APPENDIX "B"

AIR QUALITY IMPACT ANALYSIS

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GENERAL PLAN UPDATE

CITY OF SAN JACINTO, CALIFORNIA

Prepared for:

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ATMOSPHERIC SETTING

The climate of the San Jacinto area, technically called an interior valley subclimate of Southern California's semi-arid climate, is characterized by warm summers, mild winters, infrequent rainfall, moderate afternoon breezes, and generally fair weather. The clouds and the fog that form along the area's coastline rarely extend as far inland as the San Jacinto Valley, and if they do, they usually burn off quickly after sunrise. The most important weather pattern is associated with the warm season airflow across populated areas of the Los Angeles Basin that brings polluted air into western Riverside County late in the afternoon. This transport pattern creates unhealthful air quality when the fringes of this "urban smog cloud" extend to the project site during the summer months.

Temperatures in San Jacinto average a very comfortable 65°F year-round, with warm summer afternoons (95+ degrees) and often cool winter mornings (35 degrees). Rainfall in the project area varies considerably in both time and space. Almost all the annual rainfall comes from the fringes of mid-latitude storms from late November to early April with summers often completely dry. Rainfall in the area averages 12.5 inches per year, but varies markedly from one year to the next.

Winds are an important factor in characterizing the local air quality environment because they both determine the regional pattern of air pollution transport and control the local rate of pollution dispersion. Daytime winds are from the NW at 6-8 mph as air moves regionally onshore from the cool Pacific Ocean to the warm Mojave Desert interior of Southern California. These winds allow for good local mixing, but they may bring air pollutants from urbanized coastal areas into interior valleys. Strong thermal convection in the summer ultimately dilutes the smog cloud from urbanized development, but the project area is too close to Los Angeles Basin emissions sources to completely escape the regional air quality degradation.

Light nocturnal winds result mainly from drainage of cool air off mountains east and south of the San Jacinto Valley toward the valley floor. Such winds are characterized by stagnation and poor local mixing. However, the origin of these winds in unpopulated mountain areas does not generally impair air quality.

In addition to winds that control the rate and direction of pollution dispersal, Southern California is notorious for strong temperature inversions that limit the vertical depth through which pollution can be mixed. In summer, coastal areas are characterized by a sharp discontinuity between the cool marine air at the surface and the warm, sinking air aloft within the high pressure cell over the ocean to the west. This marine/subsidence inversion allows for good local mixing, but acts like a giant lid over the basin.

A second inversion type forms on clear winter nights when cold air off the mountains sinks to the valley floor while the air aloft over the valley remains warm. This forms radiation inversions. These inversions, in conjunction with calm winds, trap pollutants such as automobile exhaust near their source. While these inversions may lead to air pollution "hot spots" in heavily developed coastal areas of the basin, there is not enough traffic in inland valleys to cause any winter air pollution problems. Thus, while summers are periods of hazy visibility and occasionally unhealthful air, winter is often a period of spectacular visibility and excellent air quality in the project area.

AIR QUALITY SETTING

Ambient Air Quality Standards (AAQS)

In order to gauge the significance of the air quality impacts of implementation of the proposed updated San Jacinto General Plan, those impacts, together with existing background air quality levels, must be compared to the applicable ambient air quality standards. These standards are the levels of air quality considered safe, with an adequate margin of safety, to protect the public health and welfare. They are designed to protect those people most susceptible to further respiratory distress such as asthmatics, the elderly, very young children, people already weakened by other disease or illness, and persons engaged in strenuous work or exercise, called "sensitive receptors." Healthy adults can tolerate occasional exposure to air pollutant concentrations considerably above these minimum standards before adverse effects are observed. Recent research has shown, however, that chronic exposure to ozone (the primary ingredient in photochemical smog) may lead to adverse respiratory health even at concentrations close to the ambient standard.

National AAQS were established in 1971 for six pollution species with states retaining the option to add other pollutants, require more stringent compliance, or to include different exposure periods. The initial attainment deadline of 1977 was extended several times in air quality problem areas like Southern California. In June 2003, EPA proposed a rule which could extend and establish a new attainment deadline for ozone, which would be as late as year 2021. Because California had established AAQS several years before the federal action and because of unique air quality problems introduced by the restrictive dispersion meteorology, there is considerable difference between state and national clean air standards. Those standards currently in effect in California are shown in Table 1. The primary sources and associated health effects of common air pollutants are listed in Table 2.

The Federal Clean Air Act Amendments (CAAA) of 1990 required that the U.S. Environmental Protection Agency (EPA) review all national AAQS in light of currently known health effects. EPA was charged with modifying existing standards or promulgating new ones where appropriate. EPA subsequently developed standards for chronic ozone exposure (8+ hours per day) and for very small diameter particulate matter (called "PM-2.5"). National AAQS were adopted on July 17, 1997.

Planning and enforcement of the 1997 federal standards for PM-2.5 and for ozone (8-hour) were challenged by trucking and manufacturing organizations. In a unanimous decision, the U.S. Supreme Court ruled that EPA did not require specific congressional authorization to adopt national clean air standards. The Court also ruled that health-based standards did not require preparation of a cost-benefit analysis. The Court did find, however, that there was some inconsistency between existing and "new" standards in their respective attainment schedules. These attainment planning schedule inconsistencies centered mainly on the 8-hour ozone standard. EPA subsequently downgrade an attainment designation for a large number of communities to "non-attainment" for the 8-hour ozone standard. Because the South Coast Air Basin is far from attaining the 1-hour federal standard, the 8-hour ozone non-attainment designation will not substantially alter the attainment planning process. The compliance deadline for the 8-hour ozone standard has been extended to 2021.

