APPENDIX E

AIR QUALITY REPORT

AIR QUALITY IMPACT ANALYSIS FOR THE PROPOSED COYOTE VALLEY SPECIFIC PLAN CITY OF SAN JOSE

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January 2007

EXISTING CONDITIONS

Air Pollution Climatology

The amount of a given pollutant in the atmosphere is determined by the amount of pollutant released and the atmosphere's ability to transport and dilute the pollutant. The major determinants of transport and dilution are wind, atmospheric stability, terrain and, for photochemical pollutants, sunshine.

The CVSP is located in the central portions of the Santa Clara Valley. The Santa Clara Valley is bound by the San Francisco Bay to the north and by mountains to the east, south and west. Winds reflect the orientation of the valley, with the primary wind directions being up-valley (northwesterly) and down-valley (southeasterly). Up valley winds dominate in the afternoon and early evening, while light down valley "drainage" flows occur in the late evening and early morning. In the summer the southern end of the Santa Clara Valley becomes a "convergence zone" when air flowing from the Monterey Bay gets channeled northward in the southern end of the valley and meets with prevailing north-northwesterly winds.[1]

Wind speeds are greatest in the spring and summer and weakest in the fall and winter. Nighttime and early morning hours frequently have calm winds in all seasons, while summer afternoons and evenings are quite breezy. Strong winds are rare associated mostly with winter storms.

Pollutants can be diluted by mixing in the atmosphere both vertically and horizontally. Vertical mixing and dilution of pollutants are often suppressed by inversion conditions, when a warm layer of air traps cooler air close to the surface. During the summer, inversions are generally elevated above ground level, but are present over 90 percent of the time in both the morning and afternoon. In winter, surface-based inversions dominate in the morning hours, but frequently dissipate by afternoon.

Topography can restrict horizontal dilution and mixing of pollutants by creating a barrier to air movement. The Santa Clara valley has significant terrain features that affect air quality.

The air pollution potential of the Santa Clara Valley is high. High summer temperatures, stable air and mountains surrounding the valley combine to promote ozone formation. In addition to local sources of pollution, ozone precursors from San Francisco, San Mateo and Alameda Counties are carried by prevailing winds to the Santa Clara Valley. In addition, on summer days with low level inversions, ozone can be recirculated by southerly drainage flows in the late evening/early morning and by the prevailing northwesterlies in the afternoon. A similar recirculation patterns occurs in the winter, affecting levels of carbon monoxide and particulate matter. This movement of the air up and down the valley

[1] Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, 1996 (Revised December 1999).

increases the impact of the pollutants significantly.[2]

The project is within the San Francisco Bay Air Basin and within the Bay Area Air Quality Management District (BAAQMD). The project is near the southern border of the San Francisco Bay Air Basin and near its border with the North Central Coast Air Basin (NCCAB) and the Monterey Bay Unified Air Pollution Control District. The NCCAB is comprised of Monterey, Santa Cruz and San Benito Counties. The San Benito Valley lies directly south of the Santa Clara Valley and extends southeastwardly. Hollister, at the northern end of the San Benito Valley, experiences west winds nearly one-third of the time. The prevailing air flow during the summer months probably originates in the Monterey Bay area and enters the northern end of the San Benito Valley via the air gap through the Gabilan Range occupied by the Pajaro River. Northwesterly air flow frequently transports pollutants into the San Benito Valley from the Santa Clara Valley, particular in the fall months when the normal sea breeze diminishes.

Ambient Air Quality Standards

Criteria Pollutants

Both the U. S. Environmental Protection Agency and the California Air Resources Board have established ambient air quality standards for common pollutants. These ambient air quality standards are levels of contaminants which represent safe levels that avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. Table 1 identifies the major criteria pollutants, characteristics, health effects and typical sources. The federal and California state ambient air quality standards are summarized in Table 2.

The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health-related effects. As a result, the federal and state standards differ in some cases. In general, the California state standards are more stringent. This is particularly true for ozone and particulate matter (PM_{10} and $PM_{2.5}$)

Suspended particulate matter (PM) is a complex mixture of tiny particles that consists of dry solid fragments, solid cores with liquid coatings, and small droplets of liquid. These particles vary greatly in shape, size and chemical composition, and can be made up of many different materials such as metals, soot, soil, and dust. "Inhalable" PM consists of particles less than 10 microns in diameter, and is defined as "suspended particulate matter" or PM_{10}. Fine particles are less than 2.5 microns in diameter ($PM_{2.5}$). $PM_{2.5}$, by

[2] Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, 1996 (Revised December 1999).

definition, is included in PM_{10}.

In 1997 new national standards for fine Particulate Matter (diameter 2.5 microns or less) were adopted for 24-hour and annual averaging periods. The current PM_{10} standards were to be retained, but the method and form for determining compliance with the standards were revised.

The State of California regularly reviews scientific literature regarding the health effects and exposure to PM and other pollutants. On May 3, 2002, the California Air Resources Board (CARB) staff recommended lowering the level of the annual standard for PM_{10} and establishing a new annual standard for $PM_{2.5}$ (particulate matter 2.5 micrometers in diameter and smaller). On April 28, 2005 the California Air Resources Board established a new 8-hour standard for ozone (0.07 PPM).

Toxic Air Contaminants

In addition to the criteria pollutants discussed above, Toxic Air Contaminants (TACs) are another group of pollutants of concern. There are many different types of TACs, with varying degrees of toxicity. Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust. Cars and trucks release at least forty different toxic air contaminants. The most important, in terms of health risk, are diesel particulate, benzene, formaldehyde, 1,3-butadiene and acetaldehyde.

Public exposure to TACs can result from emissions from normal operations, as well as accidental releases. Health effects of TACs include cancer, birth defects, neurological damage and death.

