

5. AIR QUALITY

The Air Quality Section of this EIR evaluates potential impacts on air quality resulting from the implementation of the proposed General Plan 2023. This Section incorporates guidance and air quality data from the San Joaquin Valley Air Pollution Control District (SJVAPCD). (1)

5.1 EXISTING CONDITIONS

5.1.1 San Joaquin Air Quality Designation

The San Joaquin Valley is currently designated as “severe nonattainment” for the state ozone 1-hour standard, and “serious nonattainment” for the federal 1-hour ozone and 24-hour fine particulate matter (PM10) standards, as shown in Table 5-1. (1)

Table 5-1
Attainment Status for San Joaquin County

Pollutant	Designation	
	National Standards	State Standards
Ozone- One hour	Nonattainment/Serious	Nonattainment/Severe
Ozone- Eight hour	Designation to be Determined	No State Standard
PM10	Nonattainment/Serious	Nonattainment
PM2.5	Designation to be Determined	No State Standard
CO (San Joaquin County)	Unclassified/Attainment	Attainment
Nitrogen Dioxide	Unclassified/Attainment	Attainment
Sulfur Dioxide	Unclassified/Attainment	Attainment
Lead (Particulate)	No designation	Attainment
Hydrogen Sulfide	No Federal Standard	Unclassified
Sulfates	No Federal Standard	Attainment
Visibility Reducing Particles	No Federal Standard	Unclassified

Source: San Joaquin Valley Air Pollution Control District (SJVAPCD)

5.1.2 Setting

Ironically, the long, warm summers that make the area especially suited for agriculture are the same conditions that contribute to the Valley's air quality problems. Heat and sunlight transform volatile organic compounds and nitrogen oxides from vehicle exhaust, industrial processes, and other operations into ground-level ozone, also known as smog. The surrounding mountain ranges pose an additional challenge, as they trap smog in the Valley, not allowing it to dissipate.

In addition to smog, dry weather conditions and topography allow small particles of man-made compounds, as well as soot, ash and dust to become suspended in the air, creating another harmful pollutant -- particulate matter.

The Valley does not currently meet health-based standards set by the United States Environmental Protection Agency (EPA) for ozone and particulate matter, nor the state standards for ozone. These health standards have been established to protect public health, as both smog and particulate matter can cause or aggravate respiratory and cardiac conditions. Research indicates that long-term exposure to either pollutant can contribute to the premature death of people and animals.

In addition to grave health concerns, these pollutants also have a significant impact on other quality of life issues. Ozone damages crops, ornamental vegetation, and man-made materials, affecting the Valley's economy. Particulates obscure visibility, notably distant views, and diminish the natural beauty of the area.

Topography

Air quality in the northern San Joaquin Valley is significantly influenced by topography. The City of Manteca lies within the northern portion of the San Joaquin Valley Air Basin, which in turn occupies the southern half of the Great Central Valley of California. The San Joaquin Valley is bounded by the coastal mountain ranges on the west, rising to an average elevation of 3,000 feet, and the Sierra Nevada mountain range on the east. The Carquinez Strait is 55 miles northwest of the Study Area and the intervening terrain is flat. The Strait is a sea level gap in the coastal range where the San Joaquin-Sacramento Delta empties into San Francisco Bay. Prevailing winds from the ocean blow through the Carquinez Strait, carrying pollutants from the more populous Bay Area.

Climate

The winters in the San Joaquin Valley are usually mild and fairly humid, and the summers are hot, dry, and nearly cloudless. This climate is the result of both the topography and the mean position of the seasonal mid-latitude storm track.

Temperature

In winter, the storm systems moving in from the Pacific Ocean bring a decidedly maritime influence to the San Joaquin Valley. The Sierra Nevada mountain range on the east prevents the cold, continental air masses from influencing the Valley. Temperatures below freezing are unusual. Average high temperatures in the winter are in the 50's (F), but highs in the 30's and 40's can occur with persistent fog and low cloudiness.

In summer, high temperatures often exceed 100 degrees, with averages in the low 90's in the northern valley and the high 90's in the southern valley. Summer low temperatures average in the high 50's in the northern valley and the upper 60's in the southern valley.

Precipitation

Precipitation in the San Joaquin Valley is strongly influenced by the position of the semi-permanent subtropical high pressure belt located off the Pacific coast (referred to as the Pacific High). In the winter, this high pressure system moves southward, allowing Pacific storms to move through the Valley. The majority of the precipitation in the Valley is winter rain produced by these storms. Snowstorms, hailstorms, and icestorms occur infrequently in the Valley, and severe occurrences are very rare. Precipitation during the summer is in the form of convective rain showers, and is rare.

Precipitation on the Valley floor and in the Sierra Nevada decreases from north-to-south. This is primarily because the Pacific storm track often passes through the northern part of the state, while the southern part of the state remains protected by the Pacific High.

The northern end of the Valley (Manteca and Stockton area) receives approximately 20 inches of rain per year. The central portion of the Valley (Fresno area) receives approximately 10 inches of rain per year. The southern end of the Valley (Bakersfield area) receives less than 6 inches of rain per year.

