3.6 AIR QUALITY

Introduction

This section evaluates the potential impacts on air quality resulting from implementation of the Project. This section includes the potential for the Project to: conflict with or obstruct implementation of the Air Quality Management Plan (AQMP) of the Bay Area Air Quality Management District (BAAQMD); violate an air quality standard or contribute substantially to an existing or projected air quality violation (the Bay Area is considered to have not attained the federal and State ozone standards or the State standard for respirable particulate matter [PM_{10}]); result in a cumulatively considerable net increase of any criteria pollutant for which the region is in non-attainment; expose sensitive receptors to substantial pollutant concentrations, or create objectionable odors that would affect a substantial number of people.

Information reported in this section is derived from: the United States Environmental Protection Agency (EPA) and BAAQMD air emission models that predict regional emissions and localized pollutant concentrations, and traffic data prepared by DKS Associates (DKS). The technical data used to prepare this section is provided in Appendix 3.6. Information on climate change is presented in Section 3.7, Greenhouse Gas Emissions, of this Draft EIR.

Issues identified in response to the Notice of Preparation (NOP) (Appendix 1) were considered in preparing this analysis. Applicable issues that were identified pertaining to air quality impacts include carbon dioxide (CO_2) emissions as a result of increased traffic.

Applicable Plans and Regulations

Air quality within the San Francisco Bay Area Air Basin (Bay Area Basin) is addressed through the efforts of various federal, State, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The agencies responsible for improving the air quality within the Bay Area Basin are discussed below.

Federal

US Environmental Protection Agency. The EPA is responsible for setting and enforcing the federal ambient air quality standards for atmospheric pollutants. It regulates emission sources that are under the exclusive authority of the federal government, such as aircraft, ships, and certain locomotives. The EPA also has jurisdiction over emissions sources outside State waters (outer continental shelf), and establishes various emissions standards for vehicles sold in states other than California.

As part of its enforcement responsibilities, the EPA requires each state with nonattainment areas to prepare and submit a State Implementation Plan (SIP) that demonstrates the means to attain the federal standards. The SIP must integrate federal, State, and local plan components and regulations to identify

specific measures to reduce pollution, using a combination of performance standards and market-based programs within the timeframe identified in the SIP.

State

California Air Resources Board. CARB, a part of the California Environmental Protection Agency (Cal/EPA), is responsible for the coordination and administration of both federal and State air pollution control programs within California. In this capacity, CARB conducts research, sets California Ambient Air Quality Standards (CAAQS), compiles emission inventories, develops suggested control measures, provides oversight of local programs, and prepares the SIP. CARB establishes emissions standards for motor vehicles sold in California, consumer products (such as hair spray, aerosol paints, and barbecue lighter fluid), and various types of commercial equipment. It also sets fuel specifications to further reduce vehicular emissions.

In April 2005, CARB issued a guidance document on air quality and land use, *Air Quality and Land Use Handbook: A Community Health Perspective*, which recommends that sensitive land uses not be located within 500 feet of a freeway or other high traffic roadway. It also recommends that a site-specific health risk assessment for all sensitive uses within 500 feet of a freeway or other high traffic roadway be performed as a way to more accurately evaluate the risk.

The basis for CARB's advisory recommendation of the 500 foot buffer is traffic-related studies of the additional cancer and non-cancer health risks attributable to proximity to roadways. Additional non-cancer health risks occur within 1,000 feet of freeways and high-traffic roadways. The highest concentration of emissions dissipates rapidly within the first 300 feet. According to CARB, California freeway studies also show an approximately 70 percent drop-off in particulate pollution levels at 500 feet, and lifetime cancer risk from exposure to diesel particulate matter (DPM) is expected to be lowered proportionately.[1] The guidance manual does not provide a quantitative acceptable threshold of risks from diesel exhaust from freeways in its recommendations of buffer distances between freeways and sensitive land uses. The CARB guidance acknowledges the need to balance this recommendation with other State and local policies addressing housing and transportation needs, the benefits of urban infill, community economic development priorities, and other quality of life issues.

Bay Area Air Quality Management District. BAAQMD is the primary agency responsible for comprehensive air pollution control in the entire Bay Area Air Basin, including San Mateo County. To that end, BAAQMD, a regional agency, works directly with the Association of Bay Area Governments (ABAG), the Metropolitan Transportation Commission (MTC), and local governments and cooperates actively with all federal and State government agencies. BAAQMD develops rules and regulations, establishes permitting requirements for stationary sources, inspects emissions sources, and enforces such measures through educational programs or fines, when necessary.

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[1] CARB, Air Quality and Land Use Handbook: A Community Health Perspective. April 2005. http://www.arb.ca.gov/ch/handbook.pdf. Accessed November 15 2011.

BAAQMD is directly responsible for reducing emissions from stationary (area and point) sources and for assuring that State controls on mobile sources are effectively implemented. It has responded to this requirement by preparing a sequence of Ozone Attainment Plans and Clean Air Plans that comply with the federal Clean Air Act (CAA) and the California Clean Air Act (CCAA) to accommodate growth, reduce the pollutant levels in the Bay Area Basin, meet the national and State Ambient Air Quality Standards (NAAQS)/CAAQS, and minimize the fiscal impact that pollution control measures have on the local economy. The Ozone Attainment Plans are prepared for the federal ozone standard, and the Clean Air Plans are prepared for the State ozone standards. The most recent Ozone Attainment Plan was adopted by BAAQMD Board of Directors on October 2001 and demonstrates attainment of the federal ozone standard in the Bay Area by 2006. In January 2006, BAAQMD adopted the 2005 Ozone Strategy to identify further steps needed to continue reducing public's exposure to unhealthy levels of ozone. Most recently, the 2010 Clean Air Plan was adopted by the Board of Directors on September 15, 2010, which serves to:

- Update the Bay Area 2005 Ozone Strategy in accordance with the requirements of the CCAA to implement "all feasible measures" to reduce ozone;
- Provide a control strategy to reduce ozone (O_3), particulate matter (PM), air toxics, and greenhouse gases (GHGs) in a single, integrated plan;
- Review progress in improving air quality in recent years; and
- Establish emission control measures to be adopted or implemented in the 2010-2012 timeframe.

These planning efforts have substantially decreased the population's exposure to unhealthful levels of pollutants, even while substantial population growth has occurred within the Bay Area.

In 2003, the California Legislature enacted Senate Bill 656 (SB 656) to reduce public exposure to PM_{10} and $PM_{2.5}$. SB 656 required CARB, in consultation with local air districts, to develop and adopt, by January 1, 2005, a list of the most readily available, feasible, and cost-effective control measures that could be used by CARB and the air districts to reduce PM_{10} and $PM_{2.5}$. In November 2005, BAAQMD adopted a Particulate Matter Implementation Strategy (PMIS) focusing on those measures most applicable and cost effective for the Bay Area.

Although BAAQMD is responsible for regional air quality planning efforts, it does not have the authority to directly regulate the air quality issues associated with plans and new development projects within the Bay Area. Instead, BAAQMD has used its expertise and prepared the BAAQMD California Environmental Quality Act (CEQA) Guidelines to indirectly address these issues in accordance with the projections and programs of the Ozone Attainment Plan and Clean Air Plan. The purpose of the BAAQMD CEQA Guidelines is to assist lead agencies, as well as consultants, project proponents, and other interested parties, in evaluating potential air quality impacts of projects and plans proposed in the Bay Area. Specifically, the BAAQMD CEQA Guidelines explain the procedures that BAAQMD recommends be followed during the environmental review processes required by CEQA. The BAAQMD CEQA Guidelines provide direction on how to evaluate potential air quality impacts, how to determine whether these impacts are significant, and how to mitigate these impacts. BAAQMD intends

that by providing this guidance, the air quality impacts of plans and development proposals will be analyzed accurately and consistently throughout the Bay Area, and adverse impacts will be minimized.

BAAQMD recently updated its CEQA Guidelines, and adopted revised CEQA significance thresholds on June 2, 2010. The most recent revision to the CEQA Guidelines was on May 3, 2011. All of the adopted CEQA thresholds of significance, except for the risk and hazards thresholds for new receptors, were effective June 2, 2010. The risk and hazards thresholds when considering the siting of new sensitive receptors such as residences or schools became effective May 1, 2011.

The new guidelines provide methodologies for analyzing air quality impacts for the updated CEQA significance thresholds for construction-related and operational emissions of criteria pollutants, ozone precursors, health risks, and GHGs.[2] The BAAQMD CEQA Guidelines recommend an evaluation of air concentrations from a project's traffic sources if the project is expected to add 10,000 vehicles per day or 1,000 trucks per day to surrounding roads. The Guidelines also recommend a cumulative evaluation of sources, which includes mobile emissions from major roadways, on sensitive receptors affected by project sources. BAAQMD defines a major roadway as those with daily traffic greater than 10,000 vehicles per day.

Local

City of Menlo Park. Local jurisdictions, such as the City, have the authority and responsibility to reduce air pollution through their police powers and decision-making authority. Specifically, the City is responsible for assessing the potential for and mitigating air quality problems that result from its land use decisions. The City is also responsible for the implementation of transportation control measures, as outlined in the Clean Air Plan.

In accordance with CEQA requirements and the CEQA review process, the City assesses the air quality impacts of new development projects, requires mitigation of potentially significant air quality impacts by conditioning discretionary permits and monitors and enforces the implementation of such mitigation measures. The City uses the *BAAQMD CEQA Guidelines* as its guidance document for the environmental review of plans and development proposals within its jurisdiction.

Menlo Park General Plan. The General Plan guides development and use of land within the City. Several goals and policies would be expected to contribute to improving air quality. However, the following goal and policy from the Open Space and Conservation Element[3] of the City's General Plan pertain directly to the Project.

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[2] BAAQMD, "Updated CEQA Guidelines," website: http://www.baaqmd.gov/Divisions/Planning-and-Research/CEQA-GUIDELINES/Updated-CEQA-Guidelines.aspx, accessed October 11, 2011.

[3] City of Menlo Park, Menlo Park General Plan, Open Space and Conservation Element, adopted June 26, 1973.

Goal 12: To enhance and preserve air quality in accord with regional standards.

Policy 14: Reaffirm the policies and goals of the Regional Water Quality Control Board (RWQCB) and BAAQMD.

Existing Conditions

Air Quality Background

The City is located within the Bay Area Basin, which derives its name from the surrounding mountains that confine the movement of air and the pollutants it contains. This area includes all of Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, the western half of Solano, and the southern half of Sonoma counties. The regional climate within the Bay Area Basin is considered semi-arid and is characterized by warm summers, mild winters, infrequent seasonal rainfall, moderate daytime on-shore breezes, and moderate humidity. A wide range of meteorology and emissions sources—such as dense population centers, heavy vehicular traffic, and industrial activity—primarily influence the air quality within the Bay Area Basin.

Air pollutant emissions within the Bay Area Basin are generated from stationary, area-wide, mobile, and natural sources. Stationary sources can be divided into two major subcategories: point and area sources. Point sources occur at an identified location and are usually associated with manufacturing and industry. Examples are boilers and combustion equipment that produce electricity or generate heat. Area-wide sources consist of many smaller point sources that are widely distributed. Examples of area sources include residential and commercial water heaters, painting operations, portable generators, lawn mowers, agricultural fields, landfills, and consumer products, such as barbeque lighter fluid and hair spray. Construction activities that create fugitive dust, through activities such as excavation and grading, also contribute to area source emissions. Mobile sources refer to emissions from motor vehicles, including tailpipe and evaporative emissions, and are classified as either on-road or off-road. On-road sources may be legally operated on roadways and highways. Off-road sources include aircraft, ships, trains, and self-propelled construction equipment. Air pollutants can also be generated by the natural environment, such as when fine dust particles are pulled off the ground surface and suspended in the air during high winds.

Both the federal and State governments have established ambient air quality standards for outdoor concentrations of various pollutants in order to protect public health. The NAAQS/CAAQS have been set at levels above which concentrations could be generally harmful to human health and welfare, and to protect the most sensitive persons from illness or discomfort with a margin of safety.

The air pollutants for which NAAQS/CAAQS have been promulgated and that are most relevant to air quality planning and regulation in the Bay Area Basin include ozone (O_3), carbon monoxide (CO), PM_{10}, fine particulate matter ($PM_{2.5}$), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), and lead (Pb). In addition, toxic air contaminants (TACs) are of concern in the Bay Area Basin. Each of these is briefly described below.