Ambient Air Quality

The Bay Area Air Quality Management District (BAAQMD) monitors air quality at several locations within the San Francisco Bay Air Basin. The closest multi-pollutant monitoring site to the project site is located in downtown San Jose (Central San Jose). The BAAQMD also operates two monitoring sites measuring only ozone in southern Santa Clara Valley in San Martin and in Gilroy.

The Monterey Bay Unified Air Pollution Control District monitors air quality within the North Central Coast Air Basin (NCCAB). The nearest NCCAB monitoring site to the project is located in Hollister, located in San Benito Valley.

Table 3 summarizes exceedances of State and Federal standards at theses monitoring sites during the period 2003-2005. Table 3 shows that the state/federal ozone and state PM_{10} standards are exceeded in the Santa Clara Valley. The state ozone and PM_{10} standards are also exceeded in the San Benito Valley in the NCCAB.

Table 1: Major Criteria Pollutants

Pollutant	Characteristics	Health Effects	Major Sources
Ozone	A highly reactive photochemical pollutant created by the action of sunshine on ozone precursors (primarily reactive hydrocarbons and oxides of nitrogen). Often called photochemical smog.	•Eye Irritation •Respiratory function impairment.	The major sources ozone precursors are combustion sources such as factories and automobiles, and evaporation of solvents and fuels.
Carbon Monoxide	Carbon monoxide is an odorless, colorless gas that is highly toxic. It is formed by the incomplete combustion of fuels.	•Impairment of oxygen transport in the bloodstream. •Aggravation of cardiovascular disease. •Fatigue, headache, confusion, dizziness. •Can be fatal in the case of very high concentrations.	Automobile exhaust, combustion of fuels, combustion of wood in woodstoves and fireplaces.
Nitrogen Dioxide	Reddish-brown gas that discolors the air, formed during combustion.	•Increased risk of acute and chronic respiratory disease.	Automobile and diesel truck exhaust, industrial processes, fossil-fueled power plants.
Sulfur Dioxide	Sulfur dioxide is a colorless gas with a pungent, irritating odor.	•Aggravation of chronic obstruction lung disease. •Increased risk of acute and chronic respiratory disease.	Diesel vehicle exhaust, oil-powered power plants, industrial processes.
Particulate Matter	Solid and liquid particles of dust, soot, aerosols and other matter which are small enough to remain suspended in the air for a long period of time.	•Aggravation of chronic disease and heart/lung disease symptoms.	Combustion, automobiles, field burning, factories and unpaved roads. Also a result of photochemical processes.

Table 2: Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Primary Standard	State Standard
Ozone	1-Hour 8-Hour	-- 0.08 PPM	0.09 PPM 0.07 PPM
Carbon Monoxide	8-Hour 1-Hour	9.0 PPM 35.0 PPM	9.0 PPM 20.0 PPM
Nitrogen Dioxide	Annual Average 1-Hour	0.05 PPM --	-- 0.25 PPM
Sulfur Dioxide	Annual Average 24-Hour 1-Hour	0.03 PPM 0.14 PPM --	-- 0.04 PPM 0.25 PPM
PM_{10}	Annual Average 24-Hour	-- 150 $\mu g/m^3$	20 $\mu g/m^3$ 50 $\mu g/m^3$
$PM_{2.5}$	Annual 24-Hour	15 $\mu g/m^3$ 35 $\mu g/m^3$	12 $\mu g/m^3$ --
Lead	Calendar Quarter 30 Day Average	1.5 $\mu g/m^3$ --	-- 1.5 $\mu g/m^3$
Sulfates	24 Hour	25 $\mu g/m^3$	--
Hydrogen Sulfide	1-Hour	0.03 PPM	--
Vinyl Chloride	24-Hour	0.01 PPM	--

PPM = Parts per Million
$\mu g/m^3$ = Micrograms per Cubic Meter

Source: California Air Resources Board, Ambient Air Quality Standards (11/10/06) http://www.arb.ca.gov.aqs/aaqs2.pdf

Table 3: Air Quality Data for the Santa Clara and San Benito Valleys

Pollutant/ Standard	Year	San Jose	San Martin	Gilroy	Hollister
Ozone/State 1-Hour	2003	4	9	6	0
	2004	0	0	0	0
	2005	1	2	0	0
Ozone/Fed. 1-Hour	2003	0	0	0	0
	2004	0	0	0	0
	2005	0	0	0	0
Ozone Fed. 8-Hour	2003	0	4	2	0
	2004	0	0	0	0
	2005	0	0	0	0
Carbon Monoxide/State-Fed. 8-Hour	2003	0	-	-	-
	2004	0	-	-	-
	2005	0	-	-	-
Nitrogen Dioxide/State 1-Hour	2003	0	-	-	-
	2004	0	-	-	-
	2005	0	-	-	-
PM_{10}/State-24-Hour	2003	3	-	-	0
	2004	4	-	-	0
	2005	2	-	-	0
PM_{10}/Federal 24-Hour	2002	0	-	-	0
	2003	0	-	-	0
	2004	0	-	-	0
$PM_{2.5}$/Federal 24-Hour	2003	0	-	-	-
	2004	0	-	-	-
	2005	0	-	-	-

Source: Air Resources Board, Aerometric Data Analysis and Management (ADAM), 2006. (http: //www.arb.ca.gov./adam/cgi-bin/adamtop/d2wstart)

As part of an agreement between the City of San José and the Calpine Corporation, operator of the Metcalf Energy Center, air quality monitoring equipment has been installed at Los Paseos Park located north of the plant. Monitoring began in late November 2004. Data is collected for concentration of carbon monoxide, nitric oxides (NO, NO_x and NO_2), and PM_{10}. During the period November 2004 through June 2006 no exceedances of the hourly standards for carbon monoxide or nitrogen dioxide were recorded. The state and federal PM_{10} standards were also not exceeded, but the state standard was approached in August and November of 2005.