Wind Patterns

The topography of the San Joaquin Valley has a dominating effect on wind patterns. Winds tend to blow somewhat parallel to the Valley and mountain range orientation. In spring and early summer, thermal low-pressure systems develop over the interior basins east of the Sierra Nevada mountain range, and the Pacific High moves northward. These developments and the topography produce the high incidence of relatively strong northwesterly winds in the spring and early summer.

The San Joaquin Valley receives a combination of sea breeze-land breeze and mountain-valley regimes. The sea breeze-land breeze regime has a sea breeze flowing into the Valley from the north during the day, and a land breeze flowing out of the Valley at night.

The prevailing wind direction in the City of Manteca is from the northwest, resulting from marine breezes through the Carquinez Strait. During the winter, the sea breeze diminishes.

Tule Fog

Between winter storms, high pressure and light winds allow cold moist air to pool on the Valley floor. This creates strong low-level temperature inversions and very stable air conditions. The Valley's well-known Tule Fog is the result of these conditions.

5.1.3 Sensitive Receptors

Sensitive receptors located in or near the vicinity of known air emissions sources, including freeways and intersections, are of particular concern. Sensitive receptors are located throughout the City of Manteca, and typically include the following: residences, athletic facilities, schools, health care facilities, playgrounds, convalescent centers, child care centers, and rehabilitation centers.

Land use compatibility issues relative to siting of pollution-emitting sources or siting of sensitive receptors must also be considered. In the case of schools, state law requires that siting decisions consider potential for toxic or harmful air emissions in the surrounding area.

5.2 REGULATORY SETTING AND STANDARDS

5.2.1 Applicable Federal Regulation

U. S. Environmental Protection Agency National Ambient Air Quality Standards

Pursuant to the Federal Clean Air Act of 1970 and subsequent amendments, the Environmental Protection Agency (EPA) has established ambient air pollutant concentration standards and maximum allowable emission rates (National Ambient Air Quality Standards (NAAQS)), for certain individual sources of air pollutants. Air quality is managed through the attainment and maintenance of these ambient standards and enforcement of the emission limits.

There are six Primary NAAQS "criteria" air pollutants (so called because they were established on the basis of health criteria):

- Ozone (O₃)
- Carbon Monoxide (CO)
- Nitrogen Dioxide (NO₂)
- Sulfur Dioxide (SO₂)
- Fine Particulate Matter (PM₁₀)
- Lead (Pb)

The U.S. Environmental Protection Agency (EPA) also recently adopted standards for fine particulate matter (PM2.5).

These air pollutants are further discussed below in Subsection 5.2.3

5.2.2 Applicable State Regulation

California Air Resources Board

The California Air Resources Board (CARB) coordinates and oversees the air pollution control activities performed in California by the local air districts. One of their tasks is to compile data from the numerous air quality monitoring stations throughout the state. Data collected at those stations are used to classify areas and air basins as attainment or nonattainment for each criteria air pollutant based on whether the federal ambient air quality standards have been achieved. CARB has established state ambient air quality standards, many of which are more stringent than the corresponding federal standard. State standards attempt to protect “sensitive” people. Children, the elderly, athletes, and people with existing respiratory ailments (e.g. asthma, emphysema), and heart disease are much more sensitive to air pollution than the average citizen.

Central California Air Quality Studies (CCAQS) (2)

CARB’s Central California Air Quality Studies (CCAQS) comprise two (2) studies: the California Regional Particulate Air Quality Study (CRPAQS), and the Central California Ozone Study (CCOS).

The CCAQS is a multi-year effort of meteorological and PM10/PM2.5 air quality monitoring, emission inventory development, data analysis, and air quality simulation modeling. The objectives of the study are to: 1) provide an improved understanding of emissions, PM10 and PM2.5 composition, and dynamic atmospheric processes; 2) establish a strong scientific foundation for informed decisions making; and 3) develop methods to identify the most efficient and cost-effective emission control strategies to achieve the PM10 and PM2.5 standards in Central California. The concept for the plan was initiated in 1991 by the agricultural community when they approached the U.S. EPA for funding. Government entities and industries endorsed the study, and full-scale planning began in 1992. Large-scale field monitoring programs were begun in 1999.

The CCOS consists of a field program, data analysis, emission inventory development, and modeling. The field program of the CCOS was conducted during the summer of 2000. Emission inventory development, data analysis and modeling are on-going projects. The entire effort is expected to be completed by 2005. The CARD and Air Pollution Control Districts plan to use the results of the CCOS to prepare the demonstration of attainment for the ozone standard for non-attainment areas in central California.

5.2.3 Ambient Air Quality Standards

The federal (national) and California State ambient air quality standards are shown below in Table 5-2.

Ozone (O₃)

As shown in Table 5-2, the one-hour California Ambient Air Quality Standard for ozone is 0.09 part per million (PPM), and is not to be exceeded. The one-hour National (Federal) Ambient Air Quality Standard for ozone is 0.12 ppm (measured at the highest hour during the day), and is not to be exceeded more than three (3) times in any three-year period.

Ground-level ozone (the primary constituent of smog) is the most complex, difficult to control, and pervasive in the six principal pollutants. Unlike other pollutants, ozone is not emitted directly into the air by specific sources. Ozone is a “photochemical” pollutant, created by a complex series of chemical reactions between reactive organic gases (ROG), nitrogen oxides (NO_x), and sunlight.

