

DRAFT

Air Quality Analysis Report
Hesperia General Plan Update
City of Hesperia, California

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TABLE OF CONTENTS

Section 1: Introduction	1
1.1 - Introduction	1
1.2 - Key Terms	1
1.3 - Findings	3
1.4 - Mitigation Measures Designed to Reduce Air Emissions	3
1.5 - Project Description	6
Section 2: Setting	9
2.1 - Environmental Setting	9
2.1.1 - Local Climate	9
2.1.2 - Local Air Quality	9
2.1.3 - Attainment Status	19
2.2 - Regulatory Setting	24
2.2.1 - National Regulation	24
2.2.2 - State Regulation	25
2.2.3 - Mojave Desert Air Quality Management District	28
2.2.4 - City of Hesperia	30
Section 3: Thresholds	34
3.1 - CEQA Guidelines	34
3.2 - Mojave Desert Air Quality Management District Thresholds	34
3.3 - Carbon Monoxide Hot Spot Analysis Threshold	36
Section 4: Estimation of Project Emissions	37
4.1 - Construction	37
4.2 - Operations	38
4.2.1 - Existing Emissions - 2009	39
4.2.2 - Existing General Plan	41
Proposed General Plan Update	43
Section 5: Impact Analysis of the General Plan Update	46
5.1 - Conflict with or Obstruct Implementation of the Applicable OAP	46
5.2 - Potential for Air Quality Standard Violation	47
5.3 - Cumulative Impacts	51
5.4 - Expose Sensitive Receptors to Substantial Pollutant Concentrations	53
5.5 - Create Objectionable Odors	56
Section 6: References	58

LIST OF APPENDICES

Appendix A: Emission Inventory Output

Appendix B: CALINE4 Model Output

LIST OF TABLES

Table 1: Air Pollutants	13
Table 2: Air Quality Monitoring Summary	19
Table 3: Mojave Desert Air Basin Attainment Status	20
Table 4: 2008 Annual Average Emissions – San Bernardino County Portion of the MDAB	22
Table 5: Air Quality Components of the 1991 and 2001 City of Hesperia General Plan Elements	31
Table 6: MDAQMD Thresholds	35
Table 7: Comparison of Existing and Build Out Conditions	37
Table 8: Land Use Summary for 2009 – Planning Area.....	40
Table 9: Daily Existing Emission Inventory – 2009	41
Table 10: Annual Existing Emission Inventory – 2009	41
Table 11: Land Use Summary for the Existing General Plan.....	42
Table 12: Daily Emission Inventory for the Existing General Plan	43
Table 13: Annual Emission Inventory for the Existing General Plan.....	43
Table 14: Land Use Summary for the Proposed General Plan Update	44
Table 15: Daily Emission Inventory for the Proposed General Plan Update.....	45
Table 16: Annual Emission Inventory for the Proposed General Plan Update	45
Table 17: Comparison of 2009 and Existing General Plan Maximum Daily Emissions	48
Table 18: Comparison of 2009 and Existing General Plan Annual Emissions.....	49
Table 19: Comparison of 2009 and Proposed General Plan Update Daily Emissions	49
Table 20: Comparison of 2009 and Proposed General Plan Update Annual Emissions	50
Table 21: Comparison of the Differences in Daily Emissions	50
Table 22: Comparison of the Differences in Annual Emissions	51
Table 23: Results of the CO “Hotspots” Analysis.....	54

LIST OF EXHIBITS

Exhibit 1: Regional Vicinity Map.....	8
Exhibit 2: Wind Rose	10
Exhibit 3: Historical Ozone Trends – City of Hesperia	18
Exhibit 4: Historical Particulate Matter Trends – City of Hesperia	21

ACRONYMS AND ABBREVIATIONS

$\mu\text{g}/\text{m}^3$	micrograms per cubic meter
AQMP	Air Quality Management Plan
ARB	California Air Resources Control Board
CEQA	California Environmental Quality Act
CO	carbon monoxide
DPM	Diesel Particulate Matter
EPA	Environmental Protection Agency
LOS	Level of Service
LST	Localized Significance Thresholds
MDAQMD	Mojave Desert Air Quality Management District
NO_x	nitrogen oxides
PM_{10}	particulate matter less than 10 microns in diameter
$\text{PM}_{2.5}$	particulate matter less than 2.5 microns in diameter
ppm	parts per million
ppt	parts per trillion
ROG	reactive organic gases
SO_x	sulfur oxides
VOC	volatile organic compounds

SECTION 1: INTRODUCTION

1.1 - Introduction

Air quality is a function of the rate and location of pollutant emissions under the influence of meteorological conditions and topographic features. Atmospheric conditions, such as wind direction, wind speed, and air temperature gradients, interact with the physical features of the landscape to determine the movement and dispersal of air pollutants that consequently affect air quality.

This report describes existing regional topography and climate, federal and State ambient air quality standards, air quality planning and management, levels of pollutant emissions, and existing air quality conditions. The goal of this report is to assess whether the expected air pollutant emissions generated from the City of Hesperia General Plan Update (Project) would cause significant impacts to air resources in the Project area. This assessment was conducted within the context of the California Environmental Quality Act (CEQA, California Public Resources Code Sections 21000 et seq.).

The information contained in this report was obtained from various sources including the Mojave Desert Air Quality Management District (MDAQMD) and the California Air Resources Board (ARB), among other agencies.

This document hereby incorporates by reference the proposed City of Hesperia General Plan Update and the City of Hesperia Climate Action Plan, dated May 2010.

1.2 - Key Terms

The following key terms are used throughout this report to describe air quality and the framework of regulations that pertain to these resources.

- **Mojave Desert Air Basin (MDAB).** An air basin is a geographic area that exhibits similar meteorological and geographic conditions. California is divided into 15 air basins to assist with the statewide regional management of air quality issues. The MDAB includes portions of San Bernardino County, Kern County, Riverside County, and Los Angeles County.
- **Mojave Desert Air Quality Management District (MDAQMD).** special district responsible for all aspects of air quality management as defined within federal and State law and District Regulation, within that region of California within the boundaries that include the desert portion of San Bernardino County and those portions of the County of Riverside commonly known as the Palo Verde Valley
- **PM10.** Airborne dust and other particulates exhibit a range of particle sizes. Federal and state air quality regulations reflect the fact that smaller particles are easier to inhale and can be more damaging to health. PM10 refers to particulates (including dust) that are 10 microns in diameter or smaller.

- **PM2.5.** The federal government added standards for smaller particulates. PM2.5 refers to particulates that are 2.5 microns in diameter or smaller. PM2.5 is a subset of PM10 and this smaller fraction of particulates is regulated at the state and federal level because it is considered to have potentially serious health effects.
- **Ozone and Ozone Precursors.** There are several chemical steps in creating ozone. Ozone precursors are chemicals that lead to the eventual creation of ozone in the atmosphere. Ozone precursors occur either naturally or as a result of human activities such as the use of combustion engines in cars and evaporated fuel. Common ozone precursors include reactive organic gases and nitrogen oxides that react in complex atmospheric reactions in the presence of sunlight to form ozone. Ozone is a pungent, colorless, toxic gas.
- **Stationary Source.** A non-mobile source of air pollution such as a power plant, generator, refinery or manufacturing facility.
- **Mobile Source.** A moving source of air pollution such as on road and off-road vehicles, boats, airplanes, lawn equipment, small utility engines, and rail locomotives.
- **Sensitive Receptors.** Sensitive receptors are defined as land uses that typically accommodate sensitive population groups such as long-term health care facilities, rehabilitation centers, retirement homes, convalescent homes, residences, schools, childcare centers and playgrounds. These land uses contain individuals that are at greater risk than the general population to the effects of air pollution. These individuals include the elderly, infants and children, and individuals with respiratory problems such as asthma.
- **Ambient Air Quality Standards.** These standards measure outdoor air quality. They identify the maximum acceptable concentrations of air pollutants during a specified period of time. These standards have been adopted at a state and federal level to protect public health and welfare with an adequate margin of safety. The standards are periodically updated as new medical information becomes available.
- **Reactive Organic Gases (ROG).** Reactive organic gases are photochemically reactive and are composed of non-methane hydrocarbons. These gases are a precursor to the formation of smog. ROG is also referred to as volatile organic compounds (VOC).
- **Nitrogen Oxides (Oxides of Nitrogen, NO_x).** Nitrogen oxides are compounds of nitric oxide (NO), nitrogen dioxide (NO₂) and other oxides of nitrogen. Nitrogen oxides are primarily created from the combustion process and are a major precursor to smog and acid rain formation.
- **Attainment Plan.** An attainment plan is prepared by an air agency to 1) identify the current levels of air quality and emissions; and 2) identify mitigation measures that are necessary to either attain or maintain the federal ambient air quality standards within the region under the jurisdiction of the air agency.

- Toxic Air Contaminants (TAC). A TAC is an air pollutant that may cause or contribute to an increase in mortality or serious illness or that may pose a hazard to human health.

1.3 - Findings

- The Existing General Plan and Proposed General Plan Update are consistent with the most recent Southern California Association of Governments Regional Transportation Plan and the MDAQMD Ozone Attainment Plan
- Construction of either the Existing General Plan or the Proposed General Plan Update would likely exceed the MDAQMD emission significance emission thresholds, depending on the timing and development intensity of the General Plan build out.
- The net changes in operational criteria pollutant emissions from the Existing General Plan Build Out and the Proposed General Plan Update compared to current 2009 emission levels would exceed the MDAQMD daily and annual emission significance thresholds for several criteria pollutants.
- The net changes in criteria pollutants from current 2009 levels to those in the Existing General Plan are similar to the net changes from 2009 levels to those in the Proposed General Plan Update indicating that the impacts on air quality from either General Plan condition are comparable.
- Operation of the project would not result in a localized carbon monoxide hotspot and thus would not cause or contribute to the violation of any federal or State carbon monoxide standard.
- The construction and operational emissions from the project would result in construction and operational emissions that would contribute to an existing or projected air quality violation.
- The construction and operational emissions from the project would result in a cumulatively considerable net increase in emissions for criteria pollutants that are nonattainment for federal and/or State ambient air quality standards.
- The project would not expose sensitive receptors to substantial pollutant concentrations after application of mitigation measures.
- The project would not create objectionable odors that affect sensitive receptors near the project area after application of mitigation measures.

1.4 - Mitigation Measures Designed to Reduce Air Emissions

Implementation of the following programmatic mitigation measures will reduce potential impacts but not to a level less than significant. Individual development projects will be required to undergo project-specific environmental review and mitigation measures to reduce any significant impacts. Mitigation for significant environmental impacts of each future development project shall include the

following: (1) objective of the measure; (2) specific standards or measures to be applied, along with any needed contingency measure; (3) responsible party; (4) location; (5) schedule for initiation; and (6) how the measure will reduce the associated environmental impact.

- AQ-1** The City shall implement the following measures to reduce the amount of fugitive dust that is re-entrained into the atmosphere from unpaved areas, parking lots, and construction sites:
1. Require the following measures to be taken during the construction of all projects to reduce the amount of dust and other sources of PM₁₀ in accordance with MDAQMD Rule 403:
 - a. Dust suppression at construction sites using vegetation, surfactants, and other chemical stabilizers;
 - b. Wheel washers for construction equipment;
 - c. Watering down of all construction areas;
 - d. Limit speeds at construction sites to 15 miles per hour; and
 - e. Covering of aggregate or similar material during transportation of material.
 2. Adopt incentives, regulations, and/or procedures to reduce paved road dust emissions through targeted street sweeping of roads subject to high traffic levels and silt loadings.

- AQ-2** The City shall require each project applicant, as a condition of project approval, to implement the following measures to reduce emissions during construction:
1. Commercial electric power shall be provided to the project site in adequate capacity to avoid or minimize the use of portable diesel-powered electric generators and equipment.
 2. Where feasible, equipment requiring the use of fossil fuels (e.g., diesel) shall be replaced or substituted with electrically driven equivalents (provided that they are not run via a portable generator set).
 3. To the extent feasible, alternative fuels and emission controls shall be used to further reduce exhaust emissions.
 4. On-site equipment shall be turned off when not in use or shall not idle for more than 5 minutes.
 5. Staging areas for heavy-duty construction equipment shall be located as far as possible from sensitive receptors.

6. Before construction contracts are issued, the project applicants shall perform a review of new technology, in consultation with the MDAQMD, as it relates to heavy-duty equipment, to determine what advances in emissions reductions are available for use and are economically feasible. Construction contract and bid specifications shall require contractors to utilize the best available and economically feasible technology on an established percentage of the equipment fleet.
7. Use low or zero-emitting architectural coatings.

AQ-3 The City shall work with the MDAQMD and the San Bernardino Associated Governments (SCAG) to implement the federal ozone and PM₁₀ non-attainment plans and meet all federal and state air quality standards for pollutants. The City shall participate in any future amendments and updates to the non-attainment plans. The City shall also implement, review, and interpret the General Plan and future discretionary projects in a manner consistent with the non-attainment plans to meet standards and reduce overall emissions from mobile and stationary sources.

AQ-4 The City shall consult with the MDAQMD regarding the siting of project land uses within a specified distance of existing or planned (zoned) sensitive receptor land uses

- a. 1,000 feet of a major transportation project (50,000 or more vehicles per day)
- b. 1,000 feet of a distribution center (that accommodates more than 40 trucks per day);
- c. 1,000 feet of any industrial project;
- d. 500 feet of any dry cleaning operation using perchloroethylene

AQ-5 The City shall implement the following measures to minimize exposure of sensitive receptors and sites to health risks related to air pollution:

1. Encourage site plan designs to provide the appropriate set-backs and/or design features that reduce toxic air contaminants at the source.
2. Encourage the applicants for sensitive land uses to incorporate design features (e.g., pollution prevention, pollution reduction, barriers, landscaping, ventilation systems, or other measures) in the planning process to minimize the potential impacts of air pollution on sensitive receptors.
3. Actively participate in decisions on the siting or expansion of facilities or land uses (e.g., freeway expansions), to ensure the inclusion of air quality mitigation measures.

4. Where decisions on land use may result in emissions of air contaminants that pose significant health risks, consider options, including possible relocation, recycling, redevelopment, rezoning, and incentive programs.
5. Activities involving idling trucks shall be oriented as far away from and downwind of existing or proposed sensitive receptors as feasible.
6. Strategies shall be incorporated to reduce the idling time of main propulsion engines through alternative technologies such as IdleAire, electrification of truck parking, and alternative energy sources for Transport Refrigeration Units to allow diesel engines to be completely turned off.

AQ-6 The City shall review discretionary land use applications for residential uses for potential odor impacts for proposals with the following uses:

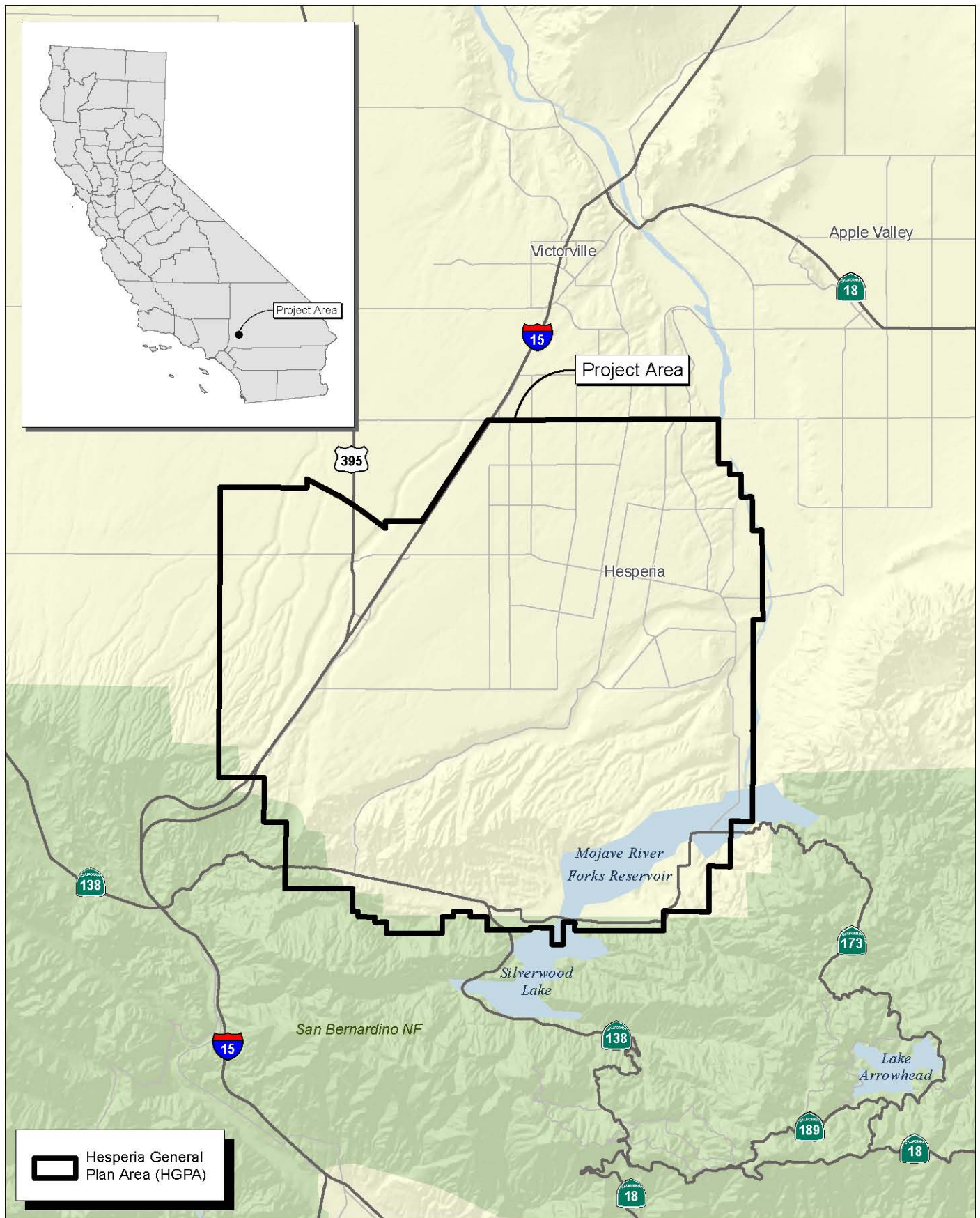
- a. 2 miles of a wastewater treatment plant
- b. 1 mile of a wastewater pumping facility
- c. 2 miles of a sanitary landfill
- d. 1 mile of a transfer station
- e. 1 mile of a composting facility
- f. 2 miles of an asphalt batch plant
- g. 1 mile of a painting/coating operation
- h. 1 mile of a green waste and recycling center

If it determined that odors from such areas have the potential to expose such residences to objectionable odors, an Odor Analysis shall be prepared to assess such impacts and recommend methods to limit exposure to such objectionable odors.

1.5 - Project Description

The proposed Project lies within the MDAB which is comprised of four air districts, the Kern County Air Pollution Control District, the Antelope Valley Air Quality Management District, the Mojave Desert Air Quality Management District, and the eastern portion of the South Coast Air Quality Management District. The Project is located within the MDAQMD portion of the MDAB and is subject to its rules and regulations. The proposed Project is situated approximately 15 miles north of the City of San Bernardino in what is locally referred to as the high desert as shown in Exhibit 1. The 2000 census indicated that the population of the City of Hesperia is 62,590. As of the census of 2009, the California Department of Finance estimates the population of Hesperia at 88,184 people, an increase of 40 percent from the 2000 census.

This General Plan Update establishes an overall development capacity for the City and its sphere of influence, collectively called the Planning Area, and serves as a policy guide for determining the appropriate physical development and character of the Planning Area. The General Plan applies to all properties within the Planning Area. The City has undertaken a comprehensive update of the General Plan to reflect the growth that has occurred in the Planning Area since the adoption of the 1991 General Plan, as well as anticipated growth out to the future. The most significant changes from the 1991 General Plan focus upon the development of property along the I-15 corridor.



SECTION 2: SETTING

2.1 - Environmental Setting

2.1.1 - Local Climate

The MDAB is an assemblage of mountain ranges interspersed with long broad valleys that often contain dry lakes. Many of the lower mountains, which dot the vast terrain, rise from 1,000 to 4,000 feet above the valley floor. Prevailing winds in the MDAB are from the west and southwest. These prevailing winds are due to the proximity of the MDAB to coastal and central regions and the blocking nature of the Sierra Nevada Mountains to the north. Air masses pushed onshore in southern California by differential heating between the Pacific Ocean and the interior desert areas are channeled through the MDAB. As shown in the Wind Rose (Exhibit 2), the winds were generally from the southwest direction. The data is from Victorville, which is the neighboring city to the north of Hesperia.

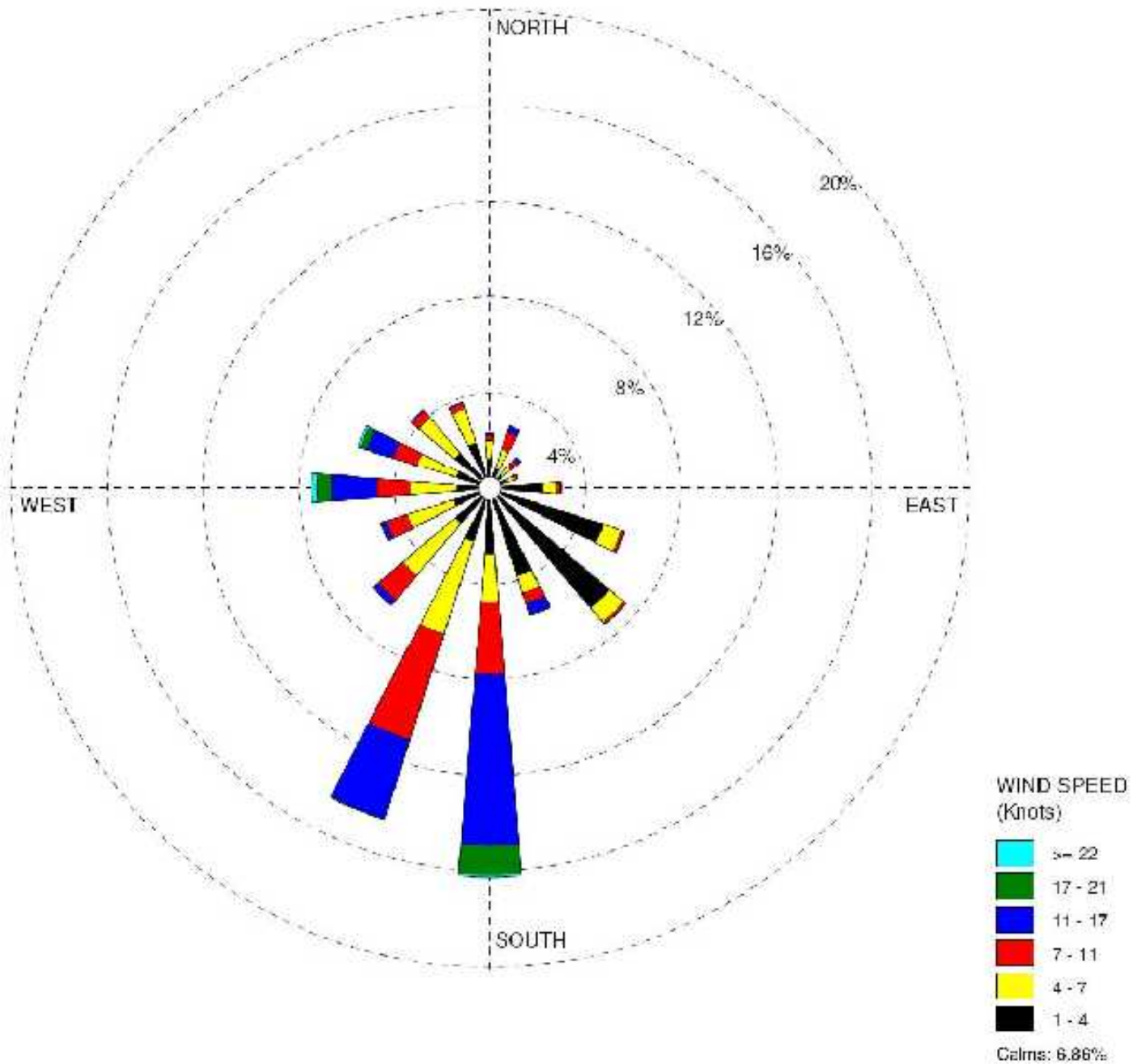
The MDAB is separated from the southern California coastal and central California valley regions by mountains (highest elevation approximately 10,000 feet), whose passes form the main channels for these air masses. The Antelope Valley is bordered in the northwest by the Tehachapi Mountains, separated from the Sierra Nevadas in the north by the Tehachapi Pass (3,800 ft elevation). The Antelope Valley is bordered in the south by the San Gabriel Mountains, bisected by Soledad Canyon (3,300 ft). The Mojave Desert is bordered in the southwest by the San Bernardino Mountains, separated from the San Gabriels by the Cajon Pass (4,200 ft).

The Palo Verde Valley portion of the Mojave Desert lies in the low desert, at the eastern end of a series of valleys (notably the Coachella Valley) whose primary channel is the San Gorgonio Pass (2,300 ft) between the San Bernardino and San Jacinto Mountains.

