersion coefficients), and 5 years (2004 to 2008) of hourly meteorological data obtained from BAAQMD for the Mission Bay meteorological station.

Meteorological Data

ISCST3 requires a sequential hourly record of dispersion meteorology representative of the region within which the proposed source would be located. For this analysis, the proposed sources are represented by area sources at the location of proposed construction and demolition. ISCST3 was applied with 5 years (2004 to 2008) of hourly meteorological data consisting of surface observations from the Mission Bay meteorological station in San Francisco. A wind rose of the 5 years of data is shown in Figure 3.2-3. The wind rose indicates that the predominant wind direction is west to west-southwest.

Terrain and Receptor Data Processing

An important consideration in an air dispersion modeling analysis is whether the terrain in the modeling area is simple or complex (i.e., terrain above the effective height of the emission point). Complex terrain can affect the results of a dispersion analysis involving point and volume sources, but does not affect the predicted results for area sources (EPA, 2004).

Terrain elevations were obtained from commercially available digital terrain elevations developed by the U.S. Geological Survey by using its National Elevation Dataset (NED). The NED data provide terrain elevations with 1-meter vertical resolution and 30-meter (1 arc-second) horizontal resolution based on a Universal Transverse Mercator (UTM) coordinate system. The U.S. Geological Survey specifies coordinates in North American Datum 83, UTM Zone 10. Lakes Environmental software was used to process the NED data and assign elevations to the receptor locations and sources. Electronic files containing these terrain elevations are included in Appendix A. Because the modeling area for this assessment contains complex terrain, complex terrain elevations were used in the air dispersion modeling for this HRA.

$PM_{2.5}$ concentrations were estimated for 1.8-meter high-grid receptors within a 1,000-foot radius from the project boundary, referred to as the “zone of influence” (Figure 3.2-4). Because of the nature of the health risk being evaluated (i.e. temporary construction health risks), the potential receptors were not limited to nearby residents, which would be typical of a health risk evaluation. In order to present a conservative analysis, all potential receptors, including park visitors and pedestrians, were considered. No receptors were placed within the project boundary. All coordinates for sources and receptors were specified in North American Datum 83, UTM Zone 10.

Operating Schedule, Source Parameters, and Emissions Summary

For this analysis, the operating schedule of the construction equipment is assumed to be 7 a.m. to 6 p.m., Monday through Friday. The area-source parameters used in the air dispersion model are summarized in Table 3.2-7.