- *Ozone* (O_3) is a gas that is formed when volatile organic compounds (VOCs), which can also be referred to as reactive organic gases (ROG), and nitrogen oxides (NO_x), both byproducts of internal combustion engine exhaust, undergo slow photochemical reactions in the presence of sunlight. Meteorological conditions that are needed to produce high concentrations of ozone are direct sunshine, early morning stagnation in source areas, high ground surface temperatures, strong and low morning inversions, greatly restricted vertical mixing during the day, and daytime subsidence that strengthens the inversion layer. Ozone concentrations are generally highest during the summer months when direct sunlight, light wind, and warm temperature conditions are favorable.
- *Carbon Monoxide* (CO) is a colorless, odorless gas produced by the incomplete combustion of fuels. CO concentrations tend to be the highest in the winter mornings when surface-based inversions trap the pollutant at ground level. Because CO is emitted directly from internal combustion engines, unlike ozone, and motor vehicles operating at slow speeds are the primary source of CO in the Bay Area Basin, the highest ambient CO concentrations are generally found near congested transportation corridors and intersections.
- *Respirable Particulate Matter* (PM_{10}) and *Fine Particulate Matter* ($PM_{2.5}$) consist of extremely small, suspended particles or droplets 10 microns and 2.5 microns, respectively, or smaller in diameter. Some sources of particulate matter, like pollen and windstorms, are naturally occurring. However, in populated areas, most particulate matter is caused by road dust, diesel soot, combustion products, abrasion of tires and brakes, and construction activities.
- *Nitrogen dioxide* (NO_2) is a reddish-brown reactive, oxidizing gas capable of damaging cells lining the respiratory tract and is an essential ingredient in the formation of ozone. Like O_3, NO_2 is not directly emitted but is formed through a reaction between nitric oxide (NO) and atmospheric oxygen. NO and NO_2 are collectively referred to as nitrogen oxides (NO_x) and are major contributors to O_3 formation. NO_2 also contributes to the formation of PM_{10} and is emitted as a by-product of fuel combustion.
- *Sulfur oxide* (SO_x), primarily SO_2, is a product of high-sulfur fuel combustion and chemical processes occurring at chemical plants and refineries. It is a colorless, extremely irritating gas or liquid. Although sulfur dioxide concentrations have been reduced to levels well below State and national standards, further reductions are desirable to attain compliance with standards for PM_{10}, of which SO_2 is a contributor.
- *Lead* (Pb) occurs in the atmosphere as particulate matter. The combustion of leaded gasoline is the primary source of airborne lead in the Bay Area Basin. The use of leaded gasoline is no longer permitted for on-road motor vehicles; therefore, most lead combustion emissions are associated with off-road vehicles such as racecars and some jet fuels. Other sources of lead occur in the manufacturing and recycling of batteries, paint, ink, ceramics, ammunition, and secondary lead smelters.
- *Toxic Air Contaminants* (TACs) is a general term for a diverse group of air pollutants that can adversely affect human health, but have not had ambient air quality standards established for them. They are not fundamentally different from the pollutants discussed above, but lack ambient air quality standards for a variety of reasons (e.g., insufficient data on toxicity, association with particular workplace exposures rather than general environmental exposure, etc.). TACs effects tend to be local rather than regional. CARB has designated nearly 200

compounds as TACs. Additionally, CARB has implemented control measures for a number of compounds that pose high risks and show potential for effective control. The majority of the estimated health risks from TACs can be attributed to a relatively few compounds, the most important being particulate matter from diesel-fueled engines. The health effects of TACs can result from either acute or chronic exposure; many types of cancer are associated with chronic TAC exposures.

Existing Regional Air Quality

The emissions inventory for the entire Bay Area Basin and San Mateo County is summarized in Table 3.6-1. In the Bay Area Basin, motor vehicles generate the majority of ROG, NO_X, and CO. Stationary sources generate the most SO_x and area-wide sources generate the most airborne particulates.

Table 3.6-1
2010 Estimated Average Daily Emissions

	Emissions in Tons per Day					
Emissions Source	**ROG**	**NO_x**	**CO**	**SO_x**	**PM_{10}**	**$PM_{2.5}$**
San Francisco Bay Area Air Basin	359.2	414.2	1595.7	62.2	215.7	81.6
San Mateo County	33.4	56.2	158.3	8.6	20.9	7.6

Source: California Air Resources Board, *California Almanac of Emissions and Air Quality*, website: http://www.arb.ca.gov/app/emsinv/emssumcat.php, 2011.

Measurements of ambient concentrations of the criteria pollutants (CP) are used by the EPA and CARB to assess and classify the air quality of each regional air basin, county, or, in some cases, a specific urbanized area. The classification is determined by comparing actual monitoring data with national and State standards. If a pollutant concentration in an area is lower than the standard, the area is classified as being in "attainment" for that pollutant. If the pollutant exceeds the standard, the area is in marginal, moderate, serious, severe, or extreme "nonattainment," depending on the magnitude of the air quality standard exceedance. If there are not enough data available to determine whether the standard is exceeded in an area, the area is designated "unclassified."

The EPA and CARB use different standards for determining whether the Bay Area Basin is an attainment area. Under national standards, the Bay Area Basin is currently classified as a nonattainment area for O_3. The Bay Area Basin is in attainment or designated as unclassified for all other pollutants under national standards. Under State standards, the Bay Area Basin is designated as a nonattainment area for O_3 and PM_{10}, and an attainment area for all other pollutants.

Existing Local Air Quality

BAAQMD monitors ambient air pollutant concentrations through a series of monitoring stations located throughout the Bay Area Basin. There is no monitoring station in the City, but there is one in Redwood City, approximately three miles to the north of the Project site, that currently measures CP concentrations, including O_3, CO, NO_2, and particulates (both PM_{10} and $PM_{2.5}$). The air quality on the Peninsula, including the City, has generally improved over the past 20 years, as motor vehicles have

become cleaner, agricultural and residential burning has been curtailed, and consumer products containing ROGs have been reformulated or replaced.

Table 3.6-2 identifies the national and State ambient air quality standards for relevant air pollutants along with the ambient pollutant concentrations that have been measured at the Redwood City monitoring station through the period of 2007 to 2009. Measurements from these years indicate that State standards for O_3 were not exceeded. Particulate air quality is a moderate problem on the Peninsula. There was one exceedance of the State 24-hour standard in 2007 at the Redwood City monitoring station. Carbon monoxide, a product of incomplete combustion, was formerly a problem for the Peninsula; but with improved motor vehicles and fuels, air quality at Redwood City meets State and federal standards. Due to the City's close proximity to the monitoring station in Redwood City, it can be assumed that pollutant concentrations are similar in the City.

Table 3.6-2
Summary of Ambient Air Quality in the Project Vicinity

Air Pollutants Monitored at San Mateo County Monitoring Stations	Year		
	2007	**2008**	**2009**
Ozone			
Maximum 1-hour concentration measured	0.077 ppm[a]	0.082 ppm	87 ppm
Days exceeding State 0.09 ppm 1-hour standard	0	0	0
Maximum 8-hour concentration measured	0.069 ppm	0.069 ppm	63 ppm
Days exceeding national 0.08 ppm 8-hour standard	0	0	0
Days exceeding State 0.07 ppm 8-hour standard	0	0	0
Respirable Particulate Matter (PM_{10})			
Maximum 24-hour concentration measured (national)	56 $\mu g/m^3$ [b]	38 $\mu g/m^3$	N/A[c]
No. of days exceeding national 150 $\mu g/m^3$ 24-hour standard	0	0[d]	N/A[c]
Days exceeding State 50 $\mu g/m^3$ 24-hour standard	1	0[d]	N/A[c]
Fine Particulate Matter ($PM_{2.5}$)			
Maximum 24-hour concentration measured	45.4 $\mu g/m^3$	27.9 $\mu g/m^3$	31.7 $\mu g/m^3$
No. of days exceeding national 35 $\mu g/m^3$ 24-hour standard	1	0	0
Carbon Monoxide (CO)			
Maximum 8-hour concentration measured	2.3 ppm	1.9 ppm	1.8 ppm
Number of days exceeding national and State 9.0 ppm 8-hour standard	0	0	0
Nitrogen Dioxide (NO_2)			
Maximum 1-hour concentration measured	0.057ppm	0.069 ppm	0.056 ppm
Days exceeding State 0.25 ppm 1-hour standard	0	0	0

Source: BAAQMD annual air quality summaries, http://www.baaqmd.gov/Divisions/Communications-and-Outreach/Air-Quality-in-the-Bay-Area/Air-Quality-Summaries.aspx, 2011. California Air Resources Board (CARB), *http://www.arb.ca.gov/adam/select8/sc8start.php*, 2011.

Notes:

a. ppm = parts by volume per million of air.

b. $\mu g/m^3$ = micrograms per cubic meter.

c. PM_{10} monitoring was discontinued on June 30, 2008 at Redwood City and is not available. In addition, data for San Mateo County from CARB is also not available.

d. Data represents PM_{10} summaries for San Mateo County in 2008. PM_{10} monitoring at Redwood City was discontinued on June 30, 2008 and is not available.

Existing uses adjacent to the Project site include Bayfront Expressway and tidal marsh to the north and northeast, industrial uses to the southeast and west, and residential uses, schools, and churches to the south in the Belle Haven neighborhood (see Figure 2-1 in Section 2, Project Description). The Bay Trail parallels Bayfront Expressway, which bisects the East Campus and the West Campus. Motor vehicles are the primary source of air pollutants in the Project vicinity.

Project Area Inventory. The Project Site consists of a 56.9-acre East Campus and a 22-acre West Campus. Together, the East Campus and the West Campus comprise the Project Area. The East Campus includes nine existing buildings, approximately one million square feet (sf), primarily consisting of office uses, cafés, and fitness center. Under the current land use designation and Conditional Development Permit (CDP), the East Campus could be occupied by a maximum of 3,600 employees. The existing development on the West Campus includes two office buildings and ancillary structures; however, the buildings are unoccupied and no existing emissions are assumed. Only the existing emissions associated with the East Campus are considered in the discussion below.

An inventory of the CP emissions generated by existing uses is provided in Table 3.6-3. The inventory includes the following emissions:

- *Area Source Emissions.*[4] Area source emissions are direct emissions sources, which include existing emissions from landscaping equipment, consumer product use, and architectural coating. These emissions were estimated using the California Emission Estimator Model™ version 2011.1.1 model (CalEEMod™)[5] along with site-specific values for building area and employee population.
- *Emissions Associated with Energy Use.* The combustion of natural gas on-site for heating, cooking and other purposes in buildings generates direct emissions of CPs. Existing natural gas usage, which was used to estimate CP emissions from existing facilities, is based upon the actual building size and usage as obtained from available records in 2008 which represents the most recent year of full occupancy at the East Campus.
- *Vehicular Emissions.* Employee and visitor vehicle trips associated with existing land uses represent the largest portion of the existing emissions inventory. The CP emissions associated with vehicle trips for the existing uses at the East Campus were estimated using the default vehicle emission factors for San Mateo County and year 2010 in the CalEEMod™ model, as well as vehicle miles traveled (VMT) and number of trips provided by DKS, which incorporate a 25 percent reduction in vehicle trips associated with the Transportation Demand Management (TDM) program (reflecting the efficacy of the TDM program for permitted occupancy of the East Campus). Fugitive emissions of PM are calculated outside of CalEEMod™, using EPA's most recent guidance in AP-42.[6]
- *Emergency Generators.* The combustion of diesel fuel during testing of the nine emergency generators located at the East Campus emits CPs. Emissions were estimated based on data

[4] Also known as "areawide" emissions.

[5] California Emissions Estimator Model, available at: http://caleemod.com.

[6] EPA, Compilation of Air Pollutant Emission Factors, Chapter 13.2.1 Paved Roads, January 2011.

provided by the Project Sponsor, BAAQMD, and manufacturer specification sheets for the emergency generators.

It is believed that the above sources represent the vast majority of the CP emissions associated with existing development within the Project area. Therefore, the CP inventory presented in Table 3.6-3 represents a reasonable estimate of all emissions directly associated with current on-site operations.

Table 3.6-3
Existing Average Daily Operational CP Emissions Within the Project Area

Source of Emissions	ROG	NO_X	PM_{10}	$PM_{2.5}$
	Average lb/day			
Area	29	0	0	0
Energy Use	0.99	8.9	0.66	0.66
Vehicular	37	69	40	13
Emergency Generators	0.06	2.3	0.033	<0.033
Total	**67**	**80**	**41**	**14**

Source: ENVIRON, 2011, Table 15 of Appendix 3.6-A.

Receptors. Populations that are more susceptible to the effects of air pollution than the population at large are often referred to as sensitive receptors. While the ambient air quality standards are designed to protect public health and are generally regarded as conservative for healthy adults, there is greater concern to protect adults who are ill or have long-term respiratory problems, and young children whose lungs are not fully developed. According to CARB, sensitive receptors include children less than 14 years of age, the elderly over 65 years of age, athletes, and people with cardiovascular and chronic respiratory diseases. According to BAAQMD, "examples of receptors include residences, schools and school yards, parks and play grounds, daycare centers, nursing homes, and medical facilities. Residences can include houses, apartments, and senior living complexes. Medical facilities can include hospitals, convalescent homes, and health clinics. Playgrounds could be play areas associated with parks or community centers."[7]

The AERMOD version 11103[8] and CAL3QHCR version 04244,[9] dispersion models for predicting pollutant concentrations, were used to estimate pollutant concentrations at sensitive receptors near congested roadways and from off-road construction equipment and stationary sources. In this case, residences are within 400 feet of the Project site and major traffic access routes in the Project vicinity and, therefore, would be affected by traffic generated by the Project and other cumulative

[7] BAAQMD. 2011. CEQA Guidelines. May, website: http://www.baaqmd.gov/~/media/Files/Planning %20and %20Research/CEQA/BAAQMD%20CEQA%20Guidelines%20May%202011.ashx?la=en.

