

4.5 AIR QUALITY AND CLIMATE CHANGE

4.5 AIR QUALITY AND CLIMATE CHANGE

This section of the Draft EIR ("Draft EIR"; "DEIR") examines air quality in the City of Ione General Plan Planning Area (Planning Area) and its environs, includes a summary of applicable air quality regulations, and analyzes potential impacts associated with the proposed project. Mitigation measures are recommended, as necessary, to reduce significant air quality impacts.

4.5.1 EXISTING SETTING

AIR BASIN CHARACTERISTICS

The City of Ione (City) is located in the Mountain Counties Air Basin (Basin) of California, an approximately 11,000-square-mile area encompassing Plumas, Sierra, Nevada, Amador, Calaveras, Tuolumne, and Mariposa counties, in addition to the western slope of El Dorado County and the central portion of Placer County. The majority of the Basin is located in the northern Sierra Nevada with the western boundary of the basin extending into the Sacramento Valley. The project site lies within the jurisdiction of the Amador Air Pollution Control District (AAPCD).

The general climate of the Basin varies considerably with elevation and proximity to mountains. The terrain features of the Basin make it possible for various climates to exist within the general area. The pattern of mountains and hills of lower elevation is primarily responsible for the wide variations of rainfall, temperatures, and localized winds that occur throughout the region. Temperature variations have an important influence on basin wind flow, dispersion along mountain ridges, vertical mixing, and photochemistry.

The portion of the Basin encompassing the Sierra Nevada mountain range receives large amounts of precipitation from storms moving over the continent from the Pacific Ocean. Precipitation in the Basin is highly variable, depending on elevation and location. Areas in the eastern portion of the Basin, with relatively high elevations, receive the most precipitation. Precipitation levels decline toward the western areas of the Basin. Climates vary from alpine in the high elevations of the eastern areas to more arid at the western edge of the Basin.

Ambient air quality in the City of Ione is similar to that of the larger Basin. Like the Basin, ambient air quality in the City is influenced by ozone transport from the Central Valley.

AIR POLLUTANTS OF CONCERN AND HEALTH EFFECTS

There are six pollutants with health-based standards specifying pollutant levels that are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect public health and welfare. These six "criteria pollutants" include ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulfur dioxide (SO_2), particulate matter 10 microns in size and smaller (PM_{10}), and lead.

Ozone

Ground level ozone, commonly referred to as smog, is greatest on warm, windless, sunny days. Ozone is not emitted directly into the air from point sources (e.g., mobile or stationary); rather, they are formed through a complex series of chemical reactions between ozone precursors reactive organic gases (ROG) and nitrogen oxides (NOx) in the presence of sunlight. The principal sources of ozone precursors are mobile sources. Specifically, ROG is generally the product of mobile source tailpipe emissions, but is also emitted from the evaporation of solvents, paints, and fuels. NOx emissions are largely from the combustion of fossil fuels.

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Ozone is a public health concern because it is a respiratory irritant that increases susceptibility to respiratory infections and diseases, and because it can harm lung tissue at high concentrations. In addition, ozone can cause substantial damage to leaf tissues of crops and natural vegetation, and can damage many natural and manmade materials by acting as a chemical oxidizing agent.

Particulate Matter (PM)

Particulate matter can be divided into several size fractions. Coarse particles are between 2.5 and 10 microns in diameter, and arise primarily from natural processes, such as wind-blown dust or soil. Fine particles are less than 2.5 microns in diameter and are produced mostly from combustion, or burning activities. Fuel burned in cars and trucks, power plants, factories, fireplaces and wood stoves produces fine particles.

The level of fine particulate matter in the air is a public health concern because it can bypass the body's natural filtration system more easily than larger particles, and can lodge deep in the lungs. The health effects vary depending on a variety of factors, including the type and size of particles. Research has demonstrated a correlation between high PM concentrations and increased mortality rates. Elevated PM concentrations can also aggravate chronic respiratory illnesses such as bronchitis and asthma.

Carbon Monoxide (CO)

Carbon monoxide (CO) is an odorless, colorless gas that is formed by the incomplete combustion of fuels. Motor vehicle emissions are the dominant source of CO in the lone area. CO emissions and ambient concentrations have decreased significantly in recent years. These improvements are due largely to the introduction of cleaner burning motor vehicles and motor vehicle fuels. CO is still a pollutant that must be closely monitored, however, due to its severe effect on human health.