Attainment Status and Regional Air Quality Plans

The federal Clean Air Act and the California Clean Air Act of 1988 require that the State Air Resources Board, based on air quality monitoring data, designate portions of the state where the federal or state ambient air quality standards are not met as "nonattainment areas". Because of the differences between the national and state standards, the designation of nonattainment areas is different under the federal and state legislation.

San Francisco Bay Air Basin

The U. S. Environmental Protection Agency has classified the San Francisco Bay Area as a non-attainment area for the federal 8-hour ozone standard. The Bay Area was designated as unclassifiable/attainment for the federal $PM_{2.5}$ standards.

Under the California Clean Air Act Santa Clara County is a non-attainment area for ozone and particulate matter (PM_{10} and $PM_{2.5}$). The county is either attainment or unclassified for other pollutants.

Air districts periodically prepare and update plans to achieve the goal of healthy air. Typically, a plan will analyze emissions inventories (estimates of current and future emissions from industry, motor vehicles, and other sources) and combine that information with air monitoring data (used to assess progress in improving air quality) and computer modeling simulations to test future strategies to reduce emissions in order to achieve air quality standards. Air quality plans usually include measures to reduce air pollutant emissions from industrial facilities, commercial processes, motor vehicles, and other sources. Bay Area plans are prepared with the cooperation of the Metropolitan Transportation Commission, and the Association of Bay Area Governments. Ozone Attainment Demonstrations are prepared for the national ozone standard and Clean Air Plans are prepared for the California ozone standard.

The *Bay Area 2001 Ozone Attainment Plan* is the current federal air quality plan. It was prepared by the BAAQMD, the Metropolitan Transportation Commission, and the Association of Bay Area Governments. This plan was a revision to the Bay Area part of California's plan (State Implementation Plan, or SIP) to achieve the national ozone standard. The plan was approved by the California Air Resources Board (CARB) and on November 30, 2001, CARB submitted the 2001 Plan to the U.S. Environmental Protection Agency. The U.S. Environmental Protection Agency is currently reviewing the plan.

The Bay Area Air Quality Management District (Air District or BAAQMD), in cooperation with the Metropolitan Transportation Commission (MTC) and the Association of Bay Area Governments (ABAG), has recently prepared the *Bay Area 2005 Ozone Strategy*. The Ozone Strategy is a roadmap showing how the San Francisco Bay Area will achieve compliance with the State one-hour air quality standard for ozone as expeditiously as practicable and how the region will reduce transport of ozone and ozone precursors to neighboring air basins.

North Central Coast Air Basin

Under the Federal Clean Air Act the NCCAB is designated a maintenance area for the federal 1-hour ozone standard. The NCCAB was re-designated from a moderate non-attainment area to a maintenance area in 1997 after meeting the federal 1-hour standard in 1990. The NCCAB is designated as unclassified/attainment for the federal 8-hour ozone standard.

Under the California Clean Air Act (CCAA), the basin is a moderate non-attainment area for the State 1-hour ozone standard. The air basin is also designated non-attainment for the state PM_{10} standard.

As required by the CCAA, the District adopted the 1991 Air Quality Management Plan. The AQMP addressed attainment of the State ambient air quality standard for ozone. In 1994, 1997, 2000 and 2004 the District adopted updates to the AQMP. The *2004 Air Quality Management Plan for the Monterey Bay Region*[3] *is* the current regional air quality plan.

Existing Air Pollution Sources

The Specific Plan area contains few existing sources of air pollution. Roadways (US 101 in particular) would be sources of mobile source emissions. Agricultural activities within the Specific Plan area would be intermittent sources of dust and vehicular emissions. The major industrial source of pollutants affecting the project site is the Metcalf Energy Center. In June 2005 the Metcalf Energy Center, a 600-megawatt natural gas-fueled power plant began operation at a location north of the Specific Plan area. Annual emissions from this facility are estimated as 124 tons per year for NO_2, 10.6 tons per year for SO_2, 589 tons per year for CO, 28.2 tons per year for Precursor Organic Compounds (POC) and 91.3 tons per year for PM_{10}.

The current inventory of Toxic Air Contaminant emissions maintained by the Bay Area Air Quality Management District lists no sources in the Specific Plan area.[4] Presumably the

[3] Monterey Bay Unified Air Pollution Control District, 2004 Air Quality Management Plan for the Monterey Bay Region, September 2004.
[4] Bay Area Air Quality Management District, Toxic Air Contaminant Control Program Annual Report 2002, June 2004.

Metcalf Energy Center will appear on the list of sources when the inventory is updated.

Other nearby major sources of Toxic Air Contaminants include the Kirby Canyon Landfill in the hills south and east of the Specific Plan area, and the United Technologies Corporation plant located on Metcalf Road in the hills north and east of the Specific Plan Area.

Sensitive Receptors

The Bay Area Air Quality Management District defines sensitive receptors as facilities where sensitive receptor population groups (children, the elderly, the acutely ill and the chronically ill) are likely to be located. These land uses include residences, schools playgrounds, child care centers, retirement homes, convalescent homes, hospitals and medical clinics. Sensitive receptors within the project area are primarily residences. The project area is primarily rural. Residences are located in the community of Coyote and scattered over the Specific Plan area.

Significance Criteria

The document *BAAQMD CEQA Guidelines*[5] provide the following definitions of a significant air quality impact:

- A project contributing to carbon monoxide (CO) concentrations exceeding the State Ambient Air Quality Standard of 9 parts per million (ppm) averaged over 8 hours or 20 ppm for 1 hour would be considered to have a significant impact.