Table 1
Ambient Air Quality Standards

Pollutant	Averaging Time	California Standards		Federal Standards		
		Concentration	Method	Primary	Secondary	Method
Ozone (O_3)	1 Hour	0.09 ppm (180 μg/m³)	Ultraviolet Photometry	0.12 ppm (235 μg/m³)	Same as Primary Standard	Ultraviolet Photometry
	8 Hour	–		0.08 ppm (157 μg/m³)		
Respirable Particulate Matter (PM_{10})	24 Hour	50 μg/m³	Gravimetric or Beta Attenuation	150 μg/m³	Same as Primary Standard	Inertial Separation and Gravimetric Analysis
	Annual Arithmetic Mean	20 μg/m³		50 μg/m³		
Fine Particulate Matter ($PM_{2.5}$)	24 Hour	No Separate State Standard		65 μg/m³	Same as Primary Standard	Inertial Separation and Gravimetic Analysis
	Annual Arithmetic Mean	12 μg/m³	Gravimetric or Beta Attenuation	15 μg/m³		
Carbon Monoxide (CO)	8 Hour	9.0 ppm (10 mg/m³)	Non-Dispersive Infrared Photometry (NDIR)	9 ppm (10 mg/m³)	None	Non-Dispersive Infrared Photometry (NDIR)
	1 Hour	20 ppm (23 mg/m³)		35 ppm (40 mg/m³)		
	8 Hour (Lake Tahoe)	6 ppm (7 mg/m³)		–	–	–
Nitrogen Dioxide (NO_2)	Annual Arithmetic Mean	–	Gas Phase Chemiluminescence	0.053 ppm (100 μg/m³)	Same as Primary Standard	Gas Phase Chemiluminescence
	1 Hour	0.25 ppm (470 μg/m³)		–		
Lead	30-Day average	1.5 μg/m³	Atomic Absorption	–	–	–
	Calendar Quarter	–		1.5 μg/m³	Same as Primary Standard	High Volume Sampler and Atomic Absorption
Sulfur Dioxide (SO_2)	Annual Arithmetic Mean	–	Ultraviolet Fluorescence	0.030 ppm (80 μg/m³)	–	Spectrophotometry (Pararosaniline Method)
	24 Hour	0.04 ppm (105 μg/m³)		0.14 ppm (365 μg/m³)	–	
	3 Hour	–		–	0.5 ppm (1,300 μg/m³)	
	1 Hour	0.25 ppm (655 μg/m³)		–	–	
Visibility Reducing Particles	8 Hour	Extinction coefficient of 0.23 per kilometer–visibility of 10 miles or more (0.07–30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent. Method: Beta Attenuation and Transmittance through Filter Tape.		No Federal Standards		
Sulfates	24 Hour	25 μg/m³	Ion Chromatography			
Hydrogen Sulfide	1 Hour	0.03 ppm (42 μg/m³)	Ultraviolet Fluorescence			
Vinyl Chloride	24 Hour	0.01 ppm (26 μg/m³)	Gas Chromatography			

Table 2

Health Effects of Major Criteria Pollutants

Pollutants	Sources	Primary Effects
Carbon Monoxide (CO)	• Incomplete combustion of fuels and other carbon-containing substances, such as motor exhaust. • Natural events, such as decomposition of organic matter.	• Reduced tolerance for exercise. • Impairment of mental function. • Impairment of fetal development. • Death at high levels of exposure. • Aggravation of some heart diseases (angina).
Nitrogen Dioxide (NO_2)	• Motor vehicle exhaust. • High temperature stationary combustion. • Atmospheric reactions.	• Aggravation of respiratory illness. • Reduced visibility. • Reduced plant growth. • Formation of acid rain.
Ozone (O_3)	• Atmospheric reaction of organic gases with nitrogen oxides in sunlight.	• Aggravation of respiratory and cardiovascular diseases. • Irritation of eyes. • Impairment of cardiopulmonary function. • Plant leaf injury.
Lead (Pb)	• Contaminated soil.	• Impairment of blood function and nerve construction. • Behavioral and hearing problems in children.
Fine Particulate Matter (PM-10)	• Stationary combustion of solid fuels. • Construction activities. • Industrial processes. • Atmospheric chemical reactions.	• Reduced lung function. • Aggravation of the effects of gaseous pollutants. • Aggravation of respiratory and cardio respiratory diseases. • Increased cough and chest discomfort. • Soiling. • Reduced visibility.
Fine Particulate Matter (PM-2.5)	• Fuel combustion in motor vehicles, equipment, and industrial sources. • Residential and agricultural burning. • Industrial processes. • Also, formed from photochemical reactions of other pollutants, including NOx, sulfur oxides, and organics.	• Increases respiratory disease. • Lung damage. • Cancer and premature death. • Reduces visibility and results in surface soiling.
Sulfur Dioxide (SO_2)	• Combustion of sulfur-containing fossil fuels. • Smelting of sulfur-bearing metal ores. • Industrial processes.	• Aggravation of respiratory diseases (asthma, emphysema). • Reduced lung function. • Irritation of eyes. • Reduced visibility. • Plant injury. • Deterioration of metals, textiles, leather, finishes, coatings, etc.