At high concentrations, CO reduces the oxygen-carrying capacity of the blood and can cause dizziness, headaches, unconsciousness, and even death. CO can also aggravate cardiovascular disease. Relatively low concentrations of CO can significantly affect the amount of oxygen in the bloodstream because CO binds to hemoglobin 220–245 times more strongly than oxygen.

Nitrogen Oxides

Nitrogen oxides (NO_x) refer to a family of nitrogen-based compounds, including nitric oxide, nitrogen dioxide (NO₂), and other oxides of nitrogen. NO oxides are produced from burning fuels, including gasoline, diesel, and coal. Nitrogen oxides react with volatile organic compounds to form ozone. Nitrogen oxides are also major components of acid rain.

NO₂ is a brown colored gas readily visible during periods of heavy air pollution. Mobile sources account for nearly all Amador County's NOx emissions, most of which are NO₂.

Sulfur Oxides

Sulfur oxides (SO_x) are composed mainly of sulfur dioxide (SO₂) and sulfates. Sulfur oxides are pungent, colorless gases (sulfates are solids) formed primarily by combustion of sulfur-containing fossil fuels, especially coal and oil. Some industrial processes, such as production of paper and

smelting of metals, produce sulfur dioxide. Sulfur dioxide is closely related to sulfuric acid and plays an important role in the production of acid rain.

Lead (Pb)

Lead is a metal that is a natural constituent of air, water, and the biosphere. Lead is neither created nor destroyed in the environment, so it essentially persists forever. Lead was used until recently to increase the octane rating in auto fuel. Since gasoline-powered automobile engines were a major source of airborne lead through the use of leaded fuels and the use of leaded fuel has been mostly phased out, the ambient concentrations of lead have dropped dramatically.

Non-Criteria Pollutants

In addition to the criteria pollutants discussed above, there are other pollutants for which there are no explicit criteria that are often air pollution issues of concern for communities. These include toxic air contaminants, odors, and wood smoke, which can produce localized health risks or nuisances for sensitive nearby land uses, also known as "sensitive receptors."

Sensitive receptors include facilities that house or attract children, the elderly, and people with illnesses or others who are especially sensitive to the effects of air pollutants. Hospitals, schools, convalescent facilities, and residential areas are examples of sensitive receptors. The proximity of sensitive receptors to existing or potential sources of localized air pollution can result in land use conflicts that expose people to unhealthful air quality.

Toxic Air Contaminants (TACs)

In addition to the criteria pollutants discussed above, toxic air contaminants (TACs) are another group of pollutants of concern. Unlike criteria pollutants, no safe levels of exposure to TACs have been established. Instead, TAC impacts are evaluated by calculating the health risks associated with a given exposure. Two types of risk are usually assessed: chronic non-cancer risk and acute non-cancer risk. There are many different types of TACs, with varying degrees of toxicity.

Sources of TACs include industrial processes such as petroleum refining and chrome plating operations, commercial operations, such as gasoline stations and dry cleaners, and motor vehicle exhaust. Public exposure to TACs can result from emissions from normal operations, as well as accidental releases of hazardous materials. The health effects of TACs include cancer, birth defects, neurological damage and death.

It is important to understand that TACs are not considered criteria air pollutants and thus are not specifically addressed through the setting of ambient air quality standards. Instead, the United States Environmental Protection Agency (EPA) and California Air Resources Board (ARB) regulate Hazardous Air Pollutants (HAPs) and TACs, respectively, through statutes and regulations that generally require the use of the maximum or best available control technology (MACT and BACT, respectively) to limit emissions.

Based on data from the Air Toxics "Hot Spots" Information and Assessment Act, there are several stationary sources in the City of Ione that have the potential to emit TACs, as illustrated in **Table 4.5-1**.

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TABLE 4.5-1
FACILITIES IN IONE WITH POTENTIAL TO EMIT TOXIC EMISSIONS
(TONS/YEAR)

Facility Name	TOG	ROG	CO	NOx	SOx	PM	PM10
George Reed	0.4	0.4	0	0.8	0	7.9	3.0
Goose Hill Rock	0	0	0	0	0	17.9	8.3
H.C. Muddox	0	0	0	0	0	5.3	2.7
Hanson Ione	2.5	2.0	0	4	0	37.2	15
Kreth Inc.	0	0	0	0	0	6.0	2.8
Mule Creek State Prison	2.1	1.0	3.1	16.0	0.1	0.9	0.9
Preston School Of Industry	0.6	0.3	4.4	1.9	0.1	0.3	0.3
Rhi Refractories	0.9	0.4	2.0	8.1	19.7	50.2	27.0
Unimin	1.5	0.7	2.1	9.3	0.1	131.3	63.8

Source: Air Resources Board, 2009.