- A project that generates criteria air pollutant emissions in excess of the BAAQMD annual or daily thresholds would be considered to have a significant air quality impact. The current thresholds are 15 tons/year or 80 pounds/day for Reactive Organic Gases (ROG), Nitrogen Oxides (NO_x) or PM_{10}. Any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact.

- Any project with the potential to frequently expose members of the public to objectionable odors would be deemed to have a significant impact.

- Any project with the potential to expose sensitive receptors or the general public to substantial levels of toxic air contaminants would be deemed to have a significant impact.

Despite the establishment of both federal and state standards for $PM_{2.5}$ (particulate matter, 2.5 microns), the BAAQMD has not developed a threshold of significance for this pollutant. For this analysis, $PM_{2.5}$ impacts would be considered significant if project emissions of

[5] Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, 1996 (Revised December 1999).

PM_{10} exceed 80 pounds per day.

The BAAQMD significance threshold for construction dust impacts is based on the appropriateness of construction dust controls. The BAAQMD guidelines provide feasible control measures for construction emissions of PM_{10}. If the appropriate construction controls are to be implemented, then air pollutant emissions for construction activities would be considered less-than-significant.

The Monterey Bay Unified Air Pollution Control District has established recommended thresholds of significance for operation of a project, to be used to evaluate air quality impacts in environmental documents.[6] For operational direct and indirect emissions, the following thresholds are recommended:

Volatile Organic Compounds (VOC)	137 pounds/day (direct + indirect)
Nitrogen Oxides (NO_x)	137 pounds/day (direct + indirect)
PM_{10}	82 pounds/day (direct only)
Carbon Monoxide (CO)	550 pounds/day (direct only)
Sulfur Oxides (SO_x)	150 pounds/day (direct only)

Direct emissions refer to pollutants onsite from equipment or stationary engines, typically found at industrial or manufacturing facilities. Indirect emissions are those related to vehicle traffic attracted or generated by a project.

[6] Monterey Bay Unified Air Pollution Control District, CEQA Air Quality Guidelines, July 2004.

IMPACTS AND MITIGATION

Impact 1: Construction Dust Emissions. Construction activities such as demolition, clearing, excavation and grading operations, construction vehicle traffic and wind blowing over exposed earth would generate fugitive particulate matter emissions that would temporarily affect local air quality. This impact is potentially significant, but normally mitigable.

Construction activities such as site clearing, excavation and grading operations, construction vehicle traffic and wind blowing over exposed earth would generate fugitive particulate matter emissions that would affect local air quality. Construction dust could affect local air quality at different times and different locations over the build-out period of the project. The dry, windy climate of the area during the summer months creates a high potential for dust generation when and if underlying soils are exposed to the atmosphere.

The proposed project would result in substantial excavation and earthmoving. The movement of earth on a site is a construction activity with a high potential for creating air pollutants. After grading of a site, dust would continue to affect local air quality during latter phases of construction.

Construction activities would generate exhaust emissions from vehicles/equipment and fugitive particulate matter emissions that would affect local air quality. Construction activities are also a source of organic gas emissions. Solvents in adhesives, non-waterbase paints, thinners, some insulating materials and caulking materials would evaporate into the atmosphere and would participate in the photochemical reaction that creates urban ozone. Asphalt used in paving is also a source of organic gases for a short time after its application.

According the *BAAQMD CEQA Guidelines*, emissions of ozone precursors (ROG and NOx) and carbon monoxide related to construction equipment are already included in the emission inventory that is the basis for regional air quality plans, and thus are not expected to impede attainment or maintenance of ozone and carbon monoxide standards in the Bay Area. Thus, the effects of construction activities would be increased dustfall and locally elevated levels of PM_{10} downwind of construction activity. Construction dust has the potential for creating a nuisance at properties downwind from areas of active construction. This is considered a potentially significant impact.

Mitigation Measure 1: Consistent with guidance from the BAAQMD, the following measures shall be required of construction contracts and specifications for all construction within the Specific Plan area:

- Water all active construction areas at least twice daily and more often during windy periods; active areas adjacent to existing land uses shall be kept damp at all times, or shall be treated with non-toxic stabilizers or dust palliatives.

- Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least 2 feet of freeboard.

- Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.

- Sweep daily (preferably with water sweepers) all paved access roads, parking areas, and staging areas at construction sites; water sweepers shall vacuum up excess water to avoid runoff-related impacts to water quality.

- Sweep streets daily (preferably with water sweepers) if visible soil material is carried onto adjacent public streets.

- Apply non-toxic soil stabilizers to inactive construction areas.

- Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiles (dirt, sand, etc.).

- Limit traffic speeds on unpaved roads to 15 mph.

- Install sandbags or other erosion control measures to prevent silt runoff to public roadways.

- Replant vegetation in disturbed areas as quickly as possible.

- Install wheel washers for all exiting trucks, or wash off the tires or tracks of all trucks and equipment leaving the site.

- Suspend excavation and grading activity when winds (instantaneous gusts) exceed 25 mph.

The following are additional mitigation measures recommended by the BAAQMD to reduce engine exhaust emissions:

- Use alternative fueled construction equipment.

- Minimize idling time (5 minutes maximum).

- Maintain properly tuned equipment.

- Limit the hours of operation of heavy equipment and/or the amount of equipment in use.

The above measures include all feasible measures for construction emissions identified by the Bay Area Air Quality Management District for large sites. According to the District threshold of significance for construction impacts, implementation of the measures would

reduce construction impacts of the project to a less-than-significant level.

Impact 2: Construction TAC Emissions. During construction various diesel-powered vehicles and equipment would be in use on the site. Exposure of sensitive receptors to diesel particulate would represent a less-than-significant impact.