[8] On November 9, 2005, the EPA promulgated final revisions to the federal *Guideline on Air Quality Models*, in which they recommended that AERMOD be used for dispersion modeling evaluations of criteria air pollutant and toxic air pollutant emissions from typical industrial facilities. The model can be downloaded online here: http://www.epa.gov/scram001/dispersion_prefrec.htm.

[9] CAL3QHCR is the EPA's preferred model for determining air pollutions' concentrations downwind from traffic. The model can be downloaded online here: http://www.epa.gov/scram001/dispersion_prefrec.htm.

development. Exposure of these receptors to pollutants from existing and future traffic and other Project sources is discussed below under Impacts and Mitigation Measures.

Impacts and Mitigation Measures

Standards of Significance

The Project would result in a significant impact if it would:

- Conflict with or obstruct implementation of the applicable air quality plan.
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation.
- Expose sensitive receptors to substantial pollutant concentrations.
- Create objectionable odors affecting a substantial number of people.
- Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors).

Air Quality Analysis Methodology

The analysis of air quality impacts involves determining the CP and TAC emission inventories for the Project sources and comparing these inventories against thresholds of significance to determine if air quality impacts would result. In addition, a health risk assessment (HRA) is conducted to determine the impacts of TACs emitted by the Project on existing sensitive receptors consistent with BAAQMD CEQA Guidelines. The HRA described in this document also considers the impacts of other nearby emission sources and foreseeable projects on the most impacted sensitive receptor to determine the cumulative impacts of the Project consistent with BAAQMD CEQA Guidelines.

This section describes the methodologies that were used to develop the emission inventories associated with the Project and to conduct the HRA. Separate emission inventories are presented for both the East Campus and the West Campus. These inventories consider five categories of criteria and TAC emissions: construction, area sources, energy use, traffic, and emergency generator testing. The inventories in this report are a reflection of the guidance and knowledge currently available.

ENVIRON, the preparers of this section, primarily utilized the CalEEMod™ to assist in quantifying the emissions from the Project presented in this section. CalEEMod™ is a statewide program designed to calculate both CP and GHG emissions from development projects in California. This model was developed under the auspices of the South Coast Air Quality Management District (SCAQMD), which received input from other California air districts, including BAAQMD, and is the currently model accepted by BAAQMD for use in quantifying the emissions associated with development projects undergoing environmental review. CalEEMod™ utilizes widely accepted models for emission estimates combined with appropriate default data that can be used if site-specific information is not available. These models and default estimates use sources, such as the EPA AP-42 compendium of emission

factors,[10] CARB's on-road and off-road equipment emission models, such as the EMission FACtor model (EMFAC) and the Off-road Emissions Inventory Program model (OFFROAD), and studies commissioned by California agencies, such as the California Energy Commission (CEC) and CalRecycle.

ENVIRON used San Mateo County CalEEMod™ defaults in the model runs, unless otherwise noted in the methodology descriptions below. Details regarding the specific methodologies used by CalEEMod™ can be found in the CalEEMod™ User's Guide and associated appendices.[11] The CalEEMod™ output files are provided for reference in Appendix 3.6-E to this report and relevant CalEEMod™ inputs can be found in Tables 1 through 5 of Appendix 3.6-A.

Consistency with the Clean Air Plan

The most current air quality plan for the region is the recently adopted 2010 Clean Air Plan, which updates the 2005 Ozone Strategy and represents a unique approach to air planning by including GHGs, as well as CPs and TACs. For the 2010 Clean Air Plan, the travel activity adjustments used in preparing the on-road mobile source inventory are the same as those used in the Transportation Air Quality Conformity Analysis for MTC's regional transportation plans. MTC's travel demand model utilizes regional demographic forecasts from ABAG's socioeconomic and population projections. Under BAAQMD methodology, for consistency with the 2010 Clean Air Plan, a project or plan must demonstrate that the population or VMT assumptions contained in the Clean Air Plan would not be exceeded and that the project or plan implements transportation control measures (TCMs) as applicable.

Construction Period Emissions

This section describes the estimation of CP emissions from construction activities at the West Campus. There are four major construction phases for an urban redevelopment: demolition, site preparation, grading, and building construction. The building construction phase can be broken down into three subphases: building construction, architectural painting, and asphalt paving. CP emissions from these construction phases are largely attributable to fuel use from construction equipment, worker commuting, and off-gassing of architectural coating and asphalt.

ENVIRON used CalEEMod™ to assist in quantification of the construction emissions. The construction schedule and equipment list are based on information provided by the Project Sponsor.[12] The off-road equipment emissions were adjusted from the CalEEMod™ output to account for a 33 percent reduction

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[10] The EPA maintains a compilation of Air Pollutant Emission Factors and process information for several air pollution source categories. The data is based on source test data, material balance studies, and engineering estimates. Website: http://www.epa.gov/ttnchie1/ap42/.

[11] Available at: http://www.caleemod.com.

[12] Justin Murphy, Development Services Manager, City of Menlo Park Community Development Department, Planning Division, electric communication with ENVIRON, July 14, 2011. Attachments: Facebook_ Construction_Data_Request_11-07-13.pdf and SCBI_EIR_Response _11-07-13.pdf, Shown in Appendix 3.6-F.

attributable to overestimation of load factors, which CARB has indicated to be appropriate.[13] The CP emissions associated with construction of the West Campus, as an average daily emissions over the construction period, are 22 pounds per day of ROG, 40 pounds per day of NO_X, 2 pounds per day of PM_{10} exhaust, and 2 pounds per day of $PM_{2.5}$ exhaust and shown in Table 3.6-4 with further details contained in Tables 6 through 9 of Appendix 3.6-A.

Table 3.6-4
Construction Criteria Air Pollutant Emissions

Phase	Construction Emissions			
	ROG	NO_x	PM_{10}	$PM_{2.5}$
	Pounds (lbs)			
Demolition I	174	1,425	87	87
Demolition II	294	3,320	100	100
Grading I	100	703	47	47
Grading II	74	395	47	47
Grading III	434	3,408	107	107
OTHER I	208	1,266	127	127
OTHER II	74	609	47	47
Building Construction I	281	1,806	127	127
Building Construction II	294	2,438	67	67
Building Construction III	134	1,171	60	60
Building Construction IV	594	3,655	154	154
Building Construction V	447	3,151	100	100
Paving	74	468	47	47
Site Preparation	154	1,044	87	87
Coating	10,220	60	40	40
Total Emissions [lbs]	*13,555*	*24,921*	*1,244*	*1,244*
Average Daily Emissions over 630 days [lb/day]	**22**	**40**	**2**	**2**

Source: ENVIRON, 2011, Table 9 of Appendix 3.6-A.

Since most construction equipment uses diesel fuel, it is assumed that all of the PM_{10} exhaust emissions from off-road equipment operated on-site is equal to the amount of DPM emissions, which are a TAC. All other TACs are based on the speciation profile of the ROG emissions as shown in Appendix 3.6-G.

[13] In September 2010, the CARB announced that its methods used to estimate the load factor for off-road equipment were incorrect and led to an overestimate of emissions by a factor of at least 33 percent. CARB is currently revising their emissions model, OFFROAD, which has not yet been released. In the meantime, we have received direction from CARB to reduce the load factors by a 33 percent to take into account this error and this will be accounted for into the analysis whether using OFFROAD directly or CalEEMod, which is based on OFFROAD. The slides from the CARB workshop discussing this change are available online at: http://www.arb.ca.gov/msprog/ordiesel/documents/emissions_inventory_presentation_full_10_09_03.pdf.

Operational Emissions – Daily Emissions of ROG, NO_X, and PM_{10}

This section outlines the operational CP emissions associated with the Project. Emissions from traffic, area sources and natural gas combustion would occur every year after build out. Emergency generator testing will also occur periodically. ENVIRON used CalEEMod™ to assist in quantification of the operational emissions, except for emergency generator testing, which was based on the emission factor from OFFROAD2007, and generator-specific emissions factors for diesel generators.

Several site-specific data were used in CalEEMod™. Natural gas use was provided by the Project Sponsor for the baseline usage at the East Campus, the incremental usage at the East Campus, and the anticipated usage at the West Campus.[14] The natural gas use analysis takes into account adjustments in energy use due to higher employee occupancy, improved building system energy use from the Tenant Improvements (TIs), adjustments to account for California's current building codes, and the Project Sponsor's commitment to reduce energy use beyond current building code thresholds. Area sources incorporate emissions associated with consumer product usage, architectural coatings associated with building upkeep, and landscaping equipment. The emissions associated with area sources were all calculated using CalEEMod™ default inputs, other than building sizes and types. The VMT and trips were provided by DKS Associates[15] and the Project Sponsor,[16] respectively. This data includes an analysis of employee commute VMT when considering the TDM program. The weekend trips and VMT were assumed to be 10 percent of the weekday trips provided, as provided by DKS. Fugitive emissions of PM were estimated using the same VMT information, but were estimated outside of CalEEMod™ using the USEPA's most recent guidance in AP-42.[17] The detailed breakdown is shown in Table 3.6-5 with further details for each category shown in Tables 10 through 15 of Appendix 3.6-A.

Emergency generators emit CPs when they are tested to ensure proper functioning. It was assumed that all West Campus emergency generators would be tested for 30 minutes each month, as specified by the Project Sponsor, and East Campus emergency generators would be tested for 20 hours per year based on BAAQMD permits as shown in Appendix 3.6-I. To calculate emissions, the horsepower rating of the engine is multiplied by an emission factor for each pollutant and the total number of hours operated per year. Emission factors were obtained from information supplied by the Project Sponsor, BAAQMD, or manufacturer specification sheets if available. The detailed breakdown is shown in Table 3.6-5 with further details for each category shown in Tables 10 through 15 of Appendix 3.6-A.

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[14] KEMA. Facebook Menlo Park Campus Energy Demands. Memorandum between Erik Dyrr, KEMA and City of Menlo Park. August 2, 2011. Shown in Appendix 3.6-H.

[15] Paul Stanis, DKS Associates, electronic communication with ENVIRON, October 26, 2011. Shown in Appendix 3.6-C.

[16] Fehr & Peers. Transportation Demand Management Program. August 2011.

[17] EPA, Compilation of Air Pollutant Emission Factors, Chapter 13.2.1 Paved Roads, January 2011.

Table 3.6-5
Project Operational Criteria Air Pollutants

	East Campus				West Campus			
Source Category	**ROG**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**	**ROG**	**NO_x**	**PM_{10}**	**$PM_{2.5}$**
Daily Emissions (average lb/day)								
Area	29	0	0	0	15	0	0	0
Natural Gas Use	0.99	9.2	0.66	0.66	0.22	1.9	0.11	0.11
Traffic	72	125	110	37	30	53	47	16
Emergency Generators	0.06	2.3	0.033	<0.033	0.02	1.4	0.007	<0.007
Total Average Daily Emissions	*101*	*136*	*111*	*37*	*46*	*56*	*47*	*16*
Annual Emissions (tons/year)								
Area	5.3	0	0	0	2.8	0	0	0
Natural Gas Use	0.18	1.7	0.12	0.12	0.04	0.35	0.02	0.02
Traffic	13	23	20	6.7	5.5	9.6	8.5	2.8
Emergency Generators	0.010	0.43	0.006	<0.006	0.004	1.4	0.001	<0.007
Annual Average Emissions	*19*	*25*	*20*	*6.8*	*8.4*	*11*	*8.5*	*2.9*

Source: ENVIRON, 2011, Table 15 of Appendix 3.6-A.

The CP emissions shown in Table 3.6-5 reflect Project design features associated with building energy use. The emissions associated with traffic reflect the proposed daily trip cap for the East Campus and estimated trip generation for the West Campus specified as part of the Project in Section 3.5, Transportation. The emergency generator emissions reflect details on generator types and sizes provided by the Project Sponsor. Emissions from area sources do not reflect any Project design features.

Operational Emissions – TACs

During operations, the Project would emit TACs from multiple sources. These sources include traffic, emergency generator testing, and natural gas combustion. Natural gas combustion for space heating and cooking is classified as a minor low emitting source and emissions of TACs are not quantified since they are de minimis according to BAAQMD guidelines. Emissions from traffic come from both diesel and gasoline-fueled vehicles. Emissions from diesel fueled vehicles and emergency generators emit diesel particulate matter, which is a TAC. Other TACs associated with diesel fuel are speciated from total organic gases based on EPA speciation profiles. Gasoline-fueled vehicles emit various TACs, which are speciated from total organic gases based on the recommended profiles in BAAQMDs guidelines. The emissions of TACs from operational sources are used in the HRA and the details of the individual chemicals emitted is contained in Table 16 of Appendix 3.6-A.

