4.6 AIR QUALITY

This EIR section describes potential impacts on local and regional air quality resulting from adoption of the Specific Plan. This section has been prepared using methodologies and assumptions recommended by the Bay Area Air Quality Management District (BAAQMD) CEQA Handbook. This section describes existing air quality, construction period impacts, emissions associated with implementation of the Specific Plan, the impacts of Specific Plan related emissions on local and regional air quality, cumulative impacts, and mitigation measures to reduce or avoid identified significant impacts.

4.6.1 EXISTING SETTING

REGIONAL SETTING

Larkspur is within the boundaries of the San Francisco Bay Area Air Basin. The climate of the basin is determined largely by a high-pressure system that is almost always present over the eastern Pacific Ocean off the West Coast of North America. High pressure systems are characterized by an upper layer of dry air that warms as it descends, restricting the mobility of cooler marine-influenced air near the ground surface, and resulting in the formation of subsidence inversions. During summer and fall, emissions generated in the basin can react in the presence of sunlight to create ozone smog. Topography and inversions also create conditions conducive to the formation of photochemical pollutants, such as ozone and secondary particulates, such as nitrates and sulfates. In the winter, stagnant conditions between storms can allow pollutant levels to build up to unhealthful levels.

LOCAL SETTING

Temperatures in Larkspur range from the low 40s on winter mornings to the mid 90s on late-summer afternoons. The warmest temperatures generally occur in September and October. Temperature extremes, reaching 100 degrees or dropping to freezing, are rare. Rainfall occurs primarily from late October to early May. Except for occasional light drizzle from thick marine stratus clouds, summers are almost completely dry.

Winds in the San Francisco Bay area display several characteristic regimes. Along the San Francisco Bay shore (i.e., Larkspur), winter winds are generally from the south and southeast, or calm. In the other seasons, winds from the north and northwest predominate (California Air Resources Board 1984). In all cases, local topography can have a strong influence on micro-scale wind patterns.

REGULATORY SETTING

Air Quality Standards

The federal and California Clean Air Acts have established ambient air quality standards for different pollutants (Table 4.6-1). National ambient air quality standards have been adopted for specific criteria pollutants. These criteria pollutants include carbon monoxide (CO), ozone

Table 4.6-1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	California Standard	Federal Primary Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone (O_3)	1 hour	0.09 ppm	0.12 ppm	Irritation and possibly permanent lung damage.	Motor vehicles, including refining and gasoline delivery.
	8 hours	---	0.08 ppm		
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Deprives body of oxygen in the blood. Causes headaches and worsens respiratory problems.	Primarily gasoline-powered internal combustion engines.
	8 hours	9 ppm	9.0 ppm		
Nitrogen Dioxide (NO_2)	Annual Average	---	0.05 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining, power plants, aircraft, ships, and railroads.
	1 hour	0.25 ppm	---		
Sulfur Dioxide (SO_2)	Annual Average	---	0.03 ppm	Irritates and may permanently injure respiratory tract and lungs. Can damage plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	1 hour	0.25 ppm	---		
	24 hours	0.04 ppm	0.14 ppm		
Suspended Particulate Matter (PM_{10}, $PM_{2.5}$)	Annual Geometric Mean	20 µg/m^3 (PM_{10})	15 µg/m^3 ($PM_{2.5}$)	May irritate eyes and respiratory tract, decreases in lung capacity, cancer, and increased mortality. Produces haze and limits visibility.	Industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Geometric Mean	12 µg/m^3 ($PM_{2.5}$)			
	Annual Arithmetic Mean	---	50 µg/m^3 (PM_{10})		
	24 hours	50 µg/m^3 (PM_{10})	150 µg/m^3 (PM_{10}) 65 µg/m^3 ($PM_{2.5}$)		
Lead	Monthly	1.5 µg/m^3	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurologic dysfunction (in severe cases).	Present source: lead smelters, battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline.
	Quarterly	---	1.5 µg/m^3		
Sulfates (SO_4)	24 hours	25 µg/m^3	---	Similar to sulfur dioxide	Industrial processes refineries.
Hydrogen Sulfide (H_2S)	1 hour	0.03 ppm (42 µg/m^3)	---	Very pungent odor similar to rotten eggs. Annoying and irritating – high concentrations fatal.	Sources include industrial processes, oil production, and geothermal wells.