During the build-out period of the project various diesel-powered vehicles and equipment would be in use within the Specific Plan area. In 1998 the California Air Resources Board identified particulate matter from diesel-fueled engines as a toxic air contaminant (TAC). CARB has completed a risk management process that identified potential cancer risks for a range of activities using diesel-fueled engines.[7] High volume freeways, stationary diesel engines and facilities attracting heavy and constant diesel vehicle traffic (distribution centers, truckstop) were identified as having the highest associated risk.

Health risks from Toxic Air Contaminants are a function of both concentration and duration of exposure. Unlike the above types of sources, construction diesel emissions are temporary, affecting an area for a period of days or perhaps weeks. Additionally, construction related sources are mobile and transient in nature, and the bulk of the emission occurs within the project site at a substantial distance from nearby receptors. Statewide emissions standards for heavy-duty construction equipment will be causing diesel particulate emission rates to drop over the build-out period of the project. Because of its short duration at any one location, health risks from construction emissions of diesel particulate would be a less-than-significant impact.

Mitigation Measure 2: None required.

Impact 3: Permanent Local Impacts. Project traffic would add to carbon monoxide concentrations near streets and intersections providing access to the site. This is a less than significant impact.

On the local scale, the project would change traffic on the local street network, changing carbon monoxide levels along roadways used by project traffic. Carbon monoxide is an odorless, colorless poisonous gas whose primary source in the Bay Area is automobiles. Concentrations of this gas are highest near intersections of major roads.

Carbon monoxide concentrations under worst-case meteorological conditions have been predicted for signalized intersections affected by the project. These intersections were selected as having the worst intersection Level Of Service and highest potential for elevated concentrations of carbon monoxide.

Peak hour traffic volumes were applied to a screening form of the CALINE-4 dispersion model to predict maximum 1-and 8-hour concentrations near these intersections. Appendix 1 provides a description of the model and a discussion of the methodology and

[7] California Air Resources Board, Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles, October 2000.

assumptions used in the analysis. The model results were used to predict the maximum 1- and 8-hour concentrations, corresponding to the 1- and 8-hour averaging times specified in the state and federal ambient air quality standards for carbon monoxide.

Table 4 shows the results of the CALINE-4 analysis for the peak 1-hour and 8-hour traffic periods in parts per million (PPM). The 1-hour values are to be compared to the federal 1-hour standard of 35 PPM and the state standard of 20 PPM. The 8-hour values in Table 4 are to be compared to the state and federal standard of 9 PPM.

Table 4 shows that existing predicted concentrations near the intersections meet the 1-hour and 8-hour standards. Background traffic increases would increase concentrations by up to 4.8 Parts Per Million (PPM). Traffic from the project would further increase concentrations by up to 1.0 Parts Per Million (PPM). However, concentrations with background and project traffic growth would not exceed the state/federal ambient air quality standards.

The data in Table 4 assumes that project traffic increases would occur in 2006. This is a worst-case assumption because per-mile emission rates of carbon monoxide will be declining over time and would be substantially below 2006 values by the time the project is built out. Assuming project traffic increases would occur in 2006 maximizes the incremental increase in carbon monoxide that could be caused by the project.

Since project traffic would not cause any new violations of the 8-hour standards for carbon monoxide, nor contribute substantially to an existing or projected violation, project impacts on local carbon monoxide concentrations are considered to be less-than-significant.

Mitigation Measure 3: None required.

Impact 4: Permanent Regional Impacts. Additional trips to and from the project and area sources associated with project land uses would result in new air pollutant emissions within the San Francisco Bay and North Central Coast air basins. The emissions from these new trips and area sources would exceed the BAAQMD and MBUAPCD thresholds of significance for ozone precursors and PM_{10}, and would result in a significant impact.

Vehicle trips generated by the project would result in air pollutant emissions affecting the entire San Francisco Bay Air Basin and adjacent North Central Coast Air Basin. Regional emissions associated with project vehicle use have been calculated using the URBEMIS2002 emission model. The methodology used in estimating emissions is described in Attachment 2.

The incremental daily emission increase associated with project land uses is identified in Table 5 for reactive organic gases and oxides of nitrogen (two precursors of ozone) and PM_{10}. The Bay Area Air Quality Management District has established thresholds of significance for ozone precursors and PM_{10} of 80 pounds per day. Proposed project emissions shown in Table 5 would exceed these thresholds of significance for all three

Table 4: Worst Case Carbon Monoxide Concentrations Near Worst-Case Intersections, in Parts Per Million

Intersection	Existing (2006)		Existing + Background (2006)		Existing+ Background+ CVSP (2006)	
	1-Hour	8-Hour	1-Hour	8-Hour	1-Hour	8-Hour
King/ Tully	6.5	4.5	7.0	4.8	7.2	4.9
McLaughlin/ Tully	8.6	5.9	9.2	6.4	9.4	6.5
Capitol/ Silver Cr.	9.4	6.5	10.0	6.9	10.1	7.0
McLaughlin /Capitol	9.1	6.3	9.3	6.4	9.4	6.5
US 101/ Blossom Hill (E)	7.2	5.0	9.8	6.8	10.0	6.9
US 101/ Blossom Hill (W)	6.5	5.8	11.3	7.8	11.4	7.9
Almaden/ Coleman	8.2	5.6	8.4	5.8	8.5	5.9
Almaden/ Blossom Hill	8.6	6.0	8.9	6.1	9.0	6.2
Almaden/ SR 85	10.0	6.9	10.5	7.2	10.6	7.3
US 101/ Bernal (E)	6.5	4.5	7.8	5.4	8.8	6.1
SR 85/ Bernal	7.0	4.8	9.4	6.5	9.4	6.5
Monterey/ Old Monterey	4.9	3.4	5.3	3.6	5.7	3.9
Monterey/ San Martin	5.8	4.0	5.9	4.1	6.0	4.1
Monterey/ Masten	5.2	3.6	5.8	4.0	5.9	4.0
Wren/First/ SR 152	5.6	3.8	6.0	4.1	6.0	4.1
Coyote/ Bailey	---	---	---	---	8.1	5.6
Most Stringent Standard	20.0	9.0	20.0	9.0	20.0	9.0

