

## 4.8 AIR QUALITY

This section evaluates the potential effects on air quality resulting from implementation of the Proposed Action. Issues associated with air quality, including consistency with applicable federal, state, and regional air quality plans, violation of existing air quality standards, exposure of sensitive receptors to increased pollutants, and potential odor problems from users, are addressed in this section. The air quality evaluation is applicable to all alternatives due to the regional nature of the Proposed Action. The evaluation focuses on the largest of the Alternatives in terms of square footage and associated parcel size in order to ensure that the maximum potential effect is considered.

### 4.8.1 AFFECTED ENVIRONMENT/ENVIRONMENTAL SETTING – ALTERNATIVE SITES 1 AND 2

The City of Redding is located in the Northern Sacramento Valley Air Basin (*NSVAB*). The *NSVAB* encompasses Shasta, Tehama, Glenn, Butte, Colusa, Sutter, and Yuba counties. The basin's principal geographic features include a large valley bounded on the north and west by the Coastal Mountain Range and on the east by the southern portion of the Cascade Mountain Range and the northern portion of the Sierra Nevada. These mountain ranges reach heights in excess of 6,000 feet with peaks rising much higher. Elevations vary from about 680 to 1800 feet above mean sea level.

The average annual precipitation at the Redding Municipal Airport is 33 inches (National Oceanic and Atmospheric Administration [*NOAA*], 1995). Most of the precipitation occurs from November through April, when Pacific storms frequently track across northern California. The average July maximum and minimum temperatures at the Airport are 101 degrees Fahrenheit (°F) and 68°F, respectively. The average January maximum and minimum temperatures are 58°F and 33°F, respectively (*NOAA*, 1995). The predominant wind direction at Redding is from the northwest (California Air Resources Board [*CARB*], 1984).

The quantity of air pollutant emissions generated within the *NSVAB* is small compared to the more densely populated areas such as the Sacramento and the San Francisco Bay areas. Nevertheless, the following characteristics of the *NSVAB* make it susceptible for the build-up of air pollution.

- Pollution generated in the broader Sacramento area and San Francisco Bay area can be transported northward into the *NSVAB*.
- The mountain ranges to the west, north, and east of the *NSVAB* act as horizontal barriers which restrict the flow of pollution out of the basin.
- The valley portion of the *NSVAB* (those areas below 1,000 feet elevation) is often subjected to temperature inversions that typically occur during cool, calm nights that restrict vertical mixing and dilution of pollutants.
- The typical clear skies and warm temperatures in the summer months promote the formation of the photochemical pollutant ozone.

The existing air quality in the area of the City is characterized using data from a network of ambient air quality monitoring stations located throughout the *NSVAB*. There are three air quality monitors in Shasta County: one on the roof of the Redding Health department, one

in Anderson at North Street, and one in Lassen National park. The monitoring station closest to the City is located on the roof of the Mental Health Building on Breslauer Way in Redding. The Shasta County Air Quality Management District (AQMD) operates the monitoring station.

The evidence from the past several years of air quality monitoring data for particulate matter and ozone show that air quality in Shasta County has hovered just above and just below federal air quality standards. Air quality problems in the Sacramento Valley and other parts of California, coupled with growth and increasing travel volumes and other pollutant sources in the County can result in increased concentrations of air pollution in Shasta County.

### Air Quality Standards and Health Effects

The Federal Clean Air Act sets standards, called National Ambient Air Quality Standards (NAAQS) for several "criteria" pollutants including carbon monoxide, lead, sulfur oxides, nitrogen dioxide, ozone, and particulate matter less than ten microns in diameter (PM-10). The standards are intended to protect public health. Areas which do not attain the standards are formally designated by EPA as "nonattainment" areas and are required to institute planning procedures to reduce emissions and resulting pollutant concentrations to below the levels set by the standard. It is allowable for states to set their own, more stringent air quality standards if they desire. California has set more stringent standards.

**Table 4.8-1** identifies the standards applicable and of current concern in Shasta County.

<b>TABLE 4.8-1</b>		
<b>FEDERAL AND STATE AIR QUALITY STANDARDS OF CONCERN IN SHASTA COUNTY</b>		
<b>Pollutant</b>	<b>State Standard</b>	<b>Federal Standard</b>
Ozone (one-hour standard)	9 pphm	12 pphm
Ozone (8-hour standard)	None	8 pphm
PM-10 (24-hour standard)	50 ug/m <sup>3</sup> <sup>1</sup>	150 ug/m <sup>3</sup>
PM-10 (annual standard)	20 ug/m <sup>3</sup>	50 ug/m <sup>3</sup>
PM2.5 (annual average standard)	None	15 ug/m <sup>3</sup>

Ozone is a seasonal problem, typically occurring during the months of May through October. Ozone is a "secondary" pollutant; it is not directly emitted from formed through the reaction of precursors in sunlight. The precursors are volatile organic compounds (VOC) and nitrogen oxides (NOx). Sufficient quantities of these precursors, combines with certain meteorological conditions such as high heat and low wind, can form unhealthy amounts of ozone. Note that the ozone layer, 15 miles above the earth, provides a protective shield from ultraviolet light. However, ground level ozone acts as a strong irritant that attacks the body's respiratory system. Symptoms include shortness of breath, chest pain when inhaling deeply, wheezing, and coughing. When ozone levels are high, people with lung disease (e.g., chronic bronchitis, emphysema, and asthma) are particularly susceptible to adverse health impacts. Sources for the pollutants, which react to form ozone, include motor vehicles, power plants, factories, chemical solvents, combustion products from various fuels, and consumer products.

<sup>1</sup> Ug/m<sup>3</sup> is micrograms of pollutant per cubic meter of air.

Particulate matter is a mixture of solid particles and liquid droplets found in the air. Particulate matter may be produced by natural causes (e.g., pollen, ocean salt spray, and soil erosion) and by human activity (e.g., rock crushing, cement production, agricultural operations, fuel combustion products, wood burning, and motor vehicles). California EPA and Federal EPA regulate “respirable” particulate at the 10-micron level (PM10) and “fine” particles at the 2.5-micron level (PM2.5). Both coarse and fine particles are of health concern because they can penetrate into the sensitive regions of the respiratory tract. Fine particles are linked to the most serious effects. They can cause persistent coughs, phlegm, wheezing, and other physical discomfort.

Exposure to particle pollution is linked to increased frequency and severity of asthma attacks and bronchitis, and even premature death in people with existing cardiac or respiratory disease. When particle levels in the air increase, so do reports of adverse health outcomes. Those most sensitive to particle pollution include people with existing respiratory and cardiac problems, children, and the elderly. Prolonged and repeated exposure can also have adverse impacts. Life expectancy is somewhat lower in areas with high particle levels. All inhalable particles are harmful – both “coarse” particles in the 2.5 to 10 micron diameter size and “fine” particles, those smaller than 2.5 microns. The EPA regulates PM-10 (particulate matter between 2.5 and 10 microns) and, beginning soon, PM2.5 (particulate matter less than 2.5 microns).

Shasta County is considered an "attainment area" for federal standards for ozone, particulate matter, carbon monoxide, lead, sulfur oxides, and nitrogen dioxide. They are considered a "nonattainment area" for the California one-hour ozone standard and the 24-hour PM-10 standard ozone. Prior to 1997, the ozone standard was expressed in terms of a one-hour average. In 1997 the Federal Environmental Protection Agency promulgated a new 8-hour average ozone standard and a PM 2.5 standard. The 8-hour ozone standard recognized that exposures to lower concentrations of ozone over longer periods could be worse for the health than one-hour exposures to higher concentrations. The one-hour standard will be revoked in mid-2005. The PM2.5 standard recognizes the special danger of health problems resulting from exposure to smaller size particles. The PM-10 standard is not being revoked, however.

The new standards were challenged for several years but eventually upheld by the Supreme Court in early 2001 and EPA has begun implementing both. EPA made final designations under the 8-hour ozone standard on April 15, 2004. Shasta County was not designated as nonattainment; in fact no counties in the *NSVAB* were so designated except for Sutter County. Designations for the PM2.5 standard were due by the end of December 2004 and did not include Shasta County or any part of the metro or northern Sacramento Valley air basin.

The following tables by the California Air Resources Board (CARB) document available air quality data for ozone and PM-10 available on their website as of July 2004 at <http://www.arb.ca.gov/adam>.

**Table 4.8-2** uses the CARB “Aerometric Data Analysis and Management (ADAM)” data from 2004 (<http://www.arb.ca.gov/adam>) for the monitoring site in Redding. Values for the 4<sup>th</sup> highest in three years are provided because violations of the standard are based on the fourth highest values in a three year period. Therefore, although Shasta County has exceeded the ozone standard a number of times, it has not been exceeded enough to qualify as a violation (and therefore causing Shasta to be designated as nonattainment).