During the summer, a Pacific Subtropical High cell that sits off the coast generally influences the MDAB, inhibiting cloud formation and encouraging daytime solar heating. The MDAB is rarely influenced by cold air masses moving south from Canada and Alaska, as these frontal systems are weak and diffuse by the time they reach the desert. Most desert moisture arrives from infrequent warm, moist and unstable air masses from the south. The MDAB averages between three and seven inches of precipitation per year (from 16 to 30 days with at least 0.01 inches of precipitation). The MDAB is classified as a dry-hot desert climate, with portions classified as dry-very hot desert, to indicate at least three months have maximum average temperatures over 100.4° F.

2.1.2 - Local Air Quality

Air quality is determined primarily by the type and amount of contaminants emitted into the atmosphere, the size and topography of the MDAB, and its meteorological conditions.



Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollution emissions and air quality.

Geographic areas and air basins are classified by the Air Resources Board (ARB) and the U.S. Environmental Protection Agency (USEPA) for several pollutants as attainment, nonattainment, or unclassified. In general, “attainment” means that the applicable federal and State ambient air quality standard has not been exceeded anywhere within the air basin. Conversely, “nonattainment” means that the applicable standard has been exceeded in the air basin. An “unclassified” status means that the available air quality information is insufficient to determine an attainment status. Measured ambient air pollutant concentrations within an air basin determine the attainment status for that air basin.

Criteria Air Pollutants

Concentrations of the following air pollutants are used as indicators of ambient air quality conditions: ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), respirable particulate matter (PM) with an aerodynamic resistance diameter of 10 micrometers or less (PM₁₀), fine particulate matter (PM) with an aerodynamic resistance diameter of 2.5 micrometers or less (PM_{2.5}), and lead. Because these are the most prevalent air pollutants known to be deleterious to human health, and because there is extensive documentation available on health-effects criteria for these pollutants, they are commonly referred to as “criteria air pollutants.”

Both the United States Environmental Protection Agency and the State of California have set ambient air quality standards that are designed to protect public health and welfare. In addition to the six criteria pollutants noted above, the State has also established air quality standards for sulfates, vinyl chloride, and hydrogen sulfide. Table 1 summarizes the national and State ambient air quality standards, the most relevant effects, the properties, and sources of these air pollutants.

Ozone and PM₁₀ are monitored in the City of Hesperia, at 17288 Olive Street. CO, NO₂, SO₂, and PM_{2.5} are monitored in nearby Victorville, 14306 Park Avenue, approximately six miles north of the City of Hesperia monitoring site. Monitored air quality data for years 2006 through 2008 are shown in Table 2. As shown in Table 2, federal or State ambient air quality standards are exceeded for ozone and PM₁₀. Note, however, that the ARB has designated the portion of the MDAB where the City is located as nonattainment for PM_{2.5}.

Exhibit 3 provides an historical view of the maximum 1 hour and 8 hour ozone concentrations in the Planning Area. As is shown in the exhibit, over the past 20 years, there has been a decreasing trend in the level of maximum ozone concentrations in the Planning Area. However, the maximum ozone concentrations still exceed the federal and California ambient air quality standards. The number of days that ozone concentrations have exceeded the California 1-hour standard has also decreased over the past 20 years from about 140 days in 1989 to around less than 30 days in 2008. Similarly, the

number days that ozone concentrations have exceeded the federal 8-hour ozone standard has declined from 130 days in 1989 to about 60 days in 2008.

The MDAB is downwind of the Los Angeles basin, and to a lesser extent, is downwind of the San Joaquin Valley. Prevailing winds transport ozone and ozone precursors from both regions into and through the MDAB during the summer ozone season. These transport couplings have been officially recognized by ARB. Local MDAB emissions contribute to exceedances of both the federal and State standards for ozone, but photochemical ozone modeling conducted by the South Coast Air Quality Management District and ARB indicates that the MDAB would be in attainment of both standards without the influence of this transported air pollution from upwind regions (MDAQMD 2008a).

Table 1: Air Pollutants

Air Pollutant	Averaging Time	California Standard	National Standard ^a	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Ozone	1 Hour	0.09 ppm	—	(a) Decrease of pulmonary function and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans; (e) Vegetation damage; (f) Property damage.	Ozone is a photochemical pollutant as it is not emitted directly into the atmosphere, but is formed by a complex series of chemical reactions between volatile organic compounds (VOC), NO _x , and sunlight. Ozone is a regional pollutant that is generated over a large area and is transported and spread by the wind.	Ozone is a secondary pollutant; thus, it is not emitted directly into the lower level of the atmosphere. The primary sources of ozone precursors (VOC and NO _x) are mobile sources (on-road and off-road vehicle exhaust).
	8 Hour	0.070 ppm	0.075 ppm			
Carbon Monoxide (CO)	1 Hour	20 ppm	35 ppm	(a) Aggravation of angina pectoris (chest pain) and other aspects of coronary heart disease; (b) Decreased exercise tolerance in persons with peripheral vascular disease and lung disease; (c) Impairment of central nervous system functions; (d) Possible increased risk to fetuses.	CO is a colorless, odorless, toxic gas. CO is somewhat soluble in water; therefore, rainfall and fog can suppress CO conditions. CO enters the body through the lungs, dissolves in the blood, replaces oxygen as an attachment to hemoglobin, and reduces available oxygen in the blood.	CO is produced by incomplete combustion of carbon-containing fuels (e.g., gasoline, diesel fuel, and biomass). Sources include motor vehicle exhaust, industrial processes (metals processing and chemical manufacturing), residential wood burning, and natural sources.
	8 Hour	9.0 ppm	9 ppm			
Nitrogen Dioxide ^c (NO ₂)	1 Hour	0.18 ppm	0.10 ppm	(a) Potential to aggravate chronic respiratory disease and respiratory symptoms in sensitive groups; (b) Risk to public health implied by pulmonary and extra-pulmonary biochemical and cellular changes and pulmonary structural changes; (c) Contribution to atmospheric discoloration.	During combustion of fossil fuels, oxygen reacts with nitrogen to produce nitrogen oxides - NO _x (NO, NO ₂ , NO ₃ , N ₂ O, N ₂ O ₃ , N ₂ O ₄ , and N ₂ O ₅). NO _x is a precursor to ozone, PM ₁₀ , and PM _{2.5} formation. NO _x can react with compounds to form nitric acid and related particles.	NO _x is produced in motor vehicle internal combustion engines and fossil fuel-fired electric utility and industrial boilers. NO ₂ concentrations near major roads can be 30 to 100 percent higher than those at monitoring stations
	Annual	0.030 ppm	0.053 ppm			

Table 1 (cont.): Air Pollutants

Air Pollutant	Averaging Time	California Standard	National Standard ^a	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfur Dioxide (SO ₂)	1 Hour	0.25 ppm	—	Bronchoconstriction accompanied by symptoms which may include wheezing, shortness of breath and chest tightness, during exercise or physical activity in persons with asthma. Some population-based studies indicate that the mortality and morbidity effects associated with fine particles show a similar association with ambient sulfur dioxide levels. It is not clear whether the two pollutants act synergistically or one pollutant alone is the predominant factor.	Sulfur dioxide is a colorless, pungent gas. At levels greater than 0.5 ppm, the gas has a strong odor, similar to rotten eggs. Sulfur oxides (SO _x) include sulfur dioxide and sulfur trioxide. Sulfuric acid is formed from sulfur dioxide, which can lead to acid deposition and can harm natural resources and materials. Although sulfur dioxide concentrations have been reduced to levels well below State and national standards, further reductions are desirable because sulfur dioxide is a precursor to sulfate and PM ₁₀ .	Human caused sources include fossil-fuel combustion, mineral ore processing, and chemical manufacturing. Volcanic emissions are a natural source of sulfur dioxide. The gas can also be produced in the air by dimethylsulfide and hydrogen sulfide. Sulfur dioxide is removed from the air by dissolution in water, chemical reactions, and transfer to soils and ice caps. The sulfur dioxide levels in the State are well below the maximum standards.
	3 Hour ¹	—	0.5 ppm			
	24 Hour	0.04 ppm	0.14 ppm			
	Annual	—	0.030 ppm			
Particulate Matter (PM ₁₀)	24 hour	50 µg/m ³	150 µg/m ³	(a) Exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) Declines in pulmonary function growth in children; (c) Increased risk of premature death from heart or lung diseases in the elderly. Daily fluctuations in PM _{2.5} levels have been related to hospital admissions for acute respiratory conditions, school absences, and increased medication use in children and adults with asthma.	Suspended particulate matter is a mixture of small particles that consist of dry solid fragments, droplets of water, or solid cores with liquid coatings. The particles vary in shape, size, and composition. PM ₁₀ refers to particulate matter that is 10 microns or less in diameter, (1 micron is one-millionth of a meter). PM _{2.5} refers to particulate matter that is 2.5 microns or less in diameter.	Stationary sources include fuel combustion for electrical utilities, residential space heating, and industrial processes; construction and demolition; metals, minerals, and petrochemicals; wood products processing; mills and elevators used in agriculture; erosion from tilled lands; waste disposal, and recycling. Mobile or transportation-related sources are from vehicle exhaust and road dust.
	Mean	20 µg/m ³	—			
Particulate Matter (PM _{2.5})	24 Hour	—	35 µg/m ³			
	Annual	12 µg/m ³	15.0 µg/m ³			

Table 1 (cont.): Air Pollutants

Air Pollutant	Averaging Time	California Standard	National Standard ^a	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Sulfates	24 Hour	25 µg/m ³	—	(a) Decrease in ventilatory function; (b) Aggravation of asthmatic symptoms; (c) Aggravation of cardio-pulmonary disease; (d) Vegetation damage; (e) Degradation of visibility; (f) Property damage.	The sulfate ion is a polyatomic anion with the empirical formula SO ₄ ²⁻ . Sulfates occur in combination with metal and/or hydrogen ions. Many sulfates are soluble in water.	Sulfates are particulates formed through the photochemical oxidation of sulfur dioxide. In California, the main source of sulfur compounds is combustion of gasoline and diesel fuel.
Lead ^b	30-day	1.5 µg/m ³	—	Lead accumulates in bones, soft tissue, and blood and can affect the kidneys, liver, and nervous system. It can cause impairment of blood formation and nerve conduction. The more serious effects of lead poisoning include behavior disorders, mental retardation, neurological impairment, learning deficiencies, and low IQs. Lead may also contribute to high blood pressure and heart disease.	Lead is a solid heavy metal that can exist in air pollution as an aerosol particle component. An aerosol is a collection of solid, liquid, or mixed-phase particles suspended in the air. Lead was first regulated as an air pollutant in 1976. Leaded gasoline was first marketed in 1923 and was used in motor vehicles until around 1970. Lead concentrations have not exceeded State or national air quality standards at any monitoring station since 1982.	Lead ore crushing, lead-ore smelting, and battery manufacturing are currently the largest sources of lead in the atmosphere in the United States. Other sources include dust from soils contaminated with lead-based paint, solid waste disposal, and crustal physical weathering. Lead can be removed from the atmosphere through deposition to soils, ice caps, oceans, and inhalation.
	Quarter	—	1.5 µg/m ³			
	Rolling 3-month average	—	0.15 µg/m ³			
Vinyl Chloride ^b	24 Hour	0.01 ppm	—	Short-term exposure to high levels of vinyl chloride in the air causes central nervous system effects, such as dizziness, drowsiness, and headaches. Epidemiological studies of occupationally exposed workers have linked vinyl chloride exposure to development of a rare cancer, liver angiosarcoma, and have suggested a relationship between exposure and lung and brain cancers.	Vinyl chloride, or chloroethene, is a chlorinated hydrocarbon and a colorless gas with a mild, sweet odor. In 1990, ARB identified vinyl chloride as a toxic air contaminant and estimated a cancer unit risk factor.	Most vinyl chloride is used to make polyvinyl chloride plastic and vinyl products, including pipes, wire and cable coatings, and packaging materials. It can be formed when plastics containing these substances are left to decompose in solid waste landfills. Vinyl chloride has been detected near landfills, sewage plants, and hazardous waste sites.

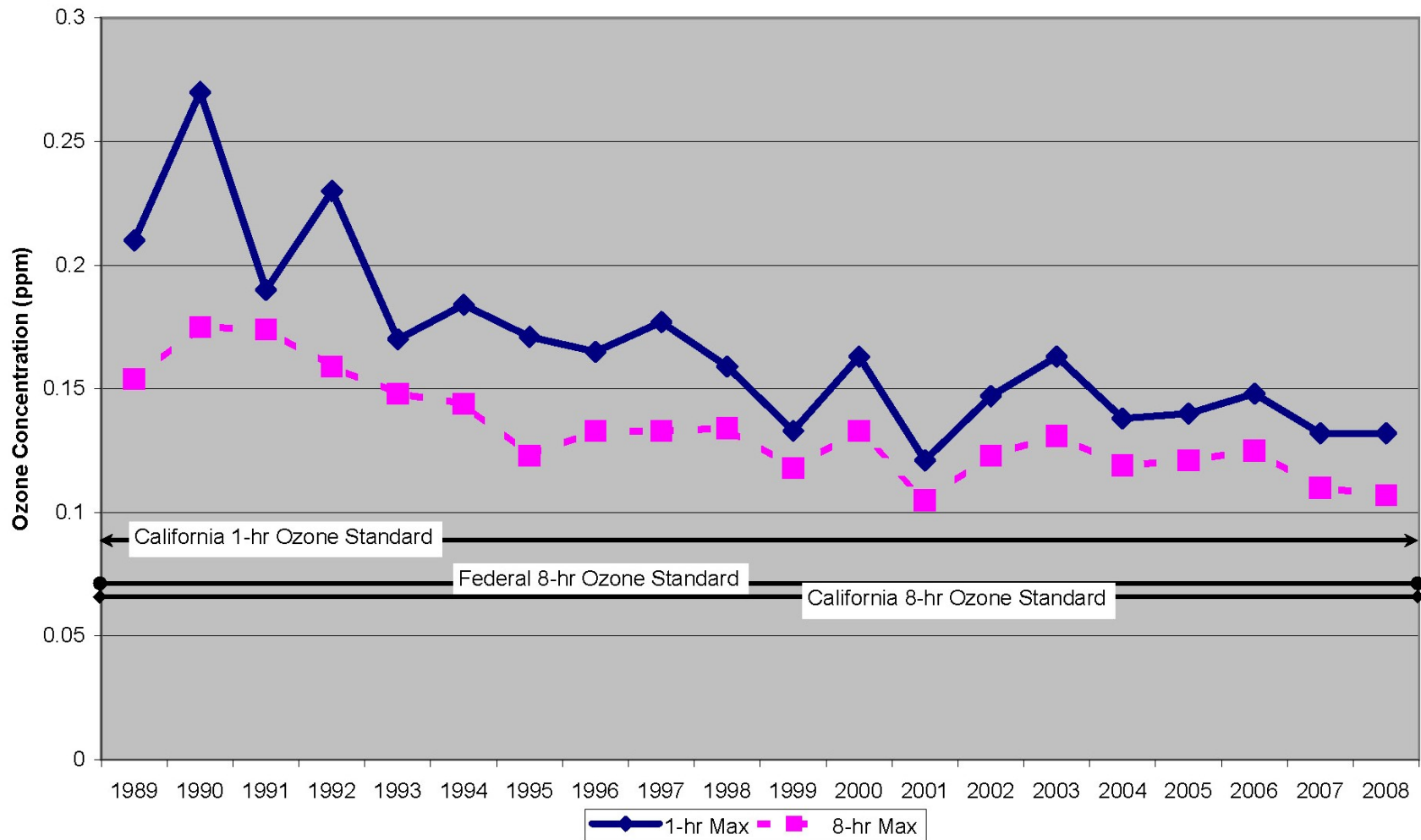
Table 1 (cont.): Air Pollutants

Air Pollutant	Averaging Time	California Standard	National Standard ^a	Most Relevant Effects from Pollutant Exposure	Properties	Sources
Hydrogen Sulfide	1 Hour	0.03 ppm	—	High levels of hydrogen sulfide can cause immediate respiratory arrest. It can irritate the eyes and respiratory tract and cause headache, nausea, vomiting, and cough. Long exposure can cause pulmonary edema.	Hydrogen sulfide (H ₂ S) is a flammable, colorless, poisonous gas that smells like rotten eggs.	Manure, storage tanks, ponds, anaerobic lagoons, and land application sites are the primary sources of hydrogen sulfide. Anthropogenic sources include the combustion of sulfur containing fuels (oil and coal).
Visibility Reducing Particles	8 Hour California Standard: Extinction coefficient of 0.23 per kilometer — visibility of ten miles or more (0.07 — 30 miles or more for Lake Tahoe) due to particles when relative humidity is less than 70 percent.		None	Haze is caused when sunlight encounters tiny pollution particles in the air, which reduce the clarity and color of what we see, and particularly during humid conditions. Since 1988, the federal government has been monitoring visibility in national parks and wilderness areas. Visibility is often characterized by “visual range” (VR). VR is the maximum distance at which a person can barely perceive a dark object. The ability to perceive an object is determined by the difference in contrast between the object and the background. A 2 percent contrast is considered barely perceptible, and typically at least 5 percent change in contrast is needed. The less water vapor, sea salt particulate, and pollutants in the air, the greater the VR. VRs of up to approximately 150 miles can occur in clean desert areas where there is very low relative humidity. In coastal regions, however, the occurrence of sea salt particulate and water vapor significantly reduces the maximum VR that could occur.		
Diesel Particulate Matter (DPM)	There are no ambient air quality standards for DPM.		Some short-term (acute) effects of diesel exhaust exposure include eye, nose, throat, and lung irritation, and can cause coughs, headaches, light-headedness, and nausea. Studies have linked elevated particle levels in the air to increased hospital admissions, emergency room visits, asthma attacks, and premature deaths among those suffering from respiratory problems. Human studies on the carcinogenicity of DPM demonstrate an increased risk of lung cancer, although the increased risk cannot be clearly attributed to diesel exhaust exposure.	DPM is a source of PM _{2.5} —diesel particles are typically 2.5 microns and smaller. Diesel exhaust is a complex mixture of thousands of particles and gases that is produced when an engine burns diesel fuel. Organic compounds account for 80 percent of the total particulate matter mass, which is comprised of compounds such as hydrocarbons and their derivatives, and polycyclic aromatic hydrocarbons (PAHs) and their derivatives. Fifteen PAHs are confirmed carcinogens, a number of which are found in diesel exhaust.	Diesel exhaust is a major source of ambient particulate matter pollution in urban environments. In 2002 in the South Coast Air Basin, the main sources of diesel particulate matter were due to the combustion of diesel fuel in diesel-powered engines. Such engines can include on-road vehicles like diesel trucks, off-road construction vehicles, diesel electrical generators, and various pieces of stationary construction equipment.	
Abbreviations:						

Table 1 (cont.): Air Pollutants

Air Pollutant	Averaging Time	California Standard	National Standard ^a	Most Relevant Effects from Pollutant Exposure	Properties	Sources
ppm = parts per million (concentration) $\mu\text{g}/\text{m}^3$ = micrograms per cubic meter Annual = Annual Arithmetic Mean 30-day = 30-day average Quarter = Calendar quarter a) National standard refers to the primary national ambient air quality standard, or the levels of air quality necessary, with an adequate margin of safety to protect the public health. All standards listed are primary standards except for 3 Hour SO_2, which is a secondary standard. A secondary standard is the level of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. b) The ARB has identified lead and vinyl chloride as 'toxic air contaminants' with no threshold level of exposure for adverse health effects determined. These actions allow for the implementation of control measures at levels below the ambient concentrations specified for these pollutants. c) EPA is proposing to establish a new 1-hour nitrogen dioxide standard at a level between 0.08 to 0.10 ppm. This standard would protect against health effects associated with short-term exposures to nitrogen dioxide, which are generally highest on and near major roads. Source of effects: SCAQMD 2007; OEHA 2002; ARB 2009a; EPA 2007; EPA 2000; NTP 2005a. Source of standards: ARB 2008a. Source of properties and sources: EPA 1997a; EPA 1999; EPA 2002; EPA 2003a; EPA 2008; EPA 2009a; EPA 2009b; NTP 2005b.						

Trend in Maximum 1-hour and 8-hour Ozone at Hesperia



As shown in Exhibit 4, PM₁₀ concentrations in Hesperia have remained somewhat variable over the past 20 years. Annual average and 24 hour average concentrations are generally over the PM₁₀ State standards.

Table 2: Air Quality Monitoring Summary

Air Pollutant, Location	Averaging Time (Units)	2006	2007	2008
Ozone, Hesperia	Max 1 Hour (ppm)	0.148	0.132	0.132
	Days > State Standard (0.09 ppm)	22	24	29
	Max 8 Hour (ppm)	0.125	0.110	0.107
	Days > State Standard (0.07 ppm)	76	75	80
	Days > National Standard (0.075 ppm)	50	47	58
Carbon monoxide, Victorville	Max 1 Hour (ppm) ⁽¹⁾	2.23	2.30	1.49
	Max 8 Hour (ppm)	1.56	1.61	1.04
	Days > State Standard (9.0 ppm)	0	0	0
	Days > National Standard (9 ppm)	0	0	0
Nitrogen dioxide, Victorville	Mean (ppm)	0.020	0.018	0.016
	Max 1 Hour (ppm)	0.079	0.071	0.074
	Days > State Standard (0.18 ppm)	0	0	0
Sulfur dioxide, Victorville	Max 24 Hour (ppm)	0.005	0.005	0.002
	Days > State Standard (0.04 ppm)	0	0	0
	Days > National Standard (0.14 ppm)	0	0	0
	Mean (ppm)	0.001	0.001	0.001
Fine particulate matter (PM ₁₀), Hesperia	Annual Average (µg/m ³)	ID	29.2	ID
	24 Hour (µg/m ³)	56	99	81
	Days > State Standard (50 µg/m ³)	ID	24	ID
	Days > National Standard (150 µg/m ³)	0	0	0
Ultra fine particulate matter (PM _{2.5}), Victorville	Annual Average (µg/m ³)	10.4	9.7	ID
	24 Hour (µg/m ³)	22	28	19
	Days > National Standard (35 µg/m ³)	0	0	0
Abbreviations: > = exceed ppm = parts per million µg/m ³ = micrograms per cubic meter Note: ⁽¹⁾ 1-hour CO concentrations are not reported by the ARB. The 1-hour average was estimated by dividing the 8-hour average by a persistence factor of 0.7. ID = insufficient data ND = no data max = maximum State Standard = California Ambient Air Quality Standard National Standard = National Ambient Air Quality Standard Source: California Air Resources Board (ARB 2010).				

2.1.3 - Attainment Status

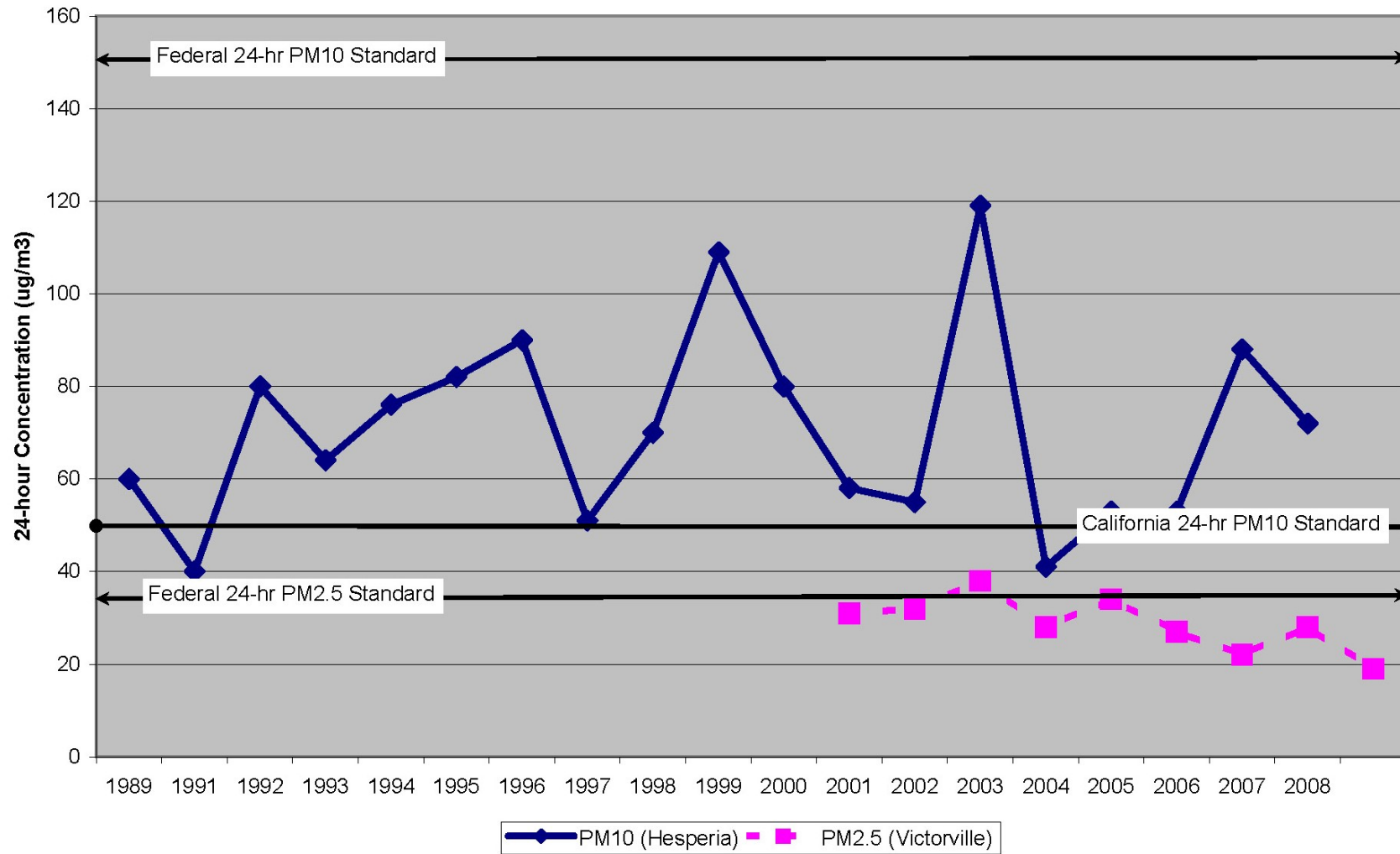
The EPA and the ARB designate air basins as attainment, nonattainment, or unclassified. National nonattainment areas are further designated as marginal, moderate, serious, severe, or extreme as a function of deviation from standards. The current attainment designations for the Mojave Desert Air

Basin (the MDAQMD portion) are shown in Table 3. The basin is designated as nonattainment for the ozone and PM₁₀.