Scientific evidence indicates that ground-level ozone not only affects people with impaired respiratory systems (such as asthmatics), but healthy adults and children as well. Exposure to ozone for six to seven hours, even at relatively low concentrations, significantly reduces lung function and induces respiratory inflammation in normal, healthy people during periods of moderate exercise. It can be accompanied by symptoms such as chest pain, coughing, nausea, and pulmonary congestion. Recent studies provide evidence of an association between elevated ozone levels and increases in hospital admissions for respiratory problems in several U.S. cities. Ozone is also responsible for several billion dollars of agricultural crop yield loss in the U.S. each year. Ozone damages natural ecosystems such as forests and foothill communities, as well as some man-made materials such as rubber, paint, and plastics.

The Valley’s long, hot summers, stagnant weather conditions, frequent inversions, and bowl shape with surrounding mountain barriers, create the perfect conditions to form and trap ground-level ozone. A fast growing population driving approximately 90 million miles per day compounds the problem.

There are literally thousands of sources of the reactive organic gases (ROG) and nitrogen oxides (NO_x) which react with sunlight to form ozone. ROG and NO_x are emitted from fuel combustion, and agricultural and industrial processes. Some of the more common sources include gasoline vapors, chemical solvents, combustion products of various fuels, and consumer products. They can originate from large industrial facilities, gas stations, and small businesses such as bakeries and dry cleaners. Often these “precursor” gases are emitted in one area, but the actual chemical reactions, stimulated by sunlight and temperature, take place in another.

Table 5-2
Ambient Air Quality Standards

Pollutant	Averaging Time	Concentration	
		National Standards	California Standards
Ozone (O3)	8-hour	0.08 ppm	N/A
	1-hour	0.12 ppm	0.09 ppm
Carbon Monoxide (CO)	8-hour	9 ppm	9 ppm
	1-hour	35 ppm	20 ppm
Nitrogen Dioxide (NO2)	Annual Avg.	0.053 ppm	N/A
	1-hour	N/A	20 ppm
Sulfur Dioxide (SO2)	Annual Avg.	0.03 ppm	N/A
	24-hour	0.14 ppm	0.04 ppm
	1-hour	N/A	0.25 ppm
Particulate Matter (PM10)	24-hour	150 micrograms/ cubic meter	50 micrograms/ cubic meter
Lead (Pb)	30-day average	N/A	1.5 micrograms/ cubic meter
	Calendar Quarter	1.5 micrograms/ cubic meter	N/A
Particulate Matter (PM2.5)	24-hour	65 micrograms/ cubic meter	N/A

Source: CARB and San Joaquin Valley Unified Air Pollution Control District

Combined emissions from motor vehicles and stationary sources can be transported and spread by wind hundreds of miles from their origins, forming high ozone concentrations over very large regions.

Approximately 60 percent of the Valley's smog problems come from cars, diesel trucks, and other internal combustion engines such as lawnmowers and boats. These are collectively called "mobile sources." The other 40 percent comes from business and industrial sources.

Carbon Monoxide (CO)

State and federal CO standards have been set for both 1-hour and 8-hour averaging periods. The state 1-hour CO standard is 20 parts per million (ppm) by volume, while federal 1-hour standards are 35 ppm. Both state and federal standards are 9 ppm for the 8-hour averaging period. State CO standards are phrased as values not to be exceeded; federal CO standards are phrased as values not to be exceeded more than once per year.

Nitrogen Dioxide (NO₂)

Nitrogen dioxide belongs to a family of highly reactive gases called nitrogen oxides (NO_x). These gases form when fuel is burned at high temperatures, and come principally from motor vehicle exhaust and stationary sources such as electric utilities and industrial boilers. A suffocating, brownish gas, nitrogen dioxide is a strong oxidizing agent that reacts in the air to form corrosive nitric acid, as well as toxic organic nitrates. It also plays a major role in the atmospheric reactions that produce ground-level ozone (or smog).

Nitrogen dioxide can irritate the lungs and lower resistance to respiratory infections such as influenza. The effects of short-term exposure are still unclear, but continued or frequent exposure to concentrations that are typically much higher than those normally found in the ambient air may cause increased incidence of acute respiratory illness in children. EPA's health-based national air quality standard for NO₂ is 0.053 ppm (measured as an annual average). Nitrogen oxides are important in forming ozone and may affect both terrestrial and aquatic ecosystems.

Sulfur Dioxide (SO₂)

Sulfur dioxide belongs to the family of sulfur oxide gases (SO_x). These gases are formed when fuel containing sulfur (mainly coal and oil) is burned, and during metal smelting and other industrial processes.

The major health concerns associated with exposure to high concentrations of SO₂ include effects on breathing, respiratory illness, alterations in pulmonary defenses, and aggravation of existing cardiovascular disease. Major subgroups of the population that are most sensitive to SO₂ include asthmatics and individuals with cardiovascular disease or chronic lung disease (such

as bronchitis or emphysema) as well as children and the elderly. EPA's health-based national air quality standard for SO₂ is 0.03 ppm (measured on an annual average) and 0.14 ppm (measured over 24 hours). Emissions of SO₂ also can damage the foliage of trees and agricultural crops. Together, SO₂ and NO_X are the major precursors to acid rain, which is associated with the acidification of lakes and streams, accelerated corrosion of buildings and monuments, and reduced visibility.