<http://www.arb.ca.gov/app/emsinv/facinfo/facinfo.php?dd=y>

Diesel exhaust is a TAC of growing concern in California. In 1998, ARB identified diesel engine particulate matter as a TAC. The exhaust from diesel engines contains hundreds of different gaseous and particulate components, many of which are toxic, but are not considered to have acute non-cancer risks.

Mobile sources, such as trucks, buses, automobiles, trains, ships and farm equipment are by far the largest source of diesel emissions. However, stationary sources such as industrial generators also produce diesel particulates. Studies show that diesel particulate matter concentrations are much higher near heavily traveled highways and intersections. Land uses where individuals could be exposed to high levels of diesel exhaust include:

- Warehouses
- Schools with high volume of bus traffic
- High volume highways
- High volume arterials and local roadways with high level of diesel traffic.

The State has begun a program of identifying and reducing risks associated with particulate matter emissions from diesel-fueled vehicles. In September 2000, ARB approved a comprehensive Diesel Risk Reduction Plan (Plan) to reduce diesel emissions from both new and existing diesel-fueled engines and vehicles. The goal of the Plan is to reduce diesel PM emissions and the associated health risk by 75 percent in 2010 and 85 percent by 2020. The Plan consists of new regulatory standards for all new on road, off-road and stationary diesel-fueled engines and vehicles, new retrofit requirements for existing on-road, off-road and stationary diesel-fueled engines and vehicles, and new diesel fuel regulations to reduce the sulfur content of diesel fuel as required by advanced diesel emission control systems.

Asbestos

Fibrous (Asbestiform) Minerals

Asbestos is the generic term for the naturally-occurring fibrous (asbestiform) varieties of six silicate minerals. Chrysotile, which belongs to the serpentine mineral group, and amphibole asbestos (such as tremolite) occur naturally in certain geologic settings in California, most commonly in association with ultramafic rocks and along associated faults (DOC, 2000).

Asbestos is a known carcinogen and exposure to asbestos fibers may result in health issues such as lung cancer, mesothelioma (a rare cancer of the thin membranes lining the lungs, chest, and abdominal cavity), and asbestosis (a non-cancerous lung disease which causes scarring of the lungs) (ARB, 2009). In 1998 new concerns were raised about possible health hazards from activities that disturb rocks and soil containing asbestos and may generate asbestos-laden dust. When disturbed, asbestos fibers are released into the air where they can remain suspended for extended periods. If inhaled, these fibers pose a serious health threat as they can become permanently lodged in body tissues. 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 (ARB, 2009).

As mentioned above, natural asbestos occurs most commonly in association with ultramafic rocks. Therefore, the presence of ultramafic rocks within a region indicates the possibility of naturally-occurring asbestos materials. Both chrysotile and amphibole asbestos are found in serpentine commonly located in the Sierra Nevada foothills and in Amador County. As shown in **Figure 4.11-2** in Section 4.11 Geology and Soils, areas containing ultramafic rocks are located to the east of the Planning Area. In addition, the Planning Area contains undivided Mesozoic volcanic and metavolcanic rocks, which may contain some metamorphosed minerals such as serpentinite.

Odors

Odors are typically regarded as an annoyance rather than a health hazard. However, manifestations of a person's reaction to foul odors can range from psychological (e.g., irritation, anger, or anxiety) to physiological (e.g., circulatory and respiratory effects, nausea, vomiting, and headache). Quality and intensity are two properties present in any odor. The quality of an odor indicates the nature of the smell experience. For instance, if a person describes an odor as flowery or sweet, then the person is describing the quality of the odor. Intensity refers to the strength of the odor. For example, a person may use the word "strong" to describe the intensity of an odor. Odor intensity depends on the odorant concentration in the air. When an odorous sample is progressively diluted, the odorant concentration decreases. As this occurs, the odor intensity weakens and eventually becomes so low that the detection or recognition of the odor is quite difficult. At some point during dilution, the concentration of the odorant reaches a detection threshold. An odorant concentration below the detection threshold means that the concentration in the air is not detectable by the average human.