Table 3: Mojave Desert Air Basin Attainment Status

Ambient Air Quality Standard	Attainment Status
Ozone, 8-hour (national)	Nonattainment; classified Severe-17 (portion of MDAQMD outside of Western Mojave Desert Ozone Non-attainment Area is unclassified/attainment)
Ozone (state)	Nonattainment; classified Moderate
PM ₁₀ (national)	Nonattainment; classified Moderate (portion of MDAQMD in Riverside County is unclassified, and the portion in the Searles Valley is attainment)
PM _{2.5} (national)	Unclassified/attainment
PM _{2.5} (state)	Nonattainment (portion of MDAQMD outside of Western Mojave Desert Ozone Nonattainment Area is unclassified/attainment)
Carbon monoxide (state and national)	Attainment
Nitrogen dioxide (state and national)	Attainment/unclassified
Sulfur dioxide (state and national)	Attainment/unclassified
Lead (state and national)	Attainment
Particulate sulfate (state)	Attainment
Hydrogen sulfide (state)	Unclassified (Searles Valley Planning Area is nonattainment)
Visibility reducing particles (state)	Unclassified
Source: MDAQMD 2009	

Trend in Maximum PM10 and PM2.5 Concentrations



Emissions Sources

The EPA has designated the Western Mojave Desert nonattainment area, which includes the City of Hesperia, as nonattainment for the federal 8-hour ozone air quality standard. The Western Mojave Desert nonattainment area includes parts of the San Bernardino County portion of the MDAQMD as well as the Antelope Valley portion of Los Angeles County.

In response to the EPA's designation as a nonattainment area for the federal ozone standard, the MDAQMD has prepared a number of implementation plans designed to show the current and future levels of air quality in the area and the means for attaining the federal ozone standard. The attainment plan was prepared in 2004 (MDAQMD 2004) and was subsequently updated in 2008 (MDAQMD 2008b).

Sources of criteria air pollutants in the MDAQMD nonattainment area include stationary, area, and mobile sources. Table 4 summarizes the emission levels in the San Bernardino County portion of the Mojave Desert Air Basin for the year 2008 as prepared by the ARB.

Table 4: 2008 Annual Average Emissions – San Bernardino County Portion of the MDAB

Sources	Daily Emissions (tons/day)							
STATIONARY SOURCES	TOG	ROG	CO	NO _x	SO _x	PM	PM ₁₀	PM _{2.5}
Fuel Combustion	3.1	0.6	5.1	18.4	1.3	7.7	4.8	3.6
Waste Disposal	20.9	0.2	0.1	0.1	0.1	0.0	0.0	0.0
Cleaning and Surface Coatings	2.8	2.1	-	-	-	0.2	0.2	0.2
Petroleum Production and Marketing	8.7	3.0	0.0	0.0	-	0.0	0.0	0.0
Industrial Processes	2.4	1.8	9.4	37.3	2.5	40.1	23.3	13.1
* TOTAL STATIONARY SOURCES	37.9	7.7	14.6	55.8	3.9	48.1	28.3	16.8
AREAWIDE SOURCES	TOG	ROG	CO	NO _x	SO _x	PM	PM ₁₀	PM _{2.5}
Solvent Evaporation	5.3	4.8	-	-	-	-	-	-
Miscellaneous Processes	13.2	2.7	14.1	1.3	0.0	160.5	83.6	12.9
* TOTAL AREAWIDE SOURCES	18.6	7.5	14.1	1.3	0.0	160.5	83.6	12.9
MOBILE SOURCES	TOG	ROG	CO	NO _x	SO _x	PM	PM ₁₀	PM _{2.5}
On-road Motor Vehicles	15.3	13.7	142.2	73.5	0.1	3.6	3.6	3.0
Other Mobile Sources	26.8	24.7	76.1	32.6	0.5	1.8	1.8	1.5
* TOTAL MOBILE SOURCES	42.2	38.4	218.3	106.1	0.6	5.4	5.3	4.5
TOTAL SAN BERNARDINO COUNTY IN MOJAVE DESERT AIR BASIN	98.6	53.6	247.0	163.1	4.6	214.1	117.2	34.2
Source: ARB 2009b								

Generally speaking, the highest levels of VOC, NO_x, and CO are due to mobile sources while the highest emission levels of PM₁₀ and PM_{2.5} are attributable to miscellaneous area sources such as unpaved road dust, wood fireplace usage, paved road dust, and construction and demolition.

Toxic Air Contaminants

Concentrations of TACs, or in federal parlance, hazardous air pollutants, are also used as indicators of ambient air quality conditions. A TAC is defined as an air pollutant that may cause or contribute to an increase in mortality or in serious illness, or that may pose a hazard to human health. TACs are usually present in minute quantities in the ambient air; however, their high toxicity or health risk may pose a threat to public health even at low concentrations.

According to the California Almanac of Emissions and Air Quality (ARB 2009c), the majority of the estimated health risk from TACs can be attributed to relatively few compounds, the most important being particulate matter from diesel-fueled engines (DPM). DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances. DPM is emitted by diesel-fueled internal combustion engines although the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

Unlike the other TACs, no ambient monitoring data are available for DPM because no routine measurement method currently exists. However, the ARB has made preliminary concentration estimates based on a PM exposure method. This method uses the ARB emissions inventory's PM₁₀ database, ambient PM₁₀ monitoring data, and the results from several studies to estimate concentrations of DPM. In addition to DPM, the TACs for which data are available that pose the greatest existing ambient risk in California are benzene, 1,3-butadiene, acetaldehyde, carbon tetrachloride, hexavalent chromium, para-dichlorobenzene, formaldehyde, methylene chloride, and perchloroethylene. The ARB estimates that 78 percent of the known statewide cancer risk from these 10 TACs is attributable to DPM alone. The other 9 TACs are not expected to be emitted in significant quantities due to implementation of the proposed General Plan. Since these compounds represent a lower fraction of the risk and are not associated with the proposed land uses, a detailed discussion is not provided for the remaining TACs.

DPM poses the greatest health risk among these ten TACs monitored by the ARB. Based on information developed by the ARB, the estimated the airborne cancer risk due to the inhalation exposure to toxic air contaminants in the region including the City is in the range of 50 to 100 excess cancer cases per million people in 2010¹. This compares to the estimated risk of 100 to 250 excess cancer cases per million people estimate in the year 2001 (ARB 2009d). The ARB estimates that the state-wide average risk due to exposure to TACs is 680 excess cancer cases per million people based

¹ Cancer risk is expressed as a probability of an individual out of a population of one million contracting cancer via a continuous exposure to TACs over a 70-year lifetime.

on cancer risk estimates in 2007 (ARB 2009c). However, the magnitude of the health risk impact is highly dependent on the proximity of the receptor to the source of TAC emission.

Toxic emissions within the Planning Area come from a variety of emission sources including diesel-powered trucks and construction equipment, rail locomotives, dry cleaners, cement manufacturing, plating operations, gasoline service stations, gasoline fugitive emissions and gasoline motor vehicle exhaust, off-road recreational vehicles, agricultural waste burning, open burning associated with forest management, and woodstoves and fireplaces, and consumer product usage. Diesel particulate matter is the dominant TAC within the Planning Area

Sensitive Receptors

Some members of the population are especially sensitive to air pollutant emissions and should be given special consideration when evaluating air quality impacts from projects. These people include children, the elderly, persons with preexisting respiratory or cardiovascular illness, and athletes and others who engage in frequent exercise. Structures that house these persons or places where they gather are defined as sensitive receptors.

Residential areas are considered sensitive to air pollution because residents (including children and the elderly) tend to be at home for extended periods of time, resulting in sustained exposure to any pollutants present. Recreational land uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation. Industrial and commercial areas are considered the least sensitive to air pollution. Exposure periods are relatively short and intermittent as the majority of the workers tend to stay indoors most of the time. In addition, the working population is generally the healthiest segment of the public. There are numerous types of these receptors throughout the City. with designations that accommodate residential, public institution, and open space uses (i.e., areas most likely to contain sensitive land uses such as residences, day care centers, senior facilities, hospitals, and parks).

2.2 - Regulatory Setting

Air pollutants are regulated at the national, State, and air basin level; each agency has a different level of regulatory responsibility. USEPA regulates at the national level. The ARB regulates at the State level. The MDAQMD regulates at the air basin level.

2.2.1 - National Regulation

The Federal Clean Air Act, adopted in 1970 and amended twice thereafter (including the 1990 amendments), establishes the framework for modern air pollution control. The Clean Air Act directs the EPA to implement the components of the Clean Air Act by handling global, international, national, and interstate air pollution issues and policies. The EPA also sets national vehicle and

stationary source emission standards, provides research and guidance for air pollution programs, and sets National Ambient Air Quality Standards (National standards), also known as federal standards. There are National standards for six common air pollutants, called criteria air pollutants, which were identified from provisions of the Clean Air Act. The criteria pollutants are:

- Ozone;
- Particulate matter (PM₁₀ and PM_{2.5});
- Nitrogen dioxide;
- Carbon monoxide (CO);
- Lead; and
- Sulfur dioxide.

The National standards were set to protect public health with an adequate margin of safety, including that of sensitive individuals. The standards are periodically updated as more medical research becomes available regarding the health effects of the criteria pollutants. The EPA also requires individual states to prepare state implementation plans in areas where the federal standards are exceeded. The State Implementation Plan (SIP), which is reviewed and approved by the EPA, must demonstrate how the federal standards will be achieved. Failing to submit a plan or secure approval could lead to the denial of federal funding and permits for such improvements as highway construction and sewage treatment plants. For cases in which the SIP is submitted by the State but fails to demonstrate achievement of the standards, the EPA is directed to prepare a federal implementation plan or EPA can “bump up” the air basin in question to a classification with a later attainment date that allows time for additional reductions needed to demonstrate attainment. SIPs are not single documents. They are a compilation of new and previously submitted plans, programs (such as monitoring, modeling, permitting, etc.), district rules, state regulations and federal controls.

2.2.2 - State Regulation

The ARB is the agency responsible for coordination and oversight of state and local air pollution control programs in California and for implementing the California Clean Air Act (CCAA). The CCAA, which was adopted in 1988, required the ARB to establish the California Ambient Air Quality Standards (CAAQS). ARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing PM, and the above-mentioned criteria air pollutants.

In most cases, the CAAQS are more stringent than the National standards. Differences in the standards are generally explained by the health effects studies considered during the standard-setting process and the interpretation of the studies. In addition, the CAAQS incorporate a margin of safety to protect sensitive individuals.

The CCAA requires that all local air districts in the state endeavor to achieve and maintain the CAAQS by the earliest practical date. The act specifies that local air districts should focus particular

attention on reducing the emissions from transportation and areawide emission sources, and provides districts with the authority to regulate indirect sources.

Among the ARB's other responsibilities are overseeing local air district compliance with California and federal laws; approving local air quality plans; submitting the State Implementation Plan to EPA; monitoring air quality; determining and updating area designations and maps; and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

California is divided into 35 Air Pollution Control Districts and Air Quality Management Districts, which are also called air districts. These agencies are county or regional governing authorities that have primary responsibility for controlling air pollution from various sources in the regions under their jurisdiction.

The ARB and local air pollution control districts are currently developing plans for meeting the national air quality standards for ozone and PM_{2.5}. California's adopted 2007 State Strategy was submitted to the EPA as a revision to the 2003 State Implementation Plan in November 2007 (ARB 2008f).

The ARB develops regulations that pertain to air quality sources within the City of Hesperia. The following are just some of the ARB regulations.

ARB Regulation for In-Use Off-Road Diesel Vehicles. On July 26, 2007, the ARB adopted a regulation to reduce diesel particulate matter and NO_x emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. The regulation imposed limits on idling, buying older off-road diesel vehicles, and selling vehicles beginning in 2008; requires all vehicles to be reported to ARB and labeled in 2009; and then in 2010 begins gradual requirements for fleets to clean up their fleet by getting rid of older engines, using newer engines, and installing exhaust retrofits. The regulation requires equipment to be retrofitted or retired. The regulation takes effect in phases, requiring the largest fleets to comply by 2010, medium fleets by 2013, and smaller fleets by 2015.

ARB Airborne Toxic Control Measure to Limit Diesel-Fueled Commercial Motor Vehicle Idling adopts new section 2485 within Chapter 10, Article 1, Division 3, title 13 in the California Code of Regulations (ARB 2005b). The measure limits the idling of diesel vehicles to reduce emissions of toxics and criteria pollutants. The driver of any vehicle subject to this section: (1) shall not idle the vehicle's primary diesel engine for greater than five (5) minutes at any location; and (2) shall not idle a diesel-fueled auxiliary power system for more than five (5) minutes to power a heater, air conditioner, or any ancillary equipment on the vehicle if it has a sleeper berth and the truck is located within 100 feet of a restricted area (homes and schools).

ARB Final Regulation Order, Requirements to Reduce Idling Emissions from New and In-Use Trucks, would require that new 2008 and subsequent model-year heavy-duty diesel engines shall be equipped with an engine shutdown system that automatically shuts down the engine after 300 seconds of continuous idling operation once the vehicle is stopped, the transmission is set to “neutral” or “park”, and the parking brake is engaged. If the parking brake is not engaged, then the engine shutdown system shall shut down the engine after 900 seconds of continuous idling operation once the vehicle is stopped and the transmission is set to “neutral” or “park.”

Statewide Truck and Bus Rule. On December 12, 2008, the ARB approved a new regulation to significantly reduce emissions from existing on-road diesel vehicles operating in California. The regulation requires affected trucks and buses to meet performance requirements between 2011 and 2023. By January 1, 2023, all vehicles must have a 2010 model year engine or equivalent. The regulation applies to all on-road heavy-duty diesel fueled vehicles with a gross vehicle weight rating greater than 14,000 pounds, agricultural yard trucks with off-road certified engines, and certain diesel fueled shuttle vehicles of any gross vehicle weight rating. Out-of-state trucks and buses that operate in California are also subject to the regulation.

ARB Air Toxic Control Measure to Limit School Bus Idling and Idling at Schools, limits idling times for school buses, transit buses, and other commercial vehicles (gross vehicle weight greater than 10,001 pounds, except for pickup trucks) when they are stopping at a school or located within 100 feet of a school (schools at or below the 12th grade level). This regulation also requires that drivers of buses and commercial vehicles be informed of this regulation by the motor carrier (i.e., vehicle owner) and that the motor carrier keep records of compliance/noncompliance with this regulation.

Other State codes include:

California Health and Safety Code Section 42301.6. This Code requires an inventory of air toxics emissions from individual existing facilities, an assessment of health risks, and notification of potential significant health risks when found to be present. In addition, this Code requires new or modified sources of air contaminants within 1,000 feet from the outer boundary of a school to give public notice to the parents of the schoolchildren before an air pollution permit is granted.

California Education Code 17213 and Public Resources Code 21151.4. These codes require school districts to consider off-site sources of hazardous air emissions before acquiring property for a school site or approving an environmental impact report or negative declaration for a school site acquisition or new school construction project. These sections require school districts to consult with appropriate agencies to identify facilities including, but not limited to freeways and other busy traffic corridors, large agricultural operations, and rail yards within one fourth of a mile of a proposed school site that might reasonably be expected to emit hazardous air pollutants.

California Public Resources Code (Section 21151.8). This section requires, among other things, a demonstration using dispersion modeling that the air quality at the proposed school site is such that neither the short-term nor long-term exposures pose significant health risks to pupils for a school site boundary that is located within 500 feet of the edge of the closest lane of a freeway or other busy traffic corridor.

2.2.3 - Mojave Desert Air Quality Management District

The MDAQMD has jurisdiction over the desert portion of San Bernardino County and the far eastern end of Riverside County. This region includes the incorporated communities of Adelanto, Apple Valley, Barstow, Blythe, Hesperia, Needles, Twentynine Palms, Victorville, and Yucca Valley. This region also includes the National Training Center at Fort Irwin, the Marine Corps Air Ground Combat Center, the Marine Corps Logistics Base, the eastern portion of Edwards Air Force Base, and a portion of the China Lake Naval Air Weapons Station.

Under the CEQA, the MDAQMD is an expert commenting agency on air quality and related matters within its jurisdiction or impacting its jurisdiction. The MDAQMD reviews projects to ensure that they will not: (1) cause or contribute to any new violation of any air quality standard; (2) increase the frequency or severity of any existing violation of any air quality standard; or (3) delay timely attainment of any air quality standard or any required interim emission reductions or other milestones of any federal attainment plan. The MDAQMD has prepared CEQA Guidelines that are intended to assist persons preparing environmental analysis or review documents for any project within the jurisdiction of the MDAQMD by providing background information and guidance on the preferred analysis approach (MDAQMD 2009).

Air Plans

The City of Hesperia is within the Western Mojave Desert federal non-attainment area for 8-hour ozone (EPA 1997a). On June 9, 2008, the MDAQMD adopted a Federal 8-Hour Ozone Attainment Plan for the Western Mojave Desert non-attainment area (MDAQMD 2008a). The Western Mojave Desert non-attainment area includes part of the San Bernardino County portion of the MDAQMD as well as the Antelope Valley portion of Los Angeles County. The area was designed as non-attainment on April 15, 2004. The Plan (1) demonstrates that the MDAQMD will meet the primary required Federal ozone planning milestones, attainment of the 8-hour ozone national ambient air quality standard by June 2021; (2) presents the progress the MDAQMD will make towards meeting all required ozone planning milestones; and (3) discusses the newest 0.075 part per million 8-hour ozone national ambient air quality standard, preparatory to an expected non-attainment designation for the new national ambient air quality standard. Note that even though there is an ozone State ambient air quality standard (0.070 parts per million), this Plan does not address it.

On July 31, 1995, a Federal Particulate Matter (PM₁₀) Attainment Plan for the Mojave Desert Planning Area was adopted (MDAQMD 1995). The air quality of the MDAQMD is impacted by both fugitive dust from local sources and occasionally by region-wide wind blown fugitive dust

during moderate to high wind episodes. This region-wide or “regional” event includes contributions from both local and distant dust sources which frequently result in violations of the national ambient air quality standards that are multi-district and interstate in scope. The PM₁₀ Plan indicates that local sources will be controlled with a strategy that focuses on unpaved road travel, construction, and local disturbed areas in the populated areas, and certain stationary sources operating in the rural Lucerne Valley. It is not feasible, however, to implement control measures to reduce dust from regional wind events.

The nonattainment plans for the MDAB establishes a program of rules and regulations administered by MDAQMD to obtain attainment of the state and national air quality standards. The following are just some of the rules that apply to City related sources. For a complete and current listing of the MDAQMD rules, please refer to the MDAQMD Rule Book (MDAQMD 2010).

MDAQMD Rule 402

MDAQMD Rule 402 states the following:

A person shall not discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health or safety of any such persons or the public, or which cause, or have a natural tendency to cause, injury or damage to business or property.

MDAQMD Rule 403

MDAQMD Rule 403 governs emissions of fugitive dust. The rule states the following:

- a) A person shall not cause or allow the emissions of fugitive dust from any transport, handling, construction or storage activity so that the presence of such dust remains visible in the atmosphere beyond the property line of the emission source.
- b) A person shall take every reasonable precaution to minimize fugitive dust emissions from wrecking, excavation, grading, clearing of land and solid waste disposal operations.
- c) A person shall not cause or allow particulate matter to exceed 100 micrograms per cubic meter when determined as the difference between upwind and downwind samples collected on high volume samplers at the property line for a minimum of five hours.
- d) A person shall take every reasonable precaution to prevent visible particulate matter from being deposited upon public roadways as a direct result of their operations. Reasonable precautions shall include, but are not limited to, the removal of particulate matter from equipment prior to movement on paved streets or the prompt removal of any material from paved streets onto which such material has been deposited.

- e) Subsections (a) and (c) shall not be applicable when the wind speed instantaneously exceeds 40 kilometers (25 miles) per hour, or when the average wind speed is greater than 24 kilometers (15 miles) per hour. The average wind speed determination shall be on a 15-minute average at the nearest official air-monitoring station or by wind instrument located at the site being checked.

MDAQMD Rule 1303

Rule 1303 indicates that any Permit Unit or Modified Permit Unit that has the potential to emit more than 25 pounds per day of any nonattainment pollutant shall be equipped with Best Available Control Technology. The rule also indicates that any new or modified Facility with the potential to emit more than 25 tons per year of any nonattainment pollutant shall be equipped with Best Available Control Technology. The rule also indicates that any new or modified facility with emissions greater than the following shall obtain offsets as specified in Rule 1304:

- Carbon monoxide - 100 tons per year;
- Hydrogen sulfide - 10 tons per year;
- Lead - 0.6 tons per year;
- PM₁₀ - 15 tons per year;
- NO_x - 25 tons per year;
- SO_x - 25 tons per year; and
- Reactive organic compounds - 25 tons per year.

2.2.4 - City of Hesperia

The City is the land use authority for all incorporated lands within its borders. The City is required by the State to develop long term comprehensive planning for these lands. To satisfy this requirement the City originally adopted the Hesperia General Plan (City of Hesperia 1991 and 2001). Within the General Plan, there are requirements for planned projects, which specifically address air quality. There are also multiple components of the City's planning and development process that affect air quality generation by development in the City, including (but not limited to): the actions by the Planning Department, Public Works Department, Planning Commission, and City Council. In addition, the City promulgates and enacts standards and ordinances that regulate land use and operational activities within the City.

Current General Plan

The current Hesperia General Plan first adopted in 1991 and amended in 2001 contains a number of goals, objectives and policies that apply to air quality impacts in conjunction with ultimate build-out of the City in accordance with the General Plan. The specific policies listed below contained in the Land Use, Circulation, Safety, Open Space, Conservation Elements are designed to ensure that air quality impacts are minimized as development occurs. The relevant objectives and policies relating to air quality are summarized below.

Table 5: Air Quality Components of the 1991 and 2001 City of Hesperia General Plan Elements

Element	Policy	Action
Land Use	Policy LP3	LP3d(3): Require that new industrial uses meet requirements of the Air Quality District LP3d(6): Adopt performance standards for noise, odor, emissions, vibrations, glare, radiation, and other potential impacts of industrial development.
Circulation	Policy CP1	CP1d: Minimize the number, properly space, and interconnect traffic signals, in order to maximize progression and minimize the acceleration/deceleration that produces significantly higher vehicular emission and noise levels. CP1f: Require development and implementation of Transportation Management Plans for key industrial and office areas, which are designed to reduce peak hour traffic and vehicle miles of travel.
	Policy CP6	CP6a: Maintain modified work schedule options for City employees and contracted activities. CP6c: Adopt ordinances as needed to implement the provisions of the Air Pollution Control District Air Quality Attainment Plan for the Mojave Desert Air Basin, addressing parking management, merchant incentives and auto use restrictions
Conservation	Policy CNI	CNI11: Participation with the San Bernardino County Air Pollution Control District in formulating and implementing an Air Quality Plan for the Victor Valley.
	Policy CNP1	CNP1c: Through the environmental review process, minimize the disruption and degradation of environmental systems as land development occurs CNP1d: Discourage establishment of uses having a high potential for pollution of air and groundwater resources within the community. CNP1e: Adopt and enforce performance standards for industrial uses to assure an acceptable conformance with environmental standards.
	Policy CNP5	CNP5a: Establish performance standards for new industrial development to regulate emissions and particulates. CNP5b: Utilize and adhere to standards established by the Southeast Desert Air Basin. CNP5c: Establish land use policies which minimize degradation of air quality through reduction of vehicle trips and more efficient traffic flow. CNP5d: Require use of dust palliatives on construction sites to reduce or eliminate fugitive dust emissions CNP5h: Increase citizen awareness and participation in efforts to reduce air pollution.