Note: ppm = parts per million; µg/m^3 = micrograms per cubic meter.
Source: California Air Resources Board

(O_3), nitrogen dioxide (NO_2), inhalable particulate matter (PM_{10} and $PM_{2.5}$), sulfur dioxide (SO_2), and lead (Pb). California established ambient air quality standards as early as 1969 through the Mulford-Carrell Act. Pollutants regulated under the California Clean Air Act are similar to those regulated under the federal Clean Air Act. In many cases, California standards are more stringent than the national ambient air quality standards.

Ozone is a considered a secondary pollutant, because it is not emitted directly into the atmosphere, but is produced through a complex series of photochemical reactions involving reactive organic gases (ROG) and NO_X. These two compounds, ROG and NO_X, are recognized as precursors to ozone smog. Because O_3 precursors are transported and diffused by wind, with the capacity to form smog miles from their emission source, ozone is regarded as a regional air pollutant. Ozone is the major component in smog, and exposure to ozone can causes adverse health impacts. When O_3concentrations are predicted to reach or exceed 0.1 parts per million (ppm), the BAAQMD issues a Spare the Air advisory, telling those who would be adversely affected by unhealthful air to avoid exertion and outdoor activity, and requesting voluntary reductions in vehicle use and other actions.

CO is an odorless, colorless gas that can be lethal in high concentrations. The primary sources of CO are motor vehicles, and concentrations of this gas are greatest in areas near the intersections of roadways that carry high volumes of traffic.

Oxides of Nitrogen are produced through fuel combustion, and contribute to the formation of ozone smog. At higher concentrations, NO_X, the brown gas in smog, causes burning eyes, shortness of breath and other temporary and long-term health effects.

The use of high sulfur fuels in petroleum refining and electricity generation may result in emissions of SO_2. Fuel sulfur content has been extensively regulated, and controls on stationary sources have brought the Bay Area into compliance with federal and state standards.

Particulates that are 10 microns in diameter or smaller are identified as PM_{10}. Likewise, $PM_{2.5}$ is composed of fine particulates 2.5 microns in diameter or smaller. If inhaled deeply, these particulates can cause adverse health effects. The greatest proportion of suspended particulates originates from road dust, construction activities, and farming. During the winter, wood smoke from fireplaces can be the source of up to 40% of ambient respirable particulate matter.

Lead has been phased out as a gasoline additive in California, and annual federal and state ambient air quality standards for this criteria pollutant are met in all parts of the state.

BAAQMD Guidelines

In April 1996, the local air district adopted the BAAQMD CEQA Guidelines. This document provides background information and specific recommendations for agencies preparing and reviewing environmental documents. The guidelines were subsequently updated and revised in December 1999. While not a regulation or rule, the guidelines are generally accepted as the

source for setting, impact evaluation, and best mitigation practices. Other large air districts in California have also adopted similar CEQA guidance, with significance thresholds set depending upon local conditions (e.g., often more stringent in high-pollution areas such as the South Coast Air Quality Management District). The December 1999 BAAQMD CEQA Guidelines were used to help prepare this air quality section (BAAQMD 1999).

Current Air Quality

The BAAQMD and other government agencies operate a network of air quality monitoring stations throughout the Bay Area. The monitoring station closest to the Specific Plan area is in San Rafael. The air quality monitored at the San Rafael station is considered representative of pollution levels throughout the communities of Marin County abutting San Francisco Bay (e.g., Larkspur).

The ambient air quality standards are met in the Larkspur area except for the state PM_{10} standard (Table 4.6-2). State and federal ozone standards are exceeded routinely in other, downwind portions of the San Francisco Bay Air Basin, such as Livermore.

While O_3 levels in Marin County are generally good, as shown in Table 4.6-2 below, other parts of the air basin reach ozone smog levels at a magnitude about 33% more than the federal 1-hour standard (0.12 ppm). Ozone precursor emissions (ROG and NO_X) generated by vehicle travel and other sources associated with the Specific Plan would contribute to higher levels within the air basin. To reduce high O_3 levels in downwind areas (i.e., Livermore), the air district attempts to control ozone precursor emissions throughout the Bay Area.