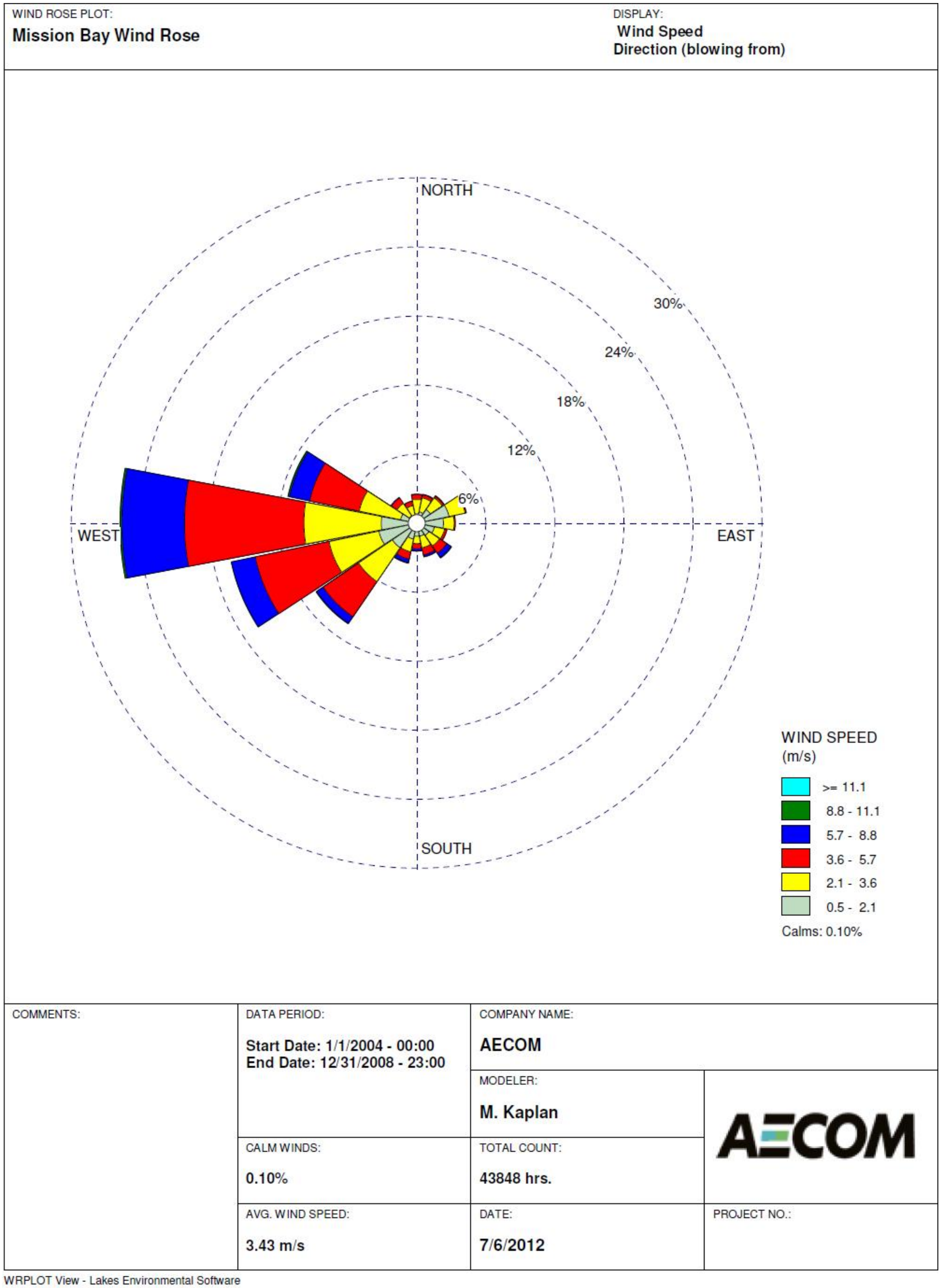


Figure 3.2-3: Wind Rose

Figure 3.2-4: Receptor Grid

Table 3.2-7: Area-Source Release Parameters for Construction Sources

Area No.	Building No. (Subphase No.)	Release Height (m)[1]	Area Dimension (square feet)
1	T17 (Subphase 1.1)	2.29	2,250.4
2	41 (Subphase 1.1)	4.57	6,290.3
3	9, 10, 11, 22 (Subphase 1.3)	3.81	21,539.7
4	5, 7 (Subphase 1.3)	3.73	20,601.6
5	13 (Subphase 1.3)	4.72	6,224.1
6	211 (Subphase 1.2)	7.62	31,427.9
7	Welcome Center (Subphase 1.4)	2.29	13,785.9
8	20, 23, 24 (Subphase 1.5, 2.3)	7.62	7,020.6
9	207 (Subphase 2.2)	6.86	3,860.3
10	D-Wing (Subphase 2.1)	2.29	5,024.1

Note:
[1] Each source was assumed to be half of the building height in meters.
Source: Data compiled by AECOM in 2012

Temporary construction activities would include operation of diesel-fueled nonroad equipment, resulting in emissions of $PM_{2.5}$, which is used as a surrogate for TACs. Emission rates for each area of construction activity were obtained from URBEMIS outputs, as described above. $PM_{2.5}$ emissions were calculated for the duration of each subphase, as presented in Table 3.2-8 below. The total $PM_{2.5}$ emissions were apportioned to the 10 construction/demolition areas on-site and modeled for the 9-, 30-, and 70-year periods for residential cancer risk and the 5-day-per-week, 40-year period for worker cancer risk. The worst-case year, 2013, was modeled using the Hotspots Analysis and Reporting Program (HARP) software package (Version 1.4f) developed by ARB for conducting health risk assessments (HRAs) in California under the Air Toxics "Hot Spots" Program.

Operational Area-Source Emissions

Direct operational area-source emissions of criteria pollutants were modeled using URBEMIS 2007, Version 9.2.4 computer program (Rimpo, 2008). Future direct area emissions (2020 and beyond) were estimated assuming that no change would occur to the intensity of area emissions (i.e., energy use per square foot of building space) of criteria pollutants from the current baseline. Direct emissions of criteria pollutants would decrease as building energy use (and associated gas use) decreases according to the strategy put forward in the *Department of Veterans Affairs Strategic Sustainability Performance Plan* (VA SSPP); however, the reductions in direct future criteria

pollutant emissions are too speculative to estimate, because the percentage reduction in natural gas use is unknown (see Section 3.7, "Greenhouse Gas Emissions," for further details).

Table 3.2-8: Source Emission Rate

Area Source No.	Building No. (Subphase No.)	Source $PM_{2.5}$ Emission Rate[1]	
		Tons per Project	Pounds per Project
1	T17 (Subphase 1.1)	0.002	4.8
2	41 (Subphase 1.1)	0.027	55.2
3	9, 10, 11, 22 (Subphase 1.3)	0.013	26.6
4	5, 7 (Subphase 1.3)	0.013	26.6
5	13 (Subphase 1.3)	0.013	26.6
6	211 (Subphase 1.2)	0.06	120
7	Welcome Center (Subphase 1.4)	0.11	220
8	20, 23, 24 (Subphase 1.5, 2.3)	0.07	140
9	207 (Subphase 2.2)	0.04	80
10	D-Wing (Subphase 2.1)	0.03	60

Notes:
Emission rates are associated with equipment exhaust and were obtained from URBEMIS output files as presented in Appendix B
Source: Modeled by AECOM in, 2012

For all alternatives, direct area emissions were calculated on the incremental difference in building square footage. For Alternatives 1 and 2, at the existing SFVAMC Fort Miley Campus, only the new buildings were considered for estimation of area emissions; for Alternative 2 off-site emissions (i.e., those occurring on the yet-to-be-determined potential new SFVAMC Mission Bay Campus), all new construction was considered for estimation of area emissions. Future direct area emissions were estimated based on square footage only, with no reduction in energy intensity. All modeled area emissions of criteria pollutants are direct emissions associated with on-site natural gas combustion (for heating) and gasoline combustion (landscaping equipment). There would be no indirect emissions, as criteria pollutants associated with building electricity use (grid-based power) would already be accounted for within SFBAAB air quality plans and the SIP, discussed previously.

Operational Mobile-Source Emissions

Operational mobile-source emissions of criteria pollutants were modeled using URBEMIS in conjunction with trip rates provided in the traffic study. For Alternatives 1 and 2, the incremental trip rate associated with new construction at the existing SFVAMC Fort Miley Campus was used to evaluate impacts. For the off-site portion of Alternative 2, trip rates associated with the new leasing and/or construction were used to evaluate impacts. For the No Action Alternative, future trip rates were assumed not to grow in the absence in hospital expansion (i.e., no new employee, patient, or delivery trips would occur in the absence of new buildings and services, including parking). Under the No Action Alternative, current hospital trips (2011) were used to evaluate future mobile-source emissions impacts in 2015 and 2023; however, future emission reductions associated with regulatory requirements in place as of 2007 were used to model future mobile-source emissions of criteria pollutants (EMFAC, 2007).