Cumulative Emissions – TACs

In order to evaluate the impacts on a cumulative basis, emissions of TACs from other nearby sources were assessed. This was done using BAAQMD's Stationary Source Screening Analysis Tool version May 2011 for San Mateo County. Sources within 1,000 feet of the Project were identified, as shown

in Figure 1 of Appendix 3.6-B. This figure shows the East Campus emergency generators represented as Sun Microsystems (the previous tenant) as well as the off-site sources since this is how items are identified by BAAQMD. A stationary source inquiry form was sent to BAAQMD requesting information for the sources that did not have complete information in the stationary source screening analysis tool. The information provided by BAAQMD to ENVIRON as a result of the stationary source inquiry form is included in Appendix 3.6-K. The data provided either gave the individual TAC emissions from sources or simply reported the health impacts and appropriate methods for scaling the health impacts by distance. As complete TACs emissions information was not explicitly provided for all sources, an emissions inventory of TACs from surrounding sources is not reported here. However, the health impacts from all the sources are used in the HRA and are fully evaluated for cumulative health impacts to the extent that information was available.

Health Risk Assessment

In order to evaluate the impacts of TACs and $PM_{2.5}$ on nearby existing sensitive receptors, a HRA was conducted consistent with BAAQMD CEQA Guidelines for determining local community risks and hazards. The HRA is a process that ENVIRON followed to evaluate the health risks associated with the Project and the findings are summarized below. The HRA evaluated Project emissions associated with construction equipment at the West Campus, testing of emergency generators, and Project traffic on nearby roadways. In addition, the impacts of TACs and $PM_{2.5}$ on the receptors from non-Project sources, both existing and foreseeable, were analyzed to determine the cumulative impact consistent with BAAQMD CEQA Guidelines for determining cumulative impacts for local community risks and hazards. The discussion that follows provides the detailed information on the methodology and data used to conduct the HRA since refined air dispersion modeling was required because screening methods were not applicable to this situation.

Project-Specific Information

Sources of TACs evaluated in the HRA are from Project construction, Project operation, other stationary sources, and traffic impacting the cumulative health risks on sensitive receptors affected by the Project sources. Project construction emissions were restricted to off-road construction equipment used in the construction of the West Campus. Emissions from on-road vehicles traveling to the West Campus construction site are not considered, as these are small in number. Project operation sources include emergency generators and Project traffic on nearby roadways. Emergency generators were only evaluated for the emissions associated with testing and not for any emergency use, as emergency use would be speculative. Project traffic on nearby roadways included all of the intersections evaluated in the traffic assessment for the Project. Figure 2 of Appendix 3.6-B identifies these roadways.

Sources considered for the cumulative evaluation include stationary sources identified using BAAQMD's stationary source inquiry tool and cumulative traffic which, includes existing traffic and traffic from anticipated new projects in the area consistent with those evaluated throughout the Draft EIR.

Chemical Selection

The chemicals considered for the cancer risk and chronic non-cancer analyses in the HRA for the Project include DPM and TACs associated with gasoline combustion. Diesel exhaust, a complex mixture that includes hundreds of individual constituents,[18] is identified by the State as a known carcinogen.[19] Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen exposure for the mixture of chemicals that make up diesel exhaust as a whole. Cal/EPA and other proponents of using the surrogate approach to quantifying cancer risks associated with the diesel mixture indicate that this method is preferable to use of a component-based approach. A component-based approach involves estimating risks for each of the individual components of a mixture. Critics of the component-based approach believe it will underestimate the risks associated with diesel, as a whole mixture, because the identity of all chemicals in the mixture may not be known and/or exposure and health effects information for all chemicals identified within the mixture may not be available. Furthermore, Cal/EPA has concluded that "potential cancer risk from inhalation exposure to whole diesel exhaust will outweigh the multi-pathway cancer risk from the speciated components."[20]

There is currently no acute non-cancer toxicity value available for DPM. Thus, speciated components of diesel with acute toxicity values were included in the acute non-cancer hazard analysis.

Six stationary sources located within 1,000 feet of the Project were identified, as can be seen in the BAAQMD information request in Appendix 3.6-K and shown in Figure 1 of Appendix 3.6-B. For two sources, the State of California Department of Transportation (CalTrans) and SRI Cogeneration Inc., BAAQMD provided specific TACs from diesel generators and boilers. If BAAQMD identified DPM for an emergency generator, as well as individual TACs that are constituents of DPM, only the DPM emissions were considered in this evaluation, as the toxicity associated with DPM is assumed to incorporate the toxicity of diesel exhaust as a whole, including the volatile and metallic constituents. BAAQMD identified other TACs from boilers including benzene, formaldehyde, toluene, and particulates. For some stationary sources, BAAQMD did not identify specific TACs, but only gave the results of the cancer risk or chronic hazard index (HI) associated with emissions for that source. BAAQMD did not provide data for Pacific Biosciences, and, therefore, no conclusions about the magnitude of TACs released from this source could be determined.

Air Dispersion Modeling Methodologies

For sources for which BAAQMD did not provide screening data, two different air dispersion models were used to determine the health risks from construction, operational stationary sources, traffic on roadways, and off-site sources considered for the cumulative analysis. The dispersion of emissions

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[18] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment. 1998a. Findings of the Scientific Review Panel on The Report on Diesel Exhaust, as adopted at the Panel's April 22, 1998, meeting.

[19] Cal/EPA, OEHHA/ARB Consolidated Table of Approved Risk Assessment Health Values, February 14, 2011. Website: http://www.arb.ca.gov/toxics/healthval/contable.pdf.

[20] Cal/EPA, the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, Office of Environmental Health Hazard Assessment, August 2003.

from traffic on roadways was simulated with the EPA preferred program for modeling roadways called CAL3QHCR. The dispersion of emissions from everything else was simulated using the EPA regulatory approved model called AERMOD. The model inputs and assumptions used in each of the dispersion models are described below. Following the description of the two dispersion modeling methodologies, which are used to obtain concentrations of TACs in the air, the exposure parameters, toxicity and the health impacts and risks are described.

Construction and Emergency Generator Modeling with AERMOD

AERMOD was used to estimate the air concentrations associated with emissions from off-road equipment used during construction. It was also used to estimate the air concentrations associated with emissions from the testing of emergency generators. AERMOD input files are shown in Appendix 3.6-L.

Meteorological Data. To characterize the transport and dispersion of pollutants in the atmosphere, AERMOD requires hourly meteorological data from surface stations and once daily upper air data. The Stanford University on-site surface meteorological station and Oakland Airport upper air station, the closest stations to the Project site, were processed to be in AERMOD ready format using the meteorological pre-processor, AERMET. Besides the meteorological data, AERMET requires surface parameters: albedo, Bowen ratio, and surface roughness, which are shown in Appendix 3.6-M.

An important consideration in an air dispersion modeling analysis is the selection of rural or urban dispersion coefficients. The designation of urban or rural is dependent on the predominant land use within three kilometers of the site. The use of a rural designation in an air dispersion model typically produces a higher estimated concentration than does an urban designation, due to the higher level of mixing associated with the buildings and heat sources in an urban area. The San Francisco Bay (Bay) is considered to be a rural land use due to the flat expanse of the Bay which does not encourage air mixing. Because the rural designation is more conservative and the Project is adjacent to the Bay, ENVIRON used rural dispersion coefficients.

Terrain Considerations. AERMOD uses a terrain preprocessor, AERMAP, to determine elevations of the surrounding landscape. Data from the National Elevation Data (NED) set, available from the United States Geological Survey (USGS), was utilized to import the elevation information for sources and receptors.

Emission Rates. The emission rates of the various TACs for the sources were quantified as described for the individual mass emissions and speciated as necessary. The mass of emissions were divided by the amount of time over which they are emitted to give the amount of each TAC emitted in terms of grams per second. Table 3.6-6 shows the emission rates used. Construction sources were assumed to operate for eight hours per day from 8:00 a.m. to 4:00 p.m. Testing for emergency generators was assumed to occur at 6:00 a.m., when dispersion conditions tend to be least favorable, which will result in a conservative estimate of concentrations. However, due to noise restrictions (discussed in Mitigation Measure NO-1.2), the emergency generator will not be tested until at least 8:00 a.m., which would result in lower concentrations than predicted here.

Table 3.6-6
Emission Rates from Construction and Operational Sources Used in AERMOD

Source	Phase	Year	DPM	$PM_{2.5}$	TOG
			g/s		
Construction	Demolition I	2012	0.003	0.003	0.066
	Demolition II	2012	0.003	0.005	0.08
	Grading I	2013	0.001	0.001	0.08
	Grading II	2013	0.001	0.001	0.038
	Grading III	2013	0.001	0.001	0.025
	OTHER I	2013	0.005	0.005	0.048
	OTHER II	2013	0.001	0.001	0.015
	Building Construction I	2013	0.005	0.005	0.048
	Building Construction II	2013	0.001	0.001	0.018
	Building Construction III	2013	0.002	0.002	0.018
	Building Construction IV	2013	0.003	0.003	0.024
	Building Construction IV	2014	0.001	0.001	
	Building Construction V	2013	0.001	0.001	0.010
	Building Construction V	2014	0.001	0.001	
	Paving	2013	0.001	0.001	0.019
	Site Preparation	2013	0.001	0.001	0.017
	Site Preparation	2014	0.002	0.002	
	Coating	2014	0	0	0.005
West	2205 HP Emergency Generator		3.0E-04		
East	1135 HP Emergency Generator		1.6E-03		
	120 HP Emergency Generator		3.7E-05		
	102 HP Emergency Generator		2.5E-04		
	750 HP Emergency Generator		1.7E-03		

Source: ENVIRON, 2011, Table 16 of Appendix 3.6-A.
Note: TOG stands for Total Organic Compounds and consists of reactive and non-reactive organic compounds.

Source Parameters. AERMOD represents sources as point sources, area sources, or volume sources. Each of these source types requires several parameters to adequately characterize the factors which influence the air dispersion. Construction sources were represented as a grid of volume sources covering the West Campus construction area with each individual volume source having dimensions of 20 by 20 meters, as shown in Figure 3 of Appendix 3.6-B. A release height of five meters, initial vertical dimension of 1.4 meters, and initial lateral dimension of 4.65 meters were the other parameters used to characterize the volume sources. Emergency generators were modeled as point sources with stack diameter, release height, exit velocity and exit temperature based on information from the Project Sponsor and manufacturer specifications as listed in Table 17 of Appendix 3.6-A. Figure 4 of Appendix 3.6-B shows the modeled locations of the emergency generators. East Campus emergency generators are included in the cumulative analysis since the testing of these generators is not included in the Project.

Receptors. In order to evaluate health impacts on off-site receptors, ENVIRON placed receptors at the locations of surrounding sensitive populations, including adult and child residents, schools, hospitals,

and playgrounds utilizing a 25 by 25 meter receptor grid for 500 meters as shown in Figure 5 of Appendix 3.6-B. A default breathing height of 1.8 meters was used for ground-level or ground floor receptors. For sensitive populations at heights other than ground level, a default height of three meters was added to the receptor height for each floor/story above ground.

Buildings. In order to evaluate the impact of building downwash[21] effects on the emergency generators, the dimensions of the buildings near the emergency generators were added to the model and the impact was simulated using EPA's building wake effect model to be used with AERMOD, called Building Profile Input Program (BPIP).

CAL3QHCR Modeling Methodology

$PM_{2.5}$ and TAC concentrations from Project and background traffic on major roadways at existing sensitive receptors were estimated using CAL3QHCR, EPA's and BAAQMD's preferred model for determining air pollutant concentrations downwind from traffic. CAL3QHCR incorporates hourly emission factors and traffic volumes with a full year of hourly meteorological data to estimate air concentrations for inert pollutants including particulate matter, such as DPM and other gaseous TACs. For the HRA, the following TACs associated with traffic were evaluated:

- DPM from diesel-fueled vehicles;
- Total organic gas (TOG) from the exhaust of diesel-fueled vehicles;
- TOG from the exhaust of gasoline-fueled vehicles;
- Evaporative TOG from gasoline-fueled vehicles;
- $PM_{2.5}$ from the exhaust of all vehicles; and
- $PM_{2.5}$ from the brake and tire wear of all vehicles.

Air dispersion models, such as CAL3QHCR, require a variety of inputs, such as source geometry, hourly traffic volumes, hourly emission factors, meteorological parameters, topography information, and receptor parameters. When site-specific information is unknown, default parameter sets were used that are designed to produce conservative (i.e. overestimates of) air concentrations.

Vehicular emission factors are expected to decrease with time due to the improvement of engines and increasingly stringent engine control regulations. Traffic volumes are assumed to increase with time due to development. Therefore, the future year (or years) that is selected to be analyzed for traffic modeling impacts the end results. For the HRA, $PM_{2.5}$ and TAC concentrations were evaluated for 2015, 2018, 2025 (consistent with analyses in Section 3.5, Transportation), and a 70-year age

[21] Turbulent eddies can be formed in the downwind side of buildings. Those eddies may cause a plume from a stack source located near the building to be drawn towards the ground much more than it would if a building or structure were not present. The effect can increase the resulting ground-level pollutant concentrations downstream of a building. The dispersion model used to evaluate the impacts of emergency generators incorporate algorithms to evaluate the effect.

sensitivity weighted average, as is required by BAAQMD for both Project and background traffic. See *Traffic Volumes* and *Emission Factors* section for more details.