The ability to detect odors varies considerably among the population and overall is quite subjective. Some individuals have the ability to smell minute quantities of specific substances; others may not have the same sensitivity but may have sensitivities to odors of other substances. In addition, people may have different reactions to the same odor; in fact, an odor that is offensive to one person (e.g., from a fast-food restaurant) may be perfectly acceptable to another. It is also important to note that an unfamiliar odor is more easily detected and is more likely to cause complaints than a familiar one. This is because of the phenomenon known as

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odor fatigue, in which a person can become desensitized to almost any odor and recognition only occurs with an alteration in the intensity.

Pesticides

Most pesticides are designed to harm or kill pests, but some pesticides also can harm or kill humans. The hazards associated with pesticides depend on the toxicity of the pesticide and the nature of the exposure and the situation surrounding the exposure. .

The effects, or symptoms, of pesticide poisoning can be defined as either topical or systemic. Topical effects generally develop at the site of pesticide contact and are a result of either the pesticide's irritant properties or an allergic response by the victim. Dermatitis, or inflammation of the skin, is the most commonly reported topical effect associated with pesticide exposure. Symptoms of dermatitis range from reddening of the skin to rashes and/or blisters. Other symptoms include coughing, wheezing and sneezing when exposed to pesticide sprays.

Systemic effects often occur away from the original point of contact as a result of the pesticide being absorbed into, and distributed throughout, the body. Systemic effects often include nausea, vomiting, fatigue, headache, and intestinal disorders. In advanced poisoning cases, the individual may experience changes in heart rate, difficulty breathing, convulsions, and coma, which could lead to death.

Pesticides are commonly used in agricultural areas, where they are often used to prevent insect damage to crops. Because of this, the proximity of sensitive receptors to agricultural land uses could expose people to the hazards listed above.

Wood Smoke

Wood smoke has long been identified as a significant source of pollutants in urban and suburban areas. Wood smoke contributes to particulate matter and carbon monoxide concentrations, reduces visibility and contains numerous toxic air contaminants. Present controls on this source include the adoption of emission standards for wood stoves and fireplace inserts. Interest in wood smoke is likely to increase with the recent adoption of a PM_{2.5} (particulate matter less than 2.5 microns in diameter) national standard.

AMBIENT AIR QUALITY

The ARB maintains several air quality monitoring sites in and around Lone. The three years of data provided in **Table 4.5-3** show the number of days standards were exceeded for each year, as well as the concentration of pollutants in the given area. The nearest air quality monitoring site in relation to the project for Ozone and Nitrogen Dioxide is the Jackson-Clinton Road monitoring station. The San Andreas-Gold Strike Road monitoring station is the nearest for Inhalable Particulates (PM₁₀), and Ultra-Fine Particulates (PM_{2.5}). For 8 hour Carbon Monoxide, the nearest air monitoring station is Yosemite National Park-Turtleback Dome. Data for the study years is not available for 8 hour CO for 2008, SO₂, or 2006-2007 NO₂.

TABLE 4.5-3
AIR MONITORING STATION ANNUAL SUMMARY

Pollutant/Standard	2006	2007	2008
O₃ (8-hour)¹			
Maximum Concentration (ppm)	0.100	0.078	0.112
Days > California Ambient Air Quality Standard (CAAQS) (0.070 ppm)	32	11	42
Days > National Ambient Air Quality Standard (NAAQS) (0.08 ppm)	18	1	31
PM_{2.5} (24-hour)²			
Maximum Concentration ($\mu\text{g}/\text{m}^3$)	23	24.4	54.9
Days > NAAQS (65 $\mu\text{g}/\text{m}^3$)	0	0	Insufficient Data
PM₁₀ (24-hour)²			
Maximum Concentration ($\mu\text{g}/\text{m}^3$)	42	44	72
Days > CAAQS (50 $\mu\text{g}/\text{m}^3$)	0	0	1
Days > NAAQS (150 $\mu\text{g}/\text{m}^3$)	0	0	0
CO (8-hour)³			
Maximum Concentration (ppm)	0.58	0.68	N/A
Days > CAAQS (9.0 ppm)	0	0	N/A
Days > NAAQS (9.0 ppm)	0	0	N/A
SO₂ (24-hour)			
Maximum Concentration (ppm)	N/A	N/A	N/A
Days > CAAQS (0.04 ppm)	N/A	N/A	N/A
Days > NAAQS (0.14 ppm)	N/A	N/A	N/A
NO₂ (1-hour)⁴			
Maximum Concentration (ppm)	N/A	N/A	0.048
Days > CAAQS (0.25 ppm)	N/A	N/A	0

Source: California Air Resources Board website, <http://www.arb.ca.gov/adam/cgi-bin/db2www/adamtop4b.d2w/Branch>. Accessed April 21, 2009.