Alternative 1: SFVAMC Fort Miley Campus Buildout Alternative

Near-Term Projects

Construction

Criteria Air Pollutants

Alternative 1 near-term projects would involve construction of approximately 208,300 gross square feet of medical facilities at the existing SFVAMC Fort Miley Campus, including the square footage of a parking garage expansion. Alternative 1 would also involve the demolition of two existing structures on the site (Buildings T17 and 20). Thus, implementation of Alternative 1 near-term projects would result in 204,300 net new square feet on the Campus.

Foreseeable construction activities for Alternative 1 near-term projects would include site preparation (e.g., demolition and clearing/grubbing), trenching, grading and excavation, building construction, asphalt paving, and application of architectural coatings. Construction activities under Alternative 1 near-term projects would occur over a period of about 2 years and 8 months beginning in 2013 and continuing on until August 2015 (see Chapter 2.0, “Alternatives,” and Appendix B for anticipated near-term construction schedules and phasing at the existing SVAMC Fort Miley Campus). Several building retrofits would occur as part of implementation of Alternative 1 near-term projects. However, these retrofits would involve the use of hand tools and would not be anticipated to generate criteria air pollutants.

Construction activities typically require the use of concrete saws (demolition), heavy trucks, excavating and grading equipment (tractors, forklifts), concrete mixers, pavers, and other mobile and stationary construction equipment. Per SFVAMC guidance, no more than two pieces of equipment would be used simultaneously in a single demolition or construction subphase (except for paving, which would require a concrete mixer, a paver, and a roller); however, as many as five subphases would be requiring demolition and construction concurrently at the SFVAMC site in a single year, which would result in maximum annual emissions from approximately 10–15 pieces of equipment in the near term (Phase 1). The types of criteria pollutants generated by construction activities are typically NO_X and PM (dust and exhaust), although CO and ROG are also emitted during operation of fossil fuel–powered construction equipment.

Quantification of direct, construction-related emissions of criteria air pollutants was performed using URBEMIS, and the results are shown in Table 3.2-9, below.

As shown in Table 3.2-9, direct, near-term, construction-related emissions of criteria pollutants would be substantially less than the significance thresholds. The direct impact on regional air quality would be minor. No indirect impacts would occur.

Because they would be concurrent in the near term, construction-related and operational emissions were combined (Table 3.2-10) to determine the “worst-case” impacts of maximum annual construction emissions and operational emissions at buildout, even though buildout would only be partial for much of the near-term construction period.

Table 3.2-9: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Alternative 1 Near-Term Construction Activities at the SFVAMC Fort Miley Campus

Source	Emissions (tons/year)[1]				
	CO	NO_X	VOCs/ROG	PM_{10}	$PM_{2.5}$
Alternative 1 Near-Term Projects	2.4	2.4	2.0	2.5	0.6
de Minimis Threshold	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compounds

1 Details of annual construction emissions, including construction phasing, input parameters used in the modeling, and detailed modeling output, may be found in Appendix B.

Source: Modeling performed by AECOM in 2012.

Table 3.2-10: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Alternative 1 Near-Term Construction and Operational Activities at the SFVAMC Fort Miley Campus

Source	Emissions (tons/year)[1]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Alternative 1 Near-Term Projects					
Max Construction	2.4	2.4	2.0	2.5	0.6
Operation	2.6	0.5	0.6	0.5	0.1
Total	5.0	2.9	2.6	3.0	0.7
de Minimis Threshold	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compounds

1 Details of annual construction and operational emissions, including input parameters used in the modeling and detailed modeling output, may be found in Appendix B.

Source: Modeling performed by AECOM in 2012

As shown in Table 3.2-10, construction-related emissions of criteria air pollutants combined with the near-term operational emissions under Alternative 1 would be substantially less than the significance thresholds, and the direct impact on regional air quality would be minor. No indirect impacts would occur.

It should be noted that in an effort to reduce the effects of construction at VA facilities on the environment, VA requires that temporary environmental controls be employed during construction activities and enumerated as part of construction specifications (Section 015719). These controls typically include actions related to the control of air pollutant emissions. The following identifies language typical of Section 015719 that would be employed during implementation of Alternative 1's near-term construction activities:

Protection of Air Resources: Keep construction activities under surveillance, management, and control to minimize pollution of air resources. Burning is not permitted on the job site. Keep activities, equipment, processes, and work operated or performed, in strict accordance with State and federal emission and performance laws and standards. Maintain ambient air quality standards set by EPA for those construction operations and activities specified.

1. *Particulates:* Control dust particles, aerosols, and gaseous by-products from all construction activities, processing, and preparation of materials (such as from asphaltic batch plants) at all times, including weekends, holidays, and hours when work is not in progress.

2. *Particulates Control:* Maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates that would cause a hazard or a nuisance. Sprinklering, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators, or other methods are permitted to control particulates in the work area.

3. *Hydrocarbons and Carbon Monoxide:* Control monoxide emissions from equipment to federal and State allowable limits.

4. *Odors:* Control odors of construction activities and prevent obnoxious odors from occurring.

Application of these controls would provide further reduction of PM and odors, although the level of reduction achieved is dependent on the manner in which the controls are implemented. As such, for the purposes of this analysis, no quantifiable reduction of project-related emissions is assessed to account for implementation of VA Specifications Section 015719. Because these controls are required by VA, implementation of these controls is assumed as part of LRDP implementation.

With implementation of the abovementioned controls, the direct impact on regional air quality of construction-related emissions of criteria pollutants from Alternative 1 near-term projects would be minor. No indirect impacts would occur.

Localized TAC and PM Emissions

As discussed previously, the near-term projects under Alternative 1 would include demolition of five existing structures. It is assumed that asbestos and lead-based paint are present in each of the structures to be demolished, and would be abated per VA Specification Sections 028333.13, “Lead-Based Paint Removal and Disposal,” and 028213.41, “Asbestos Abatement for Total Demolition Projects.”