**Table 4.8-3** lists monitoring data for particulate matter. Data for PM2.5 is not available at this time.

TABLE 4.8-2							
OZONE DATE SUMMARIES FOR SHASTA COUNTY (SOURCE: CARB)							
Year	Days Greater Than Standard		1-Hour Observations		8-Hour Averages		
	1-Hour		8-Hour		3-Year		3-Year Average
	State	National	National	Maximum	4 <sup>th</sup> High	Maximum	4 <sup>th</sup> High
2003	0	0	0	0.094	0.096	0.076	
2002	4	0	0	0.098	0.098	0.084	
2001	0	0	0	0.087	0.111	0.076	
2000	3	0	1	0.102	0.120	0.087	0.093
1999	21	0	11	0.116	0.120	0.098	0.095
1998	40	3	45	0.140	0.120	0.126	0.095
1997	8	0	6	0.119	0.110	0.107	0.086
1996	16	0	13	0.110	0.110	0.100	0.087
1995	1	0	0	0.099	0.101		
1994	7	0	7	0.113	0.110	0.105	

TABLE 4.8-3								
PM-10 DATA SUMMARIES FOR SHASTA COUNTY (SOURCE: CARB)								
Year	Estimated Days Greater Than Standard		Annual Average		3-Year Average		High 24-Hour Average	
	National	State	National	State	National	State	National	State
2003	0.0	0.0	15.0	15.2	18	21	33.0	35.0
2002	0.0	5.8	20.8	20.8	20	21	55.0	54.0
2001	0.0		19.6			19	56.0	59.0
2000	0.0	5.7	18.6	18.9		19	49.0	52.0
1999	0.0						77.0	75.0
1998	0.0		17.6				50.0	52.0
1997	0.0		17.0				44.0	44.0
1996						24	35.0	35.0
1995	0.0		19.6		21	24	49.0	49.0
1995	0.0	12.2	24.4	24.4		24	58.0	58.0

In some cases there are differences between state and federal measurements, for reasons explained on the above-referenced web site. CARB does not describe the reasons for missing data in some of the years.

With respect to PM-10, Shasta has exceeded the state 24-hour and annual standards numerous times standard a few times a year since 1988, but has never exceeded the federal 24 hour standard. Shasta has also never exceeded either the state or the federal annual standard.

Summaries of toxic data are not available from the CARB.

### Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. Sensitive receptors include children, the elderly, and people with health problems. Land uses such as primary and secondary schools, hospitals, and convalescent homes are considered sensitive receptor locations. This is because the very young, the old, and the ill are more often susceptible than the general public to respiratory infections and other air quality-related health problems. Recreational users are often moderately sensitive to air pollution, because vigorous exercise places a high demand on the human respiratory function. Currently there are no hospitals, or convalescent homes within 2 miles of the proposed business park.

However, Valley Christian School on Rancho Road is located across the street from Alternative 3 and approximately two miles from Alternatives 1 and 2. The proposed Veterans Home will be located approximately one mile south along Knighton Road. As detailed later in this evaluation, the only significant impacts are regional in nature and are not expected to be of concern to sensitive receptors except possibly during the construction phase, which could affect the Valley Christian School if Alternative 3 is selected. Numerous construction mitigation measures have been recommended to minimize this potential impact.

## 4.8.2 REGULATORY FRAMEWORK

### Overview of Applicable Air Quality Regulations

Historically, air quality laws and regulations have divided air pollutants into two broad categories: “criteria pollutants” and “toxic air contaminants.” Federal and State air quality standards have been established for six ambient air pollutants, commonly referred to as “criteria” air pollutants. These standards were so named because EPA published criteria documents to justify the choice of each standard, based on a comprehensive review of their health effects.

The criteria air pollutants for which federal and state ambient standards have been established include O<sub>3</sub>, CO, NO, sulfur dioxide (SO<sub>2</sub>), PM<sub>10</sub>, PM<sub>2.5</sub> and lead (Pb). In this analysis, O<sub>3</sub> is evaluated by assessing emissions of O<sub>3</sub> precursors: reactive organic gases (ROG) and Nitrogen Oxides (NO<sub>x</sub>). These criteria pollutants have been regulated for more than two decades. They are regulated separately from toxic air contaminants at both federal and state levels.

Shasta County is not currently classified as a nonattainment area under any federal air quality standard. Shasta County is classified as a nonattainment area for ozone and particulate matter under California standards. Shasta County, as part of the *NSVAB*, has been classified as a nonattainment area for ozone and PM-10 under California standards for some time.

The California Air Resources Board regulates mobile emissions sources, oversees the activities of county and regional Air Pollution Control Districts (APCDs) and Air Quality Management Districts (AQMDs) and implements the California Clean Air Act (CCAA) of 1988. The CARB regulates local air quality indirectly by establishing state ambient air quality standards and vehicle emission standards, by conducting research activities, and through its planning and coordinating activities.

Until the passage of the CCAA Amendments, there was no specific deadline for the attainment of state standards. The CCAA requires that nonattainment areas within the state develop plans to attain state air quality standards. These plans include the following: emission reduction requirements of all feasible control measures for an annual five percent reduction in nonattainment pollutants or its precursors, emission control standards that require local districts to stringently control emissions through varying degrees of stationary and mobile source control programs; application of additional control measures if a regional air quality management district or unified air pollution control district area contributes to downwind nonattainment areas; cost-effectiveness estimates for all proposed emission control measures; and development and implementation of transportation controls for cities and counties to enforce.

California has adopted ambient standards that are more stringent than the federal standards for the criteria air pollutants. Under the CCAA, patterned after the federal CAA, areas have been designated as attainment, nonattainment or unclassified with respect to the state ambient air quality standards. The CCAA requires that districts design a plan to achieve an annual reduction in district-wide emissions of 5 percent or more for each nonattainment criteria pollutant or its precursor(s). The *NSVAB* is in nonattainment for the state O<sub>3</sub> and PM<sub>10</sub> standards. The *NSVAB* is designated an attainment area for NO<sub>x</sub>, SO<sub>x</sub>, CO, and Pb. Sulfates, hydrogen sulfide, and visibility-reducing particles are unclassified in the SJVAB.

**Table 4.8-4** provides a summary of applicable federal and state standards.

#### **A. Related Federal Regulations**

Air toxics have been regulated at the federal level since the Clean Air Act Amendments (CAAA) of 1977. Following the passage of this law, regulations for seven hazardous air pollutants (HAPs) were promulgated as National Emission Standards for Hazardous Air Pollutants (NESHAPS) over a 13-year period. The federal Clean Air Act Amendments of 1990 revamped the NESHAPS program to offer a technology-based approach for reducing the emissions of a greater number of air toxic compounds. Under the 1990 CAAA, a group of 189 substances were identified as HAPs and slated for regulation. The program requires certain facilities to control air toxic emissions by the installation of Maximum Achievable Control Technology (MACT).

A major ongoing effort in controlling air toxics at the federal level have been programs to reduce emissions from on-road and non-road diesel engines (trucks, tractors, construction equipment and the like). EPA has regulated highway diesel fuel quality since 1993. As part of the Clean Diesel Trucks and Buses program, EPA finalized requirements that will reduce the level of sulfur in highway diesel fuel by 97 percent starting in 2006. Likewise, the Clean Air Nonroad Diesel Rule includes new fuel requirements that will decrease the allowable levels of sulfur in fuel used in nonroad diesel engines, locomotives, and marine vessels by 99 percent. Lowering sulfur in diesel fuel makes it possible for engine manufacturers to use advanced clean technologies which can be damaged by sulfur, just as lead was phased out of gasoline to prevent damage to catalytic converters. In addition, reducing sulfur levels will provide immediate public health benefits by reducing particulate matter from engines in the existing fleets of highway trucks and buses, nonroad equipment, locomotives, and marine diesel engines.

In May 2004, EPA adopted a comprehensive national program to reduce emissions from future nonroad diesel engines by integrating engine and fuel controls as a system to gain the greatest emission reductions. Exhaust emissions from these engines will decrease by more than 90 percent. Because the emission-control devices can be damaged by sulfur, the final rule also reduces the allowable level of sulfur in nonroad diesel fuel by more than 99 percent, which will result in immediate improvements in public health by reducing particulate matter from engines in the existing fleet of nonroad equipment. These emission reductions in nitrogen oxides and particulate matter are expected to provide enormous public health benefits, including preventing 12,000 premature deaths, 8,900 hospitalizations, and one million work days lost by 2030. The Rule is one of a suite of inter-related rules known as the “Clean Air Rules of 2004” which address ozone and fine particle pollution, nonroad diesel emissions, and power plant emissions of sulfur dioxide, nitrogen oxides and mercury.