Table 5: Project Regional Emissions in Pounds Per Day

	Reactive Organic Gases	Nitrogen Oxides	PM_{10}
Project Emission Sources			
Area Sources:	2043.9	325.0	1.7
Vehicles:	583.3	448.2	2564.5
Total	2637.2	773.2	2566.2
BAAQMD Significance Threshold	80.0	80.0	80.0

pollutants, so the proposed project would have a significant impact on regional ozone and particulate matter (PM_{10} and $PM_{2.5}$) air quality.

A portion of the vehicular travel generated by the project would be to/from neighboring Santa Cruz, Monterey and San Benito counties which are part of the North Central Coast Air Basin. The transportation model used to address project traffic impacts predicts that roughly 24.5% of the trips generated by the project would be directed to locations south of the project site. Under the worst cast assumption that emissions from vehicles traveling south from the project site either occur within the NCCAB or are transported into the NCCAB, daily emissions of ozone precursors affecting the NCCAB would be 143.3 pounds per day of ROG and 110.0 pounds per day of NOx. The emission of ROG would exceed the MBUAPCD threshold of significance of 137 pounds, so the project would also have a significant impact on regional air quality in the North Central Coast Air Basin.

Mitigation Measure 4: The BAAQMD has identified mitigation measures for reducing vehicle emissions from residential projects. As part of the Specific Plan, an air quality element should be prepared identifying design parameters, programs and features that will be implemented by individual developments within the Specific Plan area.

At a minimum, the following mitigation measures to reduce emissions for residential development shall be included in the air quality element:

- Provide bicycle lanes, sidewalks and/or paths, connecting project residences to adjacent schools, parks, the nearest transit stop and nearby commercial areas. Provide a satellite tele-commute center within or near the development.

- Provide an interconnected street network, with a regular grid or similar interconnected street pattern.

- Provide secure and conveniently placed bicycle parking and storage facilities at parks and other facilities.

- Implement feasible travel demand management (TDM). This would include a ride-matching program, coordination with regional ride-sharing organizations, provision of transit information, and provision of shuttle service to major destinations.

- Allow only natural gas fireplaces. No wood burning devices would be allowed.

- Require electric lawn and garden equipment for landscaping and maintenance.

- Construct transit amenities such as bus turnouts/bus bulbs, benches, shelters, etc.

- Provide direct, safe, attractive pedestrian access from project land uses to transit stops and adjacent development.

- Utilize reflective (or high albedo) and emissive roofs and light colored construction

materials to increase the reflectivity of roads, driveways, and other paved surfaces, and include shade trees near buildings to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand.

At a minimum, the following mitigation measures to reduce emissions for commercial/workplace development shall be included in the air quality element:

- Provide physical improvements, such as sidewalk improvements, landscaping and bicycle parking that would act as incentives for pedestrian and bicycle modes of travel.
- Construct transit amenities such as bus turnouts/bus bulbs, benches, shelters, etc.
- Provide direct, safe, attractive pedestrian access from project land uses to transit stops and adjacent development.
- Connect site with regional bikeway/pedestrian trail system.
- Provide transit information kiosks and bicycle parking at commercial facilities.
- Provide on-site shops and services for employees such as cafeteria, bank/ATM, convenience market, etc.
- Provide on-site child care.
- Implement feasible travel demand management (TDM) measures. This would include a ride-matching program, guaranteed ride home programs, coordination with regional ridesharing organizations, compressed work week, home-based telecommuting and transit incentives programs.
- Provide showers and lockers for employees bicycling or walking to work.
- Provide secure and conveniently located bicycle parking and storage for workers and patrons.
- Provide electric vehicle charging facilities.
- Provide preferential parking for Low Emission Vehicles (LEVs).
- Specialty equipment (utility carts, forklifts, etc.) should be electrically, CNG or propane powered.
- Utilize reflective (or high albedo) and emissive roofs and light colored construction materials to increase the reflectivity of roads, driveways, and other paved surfaces, and include shade trees near buildings to directly shield them from the sun's rays and reduce local air temperature and cooling energy demand.

The above measures have the potential to reduce project-related regional emissions by 10-20%. Even with a reduction of this magnitude, project emissions would remain well above the BAAQMD significance threshold of 80 pounds per day. Project regional air quality impacts would remain significant after mitigation.

Impact 5: Exposure to TACs. The project would include sensitive receptors that would be exposed to stationary and mobile sources of TACs. This impact would be a less-than-significant impact.

The California Air Resources Board recently published an air quality/land use handbook.[8] The handbook, which is advisory and not regulatory, was developed in response to recent studies that have demonstrated a link between exposure to poor air quality and respiratory illnesses, both cancer and non-cancer related. The CARB handbook recommends that planning agencies strongly consider proximity to these sources when finding new locations for "sensitive" land uses such as homes, medical facilities, daycare centers, schools and playgrounds. Air pollution sources of concern include freeways, rail yards, ports, refineries, distribution centers, chrome plating facilities, dry cleaners and large gasoline service stations.

Key recommendations in the handbook include taking steps to avoid siting new, sensitive land uses:

- Within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day;
- Within 1,000 feet of a major service and maintenance rail yard;
- Immediately downwind of ports (in the most heavily impacted zones) and petroleum refineries;
- Within 300 feet of any dry cleaning operation (for operations with two or more machines, provide 500 feet);
- Within 300 feet of a large gasoline dispensing facility.