Source: California Air Resources Board, 2002.

Evaluation of the most current data on the health effects of inhalation of fine particulate matter prompted the California Air Resources Board (ARB) to recommend adoption of the statewide PM-2.5 standard that is more stringent than the federal standard. This standard was adopted on June 20, 2002. The State PM-2.5 standard is more of a goal in that it does not have specific attainment planning requirements like a federal clean air standard. The state standard became enforceable in 2003 when it was incorporated into the California Health and Safety Code.

Similarly, the ARB extensively evaluated health effects of ozone exposure. A new state standard for an 8-hour ozone exposure was adopted in April 2005 that mirrors the federal standard. The California 8-hour ozone standard of 0.07 ppm is more stringent than the federal 8-hour standard of 0.08 ppm. The state standard, however, does not have a specific attainment deadline. California air quality jurisdictions are required to make steady progress toward attaining state standards, but there are no hard deadlines or any consequences of nonattainment.

Baseline Air Quality

There are no baseline air quality data available directly from San Jacinto site. Long-term air quality monitoring is carried out by the South Coast Air Quality Management District (SCAQMD) at various monitoring stations. There are no nearby stations that monitor the full spectrum of pollutants. Ozone, nitrogen oxides, and 10-micron diameter particulate matter are monitored at the Perris facility, while the closest data resource for other particulate and some gaseous species is in Riverside. Table 3 summarizes the last six years of monitoring data from a composite of available data resources.

After some marked improvement in ozone air quality in the last 20 years, the past six years have shown very little change in ozone levels. The year 1999 had the fewest violations of standards and the lowest maximum concentration. The last four years have shown increases from the cleanest year on record (1999). Year-to-year meteorological variations may be affecting the trend. Preliminary data from 2004 indicate that it was a very "clean" year again after several years of discouraging results. Overall, it is clear that the rate of growth is balancing any slow emissions reductions. Completely healthful ozone air quality is thus not likely to be achieved in the very near future.

Particulate levels have traditionally been high in western Riverside County. While the ozone trend is very flat in the project vicinity, particulate levels continue to show some slow continuing improvement. In the last six years, the frequency of days exceeding state PM-10 standards has dropped from around 50 percent of all days to around 40 percent. The federal PM-10 standard has not been exceeded in almost ten years in the project vicinity. As with ozone, the project's location downwind of emissions sources in coastal regions will likely cause the most stringent PM-10 standards to be exceeded for well into the current decade.

More localized pollutants such as carbon monoxide, nitrogen oxides, lead, etc. are very low near the project site because background levels even in downtown Riverside never exceed allowable levels, and there are almost no sources of such emissions near the project site. There is substantial excess dispersive capacity to accommodate localized vehicular air pollutants such as NOx or CO without any threat of violating applicable AAQS.

Table 3
Project Area Air Quality Monitoring Summary – 1998 to 2003
(Days Standards Were Exceeded and Maximum Observed Levels)

Pollutant/Standard	1998	1999	2000	2001	2002	2003
Ozone[1]						
1-hour > 0.09 ppm	38	10	65	73	59	67
1-hour > 0.12 ppm	8	0	15	19	4	7
8-hour > 0.08 ppm	28	6	41	58	41	46
Max 1-hour Conc. (ppm)	0.17	0.11	0.16	0.15	0.15	0.16
Carbon Monoxide[2]						
1-hour > 20. ppm	0	0	0	0	0	0
8- Hour > 9. ppm	0	0	0	0	0	0
Max 1-hour Conc. (ppm)	5.	7.	5.	5.	4.	4.
Max 8-hour Conc. (ppm)	4.6	4.4	4.3	3.4	3.0	3.7
Nitrogen Dioxide[2]						
1-hour > 0.25 ppm	0	0	0	0	0	0
Max 1-hour Conc. (ppm)	0.10	0.13	0.10	0.15	0.10	0.10
Inhalable Particulates (PM-10)[1]						
24-Hour > 50 μg/m^3	42/78	30/60	13/59	16/60	24/61	19/58
24-Hour > 150 μg/m^3	0/78	0/60	0/59	0/60	0/61	0/58
Max. 24-Hr. Conc. (μg/m^3)	116.	112.	87.	86.	100.	142.
Ultra-Fine Particulates (PM-2.5)[2]						
24-Hour > 65 μg/m3	-/-	9/151	11/304	17/325	8/327	8/350
Max. 24-Hr. Conc. (μg/m3)	---.-	111.2	119.6	98.0	77.6	104.3

- = No measurements before 1999.

Source: South Coast AQMD – [1]Perris and [2]Rubidoux Air Monitoring Station Data Summaries.