Element	Policy	Action
		CNP5i: Maintain a balance between the achievement of clean air and the other major goals of the community. CNP5j: Coordinate air quality planning and implementation efforts with other responsible agencies, including SCAG, SANBAG, APCD, and other high desert cities. CNP5j(1): Participate in development, adoption and implementation of Air Quality Improvement Strategies. CNP5j(2): Participate in formulation and adoption of the Air Pollution Control District's Plan to attain state ambient air quality standards required by the California Clean Air Act of 1988. CNP5k: Restrict or prohibit open burning
Source: City of Hesperia General Plan 1991 and Adopted Circulation Element 2001		

Climate Action Plan

The City of Hesperia Climate Action Plan contains various implementation strategies that would also reduce air pollutant emissions. Many of the strategies attempt to encourage people to drive less and use alternative transportation through the City's authority over land use. These strategies include:

- CAP-1: Reductions from the State Scoping Plan Measures including expanding and strengthening existing energy efficiency programs, implementation of passenger vehicle efficiency and emission standards, low carbon fuel standards, refrigeration management, and renewable energy portfolio standard
- CAP-2: Encouraging mixed use development in new development and redevelopment areas
- CAP-3: Increase in transit use to encourage transit ridership in developing residential and commercial centers
- CAP-4: Promote compact development by protecting open space and encouraging infill and redevelopment of underutilized parcels in urbanized areas
- CAP-5: Provide pedestrian connections in new and existing development to improve pedestrian mobility and accessibility.
- CAP-6: Increase bicycle use through a safe and well-connected system of bicycle paths and end of trip facilities.
- CAP-7: Use traffic calming measures to improve traffic flow, pedestrian orientation, and bicycle use.
- CAP-8: Use parking facility designs and parking management to reduce vehicle trips
- CAP-9: Increase the use of energy conservation features and renewable sources of energy.
- CAP-10: Reduce energy use from the transport and treatment of water.

- CAP 11: Improve the City's recycling and source reduction programs to make continued progress in minimizing waste.
- CAP-12: Participate in regional programs and initiatives that reduce greenhouse gas emissions
- CAP-13: Reduce greenhouse gas emissions from City government operations
- CAP-14: Improve the City's adaptation to climate change effects.

Other Air Quality Concerns

Asbestos is the name given to a number of naturally occurring fibrous silicate minerals that have been mined for their useful properties such as thermal insulation, chemical and thermal stability, and high tensile strength. The three most common types of asbestos are chrysotile, amosite, and crocidolite. Chrysotile, also known as white asbestos, is the most common type of asbestos found in buildings. Chrysotile makes up approximately 90 to 95 percent of all asbestos contained in buildings in the United States. Project construction sometimes requires the demolition of existing buildings where construction occurs. Buildings often include materials containing asbestos and the project may involve the demolition of existing structures where asbestos has been identified. Asbestos is also found in a natural state, known as naturally occurring asbestos. Exposure and disturbance of rock and soil that naturally contain asbestos can result in the release of fibers to the air and consequent exposure to the public. Asbestos most commonly occurs in ultramafic rock that has undergone partial or complete alteration to serpentine rock (serpentinite) and often contains chrysotile asbestos. In addition, another form of asbestos, tremolite, can be found associated with ultramafic rock, particularly near faults. Sources of asbestos emissions include unpaved roads or driveways surfaced with ultramafic rock, construction activities in ultramafic rock deposits, or rock quarrying activities where ultramafic rock is present. The Department of Conservation, Division of Mines and Geology published a guide entitled, "A General Location Guide For Ultramafic Rocks In California - Areas More Likely To Contain Naturally Occurring Asbestos", dated August 2000, for generally identifying areas that are likely to contain naturally occurring asbestos. According to the California Division of Mines and Geology, rock formations that contain naturally occurring asbestos are known to be present in 44 of California's 58 counties. The Guide has not identified San Bernardino County or the City of Hesperia as a location with naturally occurring asbestos. In July 2001, ARB approved an Air Toxic Control Measure for construction, grading, quarrying and surface mining operations to minimize Naturally Occurring Asbestos emissions. The regulation requires application of best management practices to control fugitive dust in areas known to have Naturally Occurring Asbestos, as well as requiring notification to the local air district prior to commencement of ground-disturbing activities. In addition, the MDAQMD requires prior notification of asbestos removal and that asbestos surveys to be conducted prior to renovation and demolition. Asbestos must be removed prior to activities that may disturb it.

SECTION 3: THRESHOLDS

3.1 - CEQA Guidelines

The following significance thresholds are contained in Appendix G of the CEQA Guidelines and are applicable to the proposed Project. A significant impact would occur if the project would:

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

CEQA Guidelines define a significant effect on the environment as “a substantial, or potentially substantial, adverse change in the environment.” To determine if a project would have a significant impact on air quality, the type, level, and impact of emissions generated by the project must be evaluated.

3.2 - Mojave Desert Air Quality Management District Thresholds

While the final determination of whether a project is significant is within the purview of the Lead Agency pursuant to Section 15064(b) of the CEQA Guidelines, the MDAQMD recommends that its quantitative air pollution thresholds be used to determine the significance of project emissions. If the Lead Agency finds that the project has the potential to exceed these air pollution thresholds, the project should be considered to have significant air quality impacts.

The MDAQMD CEQA Guidelines define the following four significance thresholds. In addition, the MDAQMD has defined daily and annual emission significance thresholds that are shown in Table 6.

Any project is significant if it:

- 1. Generates total emissions (direct and indirect) in excess of the thresholds given in Table 6 below; and/or,
- 2. Generates a violation of any ambient air quality standard when added to the local background; and/or,

3. Does not conform with the applicable attainment or maintenance plan(s)²; and/or,
4. Exposes sensitive receptors to substantial pollutant concentrations, including those resulting in a cancer risk greater than or equal to 10 in a million and/or a Hazard Index (HI) (non-cancerous) greater than or equal to 1. (See Sensitive Receptor discussion below)

A project found to have a significant impact must incorporate mitigation sufficient to reduce its impact to a level that is not significant. A project that cannot be mitigated to a level that is not significant must incorporate all feasible mitigation. Note that the emission thresholds below are given as a daily value and an annual value, so that multi-phased project (such as project with a construction phase and a separate operational phase) with phases shorter than one year can be compared to the daily value.

Table 6: MDAQMD Thresholds

Pollutant	Annual Threshold (tons)	Daily Threshold (pounds)
Carbon monoxide (CO)	100	548
Oxides of nitrogen (NO _x)	25	137
Volatile organic compounds (VOC)	25	137
Oxides of sulfur (SO _x)	25	137
Particulate matter (PM ₁₀)	15	82
Particulate matter (PM _{2.5})	15	82
Hydrogen sulfide (H ₂ S)	10	54
Lead (Pb)	0.6	3
Source: MDAQMD 2009.		

Sensitive Receptor Land Uses

Residences, schools, daycare centers, playgrounds and medical facilities are considered sensitive receptor land uses. The following project types proposed for sites within the specified distance to an existing or planned (zoned) sensitive receptor land use must be evaluated using significance threshold criteria number 4 (see above):

- Any industrial project within 1000 feet;
- A distribution center (40 or more trucks per day) within 1000 feet;
- A major transportation project (50,000 or more vehicles per day) within 1000 feet;
- A dry cleaner using perchloroethylene within 500 feet;
- A gasoline dispensing facility within 300 feet.

² A project is deemed to not exceed this threshold, and hence not be significant, if it is consistent with the existing land use plan. Zoning changes, specific plans, general plan amendments and similar land use plan changes which do not increase dwelling unit density, do not increase vehicle trips, and do not increase vehicle miles traveled are also deemed to not exceed this threshold.

3.3 - Carbon Monoxide Hot Spot Analysis Threshold

A carbon monoxide “hot spot” refers to a traffic intersection where existing or forecasted traffic volumes could generate carbon monoxide emissions that have the potential to exceed the State or federal carbon monoxide ambient air quality standards. Such emissions result primarily at intersections that experience heavy traffic volumes in excess of the capacity of the intersection to accommodate such traffic. At these intersections, the combination of stagnant and calm weather conditions and lines of idling traffic could result in the potential to exceed the ambient air quality standards. Project concentrations may be considered significant if a CO hot spot intersection analysis determines that project generated CO concentrations cause a localized violation of the State CO 1-hour standard of 20 parts per million (ppm), State CO 8-hour standard of 9 ppm, national CO 1-hour standard of 35 ppm, or national CO 8-hour standard of 9 ppm.

SECTION 4: ESTIMATION OF PROJECT EMISSIONS

This section provides an estimate of the criteria pollutant emissions for the existing conditions in the Planning Area as well as for two future conditions identified as the Existing General Plan and the Proposed General Plan Update. Table 7 provides a summary of the existing conditions regarding population, employment, and dwelling units and compares them to the build out conditions under the Existing General Plan and the Proposed General Plan Update for the Planning Area. Also shown are the differences between the two general plan build out conditions.

Table 7: Comparison of Existing and Build Out Conditions

Metric	Current Conditions	Existing General Plan	Proposed General Plan Update	Difference Between General Plans
Population	102,600	242,600	243,465	+1,005
Employment	31,600	76,844	76,149	-695
Dwelling Units	34,550	79,648	79,855	+207
Source: City of Hesperia General Plan Update 2010				

As noted from the above table, the differences in population, employment, and dwelling units are very small, less than one percent. The most significant changes from the original 1991 General Plan focus on the development along the Interstate 15 freeway corridor. This area was modified through the recently adopted Main Street and Freeway Corridor Specific Plan and accompanying General Plan amendment and is now part of the existing General Plan and reflected in the Southern California Association of Government's Regional Transportation Plan.

4.1 - Construction

Implementation of the Existing General Plan and the Proposed General Plan Update would result in new emissions being generated from construction activities. Major construction activities would include:

- Demolition of existing structures;
- Grading;
- Trenching for utilities;
- Building construction of the onsite structures;
- Asphalt paving of parking lots, driveways, and roadways; and
- Application of architectural coatings on exterior and interior surfaces.

Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of operation, and prevailing weather conditions. Construction emissions result from both onsite and offsite activities. Onsite emissions principally consist of exhaust emissions (NO_x,

SO_x, CO, VOC, PM₁₀, and PM_{2.5}) from heavy-duty construction equipment, motor vehicle operation, and fugitive dust (mainly PM₁₀) from disturbed soil. Additionally, paving operations and application of architectural coatings release VOC emissions. Offsite emissions are caused by motor vehicle exhaust from delivery vehicles, worker traffic, and road dust (PM₁₀ and PM_{2.5}).

In the case of the Proposed General Plan Update, which is an individual project under CEQA, it is expected that a number of construction projects could occur every year throughout the duration of the General Plan Update time horizon. Obviously, the same is true for development that would take place under the Existing General Plan. It would be difficult, if not impossible, to quantify the emissions at any specific juncture in time related to construction activities under the proposed General Plan Update as the amount and timing of each construction event is not known at this time.

4.2 - Operations

Operational or long-term emissions occur over the life of the project. Operational emissions include area and mobile source emissions. Area source emissions come from consumer product usage, mining and mineral processing, fireplace usage, heaters that consume natural gas for heating, gasoline-powered landscape equipment, consumer product usage, and application of architectural coatings (painting). Mobile emissions from on-road motor vehicles are the largest single long-term source of air pollutants from the proposed Project. Other mobile source emissions result from off-road vehicles and rail locomotives.

Operational emissions associated with the General Plan were evaluated for the following three scenarios:

- Current 2009 conditions;
- Existing General Plan Build Out; and
- Proposed General Plan Update.

The analysis of the operational emissions evaluated the following pollutants:

- Reactive organic gases (ROG);
- Nitrogen oxides (NO_x);
- Carbon monoxide (CO);
- Sulfur oxides (SO_x);
- Inhalable particulate matter (PM₁₀); and
- Fine particulate matter (PM_{2.5}).

Various sources of information were accessed to generate the respective emission inventories. These sources included Hesperia General Plan Update Transportation Technical Report (Kimley-Horn 2009), demographics information provided by the Hesperia Unified School District (HUSD 2010), California Department of Transportation, emission information from the ARB, and the draft Hesperia

General Plan Update Project Description and Land Use Element. Note that because the levels of SO_x are extremely low in the City, no further discussion of SO_x emissions is provided.

4.2.1 - Existing Emissions - 2009

To provide a common baseline to characterize the existing environment, to the extent possible, all information to develop an existing emission inventory was scaled to be representative of an “existing” year of 2009.

Emissions from area sources within the project were derived from the URBEMIS2007 model, which is designed to estimate emissions from land use development projects based on the intensity of land use. Table 8 estimates the main land use categories and their size for the Planning Area for the year 2009.

Table 8: Land Use Summary for 2009 – Planning Area

Land Use	Metric	Value
Residential ⁽¹⁾	Dwelling units	
SDU		30,715
MDU		3,835
Total		34,550
Industrial/Office ⁽²⁾	Area	10.2 million sq-ft
Commercial ⁽²⁾	Area	10.1 million sq-ft
Schools ⁽²⁾	Students	
ES		9,632
MS		3,037
HS		8,292
Total		20,962
Notes: ⁽¹⁾ SDU = single dwelling unit and MDU = multiple dwelling unit ⁽²⁾ Estimates of land use area have been scaled to be representative of a year 2009 time period and taken from the Land Use Element ⁽³⁾ ES = elementary school; MS = middle school and HS = high school Source: see Appendix A		

The above land use amounts were entered into the URBEMIS land use emission model to derive an inventory of pollutant emissions from area sources generated within the Planning Area for the year 2009.

Mobile source emissions from on-road vehicles such as cars and trucks were derived from average daily vehicle miles traveled (VMT) for the City and County of San Bernardino as compiled by the California Department of Transportation (CDOT 2009). VMT information was not available from the transportation technical report. Alternatively, information derived from the CDOT reference indicates that in 2008, the City generated approximately 1.65 million daily vehicle miles travelled from all trips made within the Planning Area via rural, urban, and state highway travel. The 2008 VMT estimates were assumed to apply to the year 2009. The estimation of daily VMT along with mobile source emission factors derived from the ARB EMFAC2007 mobile source emission model were used to develop the on-road mobile source emission inventory

Finally, the ARB facility database was searched to identify individual stationary sources that provide emission reports to the ARB (ARB 2008b). Using this information, individual stationary emission sources and their emission levels were identified within the City. Seventeen such stationary sources were identified within the City for the year 2007, the last year of facility data available from the ARB.

Table 9 provides a summary of the maximum existing daily operational emissions for 2009 for the Planning Area.

Table 9: Daily Existing Emission Inventory – 2009

Emission Source	Maximum Daily Emissions (pounds per day)				
	VOC	NO _x	CO	PM ₁₀	PM _{2.5}
Area					
Natural gas combustion	64	841	420	2	2
Hearth fuel combustion	47,631	745	57,062	7,952	7,654
Landscape fuel combustion	258	14	1,435	4	4
Consumer/Architecture	2,018	0	0	0	0
Subtotal	49,971	1,600	58,917	7,958	7,660
Mobile					
On-Road Mobile	2,441	12,113	23,598	1,820	728
Identified Stationary Sources	215	18	5	179	95
Grand Total	52,627	23,151	82,520	9,957	8,484
Source: see Appendix A for calculation methods, assumptions, and results.					

Table 10 summarizes the annual emissions for the year 2009 for the Planning Area.

Table 10: Annual Existing Emission Inventory – 2009

Emission Source	Annual Emissions (tons per year)				
	VOC	NO _x	CO	PM ₁₀	PM _{2.5}
Area					
Natural gas combustion	12	153	77	0	0
Hearth fuel combustion	597	8	712	99	96
Landscape fuel combustion	47	2	262	1	1
Consumer/Architecture	368	0	0	0	0
Subtotal	1,024	164	1,051	100	97
Mobile					
On-Road Mobile	446	2,211	4,307	332	133
Identified Stationary Sources	39	3	1	33	19
Grand Total	1,509	2,377	5,359	465	247
Source: see Appendix A for calculation methods, assumptions, and results.					

As noted from Table 9, the highest daily VOC, CO, PM₁₀, and PM_{2.5} emissions result from area sources and most predominantly from the operation of the hearth sources such as wood-burning fireplaces, which are estimated to be a major source of emissions within the Planning Area. The highest NO_x emissions result from mobile emission sources and primarily from on-road motor vehicles. On an annual basis, the highest levels of emissions result from mobile sources.

4.2.2 - Existing General Plan

Future levels of emissions were also estimated for the Existing General Plan. Discussions with the City have indicated that there is no certainty as to an exact year in the future when the entire general

plan would be totally built out. The total build out would depend on a number of factors related to economic forces that would drive demand for new housing and commercial and industrial development. For purposes of estimating the future General Plan emissions for both the Existing General Plan and the Proposed General Plan Update, a target year of 2030 was assumed. This provides a conservative estimate for the estimation of emissions since the future rate of emissions from major emission sources such as mobile sources are expected to continue to decline beyond 2030.

The estimation of future emissions takes into account the emissions associated with the development of adopted specific plans including the Main Street/I-15 Corridor, Summit Valley Ranch, and Rancho Las Flores Specific Plans. Table 11 summarizes the land use distributions for the Existing General Plan.

Table 11: Land Use Summary for the Existing General Plan

Land Use	Metric	Value
Residential ^{(1),(2)}	Dwelling Units	
SDU		70,807
MDU		8,841
Total		79,648
Industrial/Office ⁽²⁾	Area	54.05 million sq-ft
Commercial ⁽²⁾	Area	46.92 million sq-ft
Schools ^{(2),(3)}	Students	
ES		32,561
MS		10,268
HS		20,889
Total		63,718
Notes: ⁽¹⁾ SDU = single dwelling unit and MDU = multiple dwelling unit ⁽²⁾ The Industrial/Office and Commercial land use categories include area estimates under the Main Street/I-15 Corridor, Summit Valley Ranch, and Rancho Las Flores Specific Plans ⁽²⁾ ES = elementary school; MS = middle school and HS = high school Source: see Appendix A		

Table 12 provides a summary of the maximum daily operational emissions for the Existing General Plan while Table 13 provides a similar table for the annual emissions for the Planning Area. Estimates daily VMT for the City were not available from the transportation technical report so an alternative method of estimating daily VMT was derived from the ARB EMFAC2007 mobile source emissions model. Using information derived from the California Department of Transportation and the ARB, future levels of VMT were estimated at approximately 3.056 million vehicle miles per day within the Planning Area for the Existing General Plan.

Table 12: Daily Emission Inventory for the Existing General Plan

Emission Source	Maximum Daily Emissions (pounds per day)				
	VOC	NO _x	CO	PM ₁₀	PM _{2.5}
Area					
Natural gas combustion	176	2,325	1,294	4	4
Hearth fuel combustion	109,804	1,717	131,545	18,332	17,644
Landscape fuel combustion	572	36	3,170	8	8
Consumer/Architecture	4,985	0	0	0	0
Subtotal	115,537	4,078	136,009	18,344	17,656
Mobile					
On-Road Mobile	1,101	4,149	9,711	2,266	656
Identified Stationary Sources	215	18	5	179	95
Grand Total	116,853	8,246	145,725	20,789	18,407
Source: see Appendix A for calculation methods, assumptions, and results.					

Table 13: Annual Emission Inventory for the Existing General Plan

Emission Source	Annual Emissions (tons per year)				
	VOC	NO _x	CO	PM ₁₀	PM _{2.5}
Area					
Natural gas combustion	32	424	236	1	1
Hearth fuel combustion	1,374	18	1,643	229	220
Landscape fuel combustion	104	7	579	2	2
Consumer/Architecture	910	0	0	0	0
Subtotal	2,420	449	2,458	232	223
Mobile					
On-Road Mobile	201	757	1,772	414	120
Identified Stationary Sources	39	3	1	33	17
Grand Total	2,660	1,210	4,231	678	360
Source: see Appendix A for calculation methods, assumptions, and results.					

As noted from Table 12, the highest daily VOC, CO, PM₁₀, and PM_{2.5} emissions result from area sources and most predominantly from the operation of the hearth sources such as wood-burning fireplaces located within the Planning Area. The highest NO_x emissions result from mobile emission sources and primarily from on-road motor vehicles. On an annual basis, the highest levels of emissions result from mobile sources.

Proposed General Plan Update

The results of the transportation alternatives analysis were used by the City's General Plan consultant and City staff (together with information from other components of the General Plan analysis) to develop a Proposed General Plan Update. Table 14 summarizes the future land use development of the Proposed General Plan Update. Because of the similarity in many land use aspects between the two 2030 General Plan scenarios, it was assumed that the daily VMT for the Planning Area was the

same in both General Plan scenarios since daily VMT levels were not available from the transportation technical study.

Table 14: Land Use Summary for the Proposed General Plan Update

Land Use	Metric	Value
Residential ^{(1),(2)}	Dwelling Units	
SDU		79,991
MDU		8,864
Total		79,855
Industrial/Office ⁽²⁾	Area	42.32 million sq-ft
Commercial ⁽²⁾	Area	49.94 million sq-ft
Schools ^{(2),(3)}	Students	
ES		32,646
MS		10,295
HS		20,943
Total		63,884
Notes: ⁽¹⁾ SDU = single family dwelling unit and MDU = multiple family dwelling unit ⁽²⁾ The Industrial/Office and Commercial land use categories include area estimates under the Main Street/I-15 Corridor, Ranch Valley, and Rancho Las Flores Specific Plans ⁽³⁾ ES = elementary school; MS = middle school and HS = high school Source: see Appendix A		

Table 15 provides a summary of the maximum daily operational emissions for the Proposed General Plan Update. Table 16 provides a similar summary for the annual emissions.

Table 15: Daily Emission Inventory for the Proposed General Plan Update

Emission Source	Maximum Daily Emissions (pounds per day)				
	VOC	NO _x	CO	PM ₁₀	PM _{2.5}
Area					
Natural gas combustion	171	2,259	1,237	4	4
Hearth fuel combustion	110,090	1,721	131,887	18,379	17,690
Landscape fuel combustion	573	36	3,178	8	8
Consumer/Architecture	4,939	0	0	0	0
Subtotal	115,773	4,016	136,302	18,391	17,702
Mobile					
On-Road Mobile	1,101	4,150	9,711	2,266	656
Identified Stationary Sources	215	18	5	179	95
Grand Total	117,089	8,184	146,018	20,836	18,453
Source: see Appendix A for calculation methods, assumptions, and results.					

Table 16: Annual Emission Inventory for the Proposed General Plan Update

Emission Source	Annual Emissions (tons per year)				
	VOC	NO _x	CO	PM ₁₀	PM _{2.5}
Area					
Natural gas combustion	31	412	226	1	1
Hearth fuel combustion	1,377	18	1,647	230	221
Landscape fuel combustion	105	7	580	2	2
Consumer/Architecture	902	0	0	0	0
Subtotal	1,522	437	2,453	233	66
Mobile					
On-Road Mobile	201	757	1,772	414	120
Identified Stationary Sources	39	3	1	33	19
Grand Total	2,655	1,198	4,226	679	361
Source: see Appendix A for calculation methods, assumptions, and results.					

As noted from Table 15, the highest daily VOC, CO, PM₁₀, and PM_{2.5} emissions result from area sources and most predominantly from the operation of the hearth sources such as wood-burning fireplaces located within the City. The highest daily NO_x emissions result from mobile emission sources and primarily from on-road motor vehicles. On an annual basis, the highest levels of emissions result from mobile sources.

SECTION 5: IMPACT ANALYSIS OF THE GENERAL PLAN UPDATE

Emissions of criteria air pollutants and TACs during project construction and operations consistent with the proposed General Plan Update are assessed within the context of the significance thresholds contained in Appendix G of the CEQA Guidelines.

5.1 - Conflict with or Obstruct Implementation of the Applicable OAP

Impact 5.1 Implementation of the proposed General Plan Update would not result in population, employment, and household growth that substantially exceed adopted growth projections for the Planning Area and, therefore, would not conflict with or obstruct the implementation of the applicable air quality plan.

Discussion

The MDAQMD 2004 Ozone Attainment Plan (OAP) was prepared to accommodate growth, to reduce the high levels of pollutants within the areas under the jurisdiction of MDAQMD, to return clean air to the region, and to minimize the impact on the economy. Projects that are considered to be consistent with the OAP would not interfere with attainment because this growth is included in the projections utilized in the formulation of the OAP. Therefore, projects, uses, and activities that are consistent with the applicable assumptions used in the development of the OAP would not jeopardize attainment of the air quality levels identified in the OAP, even if they exceed the MDAQMD's recommended emissions thresholds.

Projects that are consistent with the projections of employment and population forecasts identified in the Regional Transportation Plan prepared by the SCAG (SCAG 2008) are considered consistent with the OAP growth projections, since the Growth Management Chapter forms the basis of the land use and transportation control portions of the OAP.

Implementation of the Existing General Plan and the Proposed General Plan Update would create new opportunities for development of residential, commercial, and industrial land uses within the Planning Area. These additional urban growth opportunities could induce growth directly (i.e., through the construction of new dwelling units) or indirectly (i.e., through the creation of new jobs). New development that would occur as a result of build out of the both the Existing General Plan and the Proposed General Plan Update would be directed towards the Interstate 15 freeway corridor. Buildout from the implementation of the proposed General Plan Update would result in an estimated 79,855 dwelling units, which would house 243,465 residents at build out. This future population would represent an increase of approximately 140,569 residents over the current population of 102,896. However, when comparing the difference in population upon build out of the Existing General Plan and the proposed General Plan Update (see Table 7), the development of the Planning Area in terms of population, employment and residential dwelling is anticipated to be extremely small, less than one percent. The most significant changes from the 1991 General Plan focuses upon the development of property along the Interstate 15 (I-15) Freeway corridor. However, this area was

modified through the recently adopted Main Street and Freeway Corridor Specific Plan and accompanying General Plan Amendment and EIR. The City's growth forecasts are included in SCAG's forecasts and the city is consistent with the RTP.