<u>Screening Assessment Results</u>

With respect to construction-related TAC emissions, BAAQMD has developed Screening Tables for Air Toxics Evaluation During Construction (BAAQMD, 2010c). The Screening Tables represent worst-case conditions (i.e., overlapping, on-site construction). Should sensitive receptors be located within applicable screening distances, additional evaluation of potential health risks would be warranted to determine the level of impact that would occur.

For a commercial project with 300,000–500,000 square feet of construction (Alternative 1 would require 410,293 square feet of construction near-term), the offset required for combined risk with age sensitivity factor ([ASF], to account for early life exposures) is 200 meters (656 feet) from the project fence line to ensure that a sensitive receptor would have a minor toxics impact. Because numerous sensitive receptors (residences) are located within 50 feet of the proposed project site fence line on the southern boundaries of the project site, the construction-related TAC impact does not pass the screen. Therefore, a refined HRA was completed to further evaluate potential health risks to sensitive receptors.

Health Risk Assessment Results

Cancer risk due to construction emissions was determined to be 1.33 in 1 million, 3.00 in 1 million, and 5.37 in 1 million for the 9-year, 30-year, and 70-year maximum cancer risks, respectively; maximum chronic HI was determined to be 0.012, as shown in Table 3.2-11. The annual average concentration for $PM_{2.5}$ is equal to 0.19, which is less than the 0.3 $\mu g/m^3$ threshold.

Table 3.2-11: Summary of Maximum Impacts for Construction

Receptor Type		9-year Maximum Cancer Risk (per million)	30-year Maximum Cancer Risk (per million)	70-year Maximum Cancer Risk (per million)	Maximum Chronic HI	Annual Average $PM_{2.5}$ Conc. ($\mu g/m^3$)
MEIR[2]	Adult	0.90	3.00	5.37	0.012	0.19
	Child	1.33	--	--	0.012	
MEIW[3]		--	1.94	--	0.012	
Significance Threshold		10	10	10	1	0.3
Exceed Threshold (Y/N)?		N	N	N	N	N

Notes:
$\mu g/m^3$ = micrograms per cubic meter; HI = Hazard Index; MEIR: Maximally exposed individual at an existing residential receptor; 70-year adult exposure scenario and 9-year child exposure scenario for cancer risk; MEIW: Maximally exposed individual at an existing occupational worker receptor; 40-year adult worker exposure scenario; $PM_{2.5}$ = fine particulate matter
Source: Data compiled by AECOM in 2012

As presented in Table 3.2-11, maximum health risk impacts for both workers and residential receptors would not exceed 10 in 1 million. In addition, annual average concentrations for $PM_{2.5}$ would not exceed the threshold. Therefore, TAC and $PM_{2.5}$ emissions generated during construction would result in a minor direct impact with respect to health risks. No indirect impacts would occur.

Odors

Construction activities associated with the near-term components of Alternative 1 could result in odors (i.e., diesel exhaust from equipment). These odors would be temporary, would occur during business hours during the construction period, and would disperse quickly given the wind in the area. Therefore, potential direct odor impacts during construction would be minor. No indirect impacts would occur.

Operation

Criteria Air Pollutants

Near-term area- and mobile-source emissions were modeled using URBEMIS and the results are summarized in Table 3.2-12, below.

Table 3.2-12: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Alternative 1 Near-Term Operational Activities at the SFVAMC Fort Miley Campus

Source	Emissions (tons/year)[1]				
	CO	**NO_X**	**VOC/ROG**	**PM_{10}**	**$PM_{2.5}$**
Alternative 1 Near-Term Projects					
Operation	2.6	0.5	0.6	0.5	0.1
de Minimis Threshold	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compounds
1 Details of annual construction and operational emissions, including input parameters used in the modeling and detailed modeling output, may be found in Appendix B.
Source: Modeling performed by AECOM in 2012

As shown in Table 3.2-12, near-term operational emissions of criteria pollutants would be substantially lower than the *de minimis* thresholds. Therefore, the direct impact on regional air quality of operational emissions of criteria pollutants under Alternative 1 near-term projects would be minor. No indirect impacts would occur.

Localized CO Emissions

Implementation of Alternative 1 near-term projects would not increase near-term (2020) traffic volumes in the vicinity of the existing SFVAMC Fort Miley Campus to 44,000 vehicles per hour (the CO hotspot screening level that has been recommended by BAAQMD and that evaluates a project's relative level of compliance with NAAQS and CAAQS), and there are no horizontal or vertical restrictions in the area that would trap CO and limit mixing. See the traffic study included as Appendix E of this EIS for detailed information regarding existing and future intersection volumes in the project vicinity. Therefore, receptors in the vicinity of the project site would not be directly adversely affected by operation of Alternative 1 near-term projects. Impacts would be minor. No indirect impacts would occur.

Localized TAC and PM Emissions

Buildout of the existing SFVAMC Fort Miley Campus under Alternative 1 near-term projects involve expansion of the existing medical facility, and medical facilities by nature are considered to be sensitive land uses. The Campus is not located near any high-volume roadways (i.e., 100,000 vehicles per day within a 150-meter radius of the hospital site), and daily delivery truck trips to the Campus average approximately two per day, as discussed previously. This number could potentially increase in the near term relative to current conditions, but not substantially. Therefore, localized emissions from both on-site and off-site mobile sources would not directly adversely affect sensitive receptors either on-site (patients) or off-site (residents).

No permitted sources of TACs operate near the existing SFVAMC Fort Miley Campus, outside of the Campus itself (Figure 3.2-1). It is unknown at the time of writing this EIS whether Alternative 1 near-term projects would include any new permitted sources of TACs such as incinerators, fume hoods, sterilizers, or backup diesel generators. Thus, Alternative 1 near-term projects could potentially include one or more of the above-mentioned sources of TACs and/or $PM_{2.5}$, but such a source would require a permit and best available control technology for toxics (T-BACT) to ensure that the patients and the neighboring community would not be adversely affected. Therefore, operational TAC and $PM_{2.5}$ emissions from stationary sources would not adversely affect sensitive receptors. Direct impacts would be minor. No indirect impacts would occur.