There is also a Proposed Rule (signed June 3, 2004) – “In-Use Testing for Heavy-Duty Engines and Vehicles” in which EPA is proposing a manufacturer-run, in-use emissions testing program for heavy-duty diesel trucks. Under this program, engine manufacturers will

measure emissions from their diesel engines in highway applications using portable onboard emission measurement systems. This proposal advances EPA's clean diesel activities by helping to ensure that the benefits of more stringent emission standards are realized under real-world driving conditions. Other initiatives to reduce air toxics include:

- EPA's Clean School Bus USA program, which brings together partners from business, education, transportation, and public health organizations to work toward eliminating unnecessary public school bus idling; retrofitting buses with better emission control technologies; and replacing the oldest buses in the fleet with new, less polluting buses;
- SmartWay Transport, a partnership with leading freight-haulers, retailers and manufacturers, to reduce fuel consumption from the transportation sector in the United States; emissions affecting human health, especially in densely populated urban areas; and greenhouse gas emissions; and
- Voluntary Diesel Retrofit Program to address pollution from diesel construction equipment and heavy-duty vehicles that are currently on the road today. The Program is building a market for clean diesel engines by working with state, local and industry partners to create demonstration projects around the country.

## **B. Related State Regulations**

California's air toxics control program began in 1983 with the passage of the Toxic Air Contaminant Identification and Control Act, better known as Assembly Bill 1807 (AB 1807) or the Tanner Bill. The Tanner Bill established a regulatory process for the scientific and public review of individual toxic compounds. When a compound becomes listed as a “toxic air contaminant” (TAC) under the Tanner process, the California Air Resources Board (CARB) normally establishes minimum statewide emission control measures to be adopted by local air pollution control districts (APCDs). By 1992, 18 of the 189 federal HAPs had been listed by the CARB as state TACs. Later legislative amendments (AB 2728, Tanner, 1992) required the CARB to incorporate all 189 federal HAPs into the state list of TACs. In April 1993, the CARB added 171 substances to the state program to make the state TAC list equivalent to the federal HAP list.

The second major component of California's air toxics program, supplementing the Tanner process, was provided by the passage of AB 2588, the Air Toxics “Hot Spots” Information and Assessment Act of 1987. AB 2588 currently regulates over 600 air compounds, including all of the Tanner-designated TACs. Under AB 2588, specified facilities must quantify emissions of regulated air toxics and report them to the local APCD. If the APCD determines that there is a potentially significant public health risk posed by a given facility, the facility is required to perform a health risk assessment and notify the public in the affected area if the calculated risks exceed specified criteria.

In addition to the above, Proposition 65 was passed by California voters in 1986, which required that a list of carcinogenic and reproductive toxicants found in the environment be compiled, the discharge of these toxicants into drinking water be prohibited, and warnings of public exposure by air, land, or water be posted if a potential public health risk is posed. The handling of any of these substances by a facility would require a public warning unless health risks could be demonstrated to be insignificant. This program is currently administered by the Office of Environmental Health Hazard Assessment (OEHHA).

**TABLE 4.8--4  
STATE AND FEDERAL AMBIENT AIR QUALITY STANDARDS**

Pollutant	Averaging Time	California Standards <sup>a</sup>	National Standards <sup>b</sup>		Sacramento Valley State Status/Classification	Sacramento Valley National Status/Classification
			Concentrations <sup>c</sup>	Primary <sup>d</sup>		
Photochemical Oxidants <sup>f</sup>	8-hour 1-hour <sup>g</sup>	-- 0.09 ppm	0.08 ppm 0.12 ppm	Same as Primary	Nonattainment / Severe	Nonattainment/Serious
Carbon Monoxide	8-hour 1-hour	9.0 ppm 20.0 ppm	9 ppm 35 ppm	Same as Primary	Attainment/None	Attainment/None
Nitrogen Dioxide	Annual Mean 1-hour	-- 0.25 ppm	0.053 ppm --	Same as Primary	Attainment/None	Attainment/None
Sulfur Dioxide	Annual Mean 24-hour 3-hour 1-hour	-- 0.04 ppm -- 0.25 ppm	0.03 ppm 0.14 ppm -- --	-- -- 0.5 ppm --	Attainment/None	Attainment/None
Fine Particulate Matter (PM <sub>10</sub> )	Annual Mean Annual Geometric Mean 24-hour	-- 30 µg/m <sup>3</sup> 50 µg/m <sup>3</sup>	50 µg/m <sup>3</sup> -- 150 µg/m <sup>3</sup>	Same as Primary -- Same as Primary	Nonattainment /Serious	Nonattainment/None
Fine Particulate Matter (PM <sub>2.5</sub> )	Annual Mean 24-hour	-- --	15 µg/m <sup>3</sup> 65 µg/m <sup>3</sup>	Same as Primary	Not Designated/None	Not Designated/or proposed for designation None

Notes: ppm = parts per million, µg/m<sup>3</sup> = micrograms per cubic meter

<sup>a</sup> California standards, other than carbon monoxide, sulfur dioxide (1-hour), and fine particulate matter, are values that are not to be equaled or violated. The carbon monoxide, sulfur dioxide (1-hour), and fine particulate matter standards are not to be violated.

<sup>b</sup> National standards, other than ozone, the 24-hour PM<sub>2.5</sub>, the PM<sub>10</sub>, and those standards based on annual averages, are not to be exceeded more than once a year. The 1-hour ozone standard is attained when the expected number of days per calendar year with maximum hourly average concentrations above the standard is equal to or less than one. The 8-hour ozone standard is attained when the 3-year average of the annual fourth highest daily maximum concentration is less than 0.08 ppm. The 24-hour PM<sub>10</sub> standard is attained when the 99th percentile of 24-hour PM<sub>10</sub> concentrations in a year, averaged over 3 years, at the population-oriented monitoring site with the highest measured values in the area, is below 150 µg/m<sup>3</sup>. The 24-hour PM<sub>2.5</sub> standard is attained when the 98th percentile of 24-hour PM<sub>2.5</sub> concentrations in a year, averaged over 3 years, at the population-oriented monitoring site with the highest measured values in the area, is below 65 µg/m<sup>3</sup>. The annual average PM<sub>2.5</sub> standard is attained when the 3-year average of the annual arithmetic mean PM<sub>2.5</sub> concentrations, from single or multiple community oriented monitors is less than or equal to 15 µg/m<sup>3</sup>.

<sup>c</sup> All measurements of air quality are to be corrected to a reference temperature of 25° C and a reference pressure of 760 mm of mercury (Hg) (1013.2 millibar); ppm in this table refers to ppm by volume, or micromoles of pollutant per mole of gas.

<sup>d</sup> National Primary Standards: The levels of air quality deemed necessary by the federal government, with an adequate margin of safety, to protect the public health.

<sup>e</sup> National Secondary Standards: The levels of air quality deemed necessary by the federal government, to protect the public welfare from any known or anticipated adverse effects to a pollutant.

<sup>f</sup> Measured as ozone.

<sup>g</sup> The 1-hour ozone standard will be replaced by the 8-hour standard one year after the effective date of classification as an 8-hour ozone nonattainment area (which will occur in May, 2005).

On August 27, 1998, the CARB formally identified particulate matter emitted by diesel-fueled engines as a TAC. Diesel engines emit TACs in both gaseous and particulate forms. The particles emitted by diesel engines are coated with chemicals, many of which have been identified by the EPA as HAPs and by the CARB as TACs. Since by weight, the vast majority of diesel exhaust particles are very small (94 percent of their combined mass consists of particles less than 2.5 micrometers in diameter), both the particles and their coating of TACs are inhaled into the lung. While the gaseous portion of diesel exhaust also contains TACs, the CARB's August 1998 action was specific to diesel particulate emissions which, according to supporting CARB studies, represent 50 to 90 percent of the mutagenicity of diesel exhaust (CARB, 1998).

The CARB action was taken at the end of a lengthy process that considered dozens of health studies, extensive analysis of health effects and exposure data, and public input collected over the last 9 years. CARB's Scientific Advisory Committee has recommended a unit risk factor of 300 in a million for diesel particulate. The CARB action will lead to additional control of diesel engine emissions in coming years by CARB. The EPA has also begun an evaluation of both the cancer and non-cancer health effects of diesel exhaust.