Particulate Matter (PM₁₀)

Particulate matter is the term for solid or liquid particles found in the air. Some particles are large or dark enough to be seen as soot or smoke. Others are so small they can be detected only with an electron microscope. Because particles originate from a variety of mobile and stationary sources (diesel trucks, wood stoves, power plants, etc.), their chemical and physical compositions vary widely.

Also shown in Table 5-2, the 24-hour California Ambient Air Quality Standard for PM₁₀ is 50 micrograms per cubic meter, and is not to be exceeded. The 24-hour National Ambient Air Quality Standard for PM₁₀ is 150 micrograms per cubic meter, and is not to be exceeded more than once per year.

In 1987, EPA replaced the earlier Total Suspended Particulate (TSP) air quality standard with a PM₁₀ standard. The newer standard focuses on smaller particles that are likely to result in adverse health effects because of their ability to reach the lower regions of the respiratory tract. The PM₁₀ standard includes particles with a diameter of 10 micrometers or less (0.0004 inches or one-seventh the width of a human hair).

Major concerns for human health from exposure to PM₁₀ are effects on breathing and respiratory systems, damage to lung tissue, cancer, and premature death. The elderly, children, and people with chronic lung disease, influenza, or asthma, tend to be especially sensitive to the effects of particulate matter. Acidic PM₁₀ can also damage manmade materials and is a major cause of reduced visibility in many parts of the U.S.

Primary man-made sources of PM₁₀ in the San Joaquin Valley are agricultural operations, agricultural burning, demolition and construction activities, entrainment of dust by motor vehicles on paved and unpaved roads, and residential wood burning. Wind erosion of agricultural land also represents a significant source of airborne dust in the Valley.

Approximately 58% of the Valley's PM₁₀ pollution comes from man-made sources and activities. Approximately 38% comes from natural causes, and approximately 4% can be attributable to unplanned fires.

Lead (Pb)

Smelters and battery plants are the major sources of the pollutant "lead" in the air. The highest concentrations of lead are found in the vicinity of nonferrous smelters and other stationary sources of lead emissions.

Exposure to lead mainly occurs through inhalation of air and ingestion of lead in food, paint, water, soil, or dust. Lead accumulates in the body in blood, bone, and soft tissue. Because it is not readily excreted, lead can also affect the kidneys, liver, nervous system, and other organs. Excessive exposure to lead may cause anemia, kidney disease, reproductive disorders, and neurological impairments such as seizures, mental retardation, and/or behavioral disorders. Even at low doses, lead exposure is associated with changes in fundamental enzymatic, energy transfer, and other processes in the body. Fetuses and children are especially susceptible to low doses of lead, often suffering central nervous system damage or slowed growth. Recent studies show that lead may be a factor in high blood pressure and subsequent heart disease in middle-aged white males. Lead may also contribute to osteoporosis in postmenopausal women. EPA's health-based national air quality standard for lead is 1.5 micrograms per cubic meter (measured as a quarterly average).

Particulate Matter (PM2.5)

The recently adopted 24-hour National Ambient Air Quality Standard for PM2.5 (particles 2.5 micrometers or less in size) is 65 micrograms per cubic meter within a 24-hour period. California has not yet set a standard for PM2.5. However, the California Air Resources Board (CARB) has developed a PM2.5 monitoring network to implement the national standard. The San Joaquin Valley Air Pollution Control District (SJVAPCD) is participating in collection of the PM2.5 data as required by the EPA.

Toxic Air Pollutants

Toxic air pollutants, such as asbestos, can be emitted during demolition of buildings containing toxic contaminants, and during operation of industries that utilize toxic substances. The Federal and State governments have implemented a number of programs to control toxic air emissions.

The Federal Clean Air Act provides a program for the control of hazardous air pollutants. The California legislature has enacted programs including the Tanner Toxics Act (AB1807), the Air Toxics Hot Spot Assessment Program (AB2588), the Toxics Emissions Near Schools Program (AB3205), and the Disposal Site Air Monitoring Program (AB3374).

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has developed an Integrated Air Toxic Program. This program integrates both state and federal requirements and is aimed at protecting public health. The District is implementing rules to control emissions from specific

sources of toxic air pollutants. As part of the District's Risk Management Policy, certain businesses are required to obtain a permit to emit toxic air pollutants.

In 1998, the California Air Resources Board (CARB), in conjunction with the California EPA, classified diesel particulate as a toxic air contaminant. Particulate matter and other gases including nitrogen oxides (NO_x) are air pollutants emitted by diesel engines. Heavy-duty trucks, buses, and heavy off-road engines are key sources of nitrogen oxides (NO_x) emissions within the Valley. In addition to nitrogen oxides, particulate matter, and other gases from diesel exhaust contain potential cancer-causing substances such as arsenic, benzene, formaldehyde, nickel, and polycyclic aromatic hydrocarbons.