Air-sheds where ambient air quality standards are exceeded are called "non-attainment" areas. If standards are met, they are designated as "attainment" areas. If there is inadequate or inconclusive data to make a definitive attainment designation, they are considered "unclassified." Federal "non-attainment" areas are considered extreme, serious or moderate as a function of deviation from standards. The current attainment designations for the San Jacinto area are as follows:

		State	**Federal**
Ozone	1-hour 8-hour	Non-attainment Non-attainment	Extreme Non-attainment[a] Extreme Non-attainment[b]
CO	8-hour	Attainment	Non-attainment[c]
NO_2	1-hour	Attainment	Attainment
PM-10	Annual	Non-attainment	Serious Non-Attainment
PM-2.5	Annual	Non-attainment	Non-attainment
All Other		Attainment or Unclassified	Attainment or Unclassified

[a]Scheduled for attainment in 2010.
[b]Tentative attainment date of 2021.
[c]Scheduled for attainment in 2006, standard is currently met, redesignation request for "attainment/maintenance" has been submitted to EPA.

State standard attainment is as early as practical without any specific year.

AIR QUALITY PLANNING

Air Quality Management Planning

The Federal Clean Air Act (1977 Amendments) required that designated agencies in any area of the nation not meeting national clean air standards must prepare a plan demonstrating the steps that will bring the area into compliance with all national standards by December 31, 1987. The South Coast Air Basin (SCAB) could not meet the deadline for ozone, nitrogen dioxide, carbon monoxide, or PM-10. In the SCAB, the agencies designated by the governor to develop regional air quality plans are the SCAQMD and the Southern California Association of Governments (SCAG). The two agencies first adopted an Air Quality Management Plan (AQMP) in 1979 and revised it several times subsequently as earlier attainment forecasts were shown to be overly optimistic.

In 1988, because of considerable uncertainty in Federal Clean Air Act reauthorization, the California Legislature enacted the California Clean Air Act (CCAA). The CCAA requires that regional emissions be reduced by 5 percent per year until attainment can be demonstrated. In July 1991, the SCAQMD adopted a revised AQMP that was designed to meet the CCAA requirements. The 1991 AQMP deferred the attainment date to 2010, consistent with the 1990 Federal Clean Air Act.

The most recent clean air plan was approved locally (SCAQMD/SCAG) and at the state level (ARB) in 2003. It was forwarded to EPA and became the adopted SIP Revision in 2004. The plan continues most emissions reductions programs, but also points out that some emissions have been undercounted and incorrectly reported, and that additional control measures must be implemented if the federal attainment deadlines for clean air standards are to be met. Table 4 summarizes the currently proposed regional attainment planning for ozone (VOC and NOx) and for carbon monoxide (CO). The recent ozone trend toward increased numbers of violations of standards and higher absolute maxima than at the turn of this decade is particularly worrisome. A flattening of the improvement trend was anticipated, but the trend reversal suggests that a "backsliding" process is in motion. The likely failure to meet further near-term improvement targets may require invoking contingency measures that had been hoped as not necessary.

With the conversion of the federal 1-hour ozone standard to an 8-hour standard, a new attainment timeline will be adopted. EPA's proposed attainment scheduled for the South Coast Air Basin is 17 years to 2021. The progress mile-posts would be spread out over a longer period than for the current 2010 attainment deadline for the 1-hour standard.

Future growth anticipated in San Jacinto relates to the air quality planning process through the growth forecasts that were used as inputs into the regional transportation model. If a proposed development is consistent with those growth forecasts, and if all available emissions reduction strategies are implemented as effectively as possible on a project-specific basis, then the air quality impact on a regional basis may be considered as less-than-significant. Inconsistency as to development scope or schedule is considered a basis for a finding of impact significance.

Table 4

South Coast Air Basin Attainment Plan
(Emissions in tons/day)

	VOC*	NOx*	CO**
Current Inventory[a]			
Stationary + Area-wide	304	103	246
On-Road Mobile	276	581	2,705
Off-Road Mobile	131	286	1,003
TOTAL	**710**	**970**	**3,953**
2010 Forecast[b]			
Stationary + Area-wide	296	89	217
On-Road Mobile	212	434	2,048
Off-Road Mobile	122	257	1,094
TOTAL	**630**	**780**	**3,359**
2020 Forecast[b]			
Stationary	340	90	234
On-Road Mobile	130	206	1,097
Off-Road Mobile	114	241	1,104
TOTAL	**584**	**537**	**2,435**

a2005 Base Year.
[b]With current emissions reduction programs and adopted growth forecasts.

Source: California Air Resources Board, The 2005 California Almanac of Emission & Air Quality

AIR QUALITY IMPACT

General development potentially impact air quality almost exclusively through increased automotive emissions. Any single community typically does not cause enough traffic and associated air pollutants to be generated as to individually threaten clean air standards. It is the cumulative effect of hundreds of such developments that cause the small incremental impact from any one development to become cumulatively significant. Minor secondary emissions during construction, from increased fossil-fueled energy utilization and from small miscellaneous sources will also be generated, but these are usually much smaller in both duration and volume than the mobile source emissions.

Standards of Significance

Many air quality impacts that derive from dispersed mobile sources, i.e., the dominant pollution generators in the basin, often occur hours later and miles away after photochemical processes have converted the primary exhaust pollutants into secondary contaminants such as ozone. The incremental regional air quality impact of an individual project is generally immeasurably small. The SCAQMD has therefore developed suggested significance thresholds based on the volume of pollution emitted rather than on actual ambient air quality because the direct air quality impact of a project is not quantifiable on a regional scale. Any projects in the SCAB with daily emissions that exceed any of the following thresholds are recommended by the SCAQMD to be considered significant:

SCAQMD Emissions Significance Thresholds (lb/day)

Pollutant	Construction	Operations
ROG	75	55
NOx	100	55
CO	550	550
PM-10	150	150
SOx	150	150

Source: SCAQMD CEQA Air Quality Handbook, November, 1993 Rev.