The Conceptual Land Uses map separates project residential uses from the US 101 corridor with a open space greenbelt that provides more than a 500 foot setback from the highway. Also, the Conceptual Land Uses Map indicates that residential uses at the northeast end of the site would be separated from the existing Metcalf Energy Center, a source of both criteria and TAC emissions, by non-sensitive "workplace" land uses.

The Specific Plan area will undoubtedly contain stationary sources of TAC emissions. Common sources are gasoline stations, emergency diesel generators, dry cleaners and

[8] California Air Resources Board, Air Quality and Land Use Handbook: A Community Health Perspective, April 2005.

some industrial processes. All these sources are regulated by the Bay Area Air Quality Management District. Any such sources would be subject to the rules and regulations of the District, which currently require that all sources of TACs be evaluated for health risks prior to issuance of a permit.

The impacts of the Specific Plan related to health risks from TACs would be less-than-significant.

Mitigation Measure 5: None required.

Impact 6: Cumulative Regional Impacts. CVSP would have a significant impact individually on regional air quality and therefore would also have a cumulatively significant regional air quality impact.

According to BAAQMD significance criteria, any proposed project that would individually have a significant air quality impact would also be considered to have a significant cumulative air quality impact. The project was found to individually have a significant impact on regional air quality and thus would also have a significant cumulative impact on regional air quality (See Impact 4 and Table 5).

Emissions from development projects have several cumulative impacts. Growth in emissions will delay attainment of the ambient air quality standards for which the region is non-attainment (ozone, particulate matter), contribute to visibility reduction and contribute to mobile-source toxic air contaminant concentrations.

Since ozone, particulate matter and some constituents of ROG that are also TACs have been shown to be correlated with adverse heath effects cumulative emissions increases in the region would have potential cumulative health effects. Studies have shown that children who participated in several sports and lived in communities with high ozone levels were more likely to develop asthma than the same active children living in areas with less ozone pollution. Other studies have found a positive association between some volatile organic compounds and symptoms in asthmatic children. A large body of evidence has shown significant associations between measured levels of particulate matter outdoors and worsening of both asthma symptoms and acute and chronic bronchitis. It is not possible, however, to predict increases in severity of disease, hospital visits or deaths from respiratory diseases for a development project.

Mitigation Measure 6: Same as Mitigation Measure 4.

ATTACHMENT 1: CALINE-4 MODELING

The CALINE-4 model is a fourth-generation line source air quality model that is based on the Gaussian diffusion equation and employs a mixing zone concept to characterize pollutant dispersion over the roadway. Given source strength, meteorology, site geometry and site characteristics, the model predicts pollutant concentrations for receptors located within 150 meters of the roadway. The CALINE-4 model allows roadways to be broken into multiple links that can vary in traffic volume, emission rates, height, width, etc.

A screening-level form of the CALINE-4 program was used to predict concentrations.[9] Normalized concentrations for each roadway size (2 lanes, 4 lanes, etc.) are adjusted for the two-way traffic volume and emission factor. Calculations were made for a receptor at a corner of the intersection, located 25 feet from the curb. Emission factors were derived from the California Air Resources Board EMFAC2002 computer program based on a 2006 Bay Area vehicle mix.

The screening form of the CALINE-4 model calculates the local contribution of nearby roads to the total concentration. The other contribution is the background level attributed to more distant traffic. The 1-hour background level in 2006 was taken as 3.7 PPM and the 8-hour background concentration was taken as 2.5 PPM. These backgrounds were estimated using isopleth maps and correction factors developed by the Bay Area Air Quality Management District.

Eight-hour concentrations were obtained from the 1-hour output of the CALINE-4 model using a persistence factor of 0.7.

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[9] Bay Area Air Quality Management District, BAAQMD CEQA Guidelines, 1999.

ATTACHMENT 2: NEW VEHICLE TRAVEL EMISSIONS

Estimates of regional emissions generated by project traffic were made using a program called URBEMIS-2002.[10] URBEMIS-2002 is a program that estimates the emissions that result from various land use development projects. Land use projects can include residential uses such as single-family dwelling units, apartments and condominiums, and nonresidential uses such as shopping centers, office buildings, and industrial parks. URBEMIS-2002 contains default values for much of the information needed to calculate emissions. However, project-specific, user-supplied information can also be used when it is available.

Inputs to the URBEMIS-2002 program include trip generation rates, vehicle mix, average trip length by trip type and average speed. Average trip lengths and vehicle mixes for the Bay Area were used. Average speed for all types of trips was assumed to be 30 MPH.

When modeling large areas or large projects the URBEMIS-2002 program, which is land-use driven, will over-predict travel by double counting trips (for example, a home-to-shop trip generated by a residence will also be counted as a non-home-based shopping trip). To accurately model project trips, the output of the VTA transportation model runs for the project were used to modify the default URBEMIS-2002 assumptions for trip rate and trip type distribution.

VTA model trip output was allocated to either residential or non-residential trips. Residential trip rates were calculated that resulted in the appropriate number of home-based trips. The VTA model output were used to change the URBEMIS-2002 distribution of these home based trips into home-based work, home-base shop and home-based other trip types.

Similarly, trip generation rates for non-home based trips were modified such that the total trips generated by URBEMIS-2002 model matched the output of the VTA model.

The URBEMIS-2002 run assumed summertime conditions with an ambient temperature of 85 degrees F. The URBEMIS-2002 output is attached.

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[10] Jones and Stokes Associates, Software User's Guide: URBEMIS2002 for Windows with Enhanced Construction Module, Version 8.7, April 2003.