In order to reduce the particulate matter, nitrogen oxide (NO_x), and sulfur oxide (SO_x) emissions from diesel engines, the CARB has adopted many important regulations. These include:

- Low sulfur/low diesel fuel requirement that reduces particulate matter, NO_x, and SO_x emissions.
- Emission standards that restrict the amount of particulate matter emitted by new diesel trucks, buses, cars, and heavy-duty trucks.
- Emission standards for NO_x emissions from diesel cars, trucks and buses.
- Roadside testing of heavy-duty on-road vehicles for excessive particulate emissions.
- Fleet inspection and maintenance of heavy-duty vehicles.
- Emission standards that restrict the amount of particulate matter and that can be emitted from many diesel utility engines built after 1995.
- Provision of funds for Carl Moyer Memorial Air Quality Standards Attainment Program, which provides grants for the incremental cost of lower-emission diesel engines for heavy-duty vehicles.

5.2.4 San Joaquin Valley Air Pollution Control District (SJVAPCD)

Manteca falls under the jurisdiction of the San Joaquin Valley Air Pollution Control District (SJVAPCD). The District was formed in 1991, and maintains its headquarters in Fresno.

The SJVAPCD is responsible for regulating stationary, indirect, and area sources of air pollution in the Valley. The eight counties that comprise the District are divided into three regions. These include the Northern Region, (Merced, San Joaquin, and Stanislaus Counties), the Central Region (Madera, Fresno, and Kings Counties), and the Southern Region (Tulare County and the Valley portion of Kern County).

Air districts have the primary responsibility for control of air pollution from all sources other than emissions directly from motor vehicles, which are the responsibility of the California Air Resources Board (ARB) and the U.S. Environmental Protection Agency (EPA). Air districts

adopt and enforce rules and regulations to achieve state and federal ambient air quality standards, and enforce applicable state and federal law.

Air districts are charged with controlling stationary sources of pollution, including industrial processes and equipment. Air districts are also required to implement transportation control measures.

Nearly all pollution control programs developed to date have relied on development and application of cleaner technology and add-on emission control devices to clean up vehicular and industrial sources, such as catalytic converters for automobiles. Only recently have efforts been directed at better use of existing emission sources (e.g. through inspection and maintenance programs, heavy-duty engine emission reduction programs, High Occupancy Vehicle or HOV Lanes, and maintenance procedures on industrial sources).

The SJVAPCD has entered into a Memorandum of Understanding (MOU) with the transportation planning agencies of the eight counties in the San Joaquin Valley Air Basin. This MOU will ensure a coordinated approach in the development and implementation of transportation plans throughout the Valley. This action will help the Regional Transportation Planning Agencies comply with pertinent provisions of the federal and State Clean Air Acts, as well as related transportation legislation.

The SJVAPCD has adopted two Attainment Plans in an attempt to achieve state and federal air quality standards:

1. 1991 California Clean Air Act Air Quality Attainment Plan (AQAP) for ozone and carbon monoxide.
2. 1991 and 1992 PM10 Nonattainment Area Plan

After the area was re-designated as “serious nonattainment” for PM10 by the EPA, the SJVAPCD submitted a Serious Area PM10 Nonattainment Plan in September 1994.

However, the SJVAPCD is considering voluntarily seeking the federal government's worst air quality designation for ground-level ozone. There has been a 45 percent reduction since 1980 in the number of days the Valley's air violates health-based levels for ground-level ozone. However, improvements have not come quickly enough to meet clean air deadlines, prompting the EPA's serious nonattainment designation. This means that the Valley must now meet the ozone standard by 2005 by reducing total emissions inventory by an additional 30- percent or 300 tons per day.

The SJVAPCD has not been able to submit an implementation plan demonstrating such drastic reductions. The District is exploring an option of requesting an “extreme” non-attainment

designation. With this designation, the new attainment date for the Valley would be 2010, instead of 2005.

5.3 IMPACT EVALUATION CRITERIA

In accordance with CEQA Guidelines, Appendix G, the proposed project would have a significant adverse impact on the environment if the project would:

- 1) conflict with or obstruct implementation of the applicable air quality plan;
- 2) violate any air quality standard or substantially contribute to an existing or projected air quality violation;
- 3) 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);
- 4) expose sensitive receptors to substantial pollutant concentrations; or
- 5) create objectionable odors affecting a substantial number of people.

URBEMIS Emissions Model

The California Air Resources Board (CARB) URBEMIS 2001 for Windows, Version 6.2.2, Emissions Estimation for Land Use Development Project Modeling Program, was used to derive emissions from construction, area sources, and operational (vehicle) emissions. The estimate of air quality impact is based on the land use assumptions established in Section 2 and Section 11 of this EIR, shown in Table 5-3 below.

The effects of development anticipated in the General Plan will occur incrementally over twenty years or more. Therefore, the methods of analysis typically applied to evaluate new development proposals provide only broad, generic indicators of future impacts. The cumulative effect of each increment of new development over a twenty year horizon creates significant impacts that can only be approximated. The actual mix of land use that will occur over time are very difficult to predict. Commercial, business professional and industrial uses, in particular, provide a broad range of development opportunities and characteristics.