Thus, since the proposed General Plan Update consists of minor incremental increases in population, employment, and residential dwellings compared to the Existing General Plan, as well as merging the land use and zoning maps into a single map, the Project would not induce substantial population growth in an area, either directly or indirectly. In addition, implementation of the goals and policies established within the proposed General Plan Update would ensure that impacts generated by substantial population growth would be avoided or minimized. Therefore, impacts in this regard would be less than significant and the Proposed Project would not interfere with the implementation of the OAP.

Levels of Significance before Mitigation

Less than Significant.

Mitigation

None required

5.2 - Potential for Air Quality Standard Violation

Impact 5.2 Implementation of the proposed General Plan Update would result in construction emissions that would contribute substantially to an existing or projected air quality violation

Discussion

The thresholds of significance recommended by the MDAQMD for new emissions were developed for individual development projects. Under either the Existing General Plan or the Proposed General Plan Update, varying amounts of construction of individual projects would likely occur every year until the eventual build out of the General Plan. Many of the individual projects would be small and generate construction emissions that would not exceed the MDAQMD's recommended thresholds of significance. Although the City would not consider these projects to cause a potentially significant air quality impact, it will require each project to implement the proposed General Plan Update policies that address air quality in order to minimize emissions. Other projects such as major warehouse and other industrial land uses will be large enough to generate construction emissions that could exceed these thresholds. Through the environmental review process for individual projects, additional mitigation may also be required to further reduce emissions and potential impacts; however, even with mitigation it may not be possible to mitigate all air quality impacts to a less-than-significant level for large projects.

In the case of the proposed General Plan Update, which is an individual project under CEQA, it is expected that a number of construction projects could occur every year. It would be difficult, if not impossible, to quantify the emissions related to construction activities under the proposed General

Plan Update as the amount and timing of each construction event is not known at this time. Because the thresholds are established for individual development projects, and it is assumed that some of the projects that would be implemented under the proposed General Plan Update could individually exceed the MDAQMD thresholds, the total amount of construction within the Planning Area under the proposed General Plan Update could also exceed the MDAQMD's recommended thresholds of significance, and this impact would be significant.

Level of Significance before Mitigation

Potentially Significant

Mitigation

The City has a number of policies within the General Plan Update that are designed to reduce overall emissions and, therefore, airborne air pollution from development. The City has also Climate Action Plan Strategies within its Climate Action Plan, which will also reduce air pollution from new and existing development. Mitigation Measures AQ-1 through AQ-3 are designed to help reduce potential impacts but not to a less than significant level.

Level of Significance after Mitigation

Significant and unavoidable.

Impact 5.3 Implementation of the Existing General Plan and the Proposed General Plan Update would result in operational emissions that would contribute substantially to an existing or projected air quality violation.

Discussion

The operational emissions associated with the existing emissions in the year 2009 and the Existing General Plan are summarized in Table 17 for the daily emissions and in Table 18 for the annual emissions along with the net changes in emissions and the MDAQMD's significance thresholds. As shown therein, the emission levels substantially exceed the significance thresholds.

Table 17: Comparison of 2009 and Existing General Plan Maximum Daily Emissions

Pollutant	Maximum Daily Emissions (pounds per day)			
	Existing 2009	Existing General Plan	Net Change	MDAQMD Significance Threshold
VOC	52,627	116,853	+64,226	137
NO _x	13,731	8,246	-5,485	137
CO	82,520	145,725	+63,205	548
PM ₁₀	9,957	20,789	+10,833	82
PM _{2.5}	8,484	18,407	+9,923	82
Source: See Appendix A				

Table 18: Comparison of 2009 and Existing General Plan Annual Emissions

Pollutant	Annual Emissions (tons per year)			
	Existing 2009	Existing General Plan	Net Change	MDAQMD Significance Threshold
VOC	1,508	2,660	+1,151	25
NO _x	2,377	1,210	-1,167	25
CO	5,359	4,231	-1,127	100
PM ₁₀	465	678	+214	15
PM _{2.5}	247	360	+113	15
Source: See Appendix A				

Table 17 indicates that operational pollutant emissions are expected to increase from current levels to the Existing General Plan build out for all pollutants except NO_x. The reduction in NO_x emissions despite the growth expected in the future is due to the effects of significant emission reduction control programs for on-road motor vehicles adopted by the ARB, which will be effective in reducing NO_x emissions from on-road motor vehicles. Pollutant emission increases for all pollutants except NO_x exceed the MDAQMD significance thresholds. On an annual basis, Table 18 indicates that the emission increases from 2009 to the Existing General Plan build out occur for VOC, PM₁₀, and PM_{2.5} and in each case exceed the applicable MDAQMD significance threshold. Annual levels of NO_x and CO are shown to decrease from 2009 levels due again to future mobile source emission rules.

Table 19 compares current emission levels in 2009 with the Proposed General Plan Update emissions on a daily basis and on an annual basis on Table 20. .

Table 19: Comparison of 2009 and Proposed General Plan Update Daily Emissions

Pollutant	Maximum Daily Emissions (pounds per day)			
	Existing 2009	Proposed General Plan Update	Net Change	MDAQMD Significance Threshold
VOC	52,627	117,089	+64,226	137
NO _x	13,731	8,184	-5,485	137
CO	82,520	146,018	+63,205	548
PM ₁₀	9,957	20,836	+10,833	82
PM _{2.5}	8,484	18,453	+9,923	82
Source: see Appendix A				

Table 20: Comparison of 2009 and Proposed General Plan Update Annual Emissions

Pollutant	Annual Emissions (tons per year)			
	Existing 2009	Proposed General Plan Update	Net Change	MDAQMD Significance Threshold
VOC	1,508	2,655	+1,147	25
NO _x	2,377	1,198	-1,179	25
CO	5,359	4,226	-1,132	100
PM ₁₀	465	679	+215	15
PM _{2.5}	247	361	+114	15
Source: see Appendix A				

The comparative results shown in Table 19 and Table 20 are similar to the results shown in Table 17 and Table 18 in that several pollutant emissions increase from current 2009 levels to those for both the Existing General Plan and the Proposed General Plan Update and further, these increases exceed the MDAQMD air quality significance thresholds. The exceptions include reductions in NO_x from 2009 on both a daily and annual basis and CO on an annual basis, and PM_{2.5} on an annual basis. The exceedances of the MDAQMD significance thresholds result in a significant impact and could result in or contribute to the violation of an ambient air quality standard.

Finally, the differences in emissions between the two General Plan scenarios are negligible indicating that each General Plan scenario would have a comparable air quality impact. The relative differences in daily between the Existing General Plan and the Proposed General Plan Update are shown in Table 20 while Table 21 summarizes the relative differences in annual emissions. As noted in these latter tables, the differences in emissions between the two General Plan build out conditions are negligible.

Table 21: Comparison of the Differences in Daily Emissions

Pollutant	Maximum Daily Emissions (pounds per day)		
	Existing General Plan	Proposed General Plan Update	Difference
VOC	116,853	117,089	+236
NO _x	8,246	8,184	-62
CO	145,725	146,018	+293
PM ₁₀	20.789	20,836	+47
PM _{2.5}	18,407	18,453	+46

Table 22: Comparison of the Differences in Annual Emissions

Pollutant	Annual Emissions (tons per year)		
	Existing General Plan	Proposed General Plan Update	Difference
VOC	2,660	2,655	-5
NO _x	1,210	1,198	-12
CO	4,231	4,226	-5
PM ₁₀	678	679	+1
PM _{2.5}	360	361	+1

Level of Significance before Mitigation

Potentially Significant

Mitigation

Although Mitigation Measure AQ-3 has been identified as well as the Climate Action Plan policies related to reducing air quality and greenhouse gases, the emission reductions from these measures would not be sufficient to reduce the impacts of the proposed project to less than significance.

Level of Significance after Mitigation

Significant and Unavoidable.

5.3 - Cumulative Impacts

Impact 5.4 Implementation of the proposed project would result in a cumulatively considerable net increase of criteria pollutants for which the project region is nonattainment under an applicable federal or State ambient air quality standard.

Discussion

The MDAQMD, where the proposed Project is located, is designated as a nonattainment area for ozone (federal and State), PM₁₀ (federal and State), and PM_{2.5} (State) which means that background levels of these air pollutants are at times higher than the ambient air quality standards. Therefore, increases in emissions of VOC and NO_x (both precursors to the formation of ozone), PM₁₀, and PM_{2.5} beyond the MDAQMD emission significance thresholds resulting from the project would result in a cumulatively considerable impact on air quality. Although the proposed Project would result in daily operational emissions of CO that would exceed the MDAQMD's significance threshold for CO, the Planning Area is currently in attainment of the federal and State CO standards. As discussed in response to Impact 5.5 below, the CO emissions from the proposed Project would not result in an exceedance of any federal or State CO ambient air quality standard.

Criteria pollutant emissions were estimated for the existing condition of 2009 as well as for two General Plan build out conditions, the Existing General Plan and the Proposed General Plan Update. As noted in the discussion of Impact 5.2, the both General Plan build out conditions have the potential to generate construction emissions that could exceed the MDAQMD's emission significance thresholds at least for large construction projects such as distribution centers, industrial parks, and regional commercial and retail centers. Further, the emission estimations from the operation of the project are shown to result in increases in emissions from current levels that would exceed the MDAQMD's emission significance thresholds for VOC, PM₁₀, and PM_{2.5} all of which are nonattainment pollutants (MDAB is currently in nonattainment for the State PM_{2.5} standard). VOC is a precursor to the formation of ozone. Because ozone is a secondary pollutant (it is not emitted directly but formed by chemical reactions in the air), it can be formed miles downwind of the Planning Area. Proposed Project emissions of VOC may combine with ambient NO_x levels to contribute to the background concentration of ozone and cumulatively cause health effects. Therefore, the General Plan build out conditions would result in cumulatively considerable net increase of criteria pollutants for which the project region is nonattainment for State and/or federal air quality standards.

The air quality standards were set to protect public health, including the health of sensitive individuals (i.e., elderly, children, and the sick). Therefore, when the concentration of those pollutants exceeds the standard, it is likely that some sensitive individuals in the population will experience health effects as summarized in Table 1. However, the health effects are a factor of the dose-response curve. This means that a concentration of the pollutant in the air (dose), the length of time exposed, and the response of the individual are factors involved in the severity and nature of health impacts. If a significant health impact results from Proposed Project emissions, it does not mean that 100 percent of the population would experience health effects.

Health impacts may include the following: (a) Pulmonary function decrements and localized lung edema in humans and animals; (b) Risk to public health implied by alterations in pulmonary morphology and host defense in animals; (c) Increased mortality risk; (d) Risk to public health implied by altered connective tissue metabolism and altered pulmonary morphology in animals after long-term exposures and pulmonary function decrements in chronically exposed humans. Short-term exposure can result in breathing pattern changes, reduction of breathing capacity, increased susceptibility to infections, inflammation of the lung tissue, and some immunological changes. Children who live in high ozone communities and who participate in multiple sports have been observed to have a higher asthma risk. This is a significant cumulative health impact associated with ground-level ozone concentrations.

Additionally, during operation or implementation of the General Plan build out conditions, the Planning Area could result in a significant cumulative contribution to PM_{2.5} and PM₁₀. Sensitive individuals may experience health impacts when concentrations of those pollutants exceed the ambient air quality standards. Health impacts from particulate matter may include the following: (a)

exacerbation of symptoms in sensitive patients with respiratory or cardiovascular disease; (b) declines in pulmonary function growth in children; (c) and/or increased risk of premature death from heart or lung diseases in the elderly.

Levels of Significance before Mitigation

Potentially Significant.

Mitigation

The City has adopted a number of policies within the General Plan Update and Climate Action Plan that are designed to reduce overall emissions and, therefore, airborne air pollution from development. In addition, mitigation measures identified as AQ-1 to AQ-5 are recommended to also reduce emission levels from development projects.

Level of Significance after Mitigation

Significant and unavoidable.

5.4 - Expose Sensitive Receptors to Substantial Pollutant Concentrations

Impact 5.5 Implementation of the proposed General Plan Update would not expose sensitive receptors to substantial pollutant concentrations.

Discussion

Typical sensitive receptors include residences, schools, playgrounds, childcare centers, athletic facilities, long-term health care facilities, rehabilitation centers, convalescent centers, and retirement homes.

Two primary air quality concerns were analyzed to address this impact: exposure to high-localized concentrations of CO due to traffic-congested roadways and intersections, and exposure to high levels of toxic air contaminants. Motor vehicles are the primary source of high-localized CO concentrations. Localized areas where ambient concentrations exceed federal and/or State standards for CO are termed CO “hotspots.”

The toxic air contaminant of greatest interest is diesel particulate matter (DPM) associated with high volume traffic roads/freeways and rail lines. Diesel truck and rail traffic are the primary sources of DPM. DPM has been identified by the ARB as a carcinogenic substance and long-term exposure to DPM can lead to a significant health risks (see Table 1 above).

CO “Hotspots” Analysis

The CALINE4 roadway air quality dispersion model was used to estimate concentrations of CO at sensitive receptors located near congested roadway intersections. For each intersection analyzed, CALINE4 adds roadway-specific CO emissions calculated from peak-hour turning volumes to the existing ambient CO air concentrations. Peak-hour turning volumes were extracted from the General

Plan Transportation Study (Kimley-Horn 2009) for several key intersections in the City. These intersections were identified as having the lowest Level of Service (LOS F)³ and the highest total peak-hour intersection traffic volumes. Three such intersections for the Existing General Plan and three intersections for the Proposed General Plan Update were identified and analyzed for the formation of a CO “hotspot”. The highest CO emissions would be expected at such intersections because these intersections exhibit the highest intersection traffic volumes and congestion and hence the highest CO emissions. CO impacts would be expected to be less at all other intersections. The results of the CO hotspot analysis are provided in Table 23.

Table 23: Results of the CO “Hotspots” Analysis

Intersection	Carbon Monoxide Concentration (ppm)				Exceeds Standards?
	Max 1-Hour Average Impact	Most Restrictive 1-hour Average Standard	Max 8-hour Average Impact(1)	Most Restrictive 8-hour Average Standard	
Scenario: Existing General Plan					
Highway 395 @ Phelan Rd	3.4	20.0	2.4	9.0	No
3 rd Avenue @ Main St	3.2	20.0	2.2	9.0	No
Mariposa @ Mojave	3.5	20.0	2.4	9.0	No
Scenario: Proposed General Plan Update					
Baldy Mesa Dr @ Phelan Rd	3.2	20.0	2.2	9.0	No
Highway 395 @ Smoke Tree	3.6	20.0	2.5	9.0	No
Mariposa @ Mojave	3.5	20.0	2.4	9.0	No
Note: (1) The 8-hour CO2 concentration was derived by multiplying the 1-hour calculated value by a persistence factor of 0.7 Source: see Appendix B					

As shown in Table 23, the concentrations at impacted intersections do not exceed the most restrictive air quality standards. The air quality standards are set to protect the health of sensitive individuals. Therefore, the General Plan build out conditions are not expected to expose future sensitive uses within the City to substantial CO concentrations even at the most congested and highest volume traffic intersections.

Toxic Air Contaminants

The MDAQMD has adopted guidelines and rules for minimizing potential exposures to toxic air contaminants from land use development projects. The MDAQMD CEQA Guidelines identify

³ Level of service (LOS) is a measure used by traffic engineers determine the effectiveness of elements of transportation infrastructure. LOS is most commonly used to analyze highways and intersections. The transportation LOS system uses the letters A through F, with A being best and F being worst. LOS A is the best, described as conditions where traffic flows at or above the posted speed limit and all motorists have complete mobility between lanes. LOS F is the lowest measurement of efficiency for a road's performance. Flow is forced; every vehicle moves in lockstep with the vehicle in front of it, with frequent slowing required. Technically, a road in a constant traffic jam would be at LOS F.

sources of toxic air contaminants and siting proximity distances that would require an analysis of potential health impacts from siting such emission sources in proximity to sensitive receptors or conversely siting sensitive receptors to sources of TACs (see Section 3.2 above). The Guideline's primary focus is on the proximity issue, that is, highlighting the potential health impacts associated with proximity to sources of toxic air contaminants. The Guidelines specify minimum siting distances between a source of toxic air contaminant emissions and a sensitive receptor for the various types of emission sources to minimize potential health risk impacts from sources of TACs.

Within the land uses established under the Existing General Plan and the Proposed General Plan Update, there will likely be developments that may be planned near a major source of toxic air contaminants such as adjacent to a distribution center, major road, freeway, or rail line. Without taking a careful consideration of potential exposures of sensitive receptors to sources of toxic air contaminants, this represents a potentially significant impact.

Operation: Indoor Air Pollution

Indoor air quality problems are caused primarily from indoor sources that release gases or particles into the air. Ventilation can decrease indoor pollutant levels by diluting the concentrations. The indoor air pollutants that may be associated with operation of the project include VOCs from new carpets and fresh paints, mold spores, radon, cigarette smoke, and combustion sources. The air pollutants that are controlled by the construction of the project include VOCs from carpets, paints, and radon.

VOCs from new carpets and new paint are temporary impacts that can be reduced by proper ventilation after installation. The health impact from these sources is anticipated to be less than significant.

Radon is a naturally occurring colorless, odorless, and tasteless radioactive gas originating from the radioactive decay of uranium in rock, soil, and groundwater. Radon gets inside a building primarily from soil under homes. It is a known human lung carcinogen and is the largest source of radiation exposure to the public. Most is rapidly exhaled; however, the inhaled decay products can deposit into the lung where they irradiate sensitive airway cells increasing the risk of lung cancer (EPA 2003b).

In general, the method and speed of radon's movement through soil is controlled by three conditions: the amount of water present in the pore space (the soil moisture content), the percentage of pore space in the soil (the porosity), and the permeability of the pore spaces that determines the soil's ability to transmit water and air. Therefore, radon moves more rapidly through permeable soils such as coarse sand and gravel, similar to those in the project area.

The distance that radon moves before most of it decays is less than 1 inch in water-saturated rocks or soils, but it can be more than 6 feet, and sometimes tens of feet, through dry rocks or soils. Even

though the project area has no “real” source of uranium to produce radon gas, the permeability of the dry gravelly soils permits high indoor radon to occur.

Indoor radon tests in the project’s zip codes, indicates the following (CDPH 2009):

- 92340 – 0 percent of 2 samples in excess of EPA threshold of 4 pCi/L; and
- 92345 – 0 percent of 6 samples in excess of EPA threshold of 4 pCi/L.

Thus, based on these samples, the project area could have a low potential for radon concentrations over 4.0 pCi/l. These samples are taken inside buildings, not in the open, as radon is easily dispersed. This potential impact is less than significant.

Level of Significance before Mitigation

Potentially Significant.

Mitigation

Mitigation Measures AQ-4 and AQ-5 are recommended to reduce the potential for exposures of sensitive populations to substantial pollutant concentrations.

|

Level of Significance after Mitigation

Less than Significant.

5.5 - Create Objectionable Odors

Impact 5.6 Implementation of the proposed General Plan Update would not create objectionable odors that could affect a substantial number of people.

Discussion

Construction activities occurring under the proposed General Plan Update would generate airborne odors associated with the operation of construction vehicles (i.e., diesel exhaust) and the application of architectural coatings. However, these odors are not generally considered to be especially offensive. Emissions would occur during daytime hours only and would be isolated to the immediate vicinity of the construction site and activity. As such, they would not affect a substantial number of people, as impacts related to these odors are limited to the number of people living and working nearby the source. However, due to the types of odors that would occur in the City, the exposure of substantial people to the source would not constitute an impact.

Potential operational airborne odors could result from cooking activities associated with the new residential and restaurant uses within the City. These odors would be similar to existing housing and food service uses throughout the City and would be confined to the immediate vicinity of the new buildings. Restaurants are also typically required to have ventilation systems that avoid substantial adverse odor impacts. The other potential source of odors would be new trash receptacles within the

community. The receptacles would be stored in areas and in containers as required by City and Health Department regulations, and be emptied on a regular basis, before potentially substantial odors have a chance to develop. Other potential sources of odor include wastewater treatment and pumping facilities, transfer station, sanitary landfill, composting facility, asphalt batch plant, green waste and recycling operations, and painting/coating operations, among others.

Level of Significance before Mitigation

Potentially Significant

Mitigation

Mitigation Measure AQ-6 provides for a series of recommended separation distances between the location of major sources of odor and existing or planned (zoned) sensitive land uses. Adherence to these guidelines would result in a less than significant impact.

AQ-6 The City shall review discretionary land use applications for residential uses for potential odor impacts for proposals with the following areas:

- a. 2 miles of a wastewater treatment plant;
- b. 1 mile of a wastewater pumping facility;
- c. 2 miles of a sanitary landfill;
- d. 1 mile of a transfer station;
- e. 1 mile of a composting facility;
- f. 2 miles of an asphalt batch plant;
- g. 1 mile of a painting/coating operation; and
- h. 1 mile of a green waste and recycling center.

If it is determined that odors from such areas have the potential to expose such residential uses to objectionable odors, an Odor Analysis shall be prepared to assess such impacts and recommended methods to limit exposure to such objectionable odors.

Level of Significance after Mitigation

Less than Significant

SECTION 6: REFERENCES

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Appendix A: Emission Inventory Output

Hesperia General Plan Update

Existing Residential (2009)

Breakdown of Residences by type of DU

30715 SFU households in Planning Area from Housing Element
3835 MFU households in Planning Area from Housing Element
34550 Total households in Planning Area from Housing Element

88.90% of total households in 2003 as SFU
11.10% of total households in 2003 as MFU

Hesperia General Plan Update

Existing Office Land Use (2005)

Office 513828 sq-ft in 2005 in Planning Area

General Plan Office Land Use (2009)

General Plan Buildout in 2030 Office Land Use

Office

Main St SP: Office (OF)	0.25	345.92	3,767,069
Summit Valley (Office Professional)	0.25	6.9	75,141
Total		353	3,842,210

Assumption 1: Assume linear growth from 2005 to 2030

Estimated Office Land Use in 2009 in Planning Area 1,046,369 sq-ft

2005	513828
2006	646963
2007	780099
2008	913234
2009	1046369
2010	1179504
2011	1312640
2012	1445775
2013	1578910
2014	1712046
2015	1845181
2016	1978316
2017	2111451
2018	2244587
2019	2377722
2020	2510857
2021	2643992
2022	2777128
2023	2910263
2024	3043398
2025	3176534
2026	3309669
2027	3442804
2028	3575939
2029	3709075
2030	3842210

Hesperia General Plan Update

Existing Commercial Land Use (2006)

Commercial 2474000 sq-ft in 2005 in Planning Area

General Plan Commercial Land Use (2009)

Commercial Assumed FAR 0.25 Acres 825.3 Square Feet 8,987,517

General Plan Buildout in 2030 Commercial Land Use

Commercial

<u>Type</u>	<u>Assumed FAR</u>	<u>Acres</u>	<u>Square feet</u>		
<u>Main Street and Freeway SP</u>				2005	2474000
Main St SP: Mixed Use- Residential/Office	0.25	33	359,370	2006	4372540
Neighborhood Commercial (C1)	0.25	448.54	4,884,601	2007	6271081
General Commercial (Pedestrian-C2)	0.35	117.24	1,787,441	2008	8169621
Service Commercial (Auto Sales- C3)	0.35	351.54	5,359,579	2009	10068162
Regional Commercial (C4)	0.35	1,589.57	24,234,584	2010	11966702
				2011	13865243
				2012	15763783
				2013	17662323
Summit Valley (Commercial)	0.25	2.9	31,581	2014	19560864
				2015	21459404
Rancho Los Flores Commercial (C)	0.25	79.9	870,111	2016	23357945
Rancho Los Flores Commercial (TC)	0.25	314.3	3,422,727	2017	25256485
				2018	27155026
Total Commercial		3762.3	49,937,511	2019	29053566
				2020	30952106
<i>Assumption 1: Assume linear growth from 2005 to 2030</i>				2021	32850647
				2022	34749187
Estimated Commercial Land Use in 2009 in Planning Area			10,068,162 sq-ft	2023	36647728
				2024	38546268
				2025	40444809
				2026	42343349
				2027	44241889
				2028	46140430
				2029	48038970
				2030	49,937,511

Hesperia General Plan Update

Existing Industrial/Business Park (2006)

Industrial/Business Park 3641400 sq-ft in 2005 in Planning Area

General Plan Industrial/Business Park (2009)

General Plan Build Out Industrial Land Use in 2030

Industrial

Limited Manufacturing (I1)	0.40	235.0	4,095,337
General Manufacturing (I2)	0.25	487.6	5,310,400
Main St. SP: Limited Manufacturing (I1)	0.40	1,150.92	20,053,630
Main St. SP: General Manufacturing (I2)	0.25	828.3	9,020,187
Total		2,702	38,479,554

Assumption 1: Industrial land use increases linearly from 2005 to 2030

Estimated Industrial Land Use in 2009 in Planning Area 9,215,505 sq-ft

2005	3641400
2006	5034926
2007	6428452
2008	7821978
2009	9215505
2010	10609031
2011	12002557
2012	13396083
2013	14789609
2014	16183135
2015	17576661
2016	18970188
2017	20363714
2018	21757240
2019	23150766
2020	24544292
2021	25937818
2022	27331344
2023	28724871
2024	30118397
2025	31511923
2026	32905449
2027	34298975
2028	35692501
2029	37086027
2030	38,479,554

Hesperia General Plan Update

Existing School Enrollment (2010)

18849 students in 2010 in the City	Ref 1
2113 students in 2010 in the SOI (Oak Hills HS)	Ref 1
20962 students in 2010 in the Planning Area	