The above (1998) ruling prompted the CARB to begin searching for means to reduce diesel PM emissions. In September 2000, the CARB approved the *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (Diesel Risk Reduction Plan). The Diesel Risk Reduction Plan outlines a comprehensive and ambitious program that includes the development of numerous new control measures over the next several years aimed at substantially reducing emissions from new and existing on-road vehicles (e.g., heavy duty trucks and buses), off-road equipment (e.g., graders, tractors, forklifts, sweepers, and boats), portable equipment (e.g., pumps), and stationary engines (e.g., stand-by power generators). More recent efforts include the 2004 West Coast Diesel Emissions Reductions Collaborative. It is a multi-stakeholder effort to reduce diesel emissions along the west coast, from Alaska to Mexico. The Collaborative involves people from different organizations such as local, state, and federal government, private and non-profit sectors, and recent EPA regulations on heavy duty diesel trucks and fuel sulfur content regulations.

Title 8 of the California Code of Regulations contains California Occupational Safety and Health Administration (Cal/OSHA) requirements for fume hoods. The regulations focus on worker health and safety, requiring a minimum flow of speed, face velocity, and certain design features to protect laboratory personnel in their work. In addition, the code established specific requirements for the use and storage of carcinogens, including a requirement to scrub or filter air emissions from areas where carcinogens are used. Other than the requirement that the top of the fume hood stack must be located at least 7 feet above the roof, the regulations do not address emissions once the exhausted air mixes with outdoor air.

### **C. City of Redding General Plan**

The City's General Plan contains an *Air Quality Element* that sets forth goals, objectives, policies, and implementation strategies to improve air quality and protect the health and welfare of City residents. This is to be accomplished mainly by promoting development that is compatible with the air quality standards of the *Air Quality Element* and the Shasta County's *Air Quality Attainment Plan*. Goals and policies within the *Air Quality Element* applicable to the project include the following:

**Goal 1**            **Effective communication, cooperation, and coordination in developing and implementing community and regional air quality programs.**

Policy 1            The City will require an air quality impact analysis using the recommended methods promulgated by the Air Quality Management District (AQMD) for all projects that are subject to CEQA review and which exceed emissions thresholds established by the AQMD.

Policy 2            The City Department of Planning and Community Development will submit a report to the Planning Commission for approval which identifies the cumulative transportation and air quality impacts of all General Plan Amendments approved during the previous year in the Annual General Plan Status Report.

**Consistency Analysis**

This environmental document provides conformance with Policy 1, and the City's annual report satisfies Policy 2.

**Goal 2**            **Reduce motor vehicle trips and vehicle miles traveled and increase average vehicle ridership (AVR).**

Policy 17           The City shall make air quality and mobility prime considerations when reviewing any proposed change to the land-use pattern. Such consideration shall include as much as possible, increased transit and pedestrian mobility.

Policy 18           The City shall, as much as possible, plan high-density development in areas that can be fitted with a transit system.

Policy 19           The City shall encourage mixed-use developments near employment centers that provide commercial services such as day-care centers, restaurants, banks, and stores.

Policy 21           The City will work with the Redding Area Bus Authority in planning multi-modal transfer sites that incorporate auto parking areas, bike parking, transit, pedestrian and bicycle paths, and park-and-ride pickup points.

Policy 22           The City shall encourage compact infill development.

Policy 24           The City shall encourage projects within urban areas that will improve the effectiveness of the transit system and will not adversely affect existing single-family development.

Policy 27           As a condition of project approval, the City shall require dedication of land for bus turnouts and shelters at sites deemed appropriate and necessary.

Policy 28           The City shall ensure that the Regional Bikeway Plan includes a comprehensive system of bikeways and pedestrian paths, which is planned and constructed in accordance with the adopted plan, based on analysis of existing and future use by the area to be The project is consistent with the relative policies noted, taking efforts to reduce vehicle trips and miles traveled, and therefore emissions, by increasing density, providing access

and expansion of the Clover Creek trail. Providing transit stops as noted in Mitigation 4.2.2 will provide further consistency.

### **Consistency Analysis**

This Proposed Action will incorporate some of the guidance provided in the various policies including but not limited to: considering air quality considerations by not permitting “smoke stack” type uses, providing for commercial services such as a day-care center, providing for transit services, providing bus turnouts and shelters, and providing for a comprehensive system of bikeways and pedestrian paths. A Planned Development Plan will be required to be prepared which will address and incorporate the various features and others which have yet to be identified.

### **Goal 3            Reduce particulate matter emissions from sources under the jurisdiction of the City.**

Policy 29            The City will require measures to reduce particulate emissions from construction, grading, and demolition to the maximum extent feasible.

### **Consistency Analysis**

The application of Standard Mitigation Measures during construction will provide consistency with this Policy.

The *Air Quality Element* provides a guide, prepared by the Shasta County Air Quality Maintenance District, which is as a recommended approach to meeting the goals of the City's Air Quality Element to mitigate motor vehicle related impacts for proposed projects.

CEQA states that a public agency should not approve a project unless feasible alternatives are considered and mitigation measures incorporated that would substantially lessen any significant effects on the environment (unless overriding considerations are made pursuant to CEQA Guidelines Section 15093).

If the impacts cannot be mitigated below the significance threshold, they must nevertheless be reduced. CEQA describes various types of mitigation as follows:

- Avoiding impacts altogether by not taking a certain action or part of an action
- Minimizing impacts by limiting the degree or magnitude of the action and its implementation
- Rectifying impacts by repairing, rehabilitating, or restoring the impacted environment
- Reducing or eliminating the impacts over time by preservation and maintenance operations during the life of the action
- Compensating for the impacts by replacing or providing substitute resources
- Reduce or eliminate impacts by adopting an environmentally superior alternative.

Section 15041 (a) of the State CEQA guidelines states that the lead agency has the authority to require changes in any or all activities involved in a project in order to lessen or avoid significant effects on the environment. The AQMD, as a local responsible CEQA agency, has a duty to recommend mitigation to lessen air quality impacts.

In addition to CEQA requirements, mitigation of impacts is necessary to achieve the goals of the City's *Air Quality Element* and the State's ambient air quality standards. Specifically, all future sources of emissions, including those associated with land development, must be mitigated to the greatest extent possible to achieve and or maintain attainment with ambient air quality standards.

### **Standard Mitigation Measures (SMMs) and Best Available Mitigation Measures (BAMMs)**

The AQMD recommended sample mitigation measures that are divided into two categories: Standard Mitigation Measures (SMMs) and Best Available Mitigation Measures (BAMMs). The AQMD recommends that SMMs be applied to all projects regardless of the extent of air quality impacts in order to reduce cumulative impacts. The recommended BAMMs or equally effective BAMMs should be applied as appropriate when a project has an impact on air quality above the specified impact threshold levels.

All projects contribute to cumulative air quality impacts and should employ the appropriate SMMs at a minimum. Cumulative impacts of projects such as convenience markets, small office developments, residential subdivisions of 100 or less, etc., must be mitigated even where a Negative Declaration is deemed the appropriate environmental document. Not only will this approach reduce overall emissions caused by cumulative impacts, but it will also reduce the likelihood that large projects will need to carry a larger burden of mitigation. Assume for example that several small projects are approved without mitigation. A larger project may subsequently be required to mitigate for cumulative impact regardless of shared responsibility.

The construction of projects within the region could result in continued non-attainment for the state air quality standards for O<sub>3</sub> and PM<sub>10</sub>. However, the problem is of a regional nature requiring close cooperation between the City of Redding, Shasta County, the City of Anderson and the City of Shasta Lake. The City of Redding will continue its effort to minimize impacts to the air basin by requiring that all projects be subject to Standard Mitigation Measures (SMMs) and Best Available Mitigation Measures (BAMMs) for both construction and operations regardless of size or emissions.

The SMMs are:

- Design streets to facilitate pedestrian access to public transit stops.
- For large projects, provide bus shelters.
- Suspend all grading activities when winds (as instantaneous gusts) exceed 20 miles per hour, as directed by the Shasta County AQMD.
- Water active construction sites at least twice daily, as directed by the Public Works Department.
- Apply non-toxic soil stabilizers according to the manufacturer's specification to all graded areas that will be inactive for 10 days or more.
- Schedule construction activities that affect traffic flow for off-peak traffic hours.
- Provide temporary traffic control (flag person), as appropriate, during all phases of construction.