Roadway Source Geometry. The roadway geometry used in the model was determined using an aerial map of the Project area. Bayfront Expressway, Marsh Road, Willow Road, University Avenue, Middlefield Road, and Highway 101 were modeled, as shown in Figure 2 of Appendix 3.6-B. Consistent with CAL3QHCR guidance,[22] each roadway was broken into a series of straight segments, or "links," which have constant emission factors and traffic volumes. The width of the link includes all travel lanes in one direction and, consistent with CAL3QHCR guidance,[23] an additional three meters on each side to account for the turbulent mixing of air behind the moving vehicles. The elevation of each link used in the model was the average elevation within the link's geometry, which was found using data from the USGS.[24]

Traffic Volumes. Project average daily traffic volumes along each roadway were obtained from DKS. Background average daily traffic volumes were obtained from DKS, the City,[25] and CalTrans Traffic Data Branch.[26] When the estimates of traffic volume differed across these sources, the larger traffic volume was used in order to be conservative. Estimated traffic volumes from other known projects in the area were also obtained from DKS and were included in the background traffic analysis. Traffic volumes were assumed to remain constant on a link between major roads. Areas of constant traffic volume are shown as one color in Figure 2 of Appendix 3.6-B. While this assumption is not consistent with what physically happens along the roadways, as vehicles would turn off or onto the roadway at minor intersections, it is a reasonable approximation of the flow of vehicles for this analysis because the largest known traffic volume was assumed for the entire segment. Estimated traffic volumes are shown in Appendix 3.6-N and Appendix 3.6-O of this Draft EIR.

Project traffic was provided for full occupancy of the East Campus and full and partial occupancy for the West Campus. For example, the 2015 traffic volume scenario incorporated the assumption that only the East Campus was fully occupied where 2018 and 2025 traffic volume scenarios incorporated the assumption that both campuses were fully occupied.[27] The 70-year average traffic volume incorporates the assumptions of full occupancy of the East Campus in 2013 and a linear phasing in of the West Campus between 2015 and 2018 with no growth in Project traffic after that time.

Background traffic was provided for the same time periods as the full occupancy of the East Campus and West Campus, discussed above. The background traffic was assumed to increase by one percent

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[22] Technology Transfer Network, Support Center for Regulatory Atmospheric Modeling, "Preferred/Recommended Models," April 19, 2011, website: http://www.epa.gov/scram001/dispersion_prefrec.htm, accessed November 21, 2011.

[23] EPA. 1995. Addendum To The User's Guide To CAL3QHC Version 2.0 (CAL3QHC User's Guide). Office of Air Quality Planning and Standards. September.

[24] United States Geological Survey, "The National Map Seamless Server Start Page," website: http://seamless.usgs.gov/website/seamless/viewer.htm, accessed November 21, 2011.

[25] Traffic volumes obtained from the city are shown in Appendix 3.6-D.

[26] California Department of Transportation, "Welcome to the Traffic Data Branch," website: http://traffic-counts.dot.ca.gov/, accessed November 21, 2011.

[27] Years evaluated are consistent with transportation analysis.

per year and included traffic from nearby anticipated projects, as detailed in Section 3.5, Transportation.

Daily traffic volumes were converted to hourly traffic volumes using an assumed percentage of traffic for each hour. For Project traffic, this percentage was obtained from the Project Sponsor (see Appendix 3.6-P). For background traffic, this percentage was calculated using the fraction of VMT at each hour obtained from EMFAC2007[28] and is shown in Appendix 3.6-P.

Because the emissions of some TACs depend on the fuel burned in combustion, the hourly traffic volumes must be broken down into diesel and gasoline fueled traffic volumes. The hourly percentage of diesel and gasoline fueled vehicles is calculated using the fraction of VMT at each hour that are diesel or gasoline fueled, which was obtained from EMFAC2007 and is shown in Appendix 3.6-N and 3.6-Q for Project and background traffic respectively.

Emissions Factors. As mentioned above, emissions factors were estimated for the following pollutants:

- DPM from diesel-fueled vehicles;
- TOG from the exhaust of diesel-fueled vehicles;
- TOG from the exhaust of gasoline-fueled vehicles;
- Evaporative TOG from gasoline-fueled vehicles;
- $PM_{2.5}$ from the exhaust of all vehicles; and
- $PM_{2.5}$ from the brake and tire wear of all vehicles.

Emission factors were calculated using EMFAC2007 in "Burden Mode" for San Mateo County, California. Burden Mode generates emission factors in terms of tons of pollutant emitted per day, which takes into account distributions of temperatures, relative humidities, and vehicular speeds that are characteristic of the area. Emissions reported by the model were converted to units of grams of pollutant emitted per VMT or trip using the daily VMT or trips. Emission factors for TOG, DPM, and $PM_{2.5}$ for each of the vehicle classes from EMFAC2007 were weighted by the fraction of VMT of each class for each hour for the relevant fuel type to obtain the hourly emission factor. Thus, these hourly emission factors incorporate the mix of vehicle types by hour. For background traffic, this percentage was calculated using unadjusted fractions of VMT from EMFAC2007 for all roadways, except for the section of Willow Road between Middlefield Road and US 101. For this section, the heavy duty trucks were removed from the default vehicle mix due to the restriction on trucks along this segment of the road. For Project traffic, the only vehicle classes considered were light duty automobiles, light and medium duty trucks, motorcycles, and urban buses.

[28] California Environmental Protection Agency, Air Resources Board, "EMFAC2007 Release," April 14, 2010, website: http://www.arb.ca.gov/msei/onroad/latest_version.htm, accessed November 21, 2011.

Emission factors used in modeling are shown in Appendix 3.6-R and Appendix 3.6-S for Project and background traffic respectively. Emission factors were calculated for the year of each modeling scenario described above. For the 70-year average scenario, the emission factors were calculated for 2013 to 2040 (the last year EMFAC2007 estimates emissions), with 2040 emission factors used for the years 2041 through 2083. This is likely an overestimate because emission factors would likely continue to decrease with time. The average is weighted by an age sensitivity factor assuming the receptor is *in utero* in 2013, consistent with BAAQMD guidance.[29] These scaling factors are shown in Appendix 3.6-T. The concentrations of TOG were speciated using BAAQMD's speciation profiles for TOG from gasoline-fueled vehicles[30] and EPA's speciation profile for TOG from diesel-fueled vehicles, which is shown in Appendix 3.6-U.

Receptors. The modeled receptor locations are presented in Figures 5 and 6 of Appendix 3.6-B**,** and are the same as the receptors used for construction and stationary source modeling. In addition to the receptors for the construction and emergency generator models described above, receptors were placed with 25 meter spacing 25, 50, and 75 feet away from each roadway modeled.

Meteorological Data. To characterize the transport and dispersion of pollutants in the atmosphere, CAL3QHCR requires hourly meteorological data in the same format as the data required by the Industrial Source Complex Short Term Model (ISCST3), another EPA air dispersion model. The same meteorological station, Stanford University on-site meteorological station, used in the emergency generator and construction model was used in the roadway analysis. However, the meteorological data was processed to be in the ISCST3 format.

An important consideration in an air dispersion modeling analysis is the selection of rural or urban dispersion coefficients. As discussed in the AERMOD model section, the rural designation was chosen, which results in the use of the rural mixing height found in the meteorological data. Much of the area surrounding the roadways is comprised of single family homes, so ENVIRON used a surface roughness of one meter, consistent with BAAQMD guidance.

Modeled Air Concentration. The maximum modeled annual concentration for DPM, $PM_{2.5}$, hourly concentration for diesel exhaust TOG, and annual and hourly concentrations for gasoline exhaust TOG and gasoline non-exhaust TOG at the receptors modeled are used to calculate the cancer risk and non-cancer HIs, which are discussed in the following sections.

Cumulative Risk Sources

Cumulative risks from nearby sources were evaluated using data from background traffic and stationary sources identified using BAAQMD's stationary source tool for sources within 1,000 feet of the Project. If emissions of specific TACs from stationary sources were given, ENVIRON used generic source parameters in AERMOD to determine the dispersion of these emissions. The emission rates used in modeling for these sources are shown in Appendix 3.6-V. In other instances, ENVIRON utilized the

[29] BAAQMD. 2011. Recommended Methods for Screening and Modeling Local Risks and Hazards.
[30] BAAQMD. 2011. Recommended Methods for Screening and Modeling Local Risks and Hazards.

specified risks and the appropriate distance multiplier provided by BAAQMD in response to the source inquiry. These details are contained in Appendix 3.6-K. Details on background traffic evaluation are discussed above.

Risk Characterization Methods

The following sections discuss the various components required for conducting the HRA in detail. This consists of using the modeled air concentrations coupled with exposure intake parameters and toxicity information to determine the health impacts to sensitive receptors.

Exposure Assessment

Potentially Exposed Populations. The Project Sponsor has indicated that there would be no on-site day care facilities. Therefore, only off-site sensitive receptors were considered. The off-site receptor populations included in this evaluation are adult resident and child resident as the closest properties to the Project site are residences. There are schools, hospitals and daycare facilities located near the Project site, however, assuming these sensitive receptors to be residences is more conservative, due to longer exposure time, duration and frequency, since recommended breathing rates are either the same or more conservative.

For purposes of the HRA, a maximally exposed individual sensitive receptor (MEISR) is identified. The MEISR is defined as the sensitive receptor with the highest estimated cancer, chronic, or acute non-cancer health impacts.

Exposure Assumptions. The exposure parameters used for estimating excess lifetime cancer risks and chronic and acute non-cancer HIs for all potentially exposed populations were obtained using risk assessment guidelines from Cal/EPA[31] and BAAQMD,[32] unless otherwise noted, and are presented in Table 3.6-7 for the Project.

Calculation of Intake: The dose estimated for the each exposure pathway is a function of the concentration of a chemical and the intake of that chemical. The intake factor for inhalation, IF_{inh}, can be calculated as follows:

$$IF_{inh} = \frac{DBR * ET * EF * ED * CF}{AT}$$

[31] Cal/EPA, the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, Office of Environmental Health Hazard Assessment. August 2003.

[32] BAAQMD, Air Toxics NSR Program Health Risk Screening Analysis (HRSA) Guidelines, January 2010.

Where:

IF_{inh}	=	Intake Factor for Inhalation (m^3/kg-day)
DBR	=	Daily Breathing Rate (L/kg-day)
ET	=	Exposure Time (hours/24 hours)
EF	=	Exposure Frequency (days/year)
ED	=	Exposure Duration (years)
AT	=	Averaging Time (days)
CF	=	Conversion Factor, 0.001 (m^3/L)

The chemical intake or dose is estimated by multiplying the inhalation intake factor, IF_{inh}, by the chemical concentration in air, C_i. When coupled with the chemical concentration, this calculation is mathematically equivalent to the dose algorithm given in Office of Environmental Health Hazard Assessment (OEHHA) Hot Spots guidance.[33]

Table 3.6-7
Exposure Parameters

		Construction		Operational	
Exposure Parameter	**Units**	**Resident Adult**	**Resident Child**	**Resident Adult**	**Resident Child**
Daily Breathing Rate (DBR)	[L/kg-day]	302	581	302	581
Exposure Time (ET)	[hours/24 hours]	24	24	24	24
Exposure Frequency (EF)	[days/year]	350	350	350	350
Exposure Duration (ED)	[years]	1.7	1.7	70.0	9.0
Averaging Time (AT)	[days]	25550	25550	25550	25550
Intake Factor, Inhalation (IF_{inh})	[m^3/kg-day]	0.007	0.014	0.290	0.072

Source: ENVIRON, 2011, Table 18 of Appendix 3.6-A.

Toxicity Assessment

The toxicity assessment characterizes the relationship between the magnitude of exposure and the nature and magnitude of adverse health effects that may result from such exposure. For purposes of calculating exposure criteria to be used in risk assessments, adverse health effects are classified into two broad categories: cancer and non-cancer endpoints. Toxicity values used to estimate the likelihood of adverse effects occurring in humans at different exposure levels are identified as part of the toxicity assessment component of a risk assessment.

In this HRA, the chemicals of potential concern were identified in accordance with the indicator chemical approach that is consistent with the Cal/EPA OEHHA guidance. Diesel exhaust, a complex mixture that includes hundreds of individual constituents, is identified by the State as a known carcinogen. Under California regulatory guidelines, DPM is used as a surrogate measure of carcinogen

[33] Cal/EPA, the Air Toxics Hot Spots Program Guidance Manual for Preparation of Health Risk Assessments, Office of Environmental Health Hazard Assessment, August 2003.

exposure for the mixture of chemicals that make up diesel exhaust as a whole. There is currently no acute non-cancer toxicity value available for DPM. Thus, speciated components of diesel with acute toxicity values were included in the acute non-cancer hazard analysis. The toxicity values for the chemicals evaluated in this analysis are summarized in Table 19 of Appendix 3.6-A.

As shown in Table 3.6-7, the estimated excess lifetime cancer risks for a resident child, daycare child, and school child were adjusted using the age sensitivity factors (ASFs) recommended in the Cal/EPA OEHHA Technical Support Document (TSD)[34] and the cancer risk adjustment factors (CRAFs) recommended by BAAQMD.[35] This approach accounts for an "anticipated special sensitivity to carcinogens" of infants and children. Cancer risk estimates are weighted by a factor of 10 for exposures that occur from the third trimester of pregnancy to two years of age and by a factor of three for exposures that occur from two years through 15 years of age. No weighting factor (i.e., an ASF of one, which is equivalent to no adjustment) is applied to ages 16 to 70 years.