Table 5-3
Projected Land Use Mix at Full Development of the
Primary Urban Service Area in the General Plan 2023

LAND USE	Proposed New Land Use	Existing Urbanized Land Use	Total 2023 Land Use
	Acres	Acres	Acres
AG Agriculture	3960.0		3960.0
GC General Commercial	518.0	154	672.0
NCC Neighborhood Commercial	111.8	380	491.8
CMU Commercial Mixed Use	255.0		255.0
HI Heavy Industrial	715.0	194.9	909.9
LI Light Industrial	798.1	226	1024.1
BIP Business Industrial Park	258.0		258.0
BP Business Professional	133.0		133.0
HDR High Density Residential (15.1 to 25 du/ac)	251.0	191	442.0
MDR Medium Density Residential (8.1 to 15 du/ac)	359.0	187.6	546.6
LDR Low Density Residential (2.1 to 8 du/ac)	3685.9	2741.7	6427.6
VLDR Very Low Density Residential (0.5 to 2 du/ac)	1181.0	109.8	1290.8
P/QP/ Public/Quasi-public Schools/Utilities	317.6	788.3	1105.9
OS Open Space	516.0	27	543.0
P Park	175.7	342.4	518.1
Subtotal	12302.1	5342.7	18577.8

Source: DRAFT Manteca General Plan 2023, Table 2-1.

Construction Emissions

Emissions caused during construction would be due to site preparation and construction of the proposed uses. During construction, emissions would be generated by tailpipe emissions of particulate, carbon monoxide and nitrous oxide from diesel-powered earth moving equipment, particulate emissions from vehicular traffic on unpaved roads, and particulates emissions from soil disturbance (actual amount depends on total acreage disturbed). These impacts will not be sustained over time, but rather will occur sporadically over a period of years as the project is developed. Grading and other earth disturbance will occur in discrete periods as new phases of the project are developed.

Area Source Emissions

Area source emissions were estimated for wood stoves, fireplaces, landscaping and consumer products. Landscape maintenance includes emissions from fuel-powered maintenance equipment. Consumer products include reactive organic compound emissions released through the use of products such as hair sprays and deodorants.

Vehicle Source Emissions

The precursor emissions for vehicle sources is evaluated by the URBEMIS 2001 program based on the target year, trip characteristics, temperature data, variable starts, vehicle fleet percentages, road dust, and pass-by trips. The URBEMIS 2001 default settings for vehicle mix, variable starts and other factors are used in the evaluation. Both summer and winter conditions were evaluated. Summer conditions create the worst case scenario for precursor emissions.

Table 5-4
Summary of Winter Emissions (Pounds/Day)

<i>Construction Emission Estimates</i>	ROG	NOx	CO	PM10
Totals (lbs/day, unmitigated)	173,438.78	381.04	722.14	73.05
Totals (lbs/day, mitigated)	173,438.78	381.04	722.14	73.05
<i>Area Source Emission Estimates</i>	ROG	NOx	CO	PM10
Totals (lbs/day, unmitigated)	2430.32	582.64	246.2	1.11
Totals (lbs/day, mitigated)	2430.14	580.23	245.24	1.10
<i>Operational (Vehicle) Emission Estimates</i>	ROG	NOx	CO	PM10
Totals (lbs/day, unmitigated)	4338.05	4520.73	50887.04	347.84
Totals (lbs/day, mitigated)	3690.92	3839.92	43238.72	295.40

Source: URBEMIS 2001 for Windows v. 6.2.2 (Detailed Report Included in DRAFT EIR FOR GENERAL PLAN 2023, Volume 2, Technical Appendix.)

**Table 5-5
Summary of Summer Emissions (Pounds/Day)**

<i>Construction Emission Estimates</i>	ROG	NOx	CO	PM10
Totals (lbs/day, unmitigated)	173,438.78	381.04	722.14	73.05
Totals (lbs/day, mitigated)	173,438.78	381.04	722.14	73.05
<i>Area Source Emission Estimates</i>	ROG	NOx	CO	PM10
Totals (lbs/day, unmitigated)	2448.76	587.31	440.74	1.28
Totals (lbs/day, mitigated)	2448.59	584.89	439.77	1.28
<i>Operational (Vehicle) Emission Estimates</i>	ROG	NOx	CO	PM10
Totals (lbs/day, unmitigated)	4838.42	2986.06	52559.58	347.84
Totals (lbs/day, mitigated)	4301.01	2536.54	44652.11	295.40

Source: URBEMIS 2001 for Windows v. 6.2.2 (Detailed Report Included in DRAFT EIR FOR GENERAL PLAN 2023, Volume 2, Technical Appendix)

5.4 IMPACTS AND MITIGATION

POTENTIAL IMPACT AQ-1: **Implementation of the General Plan 2023 could conflict with or obstruct implementation of the applicable air quality plan.**

Level of Significance: **Potentially Significant**

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has adopted an Air Quality Management Plan and an Integrated Air Toxic Program. The SJVAPCD has also adopted two Attainment Plans and a Serious Area PM10 Nonattainment Plan.