Odors

As described previously, the sensitive land uses in the vicinity of the existing SFVAMC Fort Miley Campus include residences and the hospital itself. As described above in Section 3.2.1, “Affected Environment,” no complaints about odors were recorded during the years 2009–2011 for the area surrounding the existing SFVAMC Fort Miley Campus. SFVAMC would house additional sensitive receptors under Alternative 1 near-term projects; however, major odor sources are not anticipated to be permitted on the Campus or within the nearby residential community. Major and minor odor sources, such as sewer lift stations or fume hoods (cooking or chemical/sterilizer use), would be subject to permits and odor control measures. Other minor sources such as garbage dumpsters on the Campus or within the nearby neighborhood could expose on-site and off-site sensitive receptor to odors; however, these types of odor exposures are unlikely given the windy atmospheric conditions in the area (see Section 3.2.1, “Affected Environment”). The project would develop a plan to ensure that on-site minor odor sources, such as garbage dumpsters, would not adversely affect on-site or off-site sensitive receptors. Solid and hazardous waste handling would comply with existing local, State, and federal laws, including the use of plastic waste bags and waste containers with fitted covers. Waste from the proposed uses would be collected at least once per week to avoid odor problems. With implementation of this BMP, this impact would be minor.

Long-Term Projects

Construction

Criteria Air Pollutants

Alternative 1 long-term projects would involve the construction of approximately 247,300 gross square feet of medical, research, and administrative facilities at the existing SFVAMC Fort Miley Campus. They would also involve the demolition of several existing structures on the site (Buildings 12, 18, 21, and T-23) as well as the removal of Building 14. Thus, implementation of Alternative 1 long-term projects would result in 189,700 net new square feet on the Campus.

Construction activities associated with Alternative 1 long-term projects would be similar to those discussed above for Alternative 1 near-term projects. Construction activities under Alternative 1 long-term projects would occur over a period of 7 years and 7 months, from late 2015 to 2023. Quantification of construction-related emissions of criteria air pollutants was performed using URBEMIS, and the results are shown in Table 3.2-13, below.

Table 3.2-13: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Alternative 1 Long-Term Construction Activities at the SFVAMC Fort Miley Campus

Source	Emissions (tons/year)[1]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Alternative 1 Long-Term Projects	1.4	1.2	1.4	2.8	0.6
de Minimis Threshold	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compounds
[1] Details of annual construction emissions, including input parameters used in the modeling and detailed modeling output, may be found in Appendix B.
Source: Modeling performed by AECOM in 2012

As shown in Table 3.2-13, direct, long-term construction-related impacts would be minor. No indirect impacts would occur.

Because construction activities and operation of long-term components of Alternative 1 would occur concurrently in the long term, construction and operational emissions were combined (Table 3.2-14) to determine the "worst-case" impacts of maximum annual construction emissions and operational emissions at buildout, even though buildout would only be partial for much of the long-term construction period. It should be noted that, with respect to the emission levels shown below in Table 3.2-14, construction emissions only include long-term emissions, but operational emissions include both near-term and long-term operational emissions, as both would occur in the long term.

Table 3.2-14: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Alternative 1 Long-Term Construction and Operational Activities at the SFVAMC Fort Miley Campus

Source	Emissions (tons/year)[1]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Alternative 1 Long-Term Projects					
Max Construction	1.4	1.2	1.4	2.8	0.6
Operation	15.8	1.9	1.7	5.0	0.9
Total	**17.2**	**3.1**	**3.1**	**7.8**	**1.5**
de Minimis Threshold	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compounds
[1] Details of annual construction emissions, including input parameters used in the modeling and detailed modeling output, may be found in Appendix B.
Source: Modeling performed by AECOM in 2012

As shown in Table 3.2-14, construction-related emissions of criteria air pollutants combined with the near- and long-term operational emissions under Alternative 1 would be substantially less than the significance thresholds. The direct impact on regional air quality would be minor. No indirect impacts would occur.

Localized TAC and PM Emissions

As described previously, BAAQMD has developed Screening Tables for Air Toxics Evaluation during Construction (BAAQMD, 2010c). Sensitive receptors located within applicable screening distances could result in increased health risks during construction for those residences. Depending on the intensity of construction, impacts could be considered adverse.

Screening Assessment Results

For a commercial project with 300,000–500,000 square feet of construction (Alternative 1 would require about 527,000 square feet of long-term construction), the offset required for combined risk with ASF incorporated is 200 meters (656 feet) from the project activity to ensure that a sensitive receptor would have no more than a minor toxics impact. Because numerous sensitive receptors (residences) are located within 200 meters of activities associated with Subphases 2.1 through 2.3, the construction-related TAC impact does not pass the screen.

Health Risk Assessment Results

The potential health risk impacts associated with long-term projects (Subphase 2.1 through 2.3) have been evaluated cumulatively with the impacts of the short-term projects. The health risk impacts associated with construction-related activities are presented in Table 3.2-11. As presented in Table 3.2-11, chronic and cancer health risks would not exceed the thresholds; annual average concentration of $PM_{2.5}$ would also not exceed the threshold. Therefore, direct impacts would be minor. No indirect impacts would occur.

Odors

Alternative 1 long-term projects could result in odors related to construction (i.e., diesel exhaust from equipment). These odors would be temporary, would occur during business hours during the construction period, and would disperse quickly given the wind in the area. Therefore, potential direct odor impacts during construction would be minor. No indirect impacts would occur.

Operation

Criteria Air Pollutants

Long-term area- and mobile-source emissions (both short-term and long-term operational emissions) were modeled using URBEMIS and the results are summarized in Table 3.2-15, below. Both incremental (long-term) and combined (short-term and long-term) operational emissions are shown, as both would occur simultaneously in the long term (post–August 2015).