Risk Characterization

Estimation of Cancer Risks. Excess lifetime cancer risks are estimated as the upper-bound incremental probability that an individual will develop cancer over a lifetime as a direct result of exposure to potential carcinogens. The estimated risk is expressed as a unitless probability. The cancer risk attributed to a chemical is calculated by multiplying the chemical intake or dose at the human exchange boundaries (e.g., lungs) by the chemical-specific cancer potency factor (CPF).

The equation used to calculate the potential excess lifetime cancer risk for the inhalation pathway is as follows:

$$Risk_{inh} = C_i \text{ x } CF \text{ x } IF_{inh} \text{ x } CPF_i \text{ x } ASF$$

Where:

$Risk_{inh}$ = Cancer Risk; the incremental probability of an individual developing cancer as a result of inhalation exposure to a particular potential carcinogen (unitless)

C_i = Annual Average Air Concentration for $Chemical_i$ ($\mu g/m^3$)

CF = Conversion Factor (mg/μg)

IF_{inh} = Intake Factor for Inhalation (m^3/kg-day)

CPF_I = Cancer Potency Factor for $Chemical_i$ (mg chemical/kg body weight-day)$^{-1}$

ASF = Age Sensitivity Factor (unitless)

Estimation of Chronic Non-cancer Hazard Quotients/Indices. The potential for exposure to result in chronic non-cancer effects is evaluated by comparing the estimated annual average air concentration (which is equivalent to the average daily air concentration) to the chemical-specific non-cancer chronic reference exposure levels (RELs). When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient (HQ). To evaluate the potential for adverse chronic non-cancer health effects

[34] Cal/EPA, Technical Support Document for Cancer Potency Factors: Methodologies for Derivation, Listing of Available Values, and Adjustment to Allow for Early Life Stage Exposures, May 2009.

[35] BAAQMD, California Environmental Quality Act Air Quality Guidelines, May 2011a.

from simultaneous exposure to multiple chemicals, the HQs for all chemicals are summed, yielding an HI. For evaluation of the Project, DPM is the only pollutant evaluated for chronic non-cancer risks, therefore the HQ for DPM is the same as the overall HI.

The equations used to calculate the chemical-specific HQs and the overall HI are:

$$\text{Chronic } HQ_i = C_i / cREL_i$$

$$\text{Chronic HI} = \Sigma HQ_i$$

Where:

Chronic HQ_i	=	Chronic Hazard Quotient for Chemical_i (unitless)
Chronic HI	=	Hazard Index (unitless)
C_i	=	Annual Average Air Concentration for Chemical_i ($\mu g/m^3$)
$cREL_i$	=	Chronic Non-cancer Reference Exposure Level for Chemical_i ($\mu g/m^3$)

Estimation of Acute Non-cancer Hazard Quotients/Indices. The potential for exposure to result in acute non-cancer effects is evaluated by comparing the estimated one-hour maximum air concentration to the chemical-specific non-cancer acute RELs. The estimation method for determining the 1-hr maximum concentration was described in the "Air Dispersion Modeling" section. When calculated for a single chemical, the comparison yields a ratio termed a hazard quotient or HQ. To evaluate the potential for adverse acute non-cancer health effects from simultaneous exposure to multiple chemicals, the HQs for all chemicals are summed, yielding an HI.

The equations used to calculate the chemical-specific HQs and the overall HI are:

$$\text{Acute } HQ_i = C_i / aREL_i$$

$$\text{Acute HI} = \Sigma HQ_i$$

Where:

Acute HQ_i	=	Acute Hazard Quotient for Chemical_i (unitless)
Acute HI	=	Acute Hazard Index (unitless)
C_i	=	1-hour Maximum Air Concentration for Chemical_i ($\mu g/m^3$)
$aREL_i$	=	Acute Non-cancer Reference Exposure Level for Chemical_i ($\mu g/m^3$)

Project Evaluation

The following analysis is based both on trip rates associated with the proposed CDP amendment at the East Campus, included in Section 3.5, Transportation, as well as development that would occur at the West Campus.

AQ-1 ***Conflict with or Obstruct Implementation of the Applicable Air Quality Plan.*** *The Project, at both the East Campus and West Campus, would not conflict with or obstruct implementation of the applicable air quality plan. (LTS)*

The most current air quality plan for the region is the recently adopted 2010 Clean Air Plan, which updates the 2005 Ozone Strategy and represents a unique approach to air planning by including GHGs, as well as CPs and TACs. For the 2010 Clean Air Plan, the travel activity adjustments used in preparing the on-road mobile source inventory are the same as those used in the Transportation Air Quality Conformity Analysis for MTC's regional transportation plans. MTC's travel demand model utilizes regional demographic forecasts from ABAG's socioeconomic and population projections. Under BAAQMD methodology, for consistency with the 2010 Clean Air Plan, a project or plan must demonstrate that the population or VMT assumptions contained in the Clean Air Plan would not be exceeded and that the project or plan implements TCMs as applicable.

East Campus

As mentioned in Section 2, Project Description, the East Campus is currently zoned M-2-X (General Industrial, Conditional Development) and designated General Industrial in the City's General Plan. Under the current land use designation and CDP, the East Campus could accommodate a maximum of 3,600 employees. However, the Project Sponsor seeks a CDP amendment to convert the employee cap to a vehicular trip cap in order to allow additional employees on-site. The CDP amendment would accommodate the proposed increase in employees at the site to a total of approximately 6,600 employees at the East Campus through implementation of the Project Sponsor's proposed TDM program.

West Campus

The West Campus is currently zoned M-2 (General Industrial) and designated General Industrial in the City's General Plan. The development of the West Campus would require an increase in allowable height from 35 feet to 75 feet and would require rezoning the site to M-2-X. Under the current land use designation, the West Campus can be built out to approximately 449,346 sf, with a 0.45 floor to area ratio (FAR) for office uses and a 0.55 FAR for related office uses (such as amenities). Development of the West Campus would result in an employment increase of approximately 2,800 persons.

Total Project

MTC maintains an inventory of population for the region and by county, the latest version of which was published in 2008.[36] The MTC population estimates cite a 2035 Bay Area[37]

[36] Travel Forecasts Data Summary, "Transportation 2035 Plan for the san Francisco Bay Area," website: http://www.mtc.ca.gov/planning/2035_plan/Supplementary/T2035-Travel_Forecast_Data_Summary.pdf, accessed July 26, 2011.

[37] Includes San Francisco, San Mateo, Santa Clara, Alameda, Contra Costa, Solano, Napa, Sonoma, and Marin counties.

population of 9,031,498. Implementation of the Project at the East Campus and West Campus would result in an employment increase of approximately 5,800. The East Campus is currently permitted to accommodate a maximum of 3,600 employees. The proposed approximately 6,600 employees is a 3,000-person increase in employment density. The West Campus would add approximately 2,800 employees. Therefore, the net increase in employment for the East Campus and West Campus is 5,800. As discussed in Section 3.14, Population and Housing, this represents approximately 3,257 new households in the region, which represents approximately 0.10 percent of the total anticipated growth in the Bay Area according to ABAG projections.

MTC also maintains an inventory of VMT for the nine-county Bay Area region and by county. For 2035, MTC data shows VMT for San Mateo County to be 168,120,927 miles. Full operation of the East Campus and West Campus would result in a vehicle trip generation of 15,956 trips per weekday. The resulting regional increase in VMT would be 222,886 miles per weekday. The addition of Project-related VMT represents approximately 0.13 percent of the total anticipated VMT growth in the nine county Bay Area. The Project's contribution to VMT would not exceed the regional VMT projections and do not constitute a significant share of overall VMT for the Bay Area according to MTC's VMT inventory.

Both the 2010 Clean Air Plan and the 2005 Ozone Strategy emphasize the need for smart growth and a reduction of single automobile usage. The Project includes a TDM program to reduce vehicular traffic generated by the Project, as described in Section 2, Project Description. Although the TDM program would reduce the effect of traffic impacts, conservatively, it may not be enough to reduce the impact associated with an increase in VMT. The Project would also enhance non-automotive access to and within the Project site, including providing public bicycle and pedestrian access through the undercrossing of Bayfront Expressway between the East Campus and West Campus.

The transportation improvements mentioned above, and explained in more detail in Section 3.5, Transportation, would collectively enhance connectivity between the East Campus and West Campus, promote safe bicycle and pedestrian circulation, and increase accessibility to transit. These improvements are consistent with and supportive of the TCMs identified in the 2005 Ozone Strategy and the 2010 Clean Air Plan, as critical to attaining the CCAA ozone standard. Therefore, the Project does not conflict with or obstruct implementation of the applicable Air Quality Plan and impacts are considered ***less than significant***.

AQ-2 ***Violation of any Air Quality Standard.*** *The Project, at both the East Campus and West Campus, could result in the violation of air quality standards:*

- *Operation of the Project at the East Campus would create new area and mobile sources of air pollutants that would generate emissions of ROG, PM_{10} and $PM_{2.5}$, but would not exceed BAAQMD's significance thresholds. However, emissions of NO_X from the East Campus operations would exceed BAAQMD's significance thresholds, resulting in a potentially significant impact. (PS)*

- *Operation of the Project at the West Campus would create new area and mobile sources of air pollutants that would generate emissions of ROG, PM_{10} and $PM_{2.5}$, but would not exceed BAAQMD's significance thresholds. However, emissions of NO_X from the West Campus operations would exceed BAAQMD's significance thresholds, resulting in a potentially significant impact. (PS)*
- *Operation of the Project, at both the East Campus and West Campus, would create new area and mobile sources of air pollutants that would generate emissions of ROG, NO_X, and PM_{10} and would exceed BAAQMD's significance thresholds. Thus, this impact would be potentially significant. (PS)*

East Campus

The mass emissions associated with operation of the East Campus are based on the estimates for area sources, natural gas energy use, traffic associated with the Project, and emergency generator testing. Table 3.6-5, above, presents the mass emissions from these sources, which are compared to BAAQMD's operational CP and precursors thresholds of significance outlined in Table 2-1 of BAAQMD's CEQA Guidelines. Table 3.6-8, below, shows these values compared to the mass emissions presented in Table 3.6-5, with removal of the background emissions at the East Campus. As shown in Table 3.6-8, the ROG, PM_{10}, and $PM_{2.5}$ emissions as a result of East Campus operations would be below the threshold. However, the threshold for NO_X emissions is 54 pounds per day, while operation of the East Campus would emit approximately 56 pounds per day due to the increase in traffic. As such, the Project at the East Campus would result in ***potentially significant*** NO_X emissions.

West Campus

As with the East Campus, mass emissions associated with operation of the West Campus are based on the estimates for area sources, natural gas energy use, traffic associated with the Project, and emergency generator testing. Table 3.6-8, below, shows these values compared to the mass emissions presented in Table 3.6-5, above. As shown in Table 3.6-8, the West Campus net emissions do not exceed BAAQMD's significance threshold for ROG, PM_{10} and $PM_{2.5}$, resulting in a less-than-significant impact. However, at 56 pounds per day, emissions of NO_X would exceed BAAQMD's significance thresholds of 54 pounds per day. This would be a ***potentially significant*** impact.

Total Project

The mass emissions associated with operation of the total Project are based on the estimates for area sources, natural gas energy use, traffic associated with the Project and emergency generator testing. However, the majority of the Project NO_X, ROG, and PM_{10} emissions are associated with traffic. Table 3.6-8 outlines these values compared to the mass emissions presented in Table 3.6-5, with the removal of the background emissions at the East Campus.

As shown in Table 3.6-8, $PM_{2.5}$ emissions would not exceed BAAQMD's significance thresholds, resulting in a less-than-significant impact. However, the Project would exceed emissions thresholds for ROG, NO_X, and PM_{10}. The threshold for ROG emissions is 54 lbs per year. Individually, operations at the East Campus and the West Campus would not exceed this threshold; however, when the East Campus and West Campus are combined, the Project would emit 80 lbs of ROG emissions per day, which exceeds the threshold. Similarly, while the PM_{10} threshold is 82 pounds per day, the Project would emit approximately 117 pounds per day. Since the East Campus and West Campus individually exceed NO_X thresholds, the Project would also exceed the BAAQMD NO_X threshold. Therefore, the Project would result in ***potentially significant*** ROG, NO_X, and PM_{10} emissions.

Table 3.6-8
Operational Mass Emissions

	ROG	NOx	PM_{10}	$PM_{2.5}$	ROG	NOx	PM_{10}	$PM_{2.5}$
	(Average Pounds per Day)				(Annual Average Tons per Year)			
East Campus	35	**56**	71	24	6.3	**10**	13	4.3
West Campus	46	**56**	47	16	8.4	**11**	8.5	2.9
Project	**80**	**112**	**117**	39	**15**	**22**	**21**	7.2
Threshold of Significance	54	54	82	54	10	10	15	10

Source: ENVIRON, 2011.