Table 4.6-2
Air Quality Data for San Rafael, 2000-2002

Pollutant	Standard	Statistic	2000	2001	2002
Ozone	State 1-Hour	Days Over Standard	0	0	0
		Maximum Concentration (ppm)	0.7	0.9	0.8
Ozone	Federal 8-Hour	Days Over Standard	0	0	0
		Maximum Concentration (ppm)	0.6	0.7	0.5
Particulate Matter (PM_{10}) (50 $\mu g/m^3$)	State 24-Hour	Days Over Standard (calculated)	0	**12**	0
		Maximum Concentration ($\mu g/m^3$)	40	**79**	41
		Annual Geometric Mean ($\mu g/m^3$)	**18**	**18**	**16**
Carbon Monoxide		8-Hour Average	2.3	2.4	1.7

ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter
Source: California Air Resources Board 2003
Please refer to Table 4.6-1 for explanation of state and federal standards.
Standard exceedances in BOLD

Monitors in Marin County record exceedances of state PM_{10} levels at about 33% more than the federal 1-hour standard. Marin County PM_{10} levels exceed (annual average) standards every year. In some years the 24-hour PM_{10} standard is also exceeded. There are no government-operated $PM_{2.5}$ monitors in Marin County; hence no data are presented.

Regional Air Quality Planning

The Clean Air Act of 1970 and the California Clean Air Act of 1988 require that the California Air Resources Board (CARB), based on air quality monitoring data, designate the areas where the federal or state standards are not met as "nonattainment areas." Because of the differences between the federal and state standards, federal and state nonattainment areas have different designations.

Federal Air Quality Program

Air pollutant emissions (especially O_3 precursors) generated in upwind areas can cause impacts in downwind areas. The BAAQMD is designated "moderate nonattainment" for the federal O_3 standard. The "moderate" designation means that the BAAQMD must adopt controls sufficient to meet the federal ozone standard within 6 years. This attainment designation allows the BAAQMD to adopt uniform control policies throughout the nine-county air district to meet state and federal standards. Controls will also help reduce O_3 transport from the Bay Area to downwind areas (in other air districts), such as Tracy and Stockton, which are in the San Joaquin Valley Air Basin.

Toxic Air Contaminants

Toxic Air Contaminants (TACs) are compounds known to cause cancer or acute health effects. The current list of TACs includes approximately 200 compounds. They are generally less pervasive in the urban atmosphere than the criteria pollutants, but they are linked to short-term (acute) or long-term (chronic) adverse health effects. A few TACs, such as diesel exhaust, are almost universal in urban areas and near major highways. Stationary TAC sources include industrial processes, commercial operations (e.g., gasoline stations and dry cleaners), wood smoke, and some agricultural activities (such as open burning). Unlike regulations concerning criteria air pollutants, there are no ambient air quality standards for evaluation of TACs based on the amount of emissions. Instead, TAC emissions are evaluated based on the degree of health risk that could result from exposure to these pollutants.

The state requires the local air districts to quantify and prioritize emissions from individual facilities. High-priority facilities must then perform a health risk assessment, and if specific thresholds are violated, they are required to communicate the results to the public in the form of notices and public meetings. Depending on the risk level, emitting facilities can be required to implement varying levels of risk reduction measures. According to the BAAQMD, control programs have significantly reduced many types of TACs by 60% or more. The BAAQMD's 1999 TAC Control Annual Report (BAAQMD 2000) presents a population-based estimate of excess cancer deaths. This estimate is stated as excess cancer deaths per 1 million people. For emissions from stationary sources, the estimate is 186 excess deaths per 1 million Bay Area residents.

Construction equipment and large delivery trucks serving future commercial development within the Specific Plan site would usually operate on diesel fuel. Mobile sources, such as

construction equipment, are not required to perform risk assessments, but are coming under increasing scrutiny as they contribute twice as much to the toxic burden as all other stationary sources combined (BAAQMD 2000). For diesel exhaust, the excess mortality risk is approximately 450 deaths per 1 million residents.

State Air Quality Program

Under the California Clean Air Act, the Bay Area Air Basin is classified serious nonattainment for O_3 and nonattainment for PM_{10} (respirable particulate matter). The air basin is an attainment area for all other state ambient air quality standards.

State law requires local air pollution control districts to prepare air quality attainment plans. These plans must reduce districtwide emissions of ozone precursors by 5% per year averaged over consecutive 3-year periods or, if not achievable, provide for adoption of "all feasible measures on an expeditious schedule." The California Clean Air Act also grants air districts explicit statutory authority to adopt indirect source regulations (related to land uses or facilities that attract or generate motor vehicle trips). The law also allows adoption of transportation control measures, including measures for ridesharing, flexible work hours, zero emission modes (biking and walking), or measures that reduce the number or length of vehicle trips.