Table 3.2-15: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Alternative 1 Long-Term Operational Activities at the SFVAMC Fort Miley Campus

Source	Emissions (tons/year)[1]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Alternative 1 Long-Term Projects					
Long-Term Operation	15.8	1.9	1.7	5.0	0.9
Near- and Long-Term Operation	18.4	2.4	2.3	5.5	1.0
de Minimis Threshold	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compounds

1 Details of annual construction emissions, including input parameters used in the modeling and detailed modeling output, may be found in Appendix B.

Source: Modeling performed by AECOM in 2012

As shown in Table 3.2-15, direct, long-term operational emissions of criteria pollutants (incremental and combined) would be substantially lower than the *de minimis* thresholds. Therefore, the direct impact on regional air quality of operational emissions of criteria pollutants under Alternative 1 long-term projects would be minor. No indirect impacts would occur.

Localized CO Emissions

Implementation of the incremental long-term components of Alternative 1 or the combined short-term and long-term components of Alternative 1 would not increase long-term (2023) traffic volumes in the vicinity of the existing SFVAMC Fort Miley Campus to 44,000 vehicles per hour (the CO hotspot screening level recommended by BAAQMD), and there are no horizontal or vertical restrictions in the area that would trap CO and limit mixing. Therefore, receptors in the project vicinity would not be directly adversely affected by operation of the long-term components of Alternative 1. The direct impacts would be minor. No indirect impacts would occur.

Localized TAC and PM Emissions

Alternative 1 long-term projects would not include residential uses, but medical centers are considered to be sensitive land uses. The existing SFVAMC Fort Miley Campus is not located near any high-volume roadways (i.e., 100,000 vehicles per day within a 150-meter radius of the hospital site), and daily delivery truck trips to the Campus average approximately two per day as discussed previously. This number could potentially increase in the long term relative to current conditions, but not substantially. Therefore, localized emissions from both on-site and off-site mobile operations would not directly adversely affect sensitive receptors either on-site (patients) or off-site (residents). The impact would be minor.

No permitted sources of TACs operate near vicinity the existing SFVAMC Fort Miley Campus, outside of the Campus itself (Figure 3.2-1). It is unknown at the time of writing this EIS whether Alternative 1 would include any new permitted sources of TACs such as incinerators, fume hoods, sterilizers, or backup diesel generators.

Alternative 1 long-term projects could potentially include one or more of the above-mentioned sources of TACs and/or $PM_{2.5}$, but such a source would require a permit and T-BACT to ensure that the patients and the neighboring community would not be adversely affected. Therefore, the operational impacts of stationary-source TAC and $PM_{2.5}$ emissions would not adversely affect sensitive receptors. The direct impact would be minor. No indirect impacts would occur.

Odors

Odor impacts of Alternative 1 long-term project operation would be identical to those of Alternative 1 near-term project operation. It is not anticipated that additional odor source types would occur in the long term, although numbers may increase to some degree. However, with implementation of the BMP described above under the near-term operational impacts of Alternative 1, the impact of direct, on-site odors would be minor. No indirect impacts would occur.

Alternative 2: SFVAMC Fort Miley Campus Plus Mission Bay Campus Alternative

Near-Term Projects

Alternative 2 near-term projects (both construction and operation) would be the same as Alternative 1 near-term projects (see Tables 2-1 and 2-2 and Figures 2-1 and 2-2). Therefore, the impacts of Alternative 2 near-term projects would be the same as the impacts of Alternative 1 near-term projects. These impacts would be minor.

Long-Term Projects

Alternative 2 long-term projects (both construction and operation) located at the SFVAMC Fort Miley Campus would be the same as Alternative 1 long-term projects, except that the ambulatory care center would be located at the potential new SFVAMC Mission Bay Campus under Alternative 2 (see Tables 2-1 and 2-2 and Figures 2-1 and 2-2). Therefore, the impacts of Alternative 2 long-term projects at the SFVAMC Fort Miley Campus would be the same as or less than the impacts of Alternative 1 long-term projects.

Alternative 2 long-term projects at the potential new SFVAMC Mission Bay Campus would primarily involve development of 620,000 gross square feet of new construction including an ambulatory care clinic, research space, and two parking structures at the potential new Campus. This alternative would include construction of new facilities on a footprint of approximately 3.56 acres. The impact discussion below focuses primarily on the impacts at the potential new SFVAMC Mission Bay Campus from construction and operation of the ambulatory care center, research building, and associated parking structures proposed as part of Alternative 2, Phase 2.

Construction

Criteria Air Pollutants

Quantification of construction-related emissions of criteria air pollutants was performed using URBEMIS. As shown in Table 3.2-16, direct long-term construction-related emissions of criteria pollutant would be substantially less than the established significance thresholds. Thus, the direct impact on regional air quality would be minor. No indirect impacts would occur.

Table 3.2-16: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Alternative 2 Long-Term Construction Activities

Source	Emissions (tons/year)[1]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Alternative 2 Long-Term Projects					
Construction at Existing Fort Miley Campus[2]	1.0	1.2	1.1	1.6	0.4
Construction at Potential New Mission Bay Campus[2]	1.7	1.1	2.3	2.3	0.5
Maximum Construction	*1.7*	*1.2*	*2.3*	*2.3*	*0.5*
de Minimis Threshold	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compounds

1 Details of annual construction emissions, including construction phasing, input parameters used in the modeling, and detailed modeling output, may be found in Appendix B.

2 Construction assumptions include demolition of 350,000 square feet of existing structures at the potential new SFVAMC Mission Bay Campus. This assumption was made based on the current level of development in the Mission Bay area and assumed that the square footage of structures to be demolished would be equivalent to 70 percent of the total square footage of the potential new Campus.

Source: Modeling performed by AECOM in 2012

Because they would be concurrent in the long term, construction-related and operational emissions were combined (Table 3.2-17) to determine the "worst-case" impacts of maximum annual construction emissions and operational emissions at buildout, even though buildout would only be partial for much of the long-term construction period.