Mitigation Measures:

AQ-1.1: The General Plan 2023 includes the following goal, policy (P) and implementation measures (I) to direct cooperation with San Joaquin Valley Air Pollution Control District’s air quality plans, including air toxic plans:

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- Goal AQ-1 Improve Manteca’s air quality by:
- Minimizing public exposure to toxic or hazardous air pollutants.
- AQ-P-1 Cooperate with other agencies to develop a consistent and coordinated approach to reduction of air pollution and management of hazardous air pollutants.
- AQ-I-1 Work with the San Joaquin Valley Air Pollution Control District (SJVAPCD) to implement the Air Quality Management Plan (AQMP).
- Cooperate with the APCD to develop consistent and accurate procedures for evaluating project-specific and cumulative air quality impacts.
 - Cooperate with the APCD and the California Air Resources Board to develop a local airshed model.
 - Cooperate with the APCD in their efforts to develop a cost/benefits analysis of possible control strategies (mitigation measures to minimize short and long-term stationary and area source emissions as part of the development review process, and monitoring measures to ensure that mitigation measures are implemented.
- AQ-I-2 In accordance with CEQA, submit development proposals to the APCD for review and comment prior to decision.

Residual Level of Significance: Less Than Significant with Mitigation

The above goal, policy and implementation measures are intended to reduce conflicts between the proposed General Plan 2023 and applicable air quality plans. The cooperation required in the above goal, policy and implementation measures will help achieve the SJVAPCD’s Air Quality Management Plan, Integrated Air Toxic Program, Attainment Plans, as well as any future air quality plans.

POTENTIAL IMPACT AQ-2: Implementation of the General Plan 2023 could violate air quality standards or contribute substantially to the current nonattainment status for ozone and PM10.

Level of Significance: Significant and Unavoidable

The San Joaquin Valley is currently designated as “severe nonattainment” for the state ozone 1-hour standard, and “serious nonattainment” for the federal 1-hour ozone and 24-hour fine particulate matter (PM10) standards. Table 5-6 shows the ozone trends summary from 1993 –

2002 for the San Joaquin Valley Air Basin. Table 5-7 gives the PM10 trends summary for the same period.

Any additional sources of these pollutants will contribute to this nonattainment status. Therefore, there are no mitigation measures which will reduce the increase of these air pollutants to a less-than-significant level. However, the policies (P) and implementation measures (I) listed below are intended to reduce the net increase from implementation of the General Plan 2023.

**Table 5-6
Ozone Trends Study
San Joaquin Valley Air Basin**

YEAR	DAYS > STANDARDS FOR OZONE			1-HOUR MAX	8-HOUR MAX
	1-Hour State	1-Hour National	8-Hour National	(ppm)	AVG (ppm)
2002	127	31	125	0.164	0.132
2001	123	32	109	0.149	0.120
2000	114	30	103	0.165	0.131
1999	123	28	117	0.155	0.123
1998	90	39	84	0.169	0.136
1997	110	16	95	0.147	0.127
1996	120	56	114	0.165	0.137
1995	124	44	109	0.173	0.134
1994	118	43	108	0.175	0.129
1993	125	43	104	0.160	0.125

Source: Extracted from California Air Resources Board (CARB), Air Quality and Emissions/Air Quality Data, www.arb.ca.gov.

Table 5-7
PM10 Trends Study
San Joaquin Valley Air Basin

YEAR	DAYS > STANDARDS FOR PM10		Annual Average	Maximum
	State	National	(micrograms/m3)	(micrograms/m3)
2002	267	8	59.2	189
2001	236	12	57.4	205
2000	237	0	53.1	145
1999	216	12	59.5	183
1998	185	6	39.9	160
1997	188	3	48.2	199
1996	225	0	54.1	153
1995	246	8	58.2	279
1994	253	8	50.1	190
1993	233	11	56.3	239

Source: Extracted from California Air Resources Board (CARB), Air Quality and Emissions/Air Quality Data, www.arb.ca.gov.

AQ-2.1: The General Plan 2023 includes the following goals, policies (P), and implementation measures (I) to help meet air quality standards and reduce the net contribution to the current ozone and PM10 nonattainment status.

Goal AQ-1 Improve Manteca's air quality by:

Achieving and maintaining ambient air quality standards established by the U.S. Environmental Protection Agency, the California Air Resources Board, and the San Joaquin Valley Air Pollution Control District.

Goal AQ-2 Integrate air quality planning with land use and transportation planning processes in order to reduce vehicle miles traveled in the City and by commuters.

Goal AQ-3 Increase opportunities for alternatives to internal combustion automobiles including, but not limited to, public transportation, bicycles, walking and alternative fuel vehicles including hybrid gas-electric, electric and compressed natural gas.

Goal AQ-4 Reduce air emissions through energy conservation.

- AQ-P-8 Woodburning devices shall meet current standards for controlling particulate air pollution.
- AQ-P-9 Burning of any combustible material within the City will be controlled to minimize particulate air pollution.
- AQ-I-13 All residences built in a new subdivision or housing development shall be equipped with conventional heating devices with sufficient capacity to heat all areas of the building without reliance on woodburning heating devices.
- AQ-I-14 All woodburning-heating devices installed shall meet EPA standards applicable at the time of project approval.

Air quality issues relating to construction activities are also addressed in the Air Quality Section of the General Plan 2023:

- AQ-P-7 New construction will be managed to minimize fugitive dust and construction vehicle emissions.
- AQ-I-4. Construction activity plans shall include and/or provide for a dust management plan to prevent fugitive dust from leaving the property boundaries and causing a public nuisance or a violation of an ambient air standard.
- Project development applicants shall be responsible for ensuring that all adequate dust control measures are implemented in a timely manner during all phases of project development and construction.