Breakdown by Grade Level Ref 1

10712	51.1%
3378	16.1%
6872	32.8%
20962	100.0%

Enrollment by Grade Level - Planning Area

Elementary	9632
Middle	3037
High	6179
Total	18849

Enrollment by Grade Level - Planning Area

Elementary	9632
Middle	3037
High	8292
Total	20962

Ref 1: Information provided by the Hesperia Unified School District, Demographics Report 2009-2010

Hesperia General Plan Update

Existing General Plan - Residential

Breakdown of Residential by DU (based on 2009 distribution from Housing Element)

88.9% of households as SFU

11.1% of households as MFU

Total Number of Households in Proposed Project

79,648 total number of DU in the proposed project

70,807 SDU households in 2030 for Planning Area

8,841 MDU households in 2030 for Planning Area

79,648 Total DU households in 2030 for Planning Area

Hesperia General Plan Update

General Plan - Existing General Plan Industrial and Office

General Plan Land Use (Industrial/Office)	Total Area (acres)	FAR	Total Area sq-ft
	815.6	0.33	11,724,087
Industrial/Manufacturing			
Limited Manufacturing (I1)	235.0	0.4	4,095,337
General Manufacturing (I2)	487.6	0.25	5,310,400
Main St. SP: Limited Manufacturing (I1)	1,150.9	0.4	20,053,630
Main St. SP: General Manufacturing (I2)	828.3	0.25	9,020,187
Total Industrial/Manufacturing	2,701.9		38,479,554
Office			
Main St SP: Office (OF)	345.9	0.25	3,767,069
Summit Valley (Office Professional)	6.9	0.25	75,141
Total Office	352.8		3,842,210
Total Industrial/Manufacturing/Office	3,870.3		54,045,850

Reference 1: Hesperia General Plan Update, Project Description

Hesperia General Plan Update

Existing General Plan - Commercial

General Plan Land Use	Area (acres)	FAR	Total Area sq-ft
	548.6	0.25	5,974,254
<u>Main Street and Freeway SP</u>			
Main St SP: Mixed Use- MU	33	0.25	359,370
Neighborhood Commercial (C1)	448.54	0.25	4,884,601
General Commercial (Pedestrian-C2)	117.24	0.35	1,787,441
Service Commercial (Auto Sales- C3)	351.54	0.35	5,359,579
Regional Commercial (C4)	1,589.57	0.35	24,234,584
Summit Valley (Commercial)	2.9	0.25	31,581
Rancho Los Flores Commercial (C)	79.9	0.25	870,111
Rancho Los Flores Commercial (TC)	314.3	0.25	3,422,727
Total	3485.59		46,924,248

Hesperia General Plan Update

Existing General Plan - Schools

Existing School Enrollment (2010)

18849 students in 2010 in the City	Ref 1
2113 students in 2010 in SOI (Oak Hills HS)	Ref 1
20962 Total in 2010 in the Planning Area	

Breakdown by Grade Level

Ref 1

10712	51.1%
3378	16.1%
6872	32.8%
20962	100.0%

General Plan BuildOut 2030

79648 in 2030 in the Planning Area (DU * 0.8)

Assumption 1: Breakdown by grade level in 2010 is applicable to 2030

Breakdown by Grade Level - Planning Area

Elementary	32,561
Middle	10,268
High	20,889
Total	63,718

References

References 1: Information provided by the Hesperia Unified School District, Demographics Report 2009-2010

Hesperia General Plan Update

Proposed General Plan Update - Residential

Breakdown of Residentials by DU (based on 2009 distribution from Housing Element)

88.9% of households as SFU

11.1% of households as MFU

Total Number of Households in Proposed Project

79855 total number of DU in the proposed project

70,991 SDU households in 2030 for Planning Area

8,864 MDU households in 2030 for Planning Area

79,855 Total DU households in 2030 for Planning Area

Reference 1: Hesperia General Plan Update, Project Description

Hesperia General Plan Update

Proposed General Plan Update - Industrial and Office

Estimate of Industrial Building Space	Ref 1		
			Total Area
General Plan	Total Area (acre)	FAR	(sq-ft)
Limited Manufacturing (I1)	235.0	0.4	4,095,337
General Manufacturing (I2)	487.6	0.25	5,310,400
Main St. SP: Limited Manufacturing (I1)	1,150.9	0.4	20,053,630
Main St. SP: General Manufacturing (I2)	828.3	0.25	9,020,187
Total Industrial/Manufacturing	2,701.9		38,479,554
Estimate of Office Building Space			
Main St SP: Office (OF)	345.9	0.25	3,767,069
Summit Valley (Office Professional)	6.9	0.25	75,141
Total Office	352.8		3,842,210
Total Industrial/Manufacturing/Office	3,055		42,321,763

Reference 1: Hesperia General Plan Update, Project Description

Hesperia General Plan Update

Proposed General Plan Update - Commercial

General Plan Land Use	Total Area (acres)	FAR	Total Area (sq-ft)
	825.3	0.25	8,987,517
<u>Main Street and Freeway SP</u>			
Main St SP: Mixed Use- MU	33	0.25	359,370
Neighborhood Commercial (C1)	448.54	0.25	4,884,601
General Commercial (Pedestrian-C2)	117.24	0.35	1,787,441
Service Commercial (Auto Sales- C3)	351.54	0.35	5,359,579
Regional Commercial (C4)	1,589.57	0.35	24,234,584
Summit Valley (Commercial)	2.9	0.25	31,581
Rancho Los Flores Commercial (C)	79.9	0.25	870,111
Rancho Los Flores Commercial (TC)	314.3	0.25	3,422,727
Total	3762.29		49,937,511

Hesperia General Plan Update

Proposed General Plan Update - Schools

Existing School Enrollment (2010)

18849 students in 2010 in the City	Ref 1
2113 students in 2010 in the SOI (Oak Hills HS)	Ref 1
20962 Total in the Planning Area	

Breakdown by Grade Level

Ref 1

10712	51.1%
3378	16.1%
6872	32.8%
20962	100.0%

General Plan BuildOut 2030 - Proposed Project

63,884 in 2030 in the Planning Area (DU * 0.8)

Assumption 1: Breakdown by grade level in 2010 is applicable to 2030

Breakdown by Grade Level - Planning Area

Elementary	32,646
Middle	10,295
High	20,943
Total	63,884

References 1: Information provided by the Hesperia Unified School District, Demographics Report 2009-2010

Hesperia General Plan Update

Emission Summary of Maximum Daily Emissions

Existing 2009

	ROG (pounds/day)	NOx (pounds/day)	CO (pounds/day)	PM10 (pounds/day)	PM2.5 (pounds/day)
Year: 2009					
Transportation	2441.3	12112.8	23597.9	1819.9	728.5
Natural Gas	64.0	841.0	420.0	2.0	2.0
Stationary Sources	214.8	18.1	5.5	178.6	95.3
Consumer Products/Coating	2018.0	0.0	0.0	0.0	0.0
Hearth	47631.0	745.0	57062.0	7952.0	7654.0
Landscape	258.0	14.0	1435.0	4.0	4.0
Total	52627.1	13730.9	82520.4	9956.5	8483.8

General Plan - Existing Plan

	ROG (pounds/day)	NOx (pounds/day)	CO (pounds/day)	PM10 (pounds/day)	PM2.5 (pounds/day)
Year: 2030					
Transportation	1101.2	4149.5	9710.7	2266.4	655.7
Natural Gas	176.0	2325.0	1294.0	4.0	4.0
Stationary Sources	214.8	18.1	5.5	178.6	95.3
Consumer Products/Coating	4985.0	0.0	0.0	0.0	0.0
Hearth	109804.0	1717.0	131545.0	18332.0	17644.0
Landscape	572.0	36.0	3170.0	8.0	8.0
Total	116853.0	8245.6	145725.2	20789.1	18407.1

General Plan - Proposed Plan

	ROG (pounds/day)	NOx (pounds/day)	CO (pounds/day)	PM10 (pounds/day)	PM2.5 (pounds/day)
Year: 2030					
Transportation	1101.2	4149.5	9710.7	2266.4	655.7
Natural Gas	171.0	2259.0	1237.0	4.0	4.0
Stationary Sources	214.8	18.1	5.5	178.6	95.3
Consumer Products/Coating	4939.0	0.0	0.0	0.0	0.0
Hearth	110090.0	1721.0	131887.0	18379.0	17690.0
Landscape	573.0	36.0	3178.0	8.0	8.0
Total	117089.0	8183.6	146018.2	20836.1	18453.1

Hesperia General Plan Update

Comparison of Daily Maximum Emissions

Change from 2009 to General Plan - Existing Plan

	ROG (pounds/day)	NOx (pounds/day)	CO (pounds/day)	PM10 (pounds/day)	PM2.5 (pounds/day)
Year: 2009 to GP Existing					
Transportation	-1340.1	-7963.3	-13887.2	446.6	-72.7
Natural Gas	112.0	1484.0	874.0	2.0	2.0
Stationary Sources	0.0	0.0	0.0	0.0	0.0
Consumer Products/Coating	2967.0	0.0	0.0	0.0	0.0
Hearth	62173.0	972.0	74483.0	10380.0	9990.0
Landscape	314.0	22.0	1735.0	4.0	4.0
Total	64225.9	-5485.3	63204.8	10832.6	9923.3

Change from 2009 to General Plan - Proposed Plan

	ROG (pounds/day)	NOx (pounds/day)	CO (pounds/day)	PM10 (pounds/day)	PM2.5 (pounds/day)
Year: 2009 to GP Proposed					
Transportation	-1340.1	-7963.3	-13887.2	446.6	-72.7
Natural Gas	112.0	1484.0	874.0	2.0	2.0
Stationary Sources	0.0	0.0	0.0	0.0	0.0
Consumer Products/Coating	2967.0	0.0	0.0	0.0	0.0
Hearth	62173.0	972.0	74483.0	10380.0	9990.0
Landscape	314.0	22.0	1735.0	4.0	4.0
Total	64225.9	-5485.3	63204.8	10832.6	9923.3

Change from General Plan - Existing to General Plan - Proposed

	ROG (pounds/day)	NOx (pounds/day)	CO (pounds/day)	PM10 (pounds/day)	PM2.5 (pounds/day)
Year: GP Exist to GP Proposed					
Transportation	0.0	0.0	0.0	0.0	0.0
Natural Gas	-5.0	-66.0	-57.0	0.0	0.0
Stationary Sources	0.0	0.0	0.0	0.0	0.0
Consumer Products/Coating	-46.0	0.0	0.0	0.0	0.0
Hearth	286.0	4.0	342.0	47.0	46.0
Landscape	1.0	0.0	8.0	0.0	0.0
Total	236.0	-62.0	293.0	47.0	46.0

Hesperia General Plan Update

Emission Summary of Annual Emissions

Existing 2009

	ROG (tons/year)	NOx (tons/year)	CO (tons/year)	PM10 (tons/year)	PM2.5 (tons/year)
Year: 2009					
Transportation	445.5	2210.6	4306.6	332.1	132.9
Natural Gas	12.0	153.0	77.0	0.0	0.0
Stationary Sources	39.2	3.3	1.0	32.6	17.4
Consumer Products/Coating	368.0	0.0	0.0	0.0	0.0
Hearth	597.0	8.0	712.0	99.0	96.0
Landscape	47.0	2.0	262.0	1.0	1.0
Total	1508.7	2376.9	5358.6	464.7	247.3

General Plan - Existing Plan

	ROG (tons/year)	NOx (tons/year)	CO (tons/year)	PM10 (tons/year)	PM2.5 (tons/year)
Year: 2030					
Transportation	201.0	757.3	1772.2	413.6	119.7
Natural Gas	32.0	424.0	236.0	1.0	1.0
Stationary Sources	39.2	3.3	1.0	32.6	17.4
Consumer Products/Coating	910.0	0.0	0.0	0.0	0.0
Hearth	1374.0	18.0	1643.0	229.0	220.0
Landscape	104.0	7.0	579.0	2.0	2.0
Total	2660.2	1209.6	4231.2	678.2	360.1

General Plan - Proposed Plan

	ROG (tons/year)	NOx (tons/year)	CO (tons/year)	PM10 (tons/year)	PM2.5 (tons/year)
Year: 2030					
Transportation	201.0	757.3	1772.2	413.6	119.7
Natural Gas	31.0	412.0	226.0	1.0	1.0
Stationary Sources	39.2	3.3	1.0	32.6	17.4
Consumer Products/Coating	902.0	0.0	0.0	0.0	0.0
Hearth	1377.0	18.0	1647.0	230.0	221.0
Landscape	105.0	7.0	580.0	2.0	2.0
Total	2655.2	1197.6	4226.2	679.2	361.1

Hesperia General Plan Update

Comparison of Annual Emissions

Change from 2009 to General Plan - Existing Plan

	ROG (tons/year)	NOx (tons/year)	CO (tons/year)	PM10 (tons/year)	PM2.5 (tons/year)
Year: 2009 to GP Existing					
Transportation	-244.6	-1453.3	-2534.4	81.5	-13.3
Natural Gas	20.0	271.0	159.0	1.0	1.0
Stationary Sources	0.0	0.0	0.0	0.0	0.0
Consumer Products/Coating	542.0	0.0	0.0	0.0	0.0
Hearth	777.0	10.0	931.0	130.0	124.0
Landscape	57.0	5.0	317.0	1.0	1.0
Total	1151.4	-1167.3	-1127.4	213.5	112.7

Change from 2009 to General Plan - Proposed Plan

	ROG (tons/year)	NOx (tons/year)	CO (tons/year)	PM10 (tons/year)	PM2.5 (tons/year)
Year: 2009 to GP Proposed					
Transportation	-244.6	-1453.3	-2534.4	81.5	-13.3
Natural Gas	19.0	259.0	149.0	1.0	1.0
Stationary Sources	0.0	0.0	0.0	0.0	0.0
Consumer Products/Coating	534.0	0.0	0.0	0.0	0.0
Hearth	780.0	10.0	935.0	131.0	125.0
Landscape	58.0	5.0	318.0	1.0	1.0
Total	1146.4	-1179.3	-1132.4	214.5	113.7

Change from General Plan - Existing to General Plan - Proposed

	ROG (tons/year)	NOx (tons/year)	CO (tons/year)	PM10 (tons/year)	PM2.5 (tons/year)
Year: GP Exist to GP Proposed					
Transportation	0.0	0.0	0.0	0.0	0.0
Natural Gas	-1.0	-12.0	-10.0	0.0	0.0
Stationary Sources	0.0	0.0	0.0	0.0	0.0
Consumer Products/Coating	-8.0	0.0	0.0	0.0	0.0
Hearth	3.0	0.0	4.0	1.0	1.0
Landscape	1.0	0.0	1.0	0.0	0.0
Total	-5.0	-12.0	-5.0	1.0	1.0

Summary

Emission Inventory for City of Hesperia, CA

Prepared by Michael Brandman Associates

6-Apr

Existing Emissions

2009

	ROG (pounds/day)	NOx (pounds/day)	CO (pounds/day)	PM10 (pounds/day)	PM2.5 (pounds/day)
Year 2009					
Transportation	2,441	12,113	23,598	1,820	728
Natural Gas	64	841	420	2	2
Stationary Sources	215	18	5	179	95
Consumer Products/Coating	2,018	-	-	-	-
Hearth	47,631	745	57,062	7,952	7,654
Landscape	258	14	1,435	4	4
Total	52,627	13,731	82,520	9,957	8,484

	ROG (tons/year)	NOx (tons/year)	CO (tons/year)	PM10 (tons/year)	PM2.5 (tons/year)
Year 2009					
Transportation	445.5	2210.6	4306.6	332.1	132.9
Natural Gas	12.0	153.0	77.0	0.0	0.0
Stationary Sources	39.2	3.3	1.0	32.6	17.4
Consumer Products/Coating	368.0	0.0	0.0	0.0	0.0
Hearth	597.0	8.0	712.0	99.0	96.0
Landscape	47.0	2.0	262.0	1.0	1.0
Total	1508.7	2376.9	5358.6	464.7	247.3

City of Hesperia, CA

Estimate of Area Source Emissions (extracted from URBEMIS Model output)

Base year 2009

Winter	ROG		NOX		CO		SO2		PM10		PM2.5	
	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)
Natural Gas	64	0	841	0	420	0	-	-	2	0	2	0
Hearth	47,631	24	745	0	57,062	29	100	0	7,952	4	7,654	4
Landscape	-	-	-	-	-	-	-	-	-	-	-	-
Consumer Products	1,772	1	-	-	-	-	-	-	-	-	-	-
Architectural Coatings	246	0	-	-	-	-	-	-	-	-	-	-
TOTAL	49,713	25	1,586	1	57,482	29	100	0	7,954	4	7,656	4

Summer	ROG		NOX		CO		SO2		PM10		PM2.5	
	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)
Natural Gas	64	0	841	0	420	0	-	-	2	0	2	0
Hearth	-	-	-	-	-	-	-	-	-	-	-	-
Landscape	258	0	14	0	1,435	1	-	-	4	0	4	0
Consumer Products	1,772	1	-	-	-	-	-	-	-	-	-	-
Architectural Coatings	246	0	-	-	-	-	-	-	-	-	-	-
TOTAL	2,340	1	854	0	1,855	1	-	-	6	0	6	0

MAX Daily	49,713	25	1,586	1	57,482	29	100	0	7,954	4	7,656	4
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Annual	ROG	NOx	CO	SOx	PM10	PM2.5
	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)
Natural Gas	12	153	77	-	-	-
Hearth	597	8	712	1	99	96
Landscape	47	2	262	-	1	1
Consumer Products	323	-	-	-	-	-
Architectural Coatings	45	-	-	-	-	-
TOTAL	1,024	163	1,051	1	100	97

Vehicle Miles Traveled Calculations Emission Inventory for City of Hesperia, CA

Estimate of Vehicle Miles Traveled - 2008

Daily rural+urban VMT in Hesperia	1,280,750 miles per day	Ref 1
Highway miles in Hesperia:	24.7 miles	Ref 2
Highway miles in SB County:	1,189 miles	Ref 1
% Hesperia highway miles in SB County	2.1%	
Total Daily highway VMT in SB County	35,884,050 miles per day	Ref 1
% freeway traffic that is local to Hesperia	50%	
Highway daily VMT in Hesperia	372,601 miles per day	
Daily rural+urban+highway VMT in Hesperia	1,653,351 miles per day	
% total Hesperia VMT as Highway	23%	
% total Hesperia VMT as Arterial/Local	77%	

Annual rural+urban+highway VMT in Hesperia	603,473,150 miles per year
% Hesperia rural+urban+highway of SB County highway	4.6%

Assumption 1: VMT estimates in 2008 are applicable to 2009

EMFAC2007 BURDEN Calculations of Emissions and VMT for the MDAB - 2009

Ref 3

Pollutant	MDAB Emissions (tons/day)	MDAB Daily VMT (miles/day)	Emission Factor (grams/mile)
ROG	24.97	33,821,000	0.670
NOx	123.89	33,821,000	3.326
CO	241.36	33,821,000	6.480
PM10	5.8	33,821,000	0.156
PM2.5	4.76	33,821,000	0.128

References

Reference 1: California Department of Transportation, 2009. 2008 California Public Road Data;

<http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/hpmspdf/2008PRD.pdf>

Reference 2: Google Earth highway lengths in the City of Hesperia and Sphere of Influence

Reference 3: EMFAC2007 BURDEN Model for the Mojave Desert Air Basin; emission factors derived by the dividing the daily emission totals by the daily VMT from all vehicle classes

Transportation

Emission Inventory for City of Hesperia, CA

Prepared by Michael Brandman ,

6-Apr

On-road Vehicle Exhaust Emissions

Pollutant	Emission Factor (grams/mile)	Daily VMT (miles/day)	2009 (tons/day)	2009 (tons/year)	2009 (pounds/day)
ROG	0.670	1,653,351	1.22	446	2,441
NOx	3.326	1,653,351	6.06	2,211	12,113
CO	6.480	1,653,351	11.80	4,307	23,598
PM10	0.156	1,653,351	0.28	103	567
PM2.5	0.128	1,653,351	0.23	85	465

Paved Road Dust (Ref 3 and Ref 4)

Variable	Definition
sL, Road Surface Silt Loading - Freeway	0.02 g/m2 (Ref 1)
sL - Arterial	0.035 g/m2 (Ref 1)
W, Average Vehicle Weight (tons)	2.4 tons in the MDAB
k, Particulate Size Multiplier	0.016 lb PM10/VMT (Ref 2)
P, Rainy days with greater than 0.01 inches precipitation	21 Days (Ref 3)
N, Days in Averaging Period	365 Days
E, PM10 Emission Factor - Freeway	0.0005655 lb PM10/VMT
E - Arterial	0.0008137 lb PM10/VMT
Total Daily VMT - Hesperia for 2009	1,653,351 miles/day (see VMT and Emissions Factor sheet)
Percent Highway VMT	23% (see VMT and Emissions Factor worksheet)
Percent Arterial VMT	77% (see VMT and Emissions Factor worksheet)

$$E = \left[k \left(\frac{sL}{2} \right)^{0.65} \left(\frac{W}{3} \right)^{1.5} \right] \times \left(1 - \frac{P}{4N} \right)$$

Hesperia - Paved Road Dust	2009 PM10 Emissions (lbs/day)	2009 PM10 Emissions (tons/day)	2009 PM10 Emissions (tons/year)	2009 PM2.5 Emissions (pounds/day)	2009 PM2.5 (tons/day) - (Ref 4)	2009 PM2.5 (tons/year) - (Ref 4)
Freeway Emissions	210.7	0.1	38.5	44.3	0.02	8.1
Arterial Emissions	1042.1	0.5	190.2	218.8	0.11	39.9
Total	1253	0.6	228.6	263.1	0.13	48.0

References:

Ref 1: California Air Resources Board "Section 7.8, San Joaquin Valley Entrained Road Dust, Paved Road Travel"

www.arb.ca.gov/ei/areasrc/PMSJVPavedRoadMethod2003.pdf

Ref 2: United States Environmental Protection Agency. Paved Road Dust. www.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf

Ref 3: Western Regional Climate Center. Period of Record General Climate Summary - Precipitation. Hesperia.