The current Bay Area Clean Air Plan (CAP) was adopted on December 20, 2000. It proposes emission controls on stationary sources (factories, power plants, industrial sources, etc.) and transportation control measures to reduce emissions from motor vehicles. The 2003 CAP was being prepared at the time that this Revised Draft EIR was being written.

Sensitive Receptors

The BAAQMD CEQA Guidelines define sensitive receptors as facilities where 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. The Specific Plan would allow residential development and there are residents living immediately adjacent to the Specific Plan area; Hall Middle School and Piper Park are located across Doherty Drive from the Specific Plan area; and facilities associated with Redwood High School are adjacent to the Specific Plan area across Larkspur Creek. More distant sensitive receptors (within a 2-mile radius) can be of concern if a development has the potential to produce offensive odors or other significant pollutants.

4.6.2 ENVIRONMENTAL IMPACTS

THRESHOLDS OF SIGNIFICANCE

Implementation of the Specific Plan would have a significant impact on air quality if it were to result in:

< any conflict with the applicable air quality plan,

- any obstruction of the implementation of the applicable air quality plan,
- any violation of any air quality standard,
- a substantial contribution to an existing or projected air quality violation;
- a cumulatively considerable net increase of any criteria pollutant for which the region is in nonattainment under an applicable federal or state ambient air quality standard (including releasing emissions that exceed quantitative thresholds for ozone precursors),
- exposure of sensitive receptors to substantial pollutant concentrations, or
- creation of objectionable odors affecting a substantial number of people.

The BAAQMD CEQA Guidelines specify that localized CO concentrations should be estimated for projects that could result in vehicle emissions of CO that exceed 550 pounds per day (lbs/day), if project-related traffic would affect intersections or roadway links operating at LOS D, E, or F or would cause LOS to decline to D, E, or F, or if project-related traffic would increase traffic volumes on nearby roadways by 10% or more. A project contributing to CO concentrations exceeding the State Ambient Air Quality Standard of 9 ppm averaged over 8 hours and 20 ppm for 1 hour would be considered to have a significant impact.

The BAAQMD CEQA Guidelines also specify that a project that generates 15 tons per year or 80 lbs/day of ROG, NO_X, or PM_{10} would be considered to have a significant air quality impact.

ANALYTICAL METHODOLOGY

As described below, residential and commercial operations like those land uses permitted by the Specific Plan typically create air emissions in three ways:

- construction and demolition,
- attracted or created motor vehicle trips, and
- direct emissions (such as residential wood combustion).

Construction

The BAAQMD CEQA Guidelines offer guidance to help calculate and determine the impact of emissions from these sources. For construction emissions, the BAAQMD guidance does not "expect Lead Agencies to provide detailed quantification of construction emissions" (page 53). The air district instead recommends a set of dust (PM_{10}) control measures and recommends clean fuels for large equipment (e.g., earth movers). This Revised Draft EIR recommends mitigation measures in the subsections below.

Vehicle Trips

Motor vehicle emissions are typically calculated using one of several air emission models specific to vehicles in California. Specific traffic information for the Specific Plan was developed and made available. Therefore, CARB's 2002 emission factor model (EMFAC 2002) was used for registered vehicles in Marin County to calculate daily emissions in both summer and winter. If a project's emissions exceed the BAAQMD's recommended significance thresholds, then mitigation measures are recommended as available. These mitigation measures can include the development of transit stops, bike lanes, pedestrian facilities, telecommute centers, and the like. The land uses permitted within the Specific Plan area at the density and intensity permitted would not trigger significance thresholds and no mitigation is recommended here.

Direct Emissions

Sometimes called "area sources," fireplaces and wood stoves are among the main causes of direct emissions in residential areas. Because air movement is more stagnant in winter (little wind) and wood is often burned in the evening hours when local inversions occur, residential wood combustion can create a substantial level of PM_{10} in a localized area. Consequently many communities in North America have banned installation of fireplaces and wood stoves in new construction, instead favoring clean-burning technologies. Some communities have programs to encourage replacement of older, more polluting fireplaces and wood stoves, or, like the BAAQMD, have "Don't Light Tonight" campaigns when meteorologists forecast high pollution retention within an air basin. For this Revised Draft EIR, the URBEMIS 2001 air emission model was used to estimate residential wood combustion emissions on a daily basis in winter.