- Install wheel washers where vehicles enter and exit unpaved roads, or wash trucks and any equipment leaving the site each trip.
- Sweep streets at the end of the day if visible soil material is being tracked onto adjacent public paved roads (recommended water sweeper with reclaimed water).
- All trucks hauling dirt, sand, soil or other loose materials should be covered or should maintain at least 2 feet of freeboard (minimum vertical distance between top of the load and the top of the trailer), in accordance with the requirements of *California Vehicle Code Section 23114*. This provision is enforced by local law enforcement agencies.
- All new wood-burning devices should be EPA Phase II certified.
- Provide energy-efficient process systems, such as water heaters, furnaces, and boiler units.
- Re-establish groundcover on the construction site through seeding and watering prior to final occupancy.

For commercial and industrial projects, there are two levels of Best Available Mitigation Measures (BAMMs). For sources with emissions over 25 pounds (lb)/day ROG, 25 lb/day NO<sub>x</sub>, 80 lb/day PM<sub>10</sub> (the New Source Review BACT trigger levels), feasible Level “A” BAMMs are required. These Level “A” BAMMs are:

- Implement all applicable SMMs.
- Provide preferential parking places for carpools and vanpools, and provide 7-foot two-inch (7’2”) minimum vertical clearance covered parking facilities (for vanpool access).
- Contribute to traffic-flow improvements that reduce emission and are not growth-inducing (e.g. right-of-way, capital improvements).
- Alternatively, an applicant could identify other offsets acceptable to the Shasta County AQMD to reduce emissions below the New Source Review trigger levels.

For sources with emissions over 137 lb/day ROG, 137 lb/day NO<sub>x</sub> (25 tons per year), and 438 lb/day PM<sub>10</sub> (80 tons per year and the New Source Review Offset levels), feasible Level “B” BAMMs are required. These Level “B” BAMMs are:

- Implement all applicable SMMs and Level “A” BAMMs.
- Provide onsite services such as cafeterias, food vending machines, and automatic tellers, as appropriate.
- Provide onsite childcare and after-school facilities or contribute to offsite development within walking distance.
- Provide onsite pedestrian facility improvements such as walking paths and building access, which is physically separated from street, and parking lot traffic.
- Construct onsite and offsite bus turnouts, passenger benches, or shelters.
- Provide bicycle and storage facilities.
- Shower/locker facilities should be provided when appropriate for bicycling and pedestrian commuters.
- Construct offsite bicycle and pedestrian facility improvements, such as trails linking the facility to designated pedestrian and bicycle commuting routes.
- Convert fleet vehicles to clean-burning fuel as appropriate.

- Contribute to construction of offsite park-and-ride lots.
- Establish telecommuting programs, alternative work schedules, and guaranteed ride-home programs, as appropriate.
- Implement compressed workweek schedules, where weekly work hours are compressed into fewer than 5 days, such as 9/80, 4/40, or 3/36.
- Provide for transit-use incentives, such as subsidized transit passes, and accommodate unusual work schedules to encourage transit use.
- Implement alternative transportation program, such as CalTrans' Ride Share.

Alternatively, an applicant could identify and secure other offsets acceptable to the Shasta County AQMD to reduce emissions below the New Source Review offset levels and implement the Level "A."

Emission reduction efficiencies or the "credit" that an applicant receives for implementing a specific mitigation measure are subject to Shasta County AQMD final approval. Essentially, an applicant must achieve standards by applying any combination of the above-listed mitigation measures or a similar offset measure approved by the Shasta County AQMD.

### **Consistency Analysis**

The application of Standard Mitigation Measures (SMMs) and Best Available Mitigation Measures (BAMMs) to this Project, regardless of alternative will provide consistency with this Policy.

## **4.8.3 ENVIRONMENTAL CONSEQUENCES/IMPACTS AND MITIGATION MEASURES**

### **A. Basis for Environmental Consequences/Impacts – All Alternatives**

There is the possibility that potentially significant air quality impacts could occur during the course of construction activities and due to the operation of the eventual land uses developed on the site. These impacts are applicable to all alternatives. The quantitative analysis focuses on the largest-scale Alternative in order to ensure that the maximum possible impacts are evaluated and mitigated.

### **B. Thresholds of Significance**

According to the 1994 version of the *Air Quality Element* of the Redding General plan, the City will require an air quality analysis to meet emission thresholds discussed above. If the proposed use does not exceed Level "A" thresholds (over 25 pounds per day of ROG or NOx or 80 pounds per day of PM-10) then the use must at least reduce emissions by 20 percent by applying SMMs and feasible Level "A" BAMMs. This standard addresses the need to mitigate the cumulative impacts of individual small projects such as could result from the Stillwater business park.

If, after applying BAMMs, the use still exceeds the Level B threshold, then a minimum of 25 percent of the unmitigated emissions exceeding 137 pounds per day (25 tons per year) of ROG or NOx or 438 pounds per day of PM-10 (80 tons per year) must be offset by reducing emissions from existing sources of pollution; otherwise an EIR is required to fully address air quality impacts, emissions, mitigations, and project alternatives. The EIR must

also address the reasons why the emission offsets should be waived based on potential overriding considerations (as permitted) and CEQA).

Significant effects could occur if development of the proposed Project were to:

- a. Conflict with or obstruct implementation of the applicable air quality plan;

*The proposed Project will not conflict or obstruct implementation of the Shasta County Air Quality Plan. The Shasta County APCD will review all proposed projects and determine potential conflicts and/or obstruction with implementation of the Air Quality Plan. Projects that are not in conformance will not be permitted therefore, **no impacts result and no mitigation measures are required.***

- b. Violate any air quality standard or contribute substantially to an existing or projected air quality violation;

*The potential for violating an air quality standard cannot be evaluated without grid-based photochemical modeling since particulate matter and ozone are secondary pollutants. This type of modeling is not considered appropriate for CEQA-type analyses; rather it is only required for areas that are moderate or worse federal nonattainment areas and in the context of a State Implementation Plan. Instead, emission thresholds are used to determine the potential for a project to exceed an air quality standard or to contribute to an existing or projected violation.*

*The Project has the potential to result in construction emissions of ROG and NO<sub>x</sub> (ozone precursors) that are higher than the Level B thresholds and are therefore considered to be significant. Recommended mitigation measures reduce emissions to below thresholds in all cases except the maximum possible industrial building. The City may wish to consider requiring a longer construction phase to minimize impacts if a building of this size is constructed. A Statement of Overriding Considerations will be required to be prepared and adopted for construction related NO<sub>x</sub> emissions regardless of the Alternative selected.*

*The Project has the potential to result in a considerable increase in emissions during the operational stage but does not exceed Level B thresholds for the sources that are quantifiable at this time (mobile and area). The **potential impact is therefore not significant.***

- c. Result in a cumulatively considerable net increase of any state or federal nonattainment pollutant or precursor of a nonattainment pollutant;

*The total impact of the Project does not contribute to emissions in excess of Level B thresholds for emissions that are quantifiable (area and mobile source emissions) and is therefore not significant. When evaluated relative to total regional emissions for the air basin, the Project is estimated to increase total regional emissions by approximately 0.04 percent. As growth is accounted for in these projections, it is apparent that the Project will not cause any cumulatively considerable net increase of any nonattainment pollutant.*

- d. Expose sensitive receptors to substantial pollutant concentrations;

*Valley Christian School on Rancho Road is located across the street from Alternative 3 and approximately two miles from Alternatives 1 and 2. The proposed Veterans Home will be located approximately one mile south along Knighton Road. The Project Action proposes that general industrial uses not be located along or in the vicinity of Rancho Road which would be enforced through the Planned Development Overlay Zoning. Therefore, the only potential adverse impact would be vehicular emissions that are associated with arterial roads such as Rancho Road. The Veterans home will be situated on an approximate 50-acre site so that through proper site*

*planning, sensitive uses can be located away from the business park and Knighton Road. Therefore, impacts **could be considered insignificant** thereby, **not requiring mitigation**, however, there are **no assurances** that the State will site plan the project appropriately.*

- e. Create objectionable odors affecting a substantial number of people.

*All manufacturing, in particularly those involving plastics, architectural coating, and food processing activities are to be contained indoors and filtered so that when emissions are vented, there are minimal, or no odors associated with the emission. Projects that have the potential to create obnoxious odors shall not be permitted, therefore, **no impacts will result, and no mitigation is required.***

CEQA requires BACT (Best Available Control Technology) for sources exceeding 25 lbs per day (4.56 tons per year) for ozone precursors ROG and NO<sub>x</sub>, 80 lbs per day (14.6 tpy) for PM-10 and SO<sub>x</sub>, and 500 lbs/day for CO. Shasta county thresholds for non-stationary sources and sources not covered by CEQA are 25 tons per year (137 lbs/day) for ROG and NO<sub>x</sub> and 80 tons per year (438 lbs/day) for PM-10. The thresholds are used in this analysis to determine whether the business park would have a significant impact for CEQA purposes as well as for specific Shasta County and City of Redding requirements.