<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca3935>

Ref 4: PM2.5 road dust emissions were assumed to be 21% of PM10 emissions

Emission Inventory
City of Hesperia, CA

Stationary Sources in Hesperia in 2007

Ref 1

Number	FacID	District	Facility Name	City	TOG (tons/yr)	ROG (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM (tons/yr)	PM10 (tons/yr)	PM2.5 (tons/yr)
2	44301110	Desert	Advance Disposal	Hesperia	0.4	0.3	0	0	0	0	0	0
8	157202663	Desert	Alltech Associat	Hesperia	21.6	18.3	0	0	0	0	0	0
24	35401020	Desert	C & M Wood Indus	Hesperia	7.5	1.2	0.7	1.2	0	0.1	0.1	0.1
27	53101203	Desert	Caldwell-william	Hesperia	0	0	0	0	0	0	0	0
42	32601481	Desert	Diversity Materi	Hesperia	0	0	0	0	0	1.4	0.5	0.1
54	102102392	Desert	Hesperia Sanitar	Hesperia	0.3	0.1	0.3	1.5	0	17.2	8.7	1.4
57	9800120	Desert	Hi-grade Materia	Hesperia	0	0	0	0	0	25.1	23.1	15.6
64	58601258	Desert	Jpm Product	Hesperia	0.5	0.5	0	0.1	0	0	0	0
66	58901261	Desert	Kormil Industrie	Hesperia	1.8	1.8	0	0	0	0	0	0
70	999900001	Desert	Lead Masters	Hesperia		0	0	0	0	0.2	0.2	0.2
73	6900933	Desert	Lugo Substation	Hesperia		0	0	0	0	0	0	0
80	43901106	Desert	Mcwelco Products	Hesperia	3	2.9	0	0	0	0	0	0
119	76501479	Desert	Simtec	Hesperia	0.1	0.1	0	0	0	0	0	0
133	44701247	Desert	Standard Abrasiv	Hesperia	1.4	0.7	0	0.5	0	0	0	0
134	26800927	Desert	Suncrete Materia	Hesperia	0	0	0	0	0	0	0	0
142	45801128	Desert	Terrell Industri	Hesperia	13.7	13.3	0	0	0	0	0	0
156	7601320	Desert	Verizon-hesperia	Hesperia		0	0	0	0	0	0	0
Total (tons/year)					50.3	39.2	1	3.3	0	44	32.6	17.4
Total (pounds/day)					276	215	5	18	0	241	179	95

Reference 1: California Air Resources Board 2007. Facility Search Engine. Stationary Sources Located in the Mojave Desert Air Basin
<http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php>

Summary

Emission Inventory for City of Hesperia, CA

Prepared by Michael Brandman Associates

6-Apr

General Plan BuildOut

2030

	ROG (pounds/day)	NOx (pounds/day)	CO (pounds/day)	PM10 (pounds/day)	PM2.5 (pounds/day)
Year 2030					
Transportation	1,101	4,149	9,711	2,266	656
Natural Gas	176	2,325	1,294	4	4
Stationary Sources	215	18	5	179	95
Consumer Products/Coating	4,985	-	-	-	-
Hearth	109,804	1,717	131,545	18,332	17,644
Landscape	572	36	3,170	8	8
Total	116,853	8,246	145,725	20,789	18,407

	ROG (tons/year)	NOx (tons/year)	CO (tons/year)	PM10 (tons/year)	PM2.5 (tons/year)
Year 2030					
Transportation	201	757	1,772	414	120
Natural Gas	32	424	236	1	1
Stationary Sources	39	3	1	33	17
Consumer Products/Coating	910	-	-	-	-
Hearth	1,374	18	1,643	229	220
Landscape	104	7	579	2	2
Total	2,660	1,210	4,231	678	360

City of Hesperia, CA

Estimate of Area Source Emissions (extracted from URBEMIS Model output)

General Plan BuildOut 2030

Winter	ROG		NOX		CO		SO2		PM10		PM2.5	
	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)
Natural Gas	176	0.1	2,325	1.2	1,294	0.6	-	-	4	0.0	4	0.0
Hearth	109,804	54.9	1,717	0.9	131,545	65.8	230	0.1	18,332	9.2	17,644	8.8
Landscape	-	-	-	-	-	-	-	-	-	-	-	-
Consumer Products	4,086	2.0	-	-	-	-	-	-	-	-	-	-
Architectural Coatings	899	0.4	-	-	-	-	-	-	-	-	-	-
TOTAL	114,965	57.5	4,042	2.0	132,839	66.4	230	0.1	18,336	9.2	17,648	8.8

Summer	ROG		NOX		CO		SO2		PM10		PM2.5	
	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)
Natural Gas	176	0.1	2,325	1.2	1,294	0.6	-	-	4	0.0	4	0.0
Hearth	-	-	-	-	-	-	-	-	-	-	-	-
Landscape	572	0.3	36	0.0	3,170	1.6	-	-	8	0.0	8	0.0
Consumer Products	4,086	2.0	-	-	-	-	-	-	-	-	-	-
Architectural Coatings	899	0.4	-	-	-	-	-	-	-	-	-	-
TOTAL	5,733	2.9	2,361	1.2	4,464	2.2	-	-	12	0.0	12	0.0
MAX Daily	114,965	57.5	4,042	2.0	132,839	66.4	230	0.1	18,336	9.2	17,648	8.8

Annual	ROG		NOx		CO		SOx		PM10		PM2.5	
	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)
Natural Gas	32	424	236	-	1	1	-	-	-	-	-	-
Hearth	1,374	18	1,643	3	229	220	-	-	-	-	-	-
Landscape	104	7	579	-	2	2	-	-	-	-	-	-
Consumer Products	746	-	-	-	-	-	-	-	-	-	-	-
Architectural Coatings	164	-	-	-	-	-	-	-	-	-	-	-
TOTAL	2,420	449	2,458	3	232	223	-	-	-	-	-	-

Vehicle Miles Traveled Calculations Emission Inventory for City of Hesperia, CA

General Plan BuildOut 2030

Estimate of Vehicle Miles Traveled - 2008

Daily rural+urban VMT in Hesperia	1,280,750 miles per day	Ref 1
Highway miles in Hesperia:	24.7 miles	Ref 2
Highway miles in SB County:	1,189 miles	Ref 1
% Hesperia highway miles in SB County	2.1%	
Total Daily highway VMT in SB County	35,884,050 miles per day	Ref 1
% Freeway VMT Local to Hesperia	50%	
Highway daily VMT in Hesperia	372,601 miles per day	
Daily rural+urban+highway VMT in Hesperia	1,653,351 miles per day	
% total Hesperia VMT as Highway	23%	
% total Hesperia VMT as Arterial/Local	77%	
Annual rural+urban+highway VMT in Hesperia	603,473,150 miles per year	
% Hesperia rural+urban+highway of SB County highway	4.6%	

Estimate of Vehicle Miles Traveled - 2030

MDAB Daily VMT	54,122,000 miles per day	Ref 3
	19,754,530,000 miles per year	
<i>Assumption 1: % Hesperia VMT to SB County is the same as % Hesperia VMT to MDAB</i>		
Daily VMT is Hesperia	2,493,661 miles per day	
Annual VMT in Hesperia	910,186,387 miles per year	

EMFAC2007 BURDEN Calculations of Emissions and VMT for the MDAB - 2030

Ref 3

Pollutant	MDAB Emissions (tons/day)	MDAB Daily VMT (miles/day)	Emission Factor (grams/mile)
ROG	11.95	54,122,000	0.200
NOx	45.03	54,122,000	0.755
CO	105.38	54,122,000	1.768
PM10	4.09	54,122,000	0.069
PM2.5	2.81	54,122,000	0.047

References

Reference 1: California Department of Transportation, 2009. 2008 California Public Road Data;
<http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/hpmspdf/2008PRD.pdf>

Reference 2: Google Earth highway lengths in the City of Hesperia and Sphere of Influence

Reference 3: EMFAC2007 BURDEN Model for the Mojave Desert Air Basin; emission factors derived by the dividing the daily emission totals by the daily VMT from all vehicle classes

Transportation

Emission Inventory for City of Hesperia, CA

Prepared by Michael Brandman

6-Apr

General Plan BuildOut 2030

On-road Vehicle Exhaust Emissions

Pollutant	Emission Factor (grams/mile)	Daily VMT (miles/day)	2030 (tons/day)	2030 (tons/year)	2030 (pounds/day)
ROG	0.200	2,493,661	0.55	201	1,101
NOx	0.755	2,493,661	2.07	757	4,149
CO	1.768	2,493,661	4.86	1,772	9,711
PM10	0.069	2,493,661	0.19	69	377
PM2.5	0.047	2,493,661	0.13	47	259

Paved Road Dust (Ref 3 and Ref 4)

<u>Variable</u>	<u>Definition</u>	$E = \left[k \left(\frac{sL}{2} \right)^{0.65} \left(\frac{W}{3} \right)^{1.5} \right] \times \left(1 - \frac{P}{4N} \right)$
sL, Road Surface Silt Loading - Freeway	0.02 g/m2 (Ref 1)	
sL - Arterial	0.035 g/m2 (Ref 1)	
W, Average Vehicle Weight (tons)	2.4 tons in the MDAB	
k, Particulate Size Multiplier	0.016 lb PM10/VMT (Ref 2)	
P, Rainy days with greater than 0.01 inches precipitation	21 Days (Ref 3)	
N, Days in Averaging Period	365 Days	
E, PM10 Emission Factor - Freeway	0.0005655 lb PM10/VMT	
E - Arterial	0.0008137 lb PM10/VMT	
Total Daily VMT - Hesperia for 2030	2,493,661 miles/day (see VMT and Emissions Factor sheet)	
Percent Highway VMT	23% (see VMT and Emissions Factor worksheet)	
Percent Arterial VMT	77% (see VMT and Emissions Factor worksheet)	

Hesperia - Paved Road Dust	2030 PM10 Emissions (lbs/day)	2030 PM10 Emissions (tons/day)	2030 PM10 Emissions (tons/year)	2030 PM2.5 (pounds/day) - (Ref 4)	2030 PM2.5 (tons/day) - (Ref 4)	2030 PM2.5 (tons/year) - (Ref 4)
Freeway Emissions	317.8	0.2	58.0	67	0.03	12.2
Arterial Emissions	1571.7	0.8	286.8	330	0.17	60.2
Total	1890	0.9	344.8	397	0.20	72.4

References:

Ref 1: California Air Resources Board "Section 7.8, San Joaquin Valley Entrained Road Dust, Paved Road Travel"

www.arb.ca.gov/ei/areasrc/PMSJVPavedRoadMethod2003.pdf

Ref 2: United States Environmental Protection Agency. Paved Road Dust. www.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf

Ref 3: Western Regional Climate Center. Period of Record General Climate Summary - Precipitation. Hesperia.

<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca3935>

Ref 4: PM2.5 road dust emissions were assumed to be 21% of PM10 emissions

Emission Inventory
City of Hesperia, CA

Stationary Sources in Hesperia in 2007

Ref 1

Number	FacID	District	Facility Name	City	TOG (tons/yr)	ROG (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM (tons/yr)	PM10 (tons/yr)	PM2.5 (tons/yr)
2	44301110	Desert	Advance Disposal	Hesperia	0.4	0.3	0	0	0	0	0	0
8	157202663	Desert	Alltech Associat	Hesperia	21.6	18.3	0	0	0	0	0	0
24	35401020	Desert	C & M Wood Indus	Hesperia	7.5	1.2	0.7	1.2	0	0.1	0.1	0.1
27	53101203	Desert	Caldwell-william	Hesperia	0	0	0	0	0	0	0	0
42	32601481	Desert	Diversity Materi	Hesperia	0	0	0	0	0	1.4	0.5	0.1
54	102102392	Desert	Hesperia Sanitar	Hesperia	0.3	0.1	0.3	1.5	0	17.2	8.7	1.4
57	9800120	Desert	Hi-grade Materia	Hesperia	0	0	0	0	0	25.1	23.1	15.6
64	58601258	Desert	Jpm Product	Hesperia	0.5	0.5	0	0.1	0	0	0	0
66	58901261	Desert	Kormil Industrie	Hesperia	1.8	1.8	0	0	0	0	0	0
70	999900001	Desert	Lead Masters	Hesperia		0	0	0	0	0.2	0.2	0.2
73	6900933	Desert	Lugo Substation	Hesperia		0	0	0	0	0	0	0
80	43901106	Desert	Mcwelco Products	Hesperia	3	2.9	0	0	0	0	0	0
119	76501479	Desert	Simtec	Hesperia	0.1	0.1	0	0	0	0	0	0
133	44701247	Desert	Standard Abrasiv	Hesperia	1.4	0.7	0	0.5	0	0	0	0
134	26800927	Desert	Suncrete Materia	Hesperia	0	0	0	0	0	0	0	0
142	45801128	Desert	Terrell Industri	Hesperia	13.7	13.3	0	0	0	0	0	0
156	7601320	Desert	Verizon-hesperia	Hesperia		0	0	0	0	0	0	0
Total (tons/year)					50.3	39.2	1	3.3	0	44	32.6	17.4
Total (pounds/day)					276	215	5	18	0	241	179	95

Reference 1: California Air Resources Board 2007. Facility Search Engine. Stationary Sources Located in the Mojave Desert Air Basin
<http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php>

Summary

Emission Inventory for City of Hesperia, CA

Prepared by Michael Brandman Associates

5-May

Proposed General Plan Update

2030

	ROG (pounds/day)	NOx (pounds/day)	CO (pounds/day)	PM10 (pounds/day)	PM2.5 (pounds/day)
Year 2030					
Transportation	1101.2	4149.5	9710.7	2266.4	655.7
Natural Gas	171.0	2259.0	1237.0	4.0	4.0
Stationary Sources	214.8	18.1	5.5	178.6	95.3
Consumer Products/Coating	4939.0	0.0	0.0	0.0	0.0
Hearth	110090.0	1721.0	131887.0	18379.0	17690.0
Landscape	573.0	36.0	3178.0	8.0	8.0
Total	117089.0	8183.6	146018.2	20836.1	18453.1

	ROG (tons/year)	NOx (tons/year)	CO (tons/year)	PM10 (tons/year)	PM2.5 (tons/year)
Year 2030					
Transportation	201.0	757.3	1772.2	413.6	119.7
Natural Gas	31.0	412.0	226.0	1.0	1.0
Stationary Sources	39.2	3.3	1.0	32.6	17.4
Consumer Products/Coating	902.0	0.0	0.0	0.0	0.0
Hearth	1377.0	18.0	1647.0	230.0	221.0
Landscape	105.0	7.0	580.0	2.0	2.0
Total	2655.2	1197.6	4226.2	679.2	361.1

Estimate of Area Source Emissions (extracted from URBEMIS Model output)**Proposed General Plan Update**

Winter	ROG		NOX		CO		SO2		PM10		PM2.5	
	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)	Winter (lbs/day)	Winter (tons/day)
Natural Gas	171	0.1	2,259	1.1	1,237	0.6	-	-	4	0.0	4	0.0
Hearth	110,090	55.0	1,721	0.9	131,887	65.9	230	0.1	18,379	9.2	17,690	8.8
Landscape	-	-	-	-	-	-	-	-	-	-	-	-
Consumer Products	4,097	2.0	-	-	-	-	-	-	-	-	-	-
Architectural Coatings	842	0.4	-	-	-	-	-	-	-	-	-	-
TOTAL	115,200	57.6	3,980	2.0	133,124	66.6	230	0.1	18,383	9.2	17,694	8.8

Summer	ROG		NOX		CO		SO2		PM10		PM2.5	
	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)	Summer (lbs/day)	Summer (tons/day)
Natural Gas	171	0.1	2,259	1.1	1,237	0.6	-	-	4	0.0	4	0.0
Hearth	-	-	-	-	-	-	-	-	-	-	-	-
Landscape	573	0.3	36	0.0	3,178	1.6	-	-	8	0.0	8	0.0
Consumer Products	4,097	2.0	-	-	-	-	-	-	-	-	-	-
Architectural Coatings	842	0.4	-	-	-	-	-	-	-	-	-	-
TOTAL	5,683	2.8	2,231	1.1	4,415	2.2	-	-	12	0.0	12	0.0
MAX Daily	115,200	57.6	3,980	2.0	133,124	66.6	230	0.1	18,383	9.2	17,694	8.8

Annual	ROG		NOx		CO		SOx		PM10		PM2.5	
	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)	Annual (tons/year)
Natural Gas	31	412	226	-	1	1	-	-	1	1	-	-
Hearth	1,377	18	1,647	3	230	221	-	-	230	221	-	-
Landscape	105	7	580	-	2	2	-	-	2	2	-	-
Consumer Products	748	-	-	-	-	-	-	-	-	-	-	-
Architectural Coatings	154	-	-	-	-	-	-	-	-	-	-	-
TOTAL	2,415	437	2,453	3	233	224	-	-	233	224	-	-

Vehicle Miles Traveled Calculations
Emission Inventory for City of Hesperia, CA

Proposed General Plan Update

Estimate of Vehicle Miles Traveled - 2008			
Daily rural+urban VMT in Hesperia	1,280,750	miles per day	Ref 1
Highway miles in Hesperia:	24.7	miles	Ref 2
Highway miles in SB County:	1,189	miles	Ref 1
% Hesperia highway miles in SB County	2.1%		
Total Daily highway VMT in SB County	35,884,050	miles per day	Ref 1
% Freeway VMT due to Hesperia	50%		
Highway daily VMT in Hesperia	372,601	miles per day	
Daily rural+urban+highway VMT in Hesperia	1,653,351	miles per day	
% total Hesperia VMT as Highway	23%		
% total Hesperia VMT as Arterial/Local	77%		
Annual rural+urban+highway VMT in Hesperia	603,473,150	miles per year	
% Hesperia rural+urban+highway of SB County highway	4.6%		

Estimate of Vehicle Miles Traveled - 2030

MDAB Daily VMT	54,122,000	miles per day	Ref 3
	19,754,530,000	miles per year	
Assumption 1: % Hesperia VMT to SB County is the same as % Hesperia VMT to MDAB			
Daily VMT is Hesperia	2,493,661	miles per day	
Annual VMT in Hesperia	910,186,387	miles per year	

EMFAC2007 BURDEN Calculations of Emissions and VMT for the MDAB - 2030 Ref 3

Pollutant	MDAB Emissions (tons/day)	MDAB Daily VMT (miles/day)	Emission Factor (grams/mile)
ROG	11.95	54,122,000	0.200
NOx	45.03	54,122,000	0.755
CO	105.38	54,122,000	1.768
PM10	4.09	54,122,000	0.069
PM2.5	2.81	54,122,000	0.047

General Plan - Proposed Project

Assumption 2: Total VMT for the Planning Area can be scaled by population

General Plan - Existing Plan Population	242,460
General Plan - Proposed Project Population	243,465
Ratio of Proposed to Existing Plan	1.004
Daily VMT in Hesperia	2,503,998 <u>miles per day</u>

References

Reference 1: California Department of Transportation, 2009. 2008 California Public Road Data;
<http://www.dot.ca.gov/hq/tsip/hpms/hpmslibrary/hpmspdf/2008PRD.pdf>
Reference 2: Google Earth highway lengths in the City of Hesperia and Sphere of Influence
Reference 3: EMFAC2007 BURDEN Model for the Mojave Desert Air Basin; emission factors derived by
the dividing the daily emission totals by the daily VMT from all vehicle classes

5-May

Proposed General Plan Update

On-road Vehicle Exhaust Emissions

Pollutant	Emission Factor (grams/mile)	Daily VMT (miles/day)	2030 (tons/day)	2030 (tons/year)	2030 (pounds/day)
ROG	0.200	2,493,661	0.55	201	1,101
NOx	0.755	2,493,661	2.07	757	4,149
CO	1.768	2,493,661	4.86	1,772	9,711
PM10	0.069	2,493,661	0.19	69	377
PM2.5	0.047	2,493,661	0.13	47	259

Paved Road Dust (Ref 3 and Ref 4)

Variable
sL, Road Surface Silt Loading - Freeway
sL - Arterial

Definition

0.02 g/m2 (Ref 1)
0.035 g/m2 (Ref 1)

$$E = \left[k \left(\frac{sL}{2} \right)^{0.65} \left(\frac{W}{3} \right)^{1.5} \right] \times \left(1 - \frac{P}{4N} \right)$$

W, Average Vehicle Weight (tons)
k, Particulate Size Multiplier
P, Rainy days with greater than
0.01 inches precipitation
N, Days in Averaging Period

2.4 tons in the MDAB
0.016 lb PM10/VMT (Ref 2)

21 Days (Ref 3)
365 Days

E, PM10 Emission Factor - Freeway
E - Arterial

0.0005655 lb PM10/VMT
0.0008137 lb PM10/VMT

Total Daily VMT - Hesperia for 2030
Percent Highway VMT
Percent Arterial VMT

2,493,661 miles/day (see VMT and Emissions Factor sheet)
23% (see VMT and Emissions Factor worksheet)
77% (see VMT and Emissions Factor worksheet)

Hesperia - Paved Road Dust	2030 PM10 Emissions (lbs/day)	2030 PM10 Emissions (tons/day)	2030 PM10 Emissions (tons/year)	2030 PM2.5 (pounds/day) - (Ref 4)	2030 PM2.5 (tons/day) - (Ref 4)	2030 PM2.5 (tons/year) - (Ref 4)
Freeway Emissions	317.8	0.2	58.0	66.7	0.03	12.2
Arterial Emissions	1571.7	0.8	286.8	330.1	0.17	60.2
Total	1890	0.9	344.8	396.8	0.20	72.4

References:

Ref 1: California Air Resources Board "Section 7.8, San Joaquin Valley Entrained Road Dust, Paved Road Travel"

www.arb.ca.gov/ei/areasrc/PMSJVPavedRoadMethod2003.pdf

Ref 2: United States Environmental Protection Agency. Paved Road Dust. www.epa.gov/ttn/chief/ap42/ch13/final/c13s0201.pdf

Ref 3: Western Regional Climate Center. Period of Record General Climate Summary - Precipitation. Hesperia.

<http://www.wrcc.dri.edu/cgi-bin/cliMAIN.pl?ca3935>

Ref 4: PM2.5 road dust emissions were assumed to be 21% of PM10 emissions

Proposed General Plan Update

Stationary Sources in Hesperia in 2007

Ref 1

Number	FacID	District	Facility Name	City	TOG (tons/yr)	ROG (tons/yr)	CO (tons/yr)	NOx (tons/yr)	SOx (tons/yr)	PM (tons/yr)	PM10 (tons/yr)	PM2.5 (tons/yr)
2	44301110	Desert	Advance Disposal	Hesperia	0.4	0.3	0	0	0	0	0	0
8	157202663	Desert	Alltech Associat	Hesperia	21.6	18.3	0	0	0	0	0	0
24	35401020	Desert	C & M Wood Indus	Hesperia	7.5	1.2	0.7	1.2	0	0.1	0.1	0.1
27	53101203	Desert	Caldwell-william	Hesperia	0	0	0	0	0	0	0	0
42	32601481	Desert	Diversity Materi	Hesperia	0	0	0	0	0	1.4	0.5	0.1
54	102102392	Desert	Hesperia Sanitar	Hesperia	0.3	0.1	0.3	1.5	0	17.2	8.7	1.4
57	9800120	Desert	Hi-grade Materia	Hesperia	0	0	0	0	0	25.1	23.1	15.6
64	58601258	Desert	Jpm Product	Hesperia	0.5	0.5	0	0.1	0	0	0	0
66	58901261	Desert	Kormil Industrie	Hesperia	1.8	1.8	0	0	0	0	0	0
70	999900001	Desert	Lead Masters	Hesperia		0	0	0	0	0.2	0.2	0.2
73	6900933	Desert	Lugo Substation	Hesperia		0	0	0	0	0	0	0
80	43901106	Desert	Mcwelco Products	Hesperia	3	2.9	0	0	0	0	0	0
119	76501479	Desert	Simtec	Hesperia	0.1	0.1	0	0	0	0	0	0
133	44701247	Desert	Standard Abrasiv	Hesperia	1.4	0.7	0	0.5	0	0	0	0
134	26800927	Desert	Suncrete Materia	Hesperia	0	0	0	0	0	0	0	0
142	45801128	Desert	Terrell Industri	Hesperia	13.7	13.3	0	0	0	0	0	0
156	7601320	Desert	Verizon-hesperia	Hesperia		0	0	0	0	0	0	0
Total (tons/year)					50.3	39.2	1	3.3	0	44	32.6	17.4
Total (pounds/day)					276	215	5	18	0	241	179	95

Reference 1: California Air Resources Board 2007. Facility Search Engine. Stationary Sources Located in the Mojave Desert Air Basin
<http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php>

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\MBA\Hesperia\HesperiaGP_Existing_2009.urb924

Project Name: Hesperia General Plan Update-Existing Conditions 2009 Planning Area - Area Sources

Project Location: San Bernadino County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	2,340.40	854.13	1,855.03	0.08	5.41	5.35

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	2,340.40	854.13	1,855.03	0.08	5.41	5.35

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
Natural Gas	64.22	840.61	420.28	0.01	1.59	1.57
Hearth - No Summer Emissions						
Landscape	258.19	13.52	1,434.75	0.07	3.82	3.78
Consumer Products	1,772.42					
Architectural Coatings	245.57					
TOTALS (lbs/day, unmitigated)	2,340.40	854.13	1,855.03	0.08	5.41	5.35

Area Source Changes to Defaults

- Percent residential using natural gas changed from 78% to 100%
- Percentage of residences with wood stoves changed from 10% to 5%
- Percentage of residences with wood fireplaces changed from 5% to 55%
- Percentage of residences with natural gas fireplaces changed from 85% to 40%

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\MBA\Hesperia\HesperiaGP_Existing_2009.urb924
Project Name: Hesperia General Plan Update-Existing Conditions 2009 Planning Area - Area Sources
Project Location: San Bernadino County
On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006
Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	49,713.57	1,585.21	57,482.27	99.57	7,953.62	7,655.12

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	49,713.57	1,585.21	57,482.27	99.57	7,953.62	7,655.12

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
Natural Gas	64.22	840.61	420.28	0.01	1.59	1.57
Hearth	47,631.36	744.60	57,061.99	99.56	7,952.03	7,653.55
Landscaping - No Winter Emissions						
Consumer Products	1,772.42					
Architectural Coatings	245.57					
TOTALS (lbs/day, unmitigated)	49,713.57	1,585.21	57,482.27	99.57	7,953.62	7,655.12

Area Source Changes to Defaults

- Percent residential using natural gas changed from 78% to 100%
- Percentage of residences with wood stoves changed from 10% to 5%
- Percentage of residences with wood fireplaces changed from 5% to 55%
- Percentage of residences with natural gas fireplaces changed from 85% to 40%

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\MBA\Hesperia\HesperiaGP_Existing_2009.urb924

Project Name: Hesperia General Plan Update-Existing Conditions 2009 Planning Area - Area Sources

Project Location: San Bernadino County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (tons/year, unmitigated)	1,022.73	163.86	1,051.25	1.25	100.28	96.54

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (tons/year, unmitigated)	1,022.73	163.86	1,051.25	1.25	100.28	96.54

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
Natural Gas	11.72	153.41	76.70	0.00	0.29	0.29
Hearth	595.60	7.98	712.71	1.24	99.29	95.56
Landscape	47.12	2.47	261.84	0.01	0.70	0.69
Consumer Products	323.47					
Architectural Coatings	44.82					
TOTALS (tons/year, unmitigated)	1,022.73	163.86	1,051.25	1.25	100.28	96.54

Area Source Changes to Defaults

Percent residential using natural gas changed from 78% to 100%

Percentage of residences with wood stoves changed from 10% to 5%

Percentage of residences with wood fireplaces changed from 5% to 55%

Percentage of residences with natural gas fireplaces changed from 85% to 40%

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\MBA\Hesperia\HesperiaGP_2030_BuildOut.urb924

Project Name: City of Hesperia General Plan - Existing Plan

Project Location: San Bernadino County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	5,724.96	2,348.07	4,453.52	0.16	12.73	12.62

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	5,724.96	2,348.07	4,453.52	0.16	12.73	12.62

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
Natural Gas	175.24	2,312.33	1,283.42	0.02	4.34	4.30
Hearth - No Summer Emissions						
Landscape	572.01	35.74	3,170.10	0.14	8.39	8.32
Consumer Products	4,085.94					
Architectural Coatings	891.77					
TOTALS (lbs/day, unmitigated)	5,724.96	2,348.07	4,453.52	0.16	12.73	12.62