Appendix E represents data from the air quality analysis for the Specific Plan.

PROJECT-LEVEL IMPACTS

Impact **4.6-1**

Conflicts with the Clean Air Plan. *The 2000 CAP is based upon the development planned in the general plans of local cities and counties within the air basin. The Larkspur General Plan assumed commercial development in Subareas 1 and 2, and assumed residential development in Subarea 3. The proposed Specific Plan is consistent with the planned land uses of the Larkspur General Plan, and therefore does not conflict with the 2000 CAP. This impact is considered* ***less than significant****.*

The BAAQMD, Metropolitan Transportation Commission, and ABAG develop and update a plan to achieve federal O_3 standards called the CAP. The 2000 CAP is based upon the development planned in the general plans of local cities and counties within the air basin. Adoption of the Specific Plan would permit additional commercial uses in the western portion of the Specific Plan area, and allow residential development in Specific Plan Subarea 3 (the Niven property). The Larkspur General Plan anticipated this type of development by designating the Niven property for low-density residential development, when the property is no longer used for a plant nursery. The General Plan also requires preparation of a Specific Plan before the property is developed in any use other than a plant nursery. Because the

Specific Plan is generally consistent with the provisions of the Larkspur General Plan, and because development of the specific plan area would not result in a Larkspur population greater than that currently projected by ABAG, the Specific Plan does not conflict with the current CAP. This impact is considered less than significant.

Impact **4.6-2**

Obstruction of Implementation of the Clean Air Plan. *The Specific Plan would not hinder the BAAQMD's ability to meet the federal O_3 standard. This impact is considered **less than significant**.*

Currently, many people commute into and through Marin County to reach employment sites in Marin County and San Francisco. Many of these commuters live in Sonoma and Napa counties, where home prices are significantly lower than in Marin (2003 median home prices in Sonoma and Napa counties are approximately 40% lower than in Marin County). Supply and demand market forces are a large part of the reason that home prices are higher in Marin than Sonoma or Napa counties. Therefore, an increase in the number of affordable housing units provided by the specific plan available for the local workforce could result in a reduction in commuter travel, thereby promoting implementation of the CAP. This impact is considered less than significant.

Impact **4.6-3**

Violation of Air Quality Standards. *Potential future emissions from Specific Plan development can be classified into two regimes: summer and winter. Traffic generated by development under the Specific Plan would create emissions both in summer and winter. Residential wood combustion would typically occur only in winter. Summer emissions caused by motor vehicle traffic would not cause exceedances of ambient air quality standards for CO, and emissions of NO_X, ROG, and PM_{10} are below BAAQMD significance thresholds. However, in winter, potential residential wood combustion would cause generation of ROG (wood smoke also contains TAC compounds) at levels that would exceed the significance level recommended by the BAAQMD. This impact is considered **potentially significant**.*

With development of up to 104 residential units, a 36-room hotel, and up to nearly 51,065 square feet of new commercial/mixed use space, the uses in the Specific Plan area would generate CO, ROG, NO_X, and PM_{10} during the winter as shown in Table 4.6-3. Summertime emissions are shown in Table 4.6-4.

Table 4.6-3
Winter Project Emissions - Pounds Per Day (2015)

Pollutant Species	Wood combustion	Vehicle Emissions	BAAQMD Significance Threshold	Total (exceeds BAAQMD?)
Carbon Monoxide	360.5	165.0	550	525.5 - No
Reactive Organic Gases	152.0	19.6	80	171.6 - Yes
Oxides of Nitrogen	56.2	31.1	80	87.3 - No
Particulate Matter (PM_{10})	1.0	2.0	80	3.0 - No

Source: Emission models EMFAC2002 v2.2 9/23/2002, maintained by the California Air Resources Board, and URBEMIS 2001 v6.2.2, maintained by the South Coast Air Quality Management District and the California Air Resources Board.

Table 4.6-4 Summer Project Emissions - Pounds Per Day (2015)			
Pollutant Species	Vehicle Emissions	BAAQMD Significance Threshold	Exceeds BAAQMD
Carbon Monoxide	165.0	550	No
Reactive Organic Gases	19.6	80	No
Oxides of Nitrogen	31.1	80	No
Particulate Matter (PM_{10})	2.0	80	No
Source: Emission models EMFAC2002 v2.2 9/23/2002, maintained by the California Air Resources Board, and URBEMIS 2001 v6.2.2, maintained by the South Coast Air Quality Management District and the California Air Resources Board.			