POTENTIAL IMPACT AQ-3: Implementation of the General Plan 2023 would result in a cumulatively considerable net increase in ozone and PM10 air pollutants.

Given that the Valley is nonattainment for ozone and PM10, there are no mitigation measures to reduce the cumulative increase of these air pollutants when proposing additional urban development. However, the following policies (P) and implementation measures (I) are intended to reduce the net increase to the region's cumulative air pollution from the proposed General Plan 2023. The Air Quality Element works with the Circulation Element and the Land Use Element to provide measures to reduce air pollution.

Air Quality and Land Use

- AQ-P-2 Develop a land use plan that will help to reduce the need for trips and will facilitate the common use of public transportation, walking, bicycles, and alternative fuel vehicles.
- AQ-I-4 Encourage mixed-use development that is conveniently accessible by pedestrians and public transit.
- AQ-I-5 Locate employment, school, and daily shopping destinations near residential areas.
- AQ-I-6 Locate higher density development such as multi-family housing, institutional uses, services, employment centers and retail along existing and proposed transit corridors.
- AQ-I-7 Locate public facilities in areas easily served by current and planned public transportation.

Air Quality and Transportation

- AQ-P-4 Develop and maintain street systems that provide for efficient traffic flow and thereby minimize air pollution from automobile emissions.
- AQ-P-5 Develop and maintain circulation systems that provide alternatives to the automobile for transportation, including bicycles routes, pedestrian paths, bus transit, and carpooling.
- AQ-P-6 Coordinate public transportation networks, including trains, local bus service, regional bus service and rideshare facilities to provide efficient public transit service.
- AQ-I-9 Maintain acceptable traffic levels of service (LOS~~E~~) as specified in the Circulation Element.
- AQ-I-10 In new subdivisions, require the internal street system design to include the installation of dedicated pedestrian/bicycle pathways connecting to adjacent residential and commercial areas as well as schools, parks and recreational areas.

POTENTIAL IMPACT AQ-4: **Implementation of the General Plan 2023 could expose sensitive receptors to substantial pollutant concentrations.**

Level of Significance: **Potentially Significant**

Sensitive receptors located in or near the vicinity of known air emissions sources, including freeways and intersections, are of particular concern. Sensitive receptors are located throughout the City of Manteca, and typically include the following: residences, athletic facilities, schools, health care facilities, playgrounds, convalescent centers, child care centers, and rehabilitation centers. In the case of schools, state law requires that siting decisions consider potential for toxic or harmful air emissions in the surrounding area.

Mitigation Measures:

AQ-4.1: The General Plan 2023 includes the following implementation measures (I) to help reduce exposure of sensitive receptors to pollutants:

AQ-I-8 Prior to entitlement of a project that may be an air pollution point source, such as a manufacturing and extracting facility, the developer shall provide documentation that the use is located and appropriately separated from residential areas and sensitive receptors ~~Locate air pollution point sources, such as manufacturing and extracting facilities, in areas designated for industrial development and separated from residential areas and sensitive receptors (e.g., homes, schools, and hospitals).~~

AQ-I-15 Design review criteria shall include the following considerations, at a minimum:

The developer of a sensitive air pollution point receptor shall submit documentation that the project design includes appropriate buffering ~~Establish buffer zones (e.g., distance, setbacks, landscaping) within residential and other sensitive receptor site plans~~ to separate the use ~~those uses~~ from highways, arterial streets, hazardous material locations and other sources of air pollution or odor.

Residual Level of Significance: **Less Than Significant With Mitigation**

Implementation of the above implementation measures will help protect sensitive receptors from exposure to air pollutants. These measures require land use siting and separation, and the use of buffers to protect sensitive receptors.

POTENTIAL IMPACT AQ-5: **Implementation of the General Plan 2023 could create objectionable odors affecting a substantial number of people.**

Level of Significance: **Potentially Significant**

There are no proposed land uses in the General Plan 2023 which are expected to create objectionable odors that would affect a substantial number of people. However, it may be a possibility that odors could be produced by the proposed heavy industrial land uses.

Mitigation Measures:

AQ-5.1: The General Plan 2023 includes the following goal and policy (P) to help reduce the possibility of exposing people to objectionable odors:

Goal AQ-1: Improve Manteca's air quality by:

Minimizing public exposure to pollutants that create a public nuisance, such as unpleasant odors.

AQ-P-3 Segregate and provide buffers between land uses that typically generate hazardous or obnoxious fumes and residential or other sensitive land uses.

Residual Level of Significance: **Less Than Significant with Mitigation**

Implementation of the above goal will help reduce the possibility of exposing people to objectionable odors. ~~If odors do result from the proposed heavy industrial land uses, it is required that these odors be minimized.~~ While exposure to objectionable odor pollutants can be minimized through design and separation to a less than significant level, there is no way to fully mitigate the impact due to prevailing winds, atmospheric conditions, and peripheral pollutant point sources.

References:

- (1) San Joaquin Valley Air Pollution Control District. Air Quality Guidelines for General Plans. 1994.
- (2) California Air Resources Board. Air Quality and Emissions/Air Quality Data, www.arb.ca.gov.

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