The trip threshold that triggers a finding of potential impact significance is around 5,000 trips per day. The anticipated traffic growth in the City of San Jacinto is around 600,000 trips between now and ultimate City build-out. Clearly, the total of all vehicular emissions from citywide traffic will far exceed the SCAQMD individual project threshold. At a planning level, however, consistency with regional forecasts is a greater issue than individual project thresholds.

Project-Related Sources of Potential Impact

Intensification of land uses in Riverside County potentially impacts ambient air quality on two scales of motion. As cars drive throughout Southern California, the small incremental contribution to the basin air pollution burden from any single vehicle is added to that from several million other vehicles. The impact from the San Jacinto area, even if it generates a significant number of new vehicle trips, is small on a regional scale. Basin-wide air quality impacts are, therefore, addressed in terms of project compatibility with regional air quality plans. If any given project or plan has been properly incorporated into basin-wide growth projections which are the basis for regional air quality/ transportation planning, then there will be no significant basin-wide impact because of unanticipated growth.

Locally, changes in the location of any collection of automotive sources, or changes in the number of vehicles or travel speeds may impact the micro-scale air quality around any given development site. Traffic increases not only contribute air pollutants in direct proportion to their cumulative percentage of traffic volume growth, but they may slow all existing traffic to slower, more inefficient travel speeds. The development traffic/air quality impact is thus potentially compounded with cleaner cars and with low baseline levels of primary vehicle exhaust pollutants such as CO in the San Jacinto area, the potential for any pollution "hot spots" has become progressively non-existent.

Temporary construction activity emissions will occur during area wide build-out. Such emissions include on-site generation of dust and equipment exhaust, and off-site emissions from construction employee commuting and/or trucks delivering building materials.

Construction activity emissions are difficult to quantify, since the exact type and amount of equipment that will be used or the acreage that may be disturbed on any given day in the future is not known with any reasonable certainty. The emphasis in environmental documents relative to construction activity emission impacts has therefore been to minimize the emissions as fully as possible through comprehensive emissions control even if the exact amount of emissions cannot be precisely quantified.

Construction Activity Impacts

Construction has traditionally been considered mainly a source of potential nuisance from dust or odors such that these temporary emissions are typically categorized as insignificant in many air quality impact analyses. However, because construction activities are substantial contributors to the basin-wide air pollution burden, they have become increasingly important in the regional air pollution attainment strategy. Regulatory programs such as SCAQMD Rule 403 have been strengthened, and CEQA-based discretionary emissions reduction measures for construction are actively encouraged and pursued.

Dust is normally the primary concern during construction of new buildings and amenities. Dust includes small inhalable particulate matter, as well as larger diameter particles that rapidly settle out on any surface adjacent to the source. Because such emissions are not amenable to collection and discharge through a controlled source, they are called "fugitive" emissions.

Dust (PM-10) emission rates vary as a function of many parameters (soil silt, soil moisture, wind speed, area disturbed, number of vehicles, depth of disturbance or excavation, etc.). Regulatory agencies typically use one universal factor based on the area disturbed assuming that all other input parameters into emission rate prediction fall into mid-range average values. The SCAQMD, in its 1993 "CEQA Air Quality Handbook," estimates daily PM-10 emissions during construction to be 26.4 pounds per day per acre disturbed when "standard" dust control procedures required by SCAQMD Rule 403 are used. Upgraded dust control procedures will reduce the average daily PM-10 emission rate to as low as around 10 pounds per day when a highly aggressive control program is implemented.

Use of "standard" daily PM-10 emission factors allows for the simultaneous disturbance of around 5.7 acres to generate a potentially significant emission level of 150 pounds per day determined to be potentially significant in the SCAQMD Handbook (150 ÷ 26.4 = 5.7). If strongly enhanced dust control procedures are implemented, around 15 acres could be under simultaneous disturbance to maintain a less-than-significant daily PM-10 emission rate.

The General Plan anticipates the conversion of around 12,000 acres of existing agriculture or open space to residential and supporting commercial land uses. This process is estimated to cover 30 years. Around 400 acres per year would be under development. With major grading requiring around three months, the average instantaneous disturbance area is estimated to be 100 acres.

The PM-10 emission rate from grading and other soil disturbance is around 10-pound per acre per day. At 100 acres, the average PM-10 construction dust will be 1,000 pounds per day for many years to come. General Plan build-out construction will cause the PM-10 threshold of 150 pounds per day to be exceeded by a very substantial margin. PM-10 impacts from area wide construction, even with the use of all Best Available Control Measures, will have a long-term, cumulatively significant PM-10 impact.