The BAAQMD recommends evaluation of a CO Hotspot if project traffic would increase local levels by 10%, or worsen congestion as expressed by LOS D or below. Using this guidance, a CO Hotspot was performed for the study intersection with the worst LOS and delay. The intersection of East Ward Street/Magnolia Avenue would operate at LOS F during the p.m. peak hour and would have the worst delay of all study intersections (see Section 4.7, Traffic and Circulation). Based on the CO modeling (see Appendix E-4), existing traffic volume and the Specific Plan-generated traffic volume would combine to result in CO concentration of up to 7.3 ppm for 1-hour concentrations and 4.9 ppm for 8-hour concentrations (Illingworth & Rodkin, Inc. 2003). These concentrations are lower than the standard of 20 ppm for 1 hour concentrations and 9 ppm for 8-hour concentrations. As such, no violations of air quality standards would result for this intersection. Because all other study intersections would have similar or better LOS and less delay than this intersection, no exceedances of CO standards are expected for all study intersections.

However, as mentioned above, generation of ROG would exceed the significance level recommended by the BAAQMD (Table 4.6-3). Wood stoves and fireplaces installed at homes within the Specific Plan area would create significant ROG emissions during the cooler months. Emissions of all other criteria pollutants are below BAAQMD significance thresholds. Wood smoke from fireplaces and wood stoves used within the Specific Plan area could contribute to localized exceedances of PM_{10} standards, although the project's expected emissions that would be expected to be generated by development in the Specific Plan area do not exceed 80 lbs/day. Wood smoke contains many compounds identified as TACs. Many studies have determined that the benzene soluble (e.g., ROG) fraction of wood smoke is carcinogenic, mutagenic, or teratogenic. This impact is considered potentially significant.

Impact **4.6-4**

Health Threats from Potential Construction-Related Release of Asbestos and Lead. *Materials containing asbestos may have been used during construction of older buildings in the Specific Plan area, and in Subarea 3 old gasoline tanks may have leaked leaded fuel into the soil. Asbestos fibers and lead could be entrained into the atmosphere during remediation, posing a serious health threat. This impact is considered* ***potentially significant****.*

A number of buildings in the Specific Plan area date back as far as the 1920s, and materials containing asbestos may have been used in their construction. In addition, there is lead-based

paint on some of the buildings at the Niven Nursery. This issue, and the steps to ensure complete cleanup and remediation, is fully addressed in Section 4.12, Hazardous Materials, of this Revised Draft EIR. Because asbestos fibers and lead could be released into the atmosphere, this impact is considered potentially significant.

Impact **4.6-5**

Substantial Emissions of Dust and Diesel Exhaust during Construction. *Dust generated by construction equipment and vehicles could be substantial, and could contribute to ambient PM_{10}. Construction equipment could also emit substantial amounts of diesel exhaust, which has been identified as a TAC. This impact is considered* ***potentially significant****.*

Construction and grading can create substantial amounts of dust. Once existing buildings within the Specific Plan area have been demolished, dust generated by construction equipment and vehicles could be significant. Fugitive dust is emitted during grading, trenching, and paving, and from wind erosion of exposed earth surfaces. Dirt tracked out onto nearby paved roads can be re-entrained into the atmosphere by passing vehicles and contribute to ambient PM_{10}.

In the San Francisco Bay area diesel exhaust represents about two-thirds of the total excess annual cancer burden. Construction equipment diesel exhaust is classified by CARB as a TAC. Additionally, NO_X from equipment exhaust can reform chemically into fine acid particulates and further contribute to local PM_{10} and $PM_{2.5}$ levels. Construction equipment could emit substantial amounts of diesel exhaust on some days when grading or excavation takes place. This impact is considered potentially significant.

Impact **4.6-6**

Creation of Objectionable Odors Affecting a Substantial Number of People. *Development anticipated within the Specific Plan area would not be expected to generate any objectionable odors. Odors associated with residential uses (e.g., cooking odors, odors associated with lawn and yard maintenance) are not generally be regarded as objectionable by the BAAQMD. This impact is considered* ***less than significant****.*

The BAAQMD CEQA Guidelines identify the following types of operations as potential sources of odor complaints: wastewater treatment plants, sanitary landfills, transfer stations, compost facilities, petroleum refineries, asphalt batch plants, chemical manufacturing, fiberglass manufacturing, painting/coating operations (e.g., auto body shops), rendering plants, and coffee roasters. These types of uses are not permitted within the Specific Plan area. Therefore, development in the Specific Plan area would not contain these types of facilities, and the permitted uses would not create any unusual or objectionable odors. This impact is considered less than significant.