### **Toxic Contaminants**

Since there are no ambient standards for toxic air contaminants, evaluation of impacts is based upon health risk analysis. Evaluation of significant cancer risk for TACs from stationary sources will follow regulations under Proposition 65, which defines a significant cancer risk as any risk exceeding 10 in one million.

Evaluation of significant non-carcinogenic (chronic and acute) health risks from TACs from stationary sources is based on changes in ground-level concentration of pollutants emitted from the campus that would exceed the relevant non-cancer effect criterion. For the purposes of this analysis, the non-cancer effect criterion is a hazard index greater than 1.0.

Evaluation of exposure to sensitive receptors is based on chronic cancer and non-cancer health risks calculated for a hypothetical maximally exposed individual (MEI) living at the point of highest off-site concentration for an entire 70-year lifetime.

## **C. Analysis of Project Impacts**

### **Overview**

Project impacts result from four major sources:

- Construction, including motor vehicle travel by workers to and from the site.
- “Area” sources – these are emissions that occur after a project has been implemented and include sources such as wood stoves, landscape maintenance, use of consumer products such as hair sprays and deodorants.
- Motor vehicle travel occurring after a project has been completed.
- Emissions resulting from operation of industrial sources located in the business park.

Evaluation of emissions from these sources was conducted through required procedures in California which are to use the URBEMIS model which was developed by Jones and Stokes Associates for the Yolo Solano Air Quality Management District with funding from nearly every air district within California. The most recent version of that model is URBEMIS2002 version 7.5.0. The model is being updated but the update may not be available for several months.

Estimated emissions are presented separately in this Chapter and cumulatively in **Chapter Five – Cumulative Effects/Impacts** in order to evaluate the need for mitigation measures and for consistency with CEQA and NEPA requirements.

Construction emissions are evaluated separately as they occur for a limited period of time and are distinct from operational emissions that will occur after the park is constructed. In addition, the Air Quality Element of the General Plan specifies minimal requirements for mitigation of construction emissions.

Operational emissions consist of the three additional project impacts listed on the previous page (area, motor vehicle, called operational by URBEMIS, and impacts from the sources siting at the park. The exact nature of the sources that will be sited at the park is unknown except in very general terms which are not sufficient to generate even a rough estimate of emissions. Therefore it is assumed that each parcel will result in emitting the maximum emissions of 137 pounds per day (cumulative impact from area, mobile and operational emissions from the industry). This approach was discussed with and agreed to with the Air District as the most conservative approach that could be taken until further information such as would be included in a permit becomes available<sup>2</sup>.

#### The URBEMIS Model

URBEMIS version 7.5.0 has been used in this analysis. The model is designed to estimate air emissions from land use development projects. The latest enhancements (present in the version used in this analysis) include an improved construction emission module and the use of the most recent version of EMFAC2002 (a computer model developed by the California Air Resources Board to estimate motor vehicle emissions). Previous versions of the URBEMIS model such as those used in the 2002 draft air quality analysis did not include the latest version of EMFAC; therefore EMFAC was applied separately in order to estimate motor vehicle emissions resulting from the traffic impact analysis in the 2002 air quality Stillwater analysis. Since the new version of URBEMIS does include EMFAC2002, a separate “run” of EMFAC2002 was not necessary in this analysis.

As previously noted the URBEMIS model is currently being updated. Most of the updates focus on the addition of modeling indirect source mitigation measures, however changes may be made to the architectural coatings and asphalt pavings portions as numerous comments have been made regarding the high emission rates generated by this portion of the construction phase.

#### URBEMIS Computer Program Assumptions and Defaults

The 1994 Air Quality Element of the General Plan requires that estimates of emissions generated by the traffic of a project be accomplished using the latest version of the URBEMIS model which is 7.5.0. The following assumptions and default values were used in the modeling:

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<sup>2</sup> July 28, 2004 E-mail communication between Barbara Joy and Ross Bell of the Shasta County APCD.

1. Project Year. The maximum square footage proposed on a parcel is used as an example with construction assumed to begin in 2006 and be completed in 2008 after a 30 month construction period. Operational emissions (area and motor vehicles) were estimated for 2025 to be consistent with the traffic report.
2. Land Use Types: The general industrial portions were modeled as industrial park; the light industry was modeled as general light industry; and professional offices were modeled using the commercial land use category, general office building subcategory.
3. Construction Phasing: no demolition was assumed (phase 1). Phase 2 and 3 were assumed as URBEMIS defaults (2.6 months for site grading; and 21.4 months for building construction, architectural coatings, and asphalt coating).
4. Vehicle Fleet Mix. Used URBEMIS default values.
5. Ambient Temperature. Used default values for rural/mountain counties in summer.
6. Trip Speeds. Used URBEMIS default values.
7. Project Area. As specified in the air quality element, RURAL was the area selection since this designation more closely corresponds to Shasta County.
8. Trip Lengths. Used URBEMIS default values.
9. Percent of Cold Starts and Percent of Trip Types. Same as above.
10. Percent PM10 and Percent Sulfur in Fuel. Same as above.
11. Trip Rates. The model lists 41 ITE default trip rates for various types of land use. Trip rates for the building construction phase within Stillwater were default rates in URBEMIS. Trip rates after project completion were generated by the traffic modeling performed by OMNI Means. Trip rates and vehicle travel calculated by URBEMIS were higher than those calculated for the changes estimated by OMNI Means; therefore these are reported here in order to provide a better estimate of the potential maximum emissions that could be generated by the park.

Construction Related Air Quality Effects based on Land Use Type and Maximum Building Size per Parcel

**Impact 4.8.3-1**

URBEMIS calculates construction impacts which include emission site grading, construction worker vehicles trips, stationary equipment, mobile equipment (gas and diesel) architectural coatings, and asphalt offgassing.

**Table 4.8-5** presents the construction emissions from the maximum size parcel for each use category as conceptually defined in the Omni Means traffic report.

As noted in the footnotes, ROG impacts are insignificant except for in Phase 3 of construction (architectural coating and asphalt application). Clearly the impacts for ROG in Phase 3 are higher than thresholds would allow for both minimum and maximum parcel

sizes. None of the SMMs or BAMMs would affect ROG emissions from construction except possibly SMM measure 2 which calls for the application of nontoxic soil stabilizers to all inactive construction areas.

It should be noted that a previous version of URBEMIS (URBEMIS7G) calculated much lower ROG emissions and it has been a frequent comment by users that the emissions resulting from the new model are unusually high even though the emission factors used in the old and new models are the same. This aspect may be examined and revised in the next version<sup>3</sup>.

TABLE 4.8-5			
EMISSIONS GENERATED BASED ON LAND USE TYPE & MAXIMUM BUILDING SIZE			
Pollutant (lbs/day)	General Industrial	Light Industrial	Professional Office
	Max 435,400 Sq. Ft. <sup>4</sup>	Max 305,000 Sq. Ft.	Max 174,000 Sq. Ft.
ROG	333.44 <sup>5</sup>	191.42 <sup>6</sup>	109.33 <sup>7</sup>
NOx	467.12	241.91	138.23
PM-10	71.14	46.2	26.4

#### Mitigation Measure 4.8.3-1A

*Potential mitigation measures should be reviewed with the Air District. The following measures were applied to reduce construction related emissions. These measures are consistent with **Goal 3, Policy 29** in the Air Quality Element to reduce particulate matter emissions from construction, grading and demolition to the maximum extent feasible. **Table 4.8-6** identifies the reduced emissions after application of mitigation measures.*

##### Soil Disturbance:

- *Apply soil stabilizers to inactive areas*
- *Replace ground cover in disturbed area quickly*
- *Water exposed surfaces 3 times daily*
- *Cover stockpiles with tarp*
- *Water unpaved haul roads*

<sup>3</sup> Personal communication between Tim Rimpo, Jones and Stokes URBEMIS program manager and Barbara Joy, August 11, 2002.

<sup>4</sup> The maximum hypothetical parcel size of 100 plus acres will generate 1.55 million square feet of building coverage. It is expected that this parcel will be a distribution center but it is not known whether it could be a light or general industrial use, so is not modeled separately (the emissions by parcel maximum size are presented as examples of emissions resulting from parcels that will later be applying for permits. The distribution center is included in the estimate of total build-out impacts.

<sup>5</sup> Construction emissions for ROG in the initial stages of construction are 61 pounds per day. It is in the final phase that emissions rise to the levels reported here.