Similarly, construction equipment operations will generate equipment exhaust that contains both "standard" air pollutants and toxic air contaminants such as diesel particulate matter (DPM) and various harmful organic gases (benzene, etc.) The average energy expenditure to develop one acre of land into residences and infrastructure is around 300,000 brake-horsepower-hours (BHP-HR). At 400 acres developed per year in around 300 work days, daily energy consumption will average around 400,000 BHP-HR. For a 250 hp scraper as the most typical type of construction equipment, the average daily activity level would be equivalent to 1,600 scraper hours. In 2020, the daily emissions from scrapers as the most representative type of construction equipment are as follows (lb/day):

Source	**CO**	**NOx**	**ROG**	**PM-10**	**SOx**
Emissions (lb/hour)	0.618	1.271	0.131	0.068	0.496
Daily Emissions (lb/day)	989.	2,034.	210.	109.	794.
SCAQMD Threshold (lb/day)	550.	100.	75.	150.	150.

Emission levels for four out of the five of the pollutants analyzed would exceed threshold levels. As with PM-10 emissions from fugitive dust, the area wide build-out will generate exhaust emissions that will likely exceed SCAQMD thresholds by a wide margin. The construction activity emissions should be considered as having a cumulatively significant air quality impact.

Regional Impacts

Long-term growth of the San Jacinto area will lead to an ever-increasing amount of trip generation and associated air pollution emissions. However, the on-going rate of vehicular emissions improvements will offset the effects of such growth. Automobile exhaust pollution (CO, NOx and CO) is forecast to be reduced by 50 percent in the next 10 years, and 50 percent of the residual in the 10 years thereafter. The average vehicle is forecast to be one fourth as "dirty" in 2025 than in 2005 from low-emissions technology (EMFAC2002). Although the City of San Jacinto is forecast to undergo substantial growth, the rate of emissions improvement may nevertheless create a net emissions reduction for the three major exhaust pollutants.

Mobile source emissions from airwide development were calculated by combing trip data from city demographic projects with evolving vehicular emission factors. A vehicle occupancy factor of 1.25 was used to convert "person-trips" to vehicle trips. The City's growth projections prepared by SCAG from now until 2030, and the proposed General Plan until 2050, are shown in Table 5. The General Plan will outpace SCAG's projections unless maximum growth acceleration does not occur until after 2030.

The bulk of the trip generation was assumed to be from automobiles and light duty trucks. The vehicular emission factors from the EMFAC2002 computer model shown in the SCAQMD CEQA Handbook update were extrapolated to 2030 and 2050 in order to produce a project-related vehicular emissions burden. The regional emissions calculations are summarized in Table 6. The effects of growth are offset by continued vehicular emissions improvements for CO, NOx and ROG. Because SOx and PM-10 are related to miles driven and not to smog controls, these pollutants will increase over time. The difference between build-out versus existing PM-10 will exceed the 150-pound per day significance threshold. No other pollutant will experience any significant increase despite the more than four-fold increase in travel miles for future city residents.

Regional emissions impact significance, however, is more related to project consistency with area growth projections than with the emissions magnitude some 45 years from now. The rate of growth anticipated under the General Plan may exceed the growth that SCAG has allocated for the City of San Jacinto and its sphere of influence. However, the possible difference between SCAG's forecast for 2030 and the General Plan build-out assumptions for 2050 may not necessarily have a significant air quality impact because:

1. The SCAG 2030 forecast can be accommodated within the General Plan estimates if one presumes that a greater fraction of growth will occur from 2030 to 2050, than from 2005 to 2030.

Table 5

City of San Jacinto Demographics

Parameter	Existing (2005)	2030 SCAG Forecast	2050 General Plan
Dwelling Units	8,883	16,016	34,926
Population	25,494	42,738	100,239
Persons per Household	2.87	2.67	2.87
Jobs	7,154	11,620	30,262
Jobs: Housing Ratio	0.805	0.726	0.866
Person Trips	208,154	378,231(e)	956,151
Trips per Person	8.16	8.25(e)	9.54

(e)=estimated

Table 6

Project-Related Vehicular Emissions

EMISSION FACTORS (LB/1,000MILES)

Pollutant	2005	2030	2050
CO	15.165	2.412	0.804
NOx	1.634	0.228	0.076
ROG	1.626	0.325	0.108
SOx	0.01	0.009	0.009
PM-10	0.113	0.126	0.131

DAILY EMISSION (LB/DAY)*

Pollutant	2005	2030	2050
CO	18,941	5,473	4,613
NOx	2,041	517	436
ROG	2,031	737	620
SOx	12	20	52
PM-10	141	286	752

EMISSION CHANGES (LB/DAY)*

Pollutant	2030-2005	2050-2030	2050-2005	SCAQMD Threshold
CO	-13,468	-860	-14,328	+550.
NOx	-1,524	-81	-1,605	+55.
ROG	-1,294	-117	-1,411	+55.
SOx	+8	+32	+40	+150.
PM-10	+145	+466	+611	+150.

*Person trips * 0.8 * 7.5 mi/trip * EMFAC2002 factor

2. The growth and associated emissions will occur somewhere within the air basin if not in/near San Jacinto with identical regional air quality impacts.

3. Vehicular emissions at assumed citywide build-out in 2050 may be far different than predicated by extrapolation of current emissions trends if engine technology or lack of fossil-fuel (petroleum) resources creates a more dramatic shift to alternative-fueled transportation.

There is therefore no clear-cut basis to conclude that any difference between SCAG's regional comprehensive plan forecasts and the proposed General Plan growth for San Jacinto will have a significant regional air quality impact.