CUMULATIVE IMPACTS

According to the BAAQMD CEQA Guidelines, "Any proposed project that would individually have a significant air quality impact… would also be considered to have a significant cumulative air quality impact. For any project that does not individually have significant operational air quality impacts, the determination of significant cumulative impact should be

based on an evaluation for the consistency of the project with the local general plan *and* of the general plan with the regional air quality plan" (2000 Clean Air Plan). Typically, if a project does not require a general plan amendment, then it is considered consistent with the local general plan. Also, to avoid cumulative impacts, a proposed project should not place sensitive receptors near sources of odors, toxics, or accidental releases (e.g., from a chemical plant or refinery).

The BAAQMD further evaluates cumulative impacts by determining whether a proposed project, in combination with past, present, and reasonably foreseeable future projects, would cause a jurisdiction's population to exceed CAP and ABAG population projections. If a project would do this, then it has a significant cumulative impact.

The Specific Plan, without mitigation, would have significant air quality impacts related to wood-stove-generated air pollutants. As such, the Specific Plan would contribute to a significant cumulative impact related to air quality standards. The Specific Plan is consistent with the adopted Larkspur General Plan. Development permitted under the Specific Plan would not increase population or vehicle miles traveled beyond those already forecast by ABAG and included in the 2000 CAP.

CO modeling was performed for the intersection of intersection of East Ward Street/Magnolia Avenue, which has the worst LOS and delay of all study intersections under cumulative conditions (see Appendix E-4). The estimated CO concentrations, which were up to 10.7 ppm for 1-hour concentrations and 7.3 ppm for 8-hour concentrations, are lower than the standard of 20 ppm for 1 hour concentrations and 9 ppm for 8-hour concentrations. As such, no violations of air quality standards would result for this intersection. Because all other study intersections would have similar or better LOS and less delay than this intersection, no exceedances of CO standards are expected for all study intersections under cumulative conditions (Illingworth & Rodkin, Inc. 2003).

No development projects are known or expected to be constructed in the immediate vicinity of the Specific Plan area. Properties in the immediate vicinity have already been developed and are not likely to be redeveloped in the short term. Because no additional construction activities are expected near the Specific Plan area, Impact 4.6-5, Substantial Emissions of Dust and Diesel Exhaust during Construction, is not considered to contribute considerably to cumulative impact. Therefore, the Specific Plan would not have a significant cumulative air quality impact related to construction-related release of dust, diesel exhaust, asbestos, and lead.

4.6.3 MITIGATION MEASURES

PROJECT MITIGATION MEASURES

No mitigation measures are required for the following less-than-significant impacts.

4.6-1: Conflicts with the Clean Air Plan

4.6-2: Obstruction of Implementation of the Clean Air Plan

4.6-6: Creation of Objectionable Odors Affecting a Substantial Number of People

The following mitigation measures are recommended for potentially significant impacts.

Impact **4.6-3** mitigation

Violation of Air Quality Standards.

Permit Residential Installation of Natural Gas or Pellet Burning Fireplace Appliances Only

The City shall include the following new policy in the Specific Plan.

New Policy: The City shall prohibit residential wood burning appliances and fireplaces and shall permit only natural gas or pellet burning fireplace appliances as a condition of approval of all planned development permits for residential construction. This measure effectively eliminates more than 90% of ROG emissions, thus mitigating emissions below the level of significance. Natural gas and pellet residential heating stove emissions are almost PM_{10} free; thus, wood smoke impacts would be eliminated. This measure would also control PM_{10} emissions and avoids contributing to existing violations of the 24-hour and annual PM_{10} standards. CO and TACs from combustion would also be almost completely eliminated by this measure.

Impact **4.6-4** mitigation

Health Threats from Potential Construction-Related Release of Asbestos and Lead.

Implement Mitigation Measure 4.12-2

The developer shall implement Mitigation Measure 4.12-2, Implement a Demolition Plan, described in Section 4.12, Hazards and Hazardous Materials.

Impact **4.6-5a, b** mitigation

Substantial Emissions of Dust and Diesel Exhaust During Construction.