<sup>6</sup> Construction emissions for ROG in the initial stages of construction are 30 lbs/day. It is in the final phase that emissions rise to the levels reported here.

<sup>7</sup> Construction emissions for ROG in the initial stages of construction are only 17 lbs/day. It is in the final phase that emissions rise to the levels reported here.

Off- and On-Road Measures

- Use aqueous diesel filters
- Diesel particulate traps
- Cooled exhaust gas recirculation

ROG Coating measure:

- Use coatings with no more than 0.0037 lbs/quare foot of ROG (default is 0.185 but low and zero ROG emission coatings are available)

After application of the mitigation measures, NOx emissions still exceed acceptable thresholds for the construction phase of the largest potential building. Therefore, another measure is proposed that could reduce emissions to a less than significant level.

<b>Pollutant (lbs/day)</b>	<b>General Industrial</b>	<b>Light Industrial</b>	<b>Professional Office</b>
	Max 435,400 Sq. Ft.	Max 305,000 Sq. Ft.	Max 174,000 Sq. Ft.
ROG	66.69	38.28	21.8
NOx	241.04	125.18	71.53
PM-10	28.54	5.36	3.06

**Mitigation Measure 4.8.3-1B**

*The City shall explore the feasibility of requiring **Mitigation Measure 4.8.3-1** in a Construction Emission Mitigation Plan in order to reduce emissions below threshold levels to the extent possible. Other measures to include in the plan are:*

- *Equipment should not idle for more than 10 minutes;*
- *Equipment should not be altered to increase engine horsepower;*
- *Requiring particulate traps, oxidation catalysts, and other suitable control devices on all construction equipment used at the construction site;*
- *Use ultra low sulfur diesel fuel (sulfur content of 15 ppm or less) or other suitable alternative diesel fuel;*
- *Establishment of work limitations to minimize trips and to provide staging areas for trucks located away from sensitive receptors.*

It should be noted that the use of low sulfur fuel of 15 ppm is required by California and Federal regulations to be phased in by 2010. The use of low sulfur fuel is required in order for other technologies similar to catalysts to work. It is not clear that Shasta County or the City of Redding could require a different phase-in schedule although they certainly could explore this with potential sources siting in the park, along with requesting that equipment not be idle for more than 10 minutes, or the consideration of staging areas. In addition, the use of lower- or zero-VOC paints should be explored.

### Mitigation Measure 4.8.3-1C

*Since construction emissions are higher than Level A thresholds, other potential mitigation measures that shall be included in the construction phase would be to establish work limitations such as minimizing trips and providing staging areas for trucks that are located away from sensitive receptors such as the Valley Christian School or the future Veterans Home.*

*Another possibility, to the extent feasible, would be to phase construction over a longer time period such as 36 to 48 months to minimize average daily effects. Other measures to explore would include slower phasing of the architectural coatings and asphalt pavement phases as well as lowering the amount of coating thickness of painting materials or building footage.*

### Operational Emissions

As previously noted, operational emissions consist of motor vehicle emissions resulting from activity at the business park (a potentially major category), area source emissions such as landscaping or wood stoves (a likely minor category), and impacts from light and general industrial uses (an unknown source of emissions as these depend on the source, the size and the particular technologies used). **Therefore stationary (industrial) sources cannot be quantified until permits are applied for.** For reference, a section is included at the end of this air quality analysis that discusses what is known regarding the potential emissions for the types of sources that may be sited at the park. For the purpose of assisting the City and the APCD in reviewing permit applications, a rough evaluation of the size of each source that would require a full EIR/EIS and/or offsets is included.

The URBEMIS2002 version 7.5.0 model was used to estimate the following emissions for each parcel type (general industrial, light industrial and professional office), using the input assumptions previously described. Mitigation measures listed in the *Air Quality Element* as described in the *Plan* (page 38, sample calculation of emission reduction from BAMMs).

The following tables are examples of emission levels that could result for each type of land use, based on building square footage, developing on their respective largest parcel.

The emissions in **Table 4.8-7** are the results of the largest General Industrial square footage based on the size shown in **Table 4.8-8-5**.

TABLE 4.8-7			
UNMITIGATED OPERATION EMISSIONS			
GENERAL INDUSTRIAL PARCEL			
(All emissions expressed in units of lbs/day)			
Category (all)	ROG	NOx	PM-10
Level A threshold	25	25	80
Level B threshold	137	137	438
Area Source Emissions	0.14	0.81	0.01
Mobile Source Emissions	7.71	12.01	43.78

The emissions in **Table 4.8-8** are the results of the largest light industrial square footage based on the size shown in **Table 4.8-8-5**.

<b>TABLE 4.8-8</b>			
<b>UNMITIGATED OPERATION EMISSIONS LIGHT INDUSTRIAL PARCEL</b>			
(All emissions expressed in units of lbs/day)			
<b>Category (all</b>	<b>ROG</b>	<b>NOx</b>	<b>PM-10</b>
Level A threshold	25	25	80
Level B threshold	137	137	137
Area Source Emissions	0.14	0.81	0.00
Mobile Source Emissions	6.03	9.55	34.99

The emissions in **Table 4.8-9** are the results of the largest professional office square footage based on the size shown in **Table 4.8-8-5**.

<b>TABLE 4.8-9</b>			
<b>UNMITIGATED OPERATION EMISSIONS PROFESSIONAL OFFICE PARCEL</b>			
(All emissions expressed in units of lbs/day)			
<b>Category (all</b>	<b>ROG</b>	<b>NOx</b>	<b>PM-10</b>
Level A threshold	25	25	80
Level B threshold	137	137	137
Area Source Emissions	0.17	1.17	0
Mobile Source Emissions	5.97	9.63	35.25

**Table 4.8-9** illustrates that neither the mobile source nor the sum of the mobile source and area sources for a maximum building size per parcel exceed thresholds. Individual projects would not necessarily be required to mitigate emissions other than through the application of Standard Mitigation Measures (SMMs).

Since neither the mobile source nor the sum of the mobile source and area sources for a maximum building size and parcel exceeds thresholds, individual development of parcels would not necessarily be required to mitigate emissions other than through the application of Standard Mitigation Measures (SMMs). This depends on the amount of their other emissions, such as emissions resulting from heavy or light industrial facilities siting at the park. However the total impact of development of an entire site where individual parcel development does not exceed thresholds, thresholds could be exceeded if all parcels are considered as a whole.

### **Impact 4.8.3-2**

The operational emissions resulting from full build out of Alternative 2 are the focus of this impact because they represent what is the Preferred Alternative. Whereas, Alternatives 1 and 3 propose the development of 4,410,000 square feet of buildings and could be considered the “worst-case” scenario from the perspective of air emissions the 70,000 difference in square feet is relatively insignificant compared to the total square footage. Emissions from the other alternatives are explored more briefly as they are similar to, but less than emissions from this alternative.

This alternative includes a total floor area of 4,323,600 square feet comprised of 245,000 square feet of Professional Offices, 1,053,400 square feet of Light Industrial, and 3,025,200 square feet of General Industrial. Alternatives 1 and 3, which each have a total building

square footage of 4,410,000 square feet were not modeled since, as previously stated, the 70,000 square feet is relatively insignificant. In addition, the 70,000 additional square feet is attributable to light industrial uses which generally generate less emissions than general industrial uses.

**Table 4.8-10** illustrates the emissions at full buildout of Alternative 2. All three pollutants exceed Level A thresholds but not Level B. As noted in the Air Quality Element, projects with less than “Threshold A” emissions must apply feasible SMMs. Projects exceeding Level B thresholds are required to implement all feasible SMMs and BAMMs and calculate emission reductions available from each mitigation measure using the reference tables (or project-specific analysis) provided in the Air Quality Element. Although the cumulative impacts prior to stationary sources that may locate at the park are all less than Level B thresholds, the impact of Level B mitigation is evaluated in order to explore the potential mitigated operational emissions.