Micro-Scale Impacts

Greater concentrations of traffic and associated congestion may lead to elevated levels of primary air pollutants such as carbon monoxide (CO) near major city intersections. However, the SCAQMD has demonstrated that there will be no CO "hot spots" at the most congested intersections in coastal areas of the air basin where background CO levels are much higher than in the Inland Empire. With smaller intersections with fewer cars, with less congestion, with a cleaner future vehicle fleet, and with lower background CO values than at the SCAQMD analysis sites, area wide CO levels will be much lower in San Jacinto. If the worst-case locations do not experience any "hot spot" potential in 2003, San Jacinto area roadway air pollution exposure will be acceptable with a large margin of safety. To verify this preliminary conclusion, a CO screening analysis was conducted at 25 intersections in the San Jacinto area for existing conditions for General Plan built-out with existing roadway design standards and for build-out with enhanced roadway geometry standards that reduce congestion levels (the "augmented" General Plan). A screening procedure based upon the Bay Area AQMD CEQA Handbook was used. The Bay Area procedures were modified to add any effects of congestion by including idling emissions along inbound roadway segments. The results of the screening analysis are shown in Table 7. The maximum 1-hour CO concentration in 2003 in the San Jacinto area was 4 ppm. The 8-hour maximum was 3.7 ppm. It would require a local contribution of 16 ppm for 1-hour or 5.3 ppm over 8 hours to equal the most stringent CO standard. Table 7 shows that the maximum hourly CO level for any scenario is 3.2 ppm. This level is well below any contribution that could possibly create a CO "hot spot."

Although the augmented General Plan will reduce congestion and thus reduce CO exposures for the same number of vehicles at a given intersection, future CO levels will be so low as to be unaffected by adoption of new roadway standards. A small regional emissions reduction benefit may accrue from reduced congestion, but the effect is again very small when considered within the context of basin-wide patterns of vehicular emissions.

Table 7

Micro-scale CO Screening Analysis
(1-hour CO concentrations in ppm above background)

Roadway 1	Roadway 2	Existing	Exist. G.P.	AugmentG.P.
Warren	Ramona Ex WB	0.7	0.2	0.2
	Ramona Ex EB	0.7	0.6	0.6
	Bridge St.		0.3	0.3
	Cottonwood Ave	0.3	0.5	0.5
	Esplanade Ave.	0.4		
	Florida Ave.	1.2		
SR-79 SB	Esplanade Ave.		0.2	0.2
	Cottonwood Ave		1.1	0.6
SR-79 Corridor	SR-74		3.2	
SR-79 NB	Esplanade Ave.		0.6	0.3
	Cottonwood Ave		0.9	0.8
Sanderson Ave.	Bridge St.		0.7	0.5
	Ramona Expwy	1.5		
	SR-79 SB		0.8	0.7
	SR-79 NB		0.6	0.6
	Cottonwood Ave	0.5	0.8	0.8
	7th Street	0.7	0.6	0.6
	Esplanade Ave.	0.6	0.7	0.7
Lyon Ave.	Ramona Expwy		1.2	1.0
	Cottonwood Ave	0.2	0.6	0.6
State Street	Ramona Expwy	0.9	1.3	1.1
	Cottonwood Ave	0.9	0.8	0.7
	Esplanade Ave.	0.9	0.9	0.8
San Jacinto Ave.	Esplanade Ave.	0.8	1.0	0.8
Ramona Expwy	Esplanade Ave.	0.5	1.0	0.7

Source: Screening procedure based on CALINE4 as modified from BAAQMD CEQA Guidelines (Data detail in Appendix).

MITIGATION

Significant short-term impacts may occur near individual construction sites from dust (PM-10) and equipment exhaust during grading and site preparation. The General Plan should establish a construction activity impact mitigation standard that requires an enhanced level of emissions control to reduce this impact by reasonable and feasible methods. Elements of such a design standard should include:

- Grading and other surface disturbance shall utilize best available control measures (BACMs) for fugitive dust (PM-10). Each project of 50 acres or more shall prepare a dust control plan that shall become part of the grading permit. Each such project shall have a construction activity impact coordinator who will be responsible to oversee implementation of the control plan and to respond to any deficiencies noted by governmental agencies or the public at large. The names and phone numbers of the coordinator, city code enforcement and the SCAQMD complaint "hot line" shall be clearly posted at key locations around any major construction site.
- Contractors shall make all reasonable efforts to utilize clean diesel, alternate fuels or electric grid power at any job site over five (5) acres. The grading permit application shall document the efforts that were made to secure cleaner equipment. Cost, equipment availability and usefulness for a particular task shall be considered, but preference for "clean" projects shall be given to lower pollution emissions projects in granting permits.