Note: Bolded Values are Significant

MITIGATION MEASURES. At this time there are no feasible mitigation measures that would reduce the NO_X, ROG, and PM_{10} emissions to less than significant. Thus, this impact would be significant and unavoidable. However, the silt loading used to estimate fugitive dust emissions of PM_{10} is likely an overestimate of the actual silt loading on the roads on which the Project trips would occur based on the range of silt loadings explained in EPA's AP-42.[38] Therefore, the actual PM_{10} emissions would likely be less than shown. Nonetheless, since site-specific silt loadings are not available at this time, the actual reduction in emissions is speculative. Therefore, impacts related to these emissions are ***significant and unavoidable***. (SU)

AQ-3 ***Construction Criteria Air Pollutant Emissions.*** *Construction activities at the West Campus would not generate emissions of ROG, NO_X, PM_{10} and $PM_{2.5}$ that would exceed BAAQMD's significance thresholds. (LTS)*

The CP emissions associated with construction of the West Campus are an estimate of average daily over the construction period and would result in 22 pounds per day of ROG, 40 pounds per day of NO_X, 2 pounds per day of PM_{10} exhaust, and 2 pounds per day of $PM_{2.5}$ exhaust. These are shown in Table 3.6-4, above, with further details contained in Tables 6 through 9 of Appendix 3.6-A of this Draft EIR. Table 3.6-9, below, compares the average daily mass emissions from construction to BAAQMD's construction mass emission significance thresholds shown in Table 2-1 of the BAAQMD CEQA Guidelines. As shown, the West Campus

[38] EPA, Compilation of Air Pollutant Emission Factors, Chapter 13.2.1 Paved Roads, January 2011.

construction activities would not exceed BAAQMD significance thresholds for ROG, NO_X, PM_{10}, or $PM_{2.5}$, resulting in a ***less-than-significant*** impact.

Table 3.6-9
Construction Mass Emissions

	ROG	NOx	PM_{10}	$PM_{2.5}$
West Campus Emissions (Average pounds per day)	22	40	2	2
BAAQMD Significance Threshold (Average pounds per day)	54	54	82	54

Source: ENVIRON, 2011.
Note: PM emissions are from exhaust only.

MITIGATION MEASURES. Mitigation Measure AQ-3.1 includes all appropriate dust control measures recommended by BAAQMD. Inclusion of these measures in the construction contracts for future development of the West Campus would ensure that construction-related air quality impacts remain at a less-than-significant level. (LTS)

AQ-3.1 *Implement Recommended Dust Control Measures.* BAAQMD does not have mass emission thresholds for fugitive PM, but rather requires implementation of Best Management Practices (BMPs) as mitigation measures for all proposed projects. In order to ensure that these are implemented to minimize possible fugitive PM emissions, the BMPs are designated as mitigation measures.

a. All exposed surfaces (e.g., parking areas, staging areas, soil piles, graded areas, and unpaved access roads) shall be watered two times per day.

b. All haul trucks transporting soil, sand, or other loose material off-site shall be covered.

c. All visible mud or dirt track-out onto adjacent public roads shall be removed using wet power vacuum street sweepers at least once per day. The use of dry power sweeping is prohibited.

d. All vehicle speeds on unpaved roads shall be limited to 15 mph.

e. All roadways, driveways, and sidewalks to be paved shall be completed as soon as possible. Building pads shall be laid as soon as possible after grading unless seeding or soil binders are used.

f. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

g. All construction equipment shall be maintained and properly tuned in accordance with manufacturer‘s specifications. All equipment shall be checked by a certified visible emissions evaluator.

h. Post a publicly visible sign with the telephone number and person to contact at the lead agency regarding dust complaints. This person shall respond and take corrective action within 48 hours. The Air District's phone number shall also be visible to ensure compliance with applicable regulations.

AQ-4 ***Localized Carbon Monoxide Impacts from Motor Vehicle Traffic.*** *The addition of Project-related traffic from both the East Campus and West Campus would result in increased concentrations of carbon monoxide around intersections in the vicinity of the Project, but not to the extent that the ambient air quality standards for CO would be exceeded. As a result, impacts of localized CO concentrations would be less than significant. (LTS)*

According to BAAQMD's screening criteria for CO, projects are considered less than significant if:[39]

a. The project is consistent with an applicable congestion management program established by the county's congestion management agency for designated roads or highways, regional transportation plan, and local congestion management agency plans.

b. The project traffic would not increase traffic volumes at affected intersections to more than 44,000 vehicles per hour.

c. The project traffic would not increase traffic volumes at affected intersections to 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).

As illustrated in Figure 3.5-21, Transportation, the Project would not increase traffic volumes at affected intersections to more than 24,000 vehicles per hour. Because this volume is substantially less than even the most stringent criterion (24,000 vehicles per hour), CO concentrations are considered to be ***less than significant***.

AQ-5 ***Exposure to Toxic Air Contaminants.*** *The Project at both the East Campus and West Campus could expose sensitive receptors to substantial TACs, resulting in a potentially significant impact. (PS)*

ENVIRON conducted a HRA that evaluated exposure of sensitive receptors to TACs and $PM_{2.5}$ concentrations from Project construction and operational sources. The MEISR from construction, emergency generators, and Project traffic were identified. The sum of all health impacts from Project sources at these receptors was quantified and the mitigated health impacts are listed in Table 3.6-10. The short term health impacts are shown in Table 3.6-11.

[39] BAAQMD, CEQA Air Quality Guidelines, May 2011.

Table 3.6-10
Mitigated Project Health Impacts

MEISR for each Project Source	UTMx	UTMy	Source Contribution at MEISR	Lifetime Excess Cancer Risk	Chronic HI	$PM_{2.5}$ Concentration
	M			in a million		$\mu g/m^3$
Project Construction	574,724	4,148,425	Mitigated West Campus Construction	9.1	0.014	0.09
			West Campus Emergency Generators	0.022	0.000008	4.0E-05
			Project Traffic	0.75	0.0005	0.009
Project Emergency Generator Testing	574,849	4,148,400	Mitigated West Campus Construction	0.40	0.012	0.058
			West Campus Emergency Generators	0.034	0.00001	6.3E-05
			Project Traffic	0.90	0.0006	0.011
Project Traffic	574,734	4,147,461	Mitigated West Campus Construction	0.058	0.0017	0.009
			West Campus Emergency Generators	0.012	0.000004	1.9E-05
			Project Traffic	9.0	0.009	0.156
			BAAQMD Significance Threshold	10	1	0.3
			Significant?	No	No	No

Source: ENVIRON, 2011, Table 26 of Appendix 3.6-A, with supporting information in Tables 20 through 25 of Appendix 3.6-A.

Table 3.6-11
Project Short Term Impacts

Source	MEISR Location		Acute Hazard Index
	UTMx	UTMy	
	m		
Project Construction	574,724	4,148,425	0.44
Project Traffic	574,951	4,148,088	0.013

Source: ENVIRON, 2011, Table 23 of Appendix 3.6-A.

BAAQMD requires that risks imposed by Project sources be less than 10 in a million for cancer risks. BAAQMD also requires that both chronic and acute Project health impacts result in an HI of less than 1.0. In addition, BAAQMD requires that the $PM_{2.5}$ concentration from Project sources be less than 0.3 micrograms per cubic meter ($\mu g/m^3$). The unmitigated cancer risk, chronic HI, and $PM_{2.5}$ concentration at the MEISR for Project construction are 14 in a million, 0.02, and 0.11 $\mu g/m^3$, respectively. This would result in a ***potentially significant impact***. With implementation of Mitigation Measure AQ-5.1 (discussed in more detail below), the mitigated cancer risk, chronic HI and $PM_{2.5}$ concentrations are 9.13 in a million, 0.014, and 0.16 $\mu g/m^3$, respectively.

To evaluate whether relocating the proposed emergency generators would reduce the health risks, ENVIRON performed a sensitivity analysis of the West Campus Emergency Generator locations and determined that any combination of three similarly sized emergency generators would not result in a significant Project impact.

MITIGATION MEASURE. Since the DPM emissions from the fleet mix contributed substantially to the exceedance of health risk thresholds; the HRA evaluated a reduction in the DPM emissions that would result in a less-than-significant impact. Mitigation Measure AQ-5.1 includes a plan to reduce Project fleet-wide average DPM emissions associated with off-road equipment by 35 percent from current fleet average DPM emissions levels. Inclusion of this measure in the construction contracts for future development in the Project area would reduce construction-related air quality impacts to a less-than-significant level. Therefore, implementation of Mitigation Measures AQ-5.1 would reduce construction-related mass emissions, resulting in a ***less-than-significant*** impact relative to exposure to TACs. (LTS)

AQ-5.1 *Reduce Fleet-Wide Average DPM Emissions*. The Project shall develop a plan that is approved by the City prior to issuance of building permits demonstrating that the off-road equipment (more than 50 horsepower) to be used for the West Campus construction (i.e., owned, leased, and subcontractor vehicles) would achieve a Project wide fleet-average 35 percent PM reduction compared to the most recent CARB fleet average. Acceptable options for reducing emissions include the use of late model engines, low-emission diesel products, alternative fuels, engine retrofit technology, after-treatment products, add-on devices such as particulate filters, and/or other options as such become available.

AQ-6 ***Exposure to Objectionable Odors.*** *The Project, at both the East Campus and West Campus, would not be expected to create objectionable odors that would affect a substantial number of people. This impact would be less than significant. (LTS)*

Screening tools were used to evaluate odor impacts. The Project would include on-site stationary source emissions related to the periodic testing of emergency diesel generators. These emissions are not expected to have the potential for substantial odor impacts on local sensitive receptors. Under certain circumstances, emissions for older, badly maintained diesel engines can have the potential for odor impact, but such would not be the case with the

emergency generators at the East Campus or West Campus. These generators would have advanced air emission controls systems, would be well-maintained, and would operate only briefly for periodic testing.

None of the activities associated with the Project would have the potential to expose nearby sensitive receptors (i.e., residential areas) to objectionable odors. BAAQMD presents odor screening distances in Table 3-3 of the BAAQMD CEQA Guidelines. Since the Project does not contain any of the listed land use types (including wastewater treatment plants, municipal solid waste storage or landfilling facilities, odoriferous manufacturing processes, and animal handling facilities) and is not siting a new receptor closer than the recommended screening distances to an existing odor source, the Project would not result in a significant odor impact. Therefore, the impact of exposure to objectionable odors would be ***less than significant***.

Cumulative Impacts

Regional air quality cumulative impacts of the Project are evaluated on the geographic scale of the Bay Area Basin. The BAAQMD CEQA Guidelines cumulative significance criteria are applied to the cumulative analysis of impacts to regional air quality, as discussed below. The geographic context for a discussion of cumulative impacts to localized air quality, such as for CO and PM_{10}, is the Menlo Park vicinity, in which the Project is located. This cumulative analysis examines the effects of the Project, in combination with other current projects, probable future projects, and projected future growth within the Bay Area Basin, San Mateo County and the City in the next 20 years.

Odors are not addressed cumulatively for the Project because the types of uses anticipated to be developed or allowed under the proposed zoning would not generate significant sources of odor. In addition, the Project area is not located in an area where existing or future odor-producing uses are proposed. Therefore, the additive effect of assessing cumulative odor impacts is not relevant for this Project and would not be cumulatively considerable.

C-AQ-1 ***Consistency with Applicable Air Quality Plans.*** *The Project, combined with other development within the City, would not conflict with or obstruct implementation of the applicable air quality plan. (LTS)*

Tier 1

As discussed above, the 2010 Clean Air Plan is based on ABAG's projections. Under BAAQMD methodology, for consistency with the 2010 Clean Air Plan, a project or plan must demonstrate that the population or VMT assumptions contained in the Clean Air Plan would not be exceeded and that the project or plan implements TCMs as applicable. As discussed in Section 3.14, Population and Housing, the Tier 1 projects would develop 200 dwelling units, which, when taken together with the Project's 666 new residents, would result in an increase in resident population of 1,190 (based on the current City persons per

household [pph] ratio of 2.62).[40] ABAG projects that the City's population will be approximately 37,900 in 2015 (the closest projection year to Project completion) and 40,600 in 2025. If the Tier 1 projects are completed concurrently with the Project, an increase of 1,190 total residents would result from cumulative development. Added to the current population of 32,319, this would result in a total City population of 33,509 persons in 2015, which is below ABAG projections. As such, implementation of the Tier 1 projects would not result in a conflict with the Clean Air Plan. The cumulative impacts associated with Tier 1 projects are considered ***less than significant***.