<b>TABLE 4.8-10</b>			
<b>OPERATIONAL EMISSIONS AND THRESHOLDS</b>			
<b>FULL BUILDOUT OF ALTERNATIVE 2</b>			
(All emissions expressed in units of lbs/day)			
<b>Category (all</b>	<b>ROG</b>	<b>NO<sub>x</sub></b>	<b>PM-10</b>
Level A threshold	25	25	80
Level B threshold	137	137	438
Area Source Emissions	0.48	3.26	0.01
Mobile Source Emissions	71.92	115.26	409.07

Page 36 of the Air Quality Element lists expected ranges and averages for emission reductions for mitigation measures for commercial and industrial projects. As suggested by the Element on page 32, the mid-range of each efficiency range was used for each measure listed below

**Mitigation Measure 4.8.3-2**

*As noted in the Air Quality Element, projects with less than “Threshold A” emissions must apply only feasible SMMs. No projects are expected to exceed level “A” thresholds although additional emissions will occur after permit applications containing additional emissions are provided. These emissions should be considered together with the operational emissions that are quantifiable now.*

*Projects exceeding Level “B” thresholds are required to implement all SMMs and BAMMs and calculate emission reductions available from each mitigation measure using the reference tables (or project-specific analysis) provided in the Air Quality Element.*

*All parcels shall be required to evaluate and quantify potential mitigation measures and resulting emission reductions to ensure that Level B thresholds are not exceeded when considered together with emissions for requested use.*

*Page 36 of the Air Quality Element lists expected ranges and averages for emission reductions for mitigation measures for commercial and industrial projects. As suggested by the Element on page 32, the mid-range of each efficiency range was used for each measure listed in **Table 4.8-11**.*

Measures, such as provision of residential units at the project, were not considered due to the principal nature of the project (manufacturing oriented). However, the provision of

video conferencing facilities may be considered depending on the user, however, this measure was not considered at this stage.

If all permit holders can achieve the results from the measures identified in **Table 4.8-11** and any other measures that are deemed applicable and feasible on a case-by-case basis, the mitigated emissions identified in **Table 4.8-12** would result.<sup>8</sup>

All mobile sources still exceed the Level “A” threshold but not Level “B” threshold. Other mitigation measures such as low emission vehicle fleets or measures identified by the AQMD or permit applicant may contribute to additional emission reductions.

<b>TABLE 4.8-11</b>	
<b>MITIGATION MEASURE EFFICIENCIES FOR CONTROLLING INDIRECT MOBILE SOURCE EMISSIONS</b>	
<b>Measure</b>	<b>Efficiency</b>
<i>Provision of on-site child care and after-school facilities or contribute to off-site development within walking distance</i>	0.15
<i>Establish compressed work weeks, telecommuting programs, alternate work schedules, and guaranteed ride home programs<sup>9</sup></i>	5.0
<i>Construct on-site or off-site bus turn-outs, passenger benches or shelters</i>	.55
<i>Provide on-site employee services such as cafeteria and ATMs</i>	1.8
<i>Provide preferential parking spaces for carpools and vanpools and provide 7'2" minimum vertical clearance in parking facilities for vanpool access</i>	0.55
<i>Establish alternative transportation program through Caltrans rideshare</i>	0.85
<i>Provide for transit-use incentives such as subsidized transit passes and accommodation of unusual work schedules to allow for transit stops</i>	0.95
<i>Contribute to traffic flow improvements that are not growth inducing</i>	0.2
<i>Provide shuttles to major transit stations and multimodal centers</i>	0.3
<i>Utilize parking in excess of code requirements as on-site park and ride lots or contribute to construction of off-site lots</i>	0.15
<i>Include bicycle parking facilities such as lockers and bike racks, include showers for bicycling employee's use and contribute to construction of off-site bicycle facility improvements such as bike trails linking the facility to designated bike commuting routes (at least two of the above)</i>	1.3
<i>Any two of: (1) construct off-site pedestrian facility improvements such as overpasses and wider sidewalks; (2) construct on-site pedestrian facilities such as building access physically separated from the street and parking lot traffic and walk paths; (3) include showers for pedestrian employee's use</i>	0.7

<sup>8</sup> The reductions are not applied to area sources as these sources are not likely to be affected by the mitigation measures selected. In addition, area source emissions are so small as to be nearly insignificant.

<sup>9</sup> The use and applicability of this measure would need to be explored with the permit applicant. Lower-end 5% efficiency was used for this measure as it may not be feasible for all applicants. In addition, estimated impacts of such programs when applied in the field are rarely as high as 10%.

<b>TABLE 4.8-12</b>			
<b>OPERATIONAL EMISSIONS AND THRESHOLDS</b>			
<b>FULL BUILDOUT OF ALTERNATIVE 2 – WITH MITIGATION</b>			
(All emissions expressed in units of lbs/day)			
<b>Category (all</b>	<b>ROG</b>	<b>NO<sub>x</sub></b>	<b>PM-10</b>
Level A threshold	25	25	80
Level B threshold	137	137	438
Area Source Emissions	0.48	3.26	0.01
Mobile Source Emissions	62.93	100.85	357.94

**Impact 4.8.3-3 – (Impact not measurable with available information)**

It is impossible to determine the potential stationary source impacts until specific permits are applied for. The nature of air pollution effects of any given stationary source depends on the nature of the use, the amount of throughput, fuels used, equipment used, controls used and many other factors which cannot be predicted without specifics on proposed uses such as would be provided by permit applicants.

There are a number of possible uses for the proposed project. As part of the analysis, an independent firm, Chabin Concepts, prepared a research report detailing the types of projects that were most likely to locate in the business park. Possible industry includes (1) plastic products manufacturing and/or assembly; (2) primary and fabricated metals manufacturing; (3) industrial machinery manufacturing and/or assembly; (4) electronics manufacturing and/or assembly; (5) transportation equipment manufacturing and/or assembly; (6) medical industry manufacturing and/or assembly; (7) wholesale trade/distribution; (8) information services-call centers/back office; (9) professional offices; (10) commercial uses that support the primary park uses and park employee support amenities; (11) communication antennae and electric substations; and food processing facilities.

It was found that Plastic Foam Products, Printed Circuit Boards, Surgical Appliances and Supplies, and miscellaneous electronic products have the highest potential to contribute large emissions in the area. However the exact nature of the business, production capacity, and fuels used, what exactly is being manufactured, and air controls will determine what the impacts are. These variables cannot be predicted and, as can be seen from information included later, any given example varies too widely to provide useful insight as to the potential for a source that might apply in the Business Park.

**Mitigation Measure 4.8.3-3 – (Specific mitigation measures cannot be specified with available information)**

*Appendix H provides discussion of each of these source categories and presents some examples of emissions from specific facilities that could be categorized into these source categories. The City may wish to use this Appendix as a reference tool. However, until an actual application is made and information provided, specific mitigation measures cannot be determined.*

**C. Conclusion**

Air quality impacts **will be significant** only with respect to NO<sub>x</sub> emissions during construction for the maximum potential industrial parcel, exceeding both Level “A” and Level “B” emission thresholds. Specifically, the maximum potential square footage for an

individual parcel for each land use category (general industrial, light industrial and professional office) were evaluated for construction, area, and mobile source emissions. None of the emissions exceeded even Level A thresholds except during the construction phase which is a temporary short-term impact. However, these estimates did not include estimates for stationary source emissions for the reasons explained below.

Stationary source emissions cannot be estimated without the data that would be provided as part of a permit application. Estimating emissions for a potential use category such as “electronics manufacturing and/or assembly” or “food processing” (two of the potential uses cited by an independent research firm) is not possible without specific use, the process involved, associated equipment information, and operations. It is possible that some of the potential uses will have insignificant emissions and some will have significant emissions. It appears likely that Plastic Foam Products, Printed Circuit Boards, Surgical Appliances and Supplies, and Miscellaneous Electronic Products have the highest potential to contribute a significant amount of emissions. It is recommended that the City compare potential area and mobile source emissions plus additional stationary source emissions for each permit application to determine mitigation measures, the need for EIR/EIS, and the possible payment of offset fees.

A Statement of Overriding Considerations will be required to be prepared and adopted for construction related NO<sub>x</sub> emissions regardless of the Alternative selected.

#### 4.8.4 REFERENCES

- California Air Resources Board (CARB). September 2000. *Risk Reduction Plan to Reduce Particulate Matter Emissions from Diesel-Fueled Engines and Vehicles* (Diesel Risk Reduction Plan) California Air Resources Board.
- Ibid. CARB (California Air Resources Board) documents available air quality data for ozone and PM-10 on their website as of July, 2004 at <http://www.arb.ca.gov/adam>.
- Ibid. <http://www.arb.ca.gov/ei/emsmain/reportform.htm> contains forms in which a user can fill out the California county, air district, pollutant, and year (up to 2020) of choice and receive a table showing emission projections.
- City of Redding Department of Planning and Community Development. February 1994. *Air Quality Element of the Redding General Plan*.
- Jones and Stokes Associates. May 2003. *URBEMIS, 2003 Software Users Guide and Model. Emissions Estimation for Land Use Projects. Version 7.4*. Prepared by
- Shasta County AQMD. 2003. *Northern Sacramento Valley Air Basin 2003 Air Quality Attainment Plan*