APPENDIX

CO Screening Analysis Detail

CO SCREENING ANALYSIS PROTOCOLS

(Bay Area AQMD CEQA Guidelines, modified to include congestion/delay)

CO(1-hour) = Vol (major in) * Emfac(25 mph) * DF(major)

+ Vol (major in) * Sec. Delay * Idle (3 mph) * DF(major)

+ Vol(major out) * Emfac(25 mph) * DF(major)

+ Vol(minor in) * Emfac(25 mph) * DF(minor)

+ Vol(minor in) * Sec. delay * Idle(3 mph) * DF(minor)

+ Vol(minor out) * Emfac(25 mph) * DF(minor)

DF(major) = 6.1 / 100,000

DF(minor) = 2.3 / 100,000

Delay = 2.5 sec LOS=A
= 10.0 sec LOS=B
= 20.0 sec LOS=C
= 32.5 sec LOS=D
= 50.0 sec LOS=E
= 75.0 sec LOS=F

Year	Emfac(25) (g/mi)	Idle(3) (g/sec/mile)
2005	7.57	0.111
2006	6.92	0.100
2007	6.44	0.090
2010	5.00	0.068
2020	2.20	0.027
2030	1.23	0.014

Source: EMFAC2002

CO(8-hour) = CO(1-hour) * 0.6 (persistence)

CO Screening Input Data - Scenario = Existing

Roadway 1	Roadway 2	Major In	Major Out	Minor In	Minor Out	Level of Svc
Warren	Ramona Ex WB	785	392	224	305	B
	Ramona Ex EB	785	392	224	305	B
	Bridge St.					
	Cottonwood Ave	285	184	55	121	B
	Esplanade Ave.	338	310	129	192	C
	Florida Ave.	974	968	450	468	C
SR-79 SB	Esplanade Ave.					
	Cottonwood Ave					
SR-79 Corridor	SR-74					
SR-79 NB	Esplanade Ave.					
	Cottonwood Ave					
Sanderson Ave.	Bridge St.					
	Ramona Expwy	1279	842	775	506	D
	SR-79 SB					
	SR-79 NB					
	Cottonwood Ave	584	371	120	145	A
	7^{th} Street	686	504	45	96	C
	Esplanade Ave.	581	439	232	139	B
Lyon Ave.	Ramona Expwy					
	Cottonwood Ave	187	130	102	88	A
State Street	Ramona Expwy	767	424	532	575	C
	Cottonwood Ave	698	782	246	187	C
	Esplanade Ave.	736	509	524	491	C
San Jacinto Ave.	Esplanade Ave.	638	467	578	526	B
Ramona Expwy	Esplanade Ave.	611	282	185	229	B

CO Screening Input Data - Scenario = Existing G.P.

Roadway 1	**Roadway 2**	**Major In**	**Major Out**	**Minor In**	**Minor Out**	**Level of Svc**
Warren	Ramona Ex WB	693	637	484	430	B
	Ramona Ex EB	1359	1966	1331	480	C
	Bridge St.	1090	612	631	563	C
	Cottonwood Ave	1623	1106	834	906	C
	Esplanade Ave.					
	Florida Ave.					
SR-79 SB	Esplanade Ave.	591	430	409	0	C
	Cottonwood Ave	1999	1530	590	0	F
SR-79 Corridor	SR-74	7221	4461	4036	6261	F
SR-79 NB	Esplanade Ave.	1097	0	685	1390	D
	Cottonwood Ave	1685	2390	1671	0	F
Sanderson Ave.	Bridge St.	1293	1209	677	918	D
	Ramona Expwy					
	SR-79 SB	1478	2415	1196	120	F
	SR-79 NB	1983	1590	740	442	B
	Cottonwood Ave	1929	1774	1518	1743	D
	7th Street	1744	1595	628	390	C
	Esplanade Ave.	1598	1515	1520	1367	D
Lyon Ave.	Ramona Expwy	2921	2293	1010	511	F
	Cottonwood Ave	1518	1161	1354	1511	D
State Street	Ramona Expwy	3115	2378	1261	1288	F
	Cottonwood Ave	1767	1498	1104	1069	F
	Esplanade Ave.	1781	1635	1648	1826	F
San Jacinto Ave.	Esplanade Ave.	1941	1671	1854	1602	F
Ramona Expwy	Esplanade Ave.	2230	1620	1014	1067	F

CO Screening Input Data - Scenario = Augmented G.P.

Roadway 1	Roadway 2	Major In	Major Out	Minor In	Minor Out	Level of Svc
Warren	Ramona Ex WB	693	637	484	430	B
	Ramona Ex EB	1359	1966	1331	480	C
	Bridge St.	1090	612	631	563	C
	Cottonwood Ave	1623	1106	834	906	C
	Esplanade Ave.					
	Florida Ave.					
SR-79 SB	Esplanade Ave.	591	430	409	0	C
	Cottonwood Ave	1999	1530	590	0	C
SR-79 Corridor	SR-74					
SR-79 NB	Esplanade Ave.	1097	0	685	1390	D
	Cottonwood Ave	1685	2390	1671	0	C
Sanderson Ave.	Bridge St.	1293	1209	677	918	D
	Ramona Expwy					
	SR-79 SB	1478	2415	1196	120	D
	SR-79 NB	1983	1590	740	442	B
	Cottonwood Ave	1929	1774	1518	1743	D
	7th Street	1744	1595	628	390	C
	Esplanade Ave.	1598	1515	1520	1367	D
Lyon Ave.	Ramona Expwy	2921	2293	1010	511	D
	Cottonwood Ave	1518	1161	1354	1511	D
State Street	Ramona Expwy	3115	2378	1261	1288	D
	Cottonwood Ave	1767	1498	1104	1069	D
	Esplanade Ave.	1781	1635	1648	1826	D
San Jacinto Ave.	Esplanade Ave.	1941	1671	1854	1602	D
Ramona Expwy	Esplanade Ave.	2230	1620	1014	1067	C