Area Source Changes to Defaults

Percent residential using natural gas changed from 78% to 100%

Percentage of residences with wood stoves changed from 10% to 5%

Percentage of residences with wood fireplaces changed from 5% to 55%

Percentage of residences with natural gas fireplaces changed from 85% to 40%

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\MBA\Hesperia\HesperiaGP_2030_BuildOut.urb924

Project Name: City of Hesperia General Plan - Existing Plan

Project Location: San Bernadino County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	114,957.36	4,028.84	132,828.24	229.53	18,336.12	17,648.01

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	114,957.36	4,028.84	132,828.24	229.53	18,336.12	17,648.01

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
Natural Gas	175.24	2,312.33	1,283.42	0.02	4.34	4.30
Hearth	109,804.41	1,716.51	131,544.82	229.51	18,331.78	17,643.71
Landscaping - No Winter Emissions						
Consumer Products	4,085.94					
Architectural Coatings	891.77					
TOTALS (lbs/day, unmitigated)	114,957.36	4,028.84	132,828.24	229.53	18,336.12	17,648.01

Area Source Changes to Defaults

- Percent residential using natural gas changed from 78% to 100%
- Percentage of residences with wood stoves changed from 10% to 5%
- Percentage of residences with wood fireplaces changed from 5% to 55%
- Percentage of residences with natural gas fireplaces changed from 85% to 40%

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\MBA\Hesperia\HesperiaGP_2030_BuildOut.urb924

Project Name: City of Hesperia General Plan - Existing Plan

Project Location: San Bernadino County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (tons/year, unmitigated)	2,418.68	446.92	2,455.77	2.88	231.22	222.60

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (tons/year, unmitigated)	2,418.68	446.92	2,455.77	2.88	231.22	222.60

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
Natural Gas	31.98	422.00	234.22	0.00	0.79	0.78
Hearth	1,373.88	18.40	1,643.01	2.85	228.90	220.30
Landscape	104.39	6.52	578.54	0.03	1.53	1.52
Consumer Products	745.68					
Architectural Coatings	162.75					
TOTALS (tons/year, unmitigated)	2,418.68	446.92	2,455.77	2.88	231.22	222.60

Area Source Changes to Defaults

- Percent residential using natural gas changed from 78% to 100%
- Percentage of residences with wood stoves changed from 10% to 5%
- Percentage of residences with wood fireplaces changed from 5% to 55%
- Percentage of residences with natural gas fireplaces changed from 85% to 40%

Urbemis 2007 Version 9.2.4

Combined Summer Emissions Reports (Pounds/Day)

File Name: C:\MBA\Hesperia\Hesperia GP Buildout 2030 Proposed Project.urb924

Project Name: City of Hesperia General Plan 2030 Build Out Proposed Project Area Sources

Project Location: San Bernadino County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	5,682.98	2,294.35	4,414.82	0.16	12.66	12.54

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	5,682.98	2,294.35	4,414.82	0.16	12.66	12.54

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Summer Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
Natural Gas	171.36	2,258.52	1,236.51	0.02	4.25	4.20
Hearth - No Summer Emissions						
Landscape	573.49	35.83	3,178.31	0.14	8.41	8.34
Consumer Products	4,096.56					
Architectural Coatings	841.57					
TOTALS (lbs/day, unmitigated)	5,682.98	2,294.35	4,414.82	0.16	12.66	12.54

Area Source Changes to Defaults

- Percent residential using natural gas changed from 78% to 100%
- Percentage of residences with wood stoves changed from 10% to 5%
- Percentage of residences with wood fireplaces changed from 5% to 55%
- Percentage of residences with natural gas fireplaces changed from 85% to 40%

Urbemis 2007 Version 9.2.4

Combined Winter Emissions Reports (Pounds/Day)

File Name: C:\MBA\Hesperia\Hesperia GP Buildout 2030 Proposed Project.urb924

Project Name: City of Hesperia General Plan 2030 Build Out Proposed Project Area Sources

Project Location: San Bernadino County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	115,199.28	3,979.49	133,123.21	230.12	18,383.67	17,693.76

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (lbs/day, unmitigated)	115,199.28	3,979.49	133,123.21	230.12	18,383.67	17,693.76

Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Winter Pounds Per Day, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
Natural Gas	171.36	2,258.52	1,236.51	0.02	4.25	4.20
Hearth	110,089.79	1,720.97	131,886.70	230.10	18,379.42	17,689.56
Landscaping - No Winter Emissions						
Consumer Products	4,096.56					
Architectural Coatings	841.57					
TOTALS (lbs/day, unmitigated)	115,199.28	3,979.49	133,123.21	230.12	18,383.67	17,693.76

Area Source Changes to Defaults

- Percent residential using natural gas changed from 78% to 100%
- Percentage of residences with wood stoves changed from 10% to 5%
- Percentage of residences with wood fireplaces changed from 5% to 55%
- Percentage of residences with natural gas fireplaces changed from 85% to 40%

Urbemis 2007 Version 9.2.4

Combined Annual Emissions Reports (Tons/Year)

File Name: C:\MBA\Hesperia\Hesperia GP Buildout 2030 Proposed Project.urb924

Project Name: City of Hesperia General Plan 2030 Build Out Proposed Project Area Sources

Project Location: San Bernadino County

On-Road Vehicle Emissions Based on: Version : Emfac2007 V2.3 Nov 1 2006

Off-Road Vehicle Emissions Based on: OFFROAD2007

Summary Report:

AREA SOURCE EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (tons/year, unmitigated)	2,414.60	437.17	2,452.98	2.89	231.81	223.16

SUM OF AREA SOURCE AND OPERATIONAL EMISSION ESTIMATES

	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
TOTALS (tons/year, unmitigated)	2,414.60	437.17	2,452.98	2.89	231.81	223.16

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Area Source Unmitigated Detail Report:

AREA SOURCE EMISSION ESTIMATES Annual Tons Per Year, Unmitigated

<u>Source</u>	<u>ROG</u>	<u>NOx</u>	<u>CO</u>	<u>SO2</u>	<u>PM10</u>	<u>PM2.5</u>
Natural Gas	31.27	412.18	225.66	0.00	0.78	0.77
Hearth	1,377.46	18.45	1,647.28	2.86	229.50	220.87
Landscape	104.66	6.54	580.04	0.03	1.53	1.52
Consumer Products	747.62					
Architectural Coatings	153.59					
TOTALS (tons/year, unmitigated)	2,414.60	437.17	2,452.98	2.89	231.81	223.16

Area Source Changes to Defaults

- Percent residential using natural gas changed from 78% to 100%
- Percentage of residences with wood stoves changed from 10% to 5%
- Percentage of residences with wood fireplaces changed from 5% to 55%
- Percentage of residences with natural gas fireplaces changed from 85% to 40%

Appendix B: CALINE4 Model Output

2030_GP_BO_3rd_Main.out
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2030 GP Build Out - 3rd Ave @ Main St (P
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= 4.4 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB External	10	0	10	600	AG	1133	1.6	.0	13.1
B. NB Approach	10	600	10	756	AG	865	1.9	.0	13.1
C. NB Depart	10	756	10	912	AG	974	1.9	.0	13.1
D. NB External	10	912	10	1512	AG	974	1.6	.0	13.1
E. NB Left	10	600	5	756	AG	268	1.9	.0	13.1
F. SB Left	0	912	5	756	AG	417	1.9	.0	13.1
G. SB External	0	1512	0	912	AG	1212	1.6	.0	13.1
H. SB Approach	0	912	0	756	AG	795	1.9	.0	13.1
I. SB Depart	0	756	0	600	AG	1075	1.9	.0	13.1
J. SB External	0	600	0	0	AG	1075	1.6	.0	13.1
K. EB External	-750	750	-150	750	AG	3037	1.6	.0	14.6
L. EB Approach	-150	750	5	750	AG	2777	1.9	.0	14.6
M. EB Depart	5	750	160	750	AG	3345	1.9	.0	14.6
N. EB External	160	750	760	750	AG	3345	1.6	.0	14.6
O. WB External	760	762	160	762	AG	3478	1.6	.0	14.6
P. WB Approach	160	762	5	762	AG	3168	1.9	.0	14.6
Q. WB Depart	5	762	-150	762	AG	3466	1.9	.0	14.6
R. WB External	-150	762	-750	762	AG	3466	1.6	.0	14.6
S. EB Left	-150	750	5	756	AG	260	1.9	.0	14.6
T. WB Left	160	762	5	756	AG	310	1.9	.0	14.6

□□

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: 2030 GP Build Out - 3rd Ave @ Main St (P
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	* X	* Y	* Z
1. Receptor	-8	741	2.0
2. Receptor	18	741	2.0
3. Receptor	18	770	2.0
4. Receptor	-8	770	2.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	* BRG (DEG)	* PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. Receptor	83.	.8	.0	.0	.0	.0	.0	.0	.0	.0
2. Receptor	277.	.8	.0	.0	.0	.0	.0	.0	.0	.0

2030_GP_BO_3rd_Main.out

3. Receptor	*	264.	*	.9	*	.0	.0	.0	.0	.0	.0	.0	.0
4. Receptor	*	96.	*	.9	*	.0	.0	.0	.0	.0	.0	.0	.0

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. Receptor	*	.0	.0	.0	.0	.4	.0	.0	.1	.0	.0	.0	.0
2. Receptor	*	.0	.0	.0	.4	.0	.0	.0	.0	.1	.0	.0	.0
3. Receptor	*	.0	.0	.1	.0	.0	.0	.0	.0	.5	.0	.0	.0
4. Receptor	*	.0	.0	.0	.0	.0	.1	.0	.4	.0	.0	.0	.0

□□

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2030 GP Build Out - Hwy 395 @ Phelan Rd
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= 4.4 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	* * *	LINK X1	COORDINATES (M) Y1	X2	Y2	* * *	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB External	*	10	0	10	600	*	AG	3827	1.6	.0	13.1
B. NB Approach	*	10	600	10	756	*	AG	3216	1.9	.0	13.1
C. NB Depart	*	10	756	10	912	*	AG	4266	1.9	.0	13.1
D. NB External	*	10	912	10	1512	*	AG	4266	1.6	.0	13.1
E. NB Left	*	10	600	5	756	*	AG	611	1.9	.0	13.1
F. SB Left	*	0	912	5	756	*	AG	826	1.9	.0	13.1
G. SB External	*	0	1512	0	912	*	AG	3227	1.6	.0	13.1
H. SB Approach	*	0	912	0	756	*	AG	2401	1.9	.0	13.1
I. SB Depart	*	0	756	0	600	*	AG	2698	1.9	.0	13.1
J. SB External	*	0	600	0	0	*	AG	2698	1.6	.0	13.1
K. EB External	*	-750	750	-150	750	*	AG	1764	1.6	.0	14.6
L. EB Approach	*	-150	750	5	750	*	AG	1453	1.9	.0	14.6
M. EB Depart	*	5	750	160	750	*	AG	1969	1.9	.0	14.6
N. EB External	*	160	750	760	750	*	AG	1969	1.6	.0	14.6
O. WB External	*	760	762	160	762	*	AG	2337	1.6	.0	14.6
P. WB Approach	*	160	762	5	762	*	AG	2224	1.9	.0	14.6
Q. WB Depart	*	5	762	-150	762	*	AG	2222	1.9	.0	14.6
R. WB External	*	-150	762	-750	762	*	AG	2222	1.6	.0	14.6
S. EB Left	*	-150	750	5	756	*	AG	311	1.9	.0	14.6
T. WB Left	*	160	762	5	756	*	AG	113	1.9	.0	14.6

□□

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: 2030 GP Build Out - Hwy 395 @ Phelan Rd
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	* * *	COORDINATES (M) X	Y	Z
1. Receptor	*	-8	741	2.0
2. Receptor	*	18	741	2.0
3. Receptor	*	18	770	2.0
4. Receptor	*	-8	770	2.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	* * *	BRG (DEG)	* * *	PRED CONC (PPM)	* * *	A	B	C	CONC/LINK (PPM) D	E	F	G	H
1. Receptor	*	6.	*	.9	*	.0	.0	.1	.1	.0	.0	.0	.3

2030_GP_BO_HWY_Phe1an.out

2. Receptor	*	353.	*	1.1	*	.0	.0	.5	.0	.0	.0	.0	.1
3. Receptor	*	187.	*	1.0	*	.0	.4	.0	.0	.0	.0	.0	.0
4. Receptor	*	173.	*	.9	*	.0	.1	.0	.0	.0	.0	.0	.0

RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. Receptor	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Receptor	*	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
3. Receptor	*	.1	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0
4. Receptor	*	.4	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0

□□

2030_GP_BO_Mariposa_Mojave.out
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2030 GP Build Out - Mariposa @ Mojave (P
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= 4.4 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB External	8	0	8	600	AG	2011	1.6	.0	10.6
B. NB Approach	8	600	8	752	AG	973	1.9	.0	10.6
C. NB Depart	8	752	8	905	AG	1625	1.9	.0	10.6
D. NB External	8	905	8	1505	AG	1625	1.6	.0	10.6
E. NB Left	8	600	4	752	AG	1038	1.9	.0	10.6
F. SB Left	0	905	4	752	AG	10	1.9	.0	10.6
G. SB External	0	1505	0	905	AG	1237	1.6	.0	10.6
H. SB Approach	0	905	0	752	AG	1227	1.9	.0	10.6
I. SB Depart	0	752	0	600	AG	1794	1.9	.0	10.6
J. SB External	0	600	0	0	AG	1794	1.6	.0	10.6
K. EB External	-750	750	-150	750	AG	3372	1.6	.0	10.0
L. EB Approach	-150	750	4	750	AG	2585	1.9	.0	10.0
M. EB Depart	4	750	158	750	AG	1844	1.9	.0	10.0
N. EB External	158	750	758	750	AG	1844	1.6	.0	10.0
O. WB External	758	755	158	755	AG	1377	1.6	.0	10.0
P. WB Approach	158	755	4	755	AG	1217	1.9	.0	10.0
Q. WB Depart	4	755	-150	755	AG	2734	1.9	.0	10.0
R. WB External	-150	755	-750	755	AG	2734	1.6	.0	10.0
S. EB Left	-150	750	4	752	AG	787	1.9	.0	10.0
T. WB Left	158	755	4	752	AG	160	1.9	.0	10.0

□□

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: 2030 GP Build Out - Mariposa @ Mojave (P
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	* X	* Y	* Z
1. Receptor	-7	745	2.0
2. Receptor	14	745	2.0
3. Receptor	14	760	2.0
4. Receptor	-7	760	2.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	* BRG (DEG)	* PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. Receptor	274.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Receptor	274.	1.2	.0	.0	.0	.0	.0	.0	.0	.0

Page 1

2030_GP_BO_Mariposa_Mojave.out

3. Receptor	*	266.	*	1.1	*	.0	.0	.1	.0	.0	.0	.0	.0
4. Receptor	*	265.	*	1.0	*	.0	.0	.0	.0	.0	.0	.0	.0

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. Receptor	*	.0	.0	.0	.5	.0	.0	.0	.0	.2	.0	.1	.0
2. Receptor	*	.0	.0	.0	.4	.0	.0	.0	.0	.2	.0	.1	.0
3. Receptor	*	.0	.0	.1	.2	.0	.0	.0	.0	.4	.0	.0	.0
4. Receptor	*	.0	.0	.0	.2	.0	.0	.0	.0	.6	.0	.0	.0

□□

2030_GP_PP_BaldyMesa_Phelan.out
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2030 GP Proposed Project - Baldy Mesa @
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= 4.4 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	*	LINK X1	COORDINATES (M) Y1	X2	Y2	*	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB External	*	10	0	10	600	*	AG	2440	1.6	.0	12.8
B. NB Approach	*	10	600	10	755	*	AG	1012	1.9	.0	12.8
C. NB Depart	*	10	755	10	911	*	AG	1088	1.9	.0	12.8
D. NB External	*	10	911	10	1511	*	AG	1088	1.6	.0	12.8
E. NB Left	*	10	600	5	755	*	AG	1428	1.9	.0	12.8
F. SB Left	*	0	911	5	755	*	AG	905	1.9	.0	12.8
G. SB External	*	0	1511	0	911	*	AG	2402	1.6	.0	12.8
H. SB Approach	*	0	911	0	755	*	AG	1497	1.9	.0	12.8
I. SB Depart	*	0	755	0	600	*	AG	2164	1.9	.0	12.8
J. SB External	*	0	600	0	0	*	AG	2164	1.6	.0	12.8
K. EB External	*	-750	750	-150	750	*	AG	2511	1.6	.0	14.0
L. EB Approach	*	-150	750	5	750	*	AG	2304	1.9	.0	14.0
M. EB Depart	*	5	750	160	750	*	AG	2658	1.9	.0	14.0
N. EB External	*	160	750	760	750	*	AG	2658	1.6	.0	14.0
O. WB External	*	760	761	160	761	*	AG	1658	1.6	.0	14.0
P. WB Approach	*	160	761	5	761	*	AG	1651	1.9	.0	14.0
Q. WB Depart	*	5	761	-150	761	*	AG	3101	1.9	.0	14.0
R. WB External	*	-150	761	-750	761	*	AG	3101	1.6	.0	14.0
S. EB Left	*	-150	750	5	755	*	AG	207	1.9	.0	14.0
T. WB Left	*	160	761	5	755	*	AG	7	1.9	.0	14.0

□□

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: 2030 GP Proposed Project - Baldy Mesa @
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	*	COORDINATES (M) X	Y	Z
1. Receptor	*	-8	742	2.0
2. Receptor	*	18	742	2.0
3. Receptor	*	18	769	2.0
4. Receptor	*	-8	769	2.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	*	BRG (DEG)	*	PRED CONC (PPM)	*	A	B	C	CONC/LINK (PPM) D	E	F	G	H
1. Receptor	*	85.	*	.8	*	.0	.0	.0	.0	.0	.0	.0	.0
2. Receptor	*	276.	*	.9	*	.0	.0	.0	.0	.0	.0	.0	.0

Page 1

2030_GP_PP_BaldyMesa_Phelan.out

3. Receptor	*	265.	*	.9	*	.0	.0	.0	.0	.0	.0	.0	.0
4. Receptor	*	173.	*	.9	*	.0	.0	.0	.0	.1	.0	.0	.0

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. Receptor	*	.1	.0	.0	.0	.4	.0	.0	.0	.0	.0	.0	.0
2. Receptor	*	.0	.0	.0	.3	.0	.0	.0	.0	.1	.0	.0	.0
3. Receptor	*	.0	.0	.1	.0	.0	.0	.0	.0	.4	.0	.0	.0
4. Receptor	*	.3	.0	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0

□□

2030_GP_PP_Hwy395_Smoke Tree.out
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2030 GP Proposed Project - Hwy 395 @ Smo
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= 4.4 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	* *	LINK X1	COORDINATES (M) Y1	X2	Y2	* *	TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB External	*	6	0	6	600	*	AG	5071	1.6	.0	10.0
B. NB Approach	*	6	600	6	753	*	AG	4844	1.9	.0	10.0
C. NB Depart	*	6	753	6	906	*	AG	5755	1.9	.0	10.0
D. NB External	*	6	906	6	1506	*	AG	5755	1.6	.0	10.0
E. NB Left	*	6	600	3	753	*	AG	227	1.9	.0	10.0
F. SB Left	*	0	906	3	753	*	AG	0	1.9	.0	10.0
G. SB External	*	0	1506	0	906	*	AG	3780	1.6	.0	10.0
H. SB Approach	*	0	906	0	753	*	AG	3780	1.9	.0	10.0
I. SB Depart	*	0	753	0	600	*	AG	3343	1.9	.0	10.0
J. SB External	*	0	600	0	0	*	AG	3343	1.6	.0	10.0
K. EB External	*	-750	750	-150	750	*	AG	1037	1.6	.0	10.0
L. EB Approach	*	-150	750	3	750	*	AG	126	1.9	.0	10.0
M. EB Depart	*	3	750	156	750	*	AG	0	1.9	.0	10.0
N. EB External	*	156	750	756	750	*	AG	0	1.6	.0	10.0
O. WB External	*	756	756	156	756	*	AG	0	1.6	.0	10.0
P. WB Approach	*	156	756	3	756	*	AG	0	1.9	.0	10.0
Q. WB Depart	*	3	756	-150	756	*	AG	790	1.9	.0	10.0
R. WB External	*	-150	756	-750	756	*	AG	790	1.6	.0	10.0
S. EB Left	*	-150	750	3	753	*	AG	911	1.9	.0	10.0
T. WB Left	*	156	756	3	753	*	AG	0	1.9	.0	10.0

□□

CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: 2030 GP Proposed Project - Hwy 395 @ Smo
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	* *	COORDINATES (M) X	Y	Z
1. Receptor	*	-6	744	2.0
2. Receptor	*	12	744	2.0
3. Receptor	*	12	762	2.0
4. Receptor	*	-6	762	2.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	* *	BRG (DEG)	* *	PRED CONC (PPM)	* *	A	B	C	CONC/LINK (PPM) D	E	F	G	H
1. Receptor	*	6.	*	1.2	*	.0	.0	.4	.1	.0	.0	.0	.6
2. Receptor	*	355.	*	1.3	*	.0	.0	.8	.0	.0	.0	.1	.2

Page 1

2030_GP_PP_Hwy395_Smoke Tree.out

3. Receptor	*	354.	*	1.3	*	.0	.0	.9	.0	.0	.0	.0	.2
4. Receptor	*	174.	*	1.1	*	.0	.3	.0	.0	.0	.0	.0	.0

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. Receptor	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Receptor	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3. Receptor	*	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4. Receptor	*	.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0

□□

2030_GP_PP_Mariposa_Mojave.out
CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 1

JOB: 2030 GP Proposed Project - Mariposa @ Mo
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

I. SITE VARIABLES

U= 1.0 M/S Z0= 100. CM ALT= 0. (M)
BRG= WORST CASE VD= .0 CM/S
CLAS= 7 (G) VS= .0 CM/S
MIXH= 1000. M AMB= .0 PPM
SIGTH= 5. DEGREES TEMP= 4.4 DEGREE (C)

II. LINK VARIABLES

LINK DESCRIPTION	* X1	* Y1	* X2	* Y2	* TYPE	VPH	EF (G/MI)	H (M)	W (M)
A. NB External	8	0	8	600	AG	2391	1.6	.0	10.6
B. NB Approach	8	600	8	752	AG	1377	1.9	.0	10.6
C. NB Depart	8	752	8	905	AG	2128	1.9	.0	10.6
D. NB External	8	905	8	1505	AG	2128	1.6	.0	10.6
E. NB Left	8	600	4	752	AG	1014	1.9	.0	10.6
F. SB Left	0	905	4	752	AG	26	1.9	.0	10.6
G. SB External	0	1505	0	905	AG	1644	1.6	.0	10.6
H. SB Approach	0	905	0	752	AG	1618	1.9	.0	10.6
I. SB Depart	0	752	0	600	AG	2004	1.9	.0	10.6
J. SB External	0	600	0	0	AG	2004	1.6	.0	10.6
K. EB External	-750	750	-150	750	AG	3581	1.6	.0	10.0
L. EB Approach	-150	750	4	750	AG	2741	1.9	.0	10.0
M. EB Depart	4	750	158	750	AG	1917	1.9	.0	10.0
N. EB External	158	750	758	750	AG	1917	1.6	.0	10.0
O. WB External	758	755	158	755	AG	1293	1.6	.0	10.0
P. WB Approach	158	755	4	755	AG	1186	1.9	.0	10.0
Q. WB Depart	4	755	-150	755	AG	2860	1.9	.0	10.0
R. WB External	-150	755	-750	755	AG	2860	1.6	.0	10.0
S. EB Left	-150	750	4	752	AG	840	1.9	.0	10.0
T. WB Left	158	755	4	752	AG	107	1.9	.0	10.0

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CALINE4: CALIFORNIA LINE SOURCE DISPERSION MODEL
JUNE 1989 VERSION
PAGE 2

JOB: 2030 GP Proposed Project - Mariposa @ Mo
RUN: Hour 1 (WORST CASE ANGLE)
POLLUTANT: Carbon Monoxide

III. RECEPTOR LOCATIONS

RECEPTOR	* X	* Y	* Z
1. Receptor	-7	745	2.0
2. Receptor	14	745	2.0
3. Receptor	14	760	2.0
4. Receptor	-7	760	2.0

IV. MODEL RESULTS (WORST CASE WIND ANGLE)

RECEPTOR	* BRG (DEG)	* PRED CONC (PPM)	A	B	C	D	E	F	G	H
1. Receptor	274.	1.0	.0	.0	.0	.0	.0	.0	.0	.0
2. Receptor	274.	1.2	.0	.0	.0	.0	.0	.0	.0	.0

Page 1

2030_GP_PP_Mariposa_Mojave.out

3. Receptor	*	266.	*	1.2	*	.0	.0	.1	.0	.0	.0	.0	.0
4. Receptor	*	174.	*	.9	*	.0	.0	.0	.0	.0	.0	.0	.0

		CONC/LINK (PPM)											
RECEPTOR	*	I	J	K	L	M	N	O	P	Q	R	S	T
1. Receptor	*	.0	.0	.0	.6	.0	.0	.0	.0	.2	.1	.1	.0
2. Receptor	*	.0	.0	.0	.4	.0	.0	.0	.0	.2	.0	.1	.0
3. Receptor	*	.0	.0	.1	.2	.0	.0	.0	.0	.5	.0	.0	.0
4. Receptor	*	.3	.0	.0	.1	.0	.0	.0	.0	.2	.0	.0	.0

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