As shown in Table 3.2-17, construction-related emissions of criteria air pollutants combined with the long-term operational emissions under Alternative 2 would be substantially less than the significance thresholds, and thus, the direct impact on regional air quality would be minor. No indirect impacts would occur.

Localized TAC and PM Emissions

As described previously, BAAQMD has developed Screening Tables for Air Toxics Evaluation During Construction (BAAQMD, 2010c). Sensitive receptors located within applicable screening distances could result in increased health risks during construction for those residents. Depending on the intensity of construction, impacts could be considered adverse.

For a commercial project with 500,000 to 1,000,000 square feet of construction (construction of Alternative 2 long-term projects would require about 620,000 square feet of construction including parking structures), the offset required for combined risk with ASF incorporated is 300 meters (984 feet) from the project fence line to ensure that a sensitive receptor would have a minor toxics impact.

Prolonged construction from 2024 to 2027 and associated TAC emissions could affect potential on-site and off-site sensitive receptors. Because the exact location of a proposed new campus within the Mission Bay area is unknown at this time, it would be speculative to predict the impacts of TAC and PM emissions at the numerous

Table 3.2-17: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Alternative 2 Long-Term Construction and Operational Activities

Source	Emissions (tons/year)[1]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Alternative 2 Long-Term Projects					
Max Construction[2]	1.7	1.2	2.3	2.3	0.5
Operations at Existing Fort Miley Campus	4.4	0.6	0.5	1.4	0.3
Operations at Potential New Mission Bay Campus	22.0	3.1	3.0	6.9	1.3
Total	**28.1**	**4.9**	**5.8**	**10.6**	**2.1**
de Minimis Threshold	100	100	50	-	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compounds

1 Details of annual construction emissions, including construction phasing, input parameters used in the modeling, and detailed modeling output, may be found in Appendix B.

2 Construction assumptions include demolition of 350,000 square feet of existing structures at the potential new SFVAMC Mission Bay Campus. This assumption was made based on the current level of development in the Mission Bay area and assumed that the square footage of structures to be demolished would be equivalent to 70 percent of the total square footage of the potential new Campus.

Source: Modeling performed by AECOM in 2012

on-site and off-site sensitive land uses in the Mission Bay area. Although the maximum annual construction-related exhaust[3] emissions of $PM_{2.5}$ (a proxy for diesel PM) are relatively small over the long term from 2024 to 2027 (1.7 tpy maximum), it is unknown whether TAC thresholds for carcinogens and noncarcinogens would be exceeded. Because TAC exposures could occur at nearby sensitive receptors during the 10 years of project construction, TAC exposure from construction activities could result in potentially adverse air quality impacts, and additional construction mitigation/abatement measures would be required to be incorporated into Alternative 2.

The windy atmospheric conditions in the area (see Section 3.2.1, "Affected Environment"), the limited exposure duration for carcinogenicity (10 years of construction out of a lifetime exposure of 70 years [OEHHA, 2011]), and implementation of future control technologies required under both State and federal programs (see "Properties, Effects, and Sources of Hazardous Air Pollutants") would reduce the direct impacts of TAC and PM emissions on sensitive receptors. It should be noted that the level of construction of long-term projects under Alternative 2 would be less than contemplated under Alternative 1. As such, the direct impact related to potential health risks at the existing SFVAMC Fort Miley Campus during construction of long-term projects would be minor. No indirect impacts would occur. However, because of the numerous on-site and off-site sensitive receptors that could be located in the vicinity of the potential new Mission Bay Campus, it is unknown whether the impacts would be reduced to a minor level. Therefore, this direct impact would be adverse. No indirect impacts would occur.

3 Exhaust emissions of PM are always lower than total PM emissions (dust and exhaust), and may be found in Appendix C.

Odors

Alternative 2 long-term projects could result in odors related to construction (i.e. diesel exhaust from equipment). These odors would be temporary, would occur during business hours during the construction period, and would disperse quickly given the wind in the area. Therefore, potential direct odor impacts during construction would be minor. No indirect impacts would occur.

Operation

Criteria Air Pollutants

Alternative 2 long-term area- and mobile-source emissions were modeled using URBEMIS, and the results are summarized in Table 3.2-18, below. Criteria pollutant emissions for Alternative 2 long-term projects would be lower than the *de minimis* thresholds, and the direct air quality impact from construction and operation of Alternative 2 would be minor. No indirect impacts would occur.

Table 3.2-18: Summary of Modeled Maximum Annual Emissions of Criteria Air Pollutants and Precursors Associated with Alternative 2 Long-Term Operational Activities

Source	Emissions (tons/year)[1]				
	CO	NO_X	VOC/ROG	PM_{10}	$PM_{2.5}$
Alternative 2 Long-Term Projects					
Long-Term Operations at Existing Fort Miley Campus	4.4	0.6	0.5	1.4	0.3
Long-Term Operations at Potential New Mission Bay Campus	22.0	3.1	3.0	6.9	1.3
Near- and Long-Term Operation	29.0	4.2	4.1	8.8	1.7
de Minimis Threshold	100	100	50	–	100

Notes:
CO = carbon monoxide; NO_X = oxides of nitrogen; PM_{10} = respirable particulate matter with an aerodynamic diameter of 10 micrometers or less; $PM_{2.5}$ = fine particulate matter with an aerodynamic diameter of 2.5 micrometers or less; ROG = reactive organic gases; VOC = volatile organic compounds
[1] Details of annual construction emissions, including input parameters used in the modeling and detailed modeling output, may be found in Appendix B.
Source: Modeling performed by AECOM in 2012

Localized CO Emissions

The operation of the potential new SFVAMC Mission Bay Campus is unlikely to create an adverse impact on localized CO emissions and existing CO concentrations at the site, as it would only generate an additional 3,150 vehicle trips per day (assumes that 315 p.m. peak-hour vehicle trips is representative of 10 percent of average daily vehicle trips; see the project traffic study located in Appendix E for more detailed information regarding trip generation).