Tier 2

The Tier 2 projects encompass a larger geographic area and consist of projects that are in the early stages of planning or whose development could be considered somewhat speculative. The geographic context for the Tier 2 analysis would be the County of San Mateo, within which the Tier 2 projects are located. As discussed, in Section 3.14, Population and Housing, the Tier 2 projects, if completely realized, could result in a direct population increase of 43,332 residents[41] and an indirect population increase through creation of approximately 9,830 jobs that would generate 1,129 new residents.[42] The direct and indirect growth from (43,332 direct and 1,129 indirect) Tier 2 projects would total approximately 45 percent of the population growth forecasted for San Mateo County by ABAG between 2010 and 2025. On a cumulative basis, this is considered significant. The Project itself would add approximately 1,384 new residents to San Mateo County, which represents approximately three percent of the population growth that could result from Tier 2 projects. As such, the Project's contribution to this potential cumulative impact is not considerable. Therefore, the Project's cumulative impact regarding consistency with the Clean Air Plan would be ***less than significant.***

C-AQ-2 ***Violation of any Air Quality Standard.*** *The Project, in combination with other development within the City, would create new area and mobile sources of air pollutants that would generate emissions of ROG, NO_X, and PM_{10}, resulting in a violation of an Air Quality Standard. (PS)*

Tier 1 and Tier 2

The Project, in combination with the Tier 1 and Tier 2 Projects within the City, would result in a cumulatively significant impact for ROG, NO_X, and PM_{10} since these are significant for the Project. This is considered cumulatively significant according to BAAQMD's significance thresholds when a Project exceeds the BAAQMD's Project mass

[40] 1,190 new residents = 666 residents resulting from the Project + (200 dwelling units * 2.62 pph)

[41] 43,332 residents = 16,539 dwelling units * 2.62 pph

[42] 1,129 new residents = 9,830 new jobs / 1.78 workers per household * 7.8 percent City share * 2.62 pph

emission threshold for criteria air pollutants.[43] Because no feasible mitigation has been identified, the impact for ROG, NO_X, and PM_{10} is therefore ***significant and unavoidable.***

C-AQ-3 ***Cumulative Construction Criteria Air Pollutant Emissions.*** *Construction activities associated with the West Campus, in combination with other construction activities in the City, could generate dust or diesel emissions, thus exposing people to particulate matter. This is considered a potentially significant impact. (PS)*

Tier 1

Tier 1 includes 15 projects around the Project area. The CP emissions from these projects were analyzed using screening tables created by BAAQMD.[44] These screening tables were created to identify projects with CP emissions from construction that would likely be less than significant when compared to their thresholds. Table 3.6-12 shows the 15 Tier 1 projects, the size of the projects, their respective screening values, and a comparison to the screening values. As shown in the table, 14 of the projects have less-than-significant impacts when compared against the screening table. However, Menlo Gateway shows a significant impact on a project level. Therefore, the combination of projects could result in a significant impact. Thus, the cumulative impact of the Tier 1 projects is considered ***potentially significant***.

Tier 2

Tier 2 cumulative projects are still in their planning stages and may not be completed as currently planned or programmed. Therefore, the evaluation of their specific potential impacts would be speculative. While construction-related emissions are localized and tend not to cumulate with other projects unless they are immediately nearby, the Project would build out over a two-year period, making it possible that other projects could occur in the Project vicinity, but unlikely in this time frame. It is assumed that any of these projects going forward would conduct analyses that assess their emissions and implement feasible mitigation to reduce any large emissions including the dust control BMPs. Small projects with short construction schedules would likely not add to large amounts of emissions based on the screening criteria in BAAQMD's CEQA guidelines. Since the larger Tier 2 projects would not likely be constructed concurrently with the Project, whose buildout is anticipated to be completed by 2014, cumulative emissions are considered ***less than significant***.

MITIGATION MEASURE. Mitigation Measure AQ-3.1, identified for the Project, includes all appropriate dust control measures recommended by BAAQMD; therefore, construction-related air quality impacts associated with the West Campus would be reduced to a less-than-significant level. This measure would reduce the Project's contribution to cumulative construction emissions to less than cumulatively considerable. In addition, these same measures would apply to other construction projects (i.e., Menlo Gateway) that might

[43] BAAQMD CEQA Guidelines page 2-3.

[44] Table 3-1 of BAAQMD, CEQA Air Quality Guidelines, May 2011.

occur in the vicinity of the Project area. As a result, the cumulative impact would be considered to be less than significant. (LTS)

Table 3.6-12
Analysis of Construction CP Emissions from Tier 1 Projects

ID	Type	# of Units or Square Feet	Unit	Screening Quantity	Unit	Fraction of Significance
Office/Retail/Commercial/Etc						
1	Office	3,800	sf	277	ksf	0.01
	Retail	5,096		277		0.02
2	Commercial	110,065		277		0.40
3	Medical Office	9,825		277		0.04
4	Medical Office	10,166		277		0.04
5	Office/Health Club/Restaurant/ Hotel (includes 230 Rooms)	744,304		277		2.7
6	Office	23,011		277		0.08
7	Office	8,936		277		0.03
8	Office	8,970		277		0.03
9	Fitness	26,900		277		0.10
Residential						
10	Residential	22	du	114	du	0.19
11	Residential	21		114		0.18
12	Residential	7		114		0.06
13	Residential	26		114		0.23
Mixed Use						
14	Office	14,784	sf	277	ksf	0.05
	Residential	16	du	114	du	0.14
15	Commercial	3,635	sf	277	ksf	0.01
	Residential	108	du	114	du	0.95

Source: ENVIRON, 2011, Appendix 3.6-X.
Note: ID number corresponds with Table 3.1-1 in Section 3.1.

C-AQ-4 ***Cumulative Localized CO Concentrations.*** *Cumulative development in the Project vicinity would not result in CO concentrations above the ambient air quality standards. Therefore, cumulative impacts on localized CO concentrations would be less than significant. (LTS)*

Tier 1 and Tier 2

The criteria for significance for cumulative localized CO concentrations are the same as Project CO concentrations. According to BAAQMD's screening criteria for CO, the cumulative impacts of projects are considered less than significant if:[45]

1. Project is 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.

2. The total traffic would not result in traffic volumes at affected intersections of more than 44,000 vehicles per hour.

3. The total traffic would not increase traffic volumes at affected intersections of 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).

The Project would meet all of these criteria, as discussed above in AQ-4, and it is unlikely that Tier 1 or Tier 2 projects would violate the above criteria. In order to evaluate the likelihood of the criteria being exceeded, one can consider the order of magnitude increase based on peak hourly traffic volume at key intersections. For example, 2010 data from Caltrans that tracks peak hourly traffic volumes on California state highways are shown in Table 3.6-13. As shown below, the peak hourly volume at these intersections would have to more than double to exceed 44,000 vehicles per hour, which is the applicable standard since these are not areas where condition 3 above applies. Therefore, the Project along with the cumulative CO concentrations would be ***less than significant***.

[45] BAAQMD, CEQA Air Quality Guidelines, May 2011.

Table 3.6-13
Peak Hour Traffic Volumes in 2010

Street 1	Street 2	Traffic on Street 1	Traffic on Street 2	Total traffic
		Vehicles Per Hour		
Bayfront	Willow	4,800	3,250	8,050
Bayfront	University	4,800	1,950	6,750
101	Willow	14,500	3,250	17,750
101	University	14,500	1,950	16,450

Source: Traffic and Vehicle Data Systems Unit 2010 All Traffic Volumes on California State Highway System Available at: http://traffic-counts.dot.ca.gov/2010all/index.html.

C-AQ–5 ***Cumulative Toxic Air Contaminants Emissions.*** *The Project, in combination with other foreseeable development in the Project vicinity, would expose sensitive receptors to substantial TACs. Therefore, cumulative impacts from these pollutants would be potentially significant. (PS)*

Tier 1

According to the BAAQMD CEQA Guidelines, local community risks and hazards cumulative impacts should examine the TAC and $PM_{2.5}$ sources within 1,000 feet of a proposed project site. This includes both existing and foreseeable sources. The cumulative HRA combines the Project health impacts with other stationary sources within 1,000 feet of the Project site and traffic in the vicinity including current background levels and increases from other Tier 1 projects and growth. In addition, the TAC emissions from the Tier 1 projects were analyzed using BAAQMD's construction screening table.[46] As shown in Table 3.6-14, all the Tier 1 projects would have a less than significant impact at the Project's construction MEISR. However, the impact of these projects with all other sources could result in a potentially significant impact. The impacts of the emissions from the traffic associated with these projects is included in Table 3.6-14, as discussed in the Section 3.5, Transportation, and in CAL3QHCR modeling above.

Tier 2

Tier 2 cumulative projects are still in their planning stages and may not be completed as currently planned or programmed. In some cases, the build-out may not be reasonably foreseeable. Therefore, the evaluation of construction impacts would be speculative given the unknowns relative to scope, timing, and phasing. Construction TACs do not tend to disperse far from the site of release. Provided these Tier 2 projects are not located within 1,000 feet of the Project site, it is unlikely that they would result in a significant health impact. The cumulative HRA combines the Project health impacts with other stationary sources within 1,000 feet of the Project site and traffic in the vicinity including current

[46] BAAQMD, Screening Tables for Air Toxics Evaluation during Construction, Version 1.0, May 2010.

background levels and increases from other projects and growth.[47] These were evaluated for the MEISRs identified for the Project. Due to the existing background traffic, cumulative cancer risk of 167 in a million, the cumulative cancer risk is above BAAQMD significance level of 100 in a million. Furthermore, the $PM_{2.5}$ emissions of 1.3 $\mu g/m^3$ exceed the significance threshold of 0.8 $\mu g/m^3$. This is detailed in Table 3.6-15. All receptors identified with a cancer risk above 100 in a million are provided in Figure 7 of Appendix 3.6-B. Therefore, since sensitive receptors would be exposed to substantial TACs the cumulative impacts would be ***potentially significant.***

Table 3.6-14
Analysis of Air Toxics from Construction of Tier 1 Projects

ID	Type	# of Units or Square Feet	Unit	Distance from Construction MEISR	Minimum Offset Distance		Physical Distance further than Screening Distance?
					By Land Use	By Project	
				m			
Office/Retail/Commercial/Etc							
1	Office	3,800	sf	450	100	200	YES
	Retail	5,096			100		
2	Commercial	110,065		3,700	200	200	YES
3	Medical Office	9,825		4,100	100	100	YES
4	Medical Office	10,166		4,000	100	100	YES
5	Office/Health Club/Restaurant/ Hotel (includes 230 Rooms)	744,304		1,800	300	300	YES
6	Office	23,011		7,700	100	100	YES
7	Office	8,936		2,800	100	100	YES
8	Office	8,970		7,700	100	100	YES
9	Fitness	26,900		3,200	100	100	YES
Residential							
10	Residential	22	du	2,900	125	125	YES
11	Residential	21		700	125	125	YES
12	Residential	7		6,600	100	100	YES
13	Residential	26		3,700	125	125	YES
Mixed Use							
14	Office	14,784	sf	3,800	100	225	YES
	Residential	16	du		125		
15	Commercial	3,635	sf	3,700	100	400	YES
	Residential	108	du		300		

Source: ENVIRON, 2011, Appendix 3.6-X
Note: ID number corresponds with table 3.1-1.

[47] The screening results of the Tier 1 construction health risks are not included as the screening distance is further than the relevant MEISR.

Table 3.6-15
Mitigated Project Health Impacts

Source MEISR	UTMx (m)	UTMy (m)	Source Contribution at MEISR	Lifetime Excess Cancer Risk in a million	Chronic HI	$PM_{2.5}$ Concentration $\mu g/m^3$
Project Construction	574,724	4,148,425	Mitigated West Campus Construction	9.13	0.014	0.09
			West Campus Emergency Generators	0.022	0.000008	4.0E-05
			Project Traffic	0.75	0.0005	0.009
			Other Stationary Sources	0.7	0.002	0.012
			Background Traffic	29	0.011	0.18
			Cumulative Total	**39**	**0.027**	**0.36**
Project Emergency Generator Testing	574,849	4,148,400	Mitigated West Campus Construction	0.40	0.012	0.058
			West Campus Emergency Generators	0.034	0.00001	6.3E-05
			Project Traffic	0.90	0.0006	0.011
			Other Stationary Sources	2.9	0.006	0.015
			Background Traffic	30	0.011	0.19
			Cumulative Total	**35**	**0.039**	**0.32**
Project Traffic	574,734	4,147,461	Mitigated West Campus Construction	0.058	0.0017	0.009
			West Campus Emergency Generators	0.012	0.000004	1.9E-05
			Project Traffic	9.0	0.009	0.156
			Other Stationary Sources	0.5	0.002	0.016
			Background Traffic	167	0.062	1.07
			Cumulative Total	**176**	**0.076**	**1.3**
			BAAQMD Significance Threshold	100	10	0.8

Source: ENVIRON, 2011.
Note: Shaded Cells indicate a significant impact.

MITIGATION MEASURE. The Project's contribution to a significant health impact is less than five percent. In this instance, the receptors identified above the significance threshold would be significant even without the Project. Many of these existing receptors are closer than the recommended 500 foot distance from a freeway or other high traffic roadway as suggested by CARB in its guidance document on air quality and land use, Air Quality and Land Use Handbook: A Community Health Perspective.[48] The CARB guidance acknowledges the need to balance this recommendation with other State and local policies addressing housing and transportation needs, the benefits of urban infill, community economic development priorities, and other quality of life issues. The best solution would be to not have these receptors so close to a freeway, but since they already exist this is not a feasible option. There are no feasible Project-related mitigation measures that will reduce the impact to less than significant. Therefore, the cumulative health impacts remain ***significant and unavoidable***. (SU)

[48] CARB, *Air Quality and Land Use Handbook; A Community Health Perspective,* April 2005.