(a) Implement Control Measures to Control Dust that Includes PM10 from Construction Activities

The City shall include the following new policy in the Specific Plan.

New Policy: The City shall condition all future development permits to require implementation of effective and comprehensive dust control measures. Implementation of feasible controls, outlined below, can substantially reduce construction PM_{10} emissions. Construction activities are also subject to BAAQMD Regulation VIII, which requires suppressing dust emissions from all sources of dust generation using water, chemical stabilizers, and/or vegetative ground cover.

Implementing fugitive dust control measures can greatly reduce adverse impacts. According to BAAQMD, estimating the amounts of construction dust from a particular project is at best imprecise. The air district prefers to evaluate construction dust significance by project size and proximity to sensitive receptors. Potential adverse impacts then determine which control measures will be implemented. The Specific Plan area is near existing sensitive receptors (residences, schools) and would thus need the most stringent control measures recommended by the BAAQMD. These measures, stated below, would reduce construction dust to the maximum extent feasible (by 70% or more). Therefore, the construction contractor shall implement all of the following measures:

1. Water all active construction areas at least twice daily and more often during windy periods. Active areas adjacent to residences should be kept damp at all times.

2. Cover all hauling trucks or maintain at least 2 feet of freeboard. Pave, apply water at least twice daily, or apply (nontoxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas.

3. Sweep daily (with water sweepers) all paved access roads, parking areas, and staging areas. Sweep adjacent streets daily (with water sweepers) if visible soil material is deposited onto the road surface.

4. Hydroseed or apply (nontoxic) soil stabilizers to inactive construction areas (previously graded areas that are inactive for 10 days or more).

5. Enclose, cover, water twice daily, or apply (nontoxic) soil binders to exposed stockpiles.

6. Limit traffic speeds on any unpaved roads to 15 mph.

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

8. Replant vegetation in disturbed areas as quickly as possible.

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

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

11. Designate an air quality coordinator for the project. Prominently post a phone number for this person on the job site, and distribute same to all nearby residents and businesses. The coordinator will respond to and remedy any complaints about dust, exhaust, or other air quality concerns. A log shall be kept of all complaints and how and when the problem was remedied.

(b) Implement All Feasible and Reasonable Control Measures to Reduce Construction Activity TACs.

The City shall include the following new text and policy in the Specific Plan.

Text: Diesel exhaust is a major source of fine particles, as well as more than 40 substances that are listed as hazardous pollutants. The BAAQMD CEQA Guidelines recognize use of alternatively fueled construction equipment as an effective mitigation. Low-emission fuels are currently available to minimize construction equipment TAC emissions. Engine tuning and control equipment retrofit would help minimize emissions of NO_X that contributes to PM_{10} and $PM_{2.5}$. 100% biodiesel fuel, called B100, reduces TAC emissions by approximately 80% to 90%. Ultra-low sulfur fossil diesel fuel (less than 15 ppm by weight) also significantly reduces PM_{10}.

Oxidation catalysts or catalytic particulate filters are now available for many types of diesel equipment. These systems require biodiesel or CARB ultra low-sulfur diesel fuel. These systems in combination with ultra-low sulfur diesel can reduce emissions of fine particulates and toxic hydrocarbons by 90 percent or more. CARB-approved commercially available fuel additives, such as PuriNOx, reduce emissions of both NO_X and PM_{10} by 20% to 40%, depending on equipment.

New Policy: The City shall require all onsite construction and grading equipment to implement the following three emission control techniques:

1. Use biodiesel fuel for all onsite diesel powered equipment. For equipment with engines built in 1994 or later, B100 shall be used. In pre-1994 engines, B-20 fuel (a mixture of 20% biodiesel and 80% fossil diesel fuel) may be used if necessary. If B20 is used, the fossil diesel component should be CARB ultra low-sulfur fuel.

OR

Use an oxidation catalyst or catalytic particulate filter on all diesel powered equipment rated above 50 horsepower.

2. Use PuriNOx additive or equivalent.

3. Tune vehicle engines to produce minimum NO_X, typically by engine retard of 4–8 degrees. This can reduce emissions by an additional 5%.

CUMULATIVE MITIGATION MEASURES

Significant cumulative impacts would be mitigated to a less-than-significant level with implementation of the above mitigation measures.

4.6.4 LEVEL OF SIGNIFICANCE AFTER MITIGATION

Following implementation of the above mitigation measures, no significant impacts on air quality would remain.