Within the Mission Bay area, there are numerous high-volume roadways as well as the Caltrain station, as described in Section 3.2.1, “Affected Environment.” The exact location of the potential new SFVAMC Mission

Bay Campus is unknown at the time of writing this EIS, but it is possible that operation of the potential new Campus could expose potential on-site sensitive receptors to an existing CO hotspot. This direct impact would be adverse. No indirect impacts would occur.

Localized TAC and PM Emissions

Within the Mission Bay area, there are several stationary sources, high-volume roadways, and the Caltrain station, as described in Section 3.2.1, "Affected Environment." Additionally, the new medical facilities could include permitted TAC sources. The exact location of the potential new SFVAMC Mission Bay Campus is unknown at the time of writing this EIS, but it is possible that operation of the potential new Campus could expose potential on-site sensitive receptors to existing localized TAC emissions and expose potential on- and off-site sensitive receptors to permitted sources associated with the potential new Campus facilities. This direct impact would be adverse. No indirect impacts would occur.

Odors

Within the Mission Bay area, there are numerous potential odor sources, but none have had five or more confirmed complaints in the past several years. However, the possibility exists that complaints could occur if the project were to locate new sensitive receptors near odor sources that were remotely located in the past.

The facilities that could potentially emit odors on or near the vicinity of the potential new SFVAMC Mission Bay Campus (within the screening distances presented in Table 3.2-6) include the following:

1. San Francisco South East Treatment Plant, 1700 Jerrold Avenue (wastewater treatment)
2. Darling International, 429 Amador Street, Pier 92, Islais Creek (animal rendering)
3. Central Shops/City and County of San Francisco, 1800 Jerrold Avenue (solvent use)

Additionally, there are several smaller odor sources in the vicinity of the off-site portion of Alternative 2 with more than five confirmed or unconfirmed complaints on record in the past 3 years:

1. Ritual Coffee Roasters (1050 Howard Street)
2. S&S Auto Collision (at 538 Bryant Street)

Because the exact location of the potential new SFVAMC Mission Bay Campus within the Mission Bay area is unknown at the time, it would be speculative to estimate the effects of localized odor emissions on potential sensitive receptors and recommend mitigation/abatement measures to be incorporated into the facility design. However, any new odor sources permitted within the vicinity of the potential new Campus would be subject to odor control measures, and potential odors associated with medical office use in general are considered minimal. Therefore, potential direct odor impacts would be minor. No indirect impacts would occur.

Alternative 3: No Action Alternative

Near- and Long-Term Construction

Alternative 3 involves continued operation of the existing SFVAMC Fort Miley Campus. There would be no new construction or retrofitting of existing buildings. Therefore, no construction-related air quality emissions impact would occur.

Near- and Long-Term Operation

Criteria Air Pollutant Emissions

Criteria air pollutant emissions from area sources (i.e., natural gas combustion and landscaping) are predicted to decrease in the future with implementation of the VA SSPP, but the reductions cannot be estimated, because the percentage reduction of natural gas combustion is unknown.

There is no potential for increases in criteria pollutant emissions from mobile sources with continuing operation of the current facilities at the existing SFVAMC Fort Miley Campus in the near or long term. Mobile-source emissions would decrease in the future because of current regulations and future technological improvements. Additionally, because future traffic conditions under Alternative 3 would be attributed to regional growth that occurs in the project vicinity (i.e., employee, patient, or service-related trips would not increase without expansion), Alternative 3 would not contribute to an existing problem or result in a long-term and adverse impact on air quality relative to existing conditions.[4] No direct or indirect impact would occur.

Localized CO Emissions

There is no potential for CO hotspots with continuing operation of the existing SFVAMC Fort Miley Campus in the near or long term. Because future traffic conditions under the No Action Alternative would be affected solely by regional growth (i.e., employee, patient, or service-related trips would not increase without expansion), Alternative 3 would not increase local CO concentrations relative to existing conditions. It should be noted that as vehicle emission rates continue to improve over time, CO concentrations would reasonably be expected to decrease under this alternative. No direct or indirect impact would occur.

Localized TAC and PM Emissions

As described previously, the existing SFVAMC Fort Miley Campus is the only potential source of TACs in its current location. Because future conditions under the No Action Alternative are presumed to be the same as current conditions (i.e., no expansion, employee, or service growth can be expected without expansion), the No Action Alternative is expected to remain unchanged in the near or long term with respect to exposure of sensitive receptors to TACs. Unpermitted off-site TAC sources (stationary or mobile) are not expected to increase in the mixed residential/commercial area surrounding the Campus. Because there are few truck deliveries or other mobile sources of diesel PM, and the only stationary combustion sources at the SFVAMC have been permitted by BAAQMD (14 permitted sources, six of which are exempt; see Appendix B for details), no direct or indirect adverse air quality impact associated with continued operation of Alternative 3 would occur. It should be noted

4 See the traffic study in Appendix E for further details regarding cumulative traffic volumes under the No Action Alternative.

that mobile source–related TAC emissions would decrease in the future with implementation of State and federal regulations that would reduce vehicular TAC emissions.

Odors

Because future conditions under Alternative 3 are presumed to be the same as current conditions (i.e., no expansion, employee, or service growth can be expected without expansion), near- and long-term exposures of sensitive receptors to odors are expected to remain unchanged under Alternative 3. There is currently no odor complaint history related to the SFVAMC that would affect off-site sensitive receptors, and no other odor sources in the vicinity that could affect on-site sensitive receptors; however, given the mixed residential/commercial character of the nearby area (retail food businesses with fume hoods and dumpsters), both permitted (with odor controls) and uncontrolled odor sources in the vicinity of or on the existing SFVAMC Fort Miley Campus could increase in the near term and long term. No direct or indirect odor-related impact would occur with implementation of Alternative 3.

3.2.4 References

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