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\CVSP.urb
Project Name: CVSP Buildout
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	2,043.89	325.03	443.75	3.15	1.67

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	583.27	448.15	5,732.84	18.31	2,564.51

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (lbs/day,unmitigated)	2,627.16	773.19	6,176.59	21.46	2,566.17

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\CVSP.urb
Project Name: CVSP Buildout
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

SUMMARY REPORT
(Tons/Year)

AREA SOURCE EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	332.45	59.19	56.36	0.28	0.21

OPERATIONAL (VEHICLE) EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	103.13	95.60	1,041.14	3.13	468.02

SUM OF AREA AND OPERATIONAL EMISSION ESTIMATES

	ROG	NOx	CO	SO2	PM10
TOTALS (tpy, unmitigated)	435.58	154.79	1,097.50	3.42	468.23

URBEMIS 2002 For Windows 8.7.0

File Name: C:\Program Files\URBEMIS 2002 Version 8.7\Projects2k2\CVSP.urb
Project Name: CVSP Buildout
Project Location: San Francisco Bay Area
On-Road Motor Vehicle Emissions Based on EMFAC2002 version 2.2

DETAIL REPORT
(Pounds/Day - Summer)

AREA SOURCE EMISSION ESTIMATES (Summer Pounds per Day, Unmitigated)

Source	ROG	NOx	CO	SO2	PM10
Natural Gas	24.55	323.62	177.50	0	0.61
Hearth - No summer emissions					
Landscaping	40.62	1.41	266.24	3.15	1.06
Consumer Prdcts	1,249.99	-	-	-	-
Architectural Coatings	728.73	-	-	-	-
TOTALS(lbs/day,unmitigated)	2,043.89	325.03	443.75	3.15	1.67

UNMITIGATED OPERATIONAL EMISSIONS

	ROG	NOx	CO	SO2	PM10
Single family housing	139.18	116.28	1,499.54	4.78	668.56
Multi-Family Housing	285.52	222.02	2,863.13	9.13	1,276.51
Retail	38.65	32.62	390.79	1.24	175.09
Workplace	119.92	77.23	979.38	3.16	444.35
TOTAL EMISSIONS (lbs/day)	583.27	448.15	5,732.84	18.31	2,564.51

Does not include correction for passby trips.
Does not include double counting adjustment for internal trips.

OPERATIONAL (Vehicle) EMISSION ESTIMATES

Analysis Year: 2030 Temperature (F): 85 Season: Summer

EMFAC Version: EMFAC2002 (9/2002)

Summary of Land Uses:

Unit Type	Acreage	Trip Rate	No. Units	Total Trips
Single family housing	2,333.33	7.47 trips/dwelling unit	7,000.00	52,269.00
Multi-Family Housing	1,159.38	5.38 trips/dwelling unit	18,550.00	99,799.00
Retail		14.38 trips/1000 sq. ft.	1,560.00	22,432.80
Workplace		2.92 trips/1000 sq. ft.	12,139.74	35,387.35
		Sum of Total Trips		209,888.15
		Total Vehicle Miles Traveled		1,687,492.13

Vehicle Assumptions:

Fleet Mix:

Vehicle Type	Percent Type	Non-Catalyst	Catalyst	Diesel
Light Auto	52.50	0.00	100.00	0.00
Light Truck < 3,750 lbs	15.90	0.00	100.00	0.00
Light Truck 3,751- 5,750	16.70	0.00	100.00	0.00
Med Truck 5,751- 8,500	7.60	0.00	100.00	0.00
Lite-Heavy 8,501-10,000	1.00	0.00	80.00	20.00
Lite-Heavy 10,001-14,000	0.30	0.00	66.70	33.30
Med-Heavy 14,001-33,000	0.90	0.00	22.20	77.80
Heavy-Heavy 33,001-60,000	0.70	0.00	0.00	100.00
Line Haul > 60,000 lbs	0.00	0.00	0.00	100.00
Urban Bus	0.20	0.00	50.00	50.00
Motorcycle	1.50	33.30	66.70	0.00
School Bus	0.10	0.00	0.00	100.00
Motor Home	2.60	0.00	92.30	7.70

Travel Conditions

	Residential			Commercial		
	Home-Work	Home-Shop	Home-Other	Commute	Non-Work	Customer
Urban Trip Length (miles)	11.8	4.6	6.1	11.8	5.0	5.0
Rural Trip Length (miles)	15.0	10.0	10.0	15.0	10.0	10.0
Trip Speeds (mph)	30.0	30.0	30.0	30.0	30.0	30.0
% of Trips - Residential	48.7	30.8	20.5			
% of Trips - Commercial (by land use)						
Retail				2.0	1.0	97.0
Workplace				48.0	24.0	28.0

Changes made to the default values for Land Use Trip Percentages

The Trip Rate and/or Acreage values for Single family housing
have changed from the defaults 9.57/2333.33 to 7.467/2333.33
The Trip Rate and/or Acreage values for Apartments low rise
have changed from the defaults 6.9/1159.38 to 5.38/1159.38

Changes made to the default values for Area

The hearth option switch changed from on to off.
The wood stove percentage changed from 35 to 0.
The wood fireplace percentage changed from 10 to 0.
The natural gas fireplace percentage changed from 55 to 100.

Changes made to the default values for Operations

The pass by trips option switch changed from on to off.
The operational emission year changed from 2005 to 2030.
The home based work selection item changed from 7 to 6.
The home based work trip percentage changed from 27.3 to 48.73.
The home based shopping selection item changed from 7 to 6.
The home based shopping trip percentage changed from 21.2 to 30.76.
The home based other selection item changed from 7 to 6.
The home based other trip percentage changed from 51.5 to 20.51.
The commercial based commute selection item changed from 7 to 6.
The commercial based non-work selection item changed from 7 to 6.
The commercial based customer selection item changed from 7 to 6.