Notes:

1 - Jackson-Clinton Road

2 - San Andreas-Gold Strike Road

3 - Yosemite Natl Park-Turtleback Dome

4 - Grass Valley-Litton Building

As shown in **Table 4.5-3**, PM₁₀ and 8 hour O₃ concentrations have exceeded state or federal standards between the years 2006-2008. Based on these monitoring data, the region is non-attainment for federal and State ozone and State PM₁₀ standards (**Table 4.5-4**).

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TABLE 4.5-4
FEDERAL AND STATE ATTAINMENT STATUS FOR IONE

Pollutants	Federal Classification	State Classification
Ozone	Non-Attainment	Non-Attainment
PM2.5	Unclassified/Attainment	Unclassified
PM10	Unclassified	Non-Attainment
CO	Unclassified/Attainment	Unclassified
NO ₂	Unclassified/Attainment	Attainment
SO ₂	Unclassified	Attainment

Source: California Air Resources Board, <http://www.arb.ca.gov/desig/adm/adm.htm>, accessed April 21, 2009.

NOTES:

CO = carbon monoxide; NO₂ = nitrogen dioxide; SO₂ = sulfur dioxide; PM_{2.5} = particulate matter less than 2.5 micrograms in diameter PM₁₀ = particulate matter less than 10 micrograms in diameter.

Air quality in the Mountain Counties Air Basin is regulated through the efforts of federal, state, regional, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, land use and transportation planning, policy-making, education, and a variety of programs. The agencies primarily responsible for improving the air quality in Ione are discussed below, along with their individual responsibilities.

4.5.2 REGULATORY FRAMEWORK

FEDERAL

Ambient Air Quality Standards

Both the EPA and ARB have established ambient air quality standards for common pollutants. The national ambient air quality standards ("NAAQS", or "federal standards") and California ambient air quality standards ("CAAQS", or "state standards") for important pollutants are summarized in **Table 4.5-2**. These ambient air quality standards are levels of contaminants that represent levels that protect public health and welfare, and avoid specific adverse health effects associated with each pollutant. The ambient air quality standards cover what are called "criteria" pollutants because the health and other effects of each pollutant are described in criteria documents. EPA and ARB have focused on the following air pollutants as indicators of ambient air quality: ozone, carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulate matter (PM), and lead. The federal and state ambient standards were developed independently with differing purposes and methods, although both processes attempted to avoid health related effects. As a result, the federal and state standards differ in some cases. In general, the California standards are more stringent. This is particularly true for ozone and PM10.

A geographical area identified to have air quality as good as, or better than, the national or California ambient air quality standard is referred to as being in attainment of these standards. An area may be an attainment area for one pollutant and a nonattainment area for others.

The federal standard for ozone ground-level ozone is 0.075 ppm, measured over an 8-hour averaging period. This standard replaces the previous 1-hour ozone standard that U.S. EPA had enforced for decades. National standards for fine particulate matter (diameter 2.5 microns or less) have also been established for 24-hour and annual averaging periods. The current PM10 standards were retained, but the method and form for determining compliance with the

standards were revised. Implementation of the new ozone and particulate matter standards was delayed by a lawsuit. On February 27, 2001 the U.S. Supreme Court unanimously ruled in favor of the U.S. EPA, clearing the way for implementation of the new standards.

ARB has designated the Basin as non-attainment for the new 8-hour ozone standard. On April 28, 2005, the ARB approved the 8-hour average standard at 0.070 ppm.

TABLE 4.5-2
AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	California Standards (a, c)	National Standards (b, d)	
			Primary (d)	Secondary (e)
Ozone (O ₃)	1-hour	0.09 ppm (180 µg/m ³) ¹	--	Same as Primary
	8-hour	0.070 ppm (137 µg/m ³)	0.075 ppm ^(g)	
Particulate Matter (PM10)	AAM ²	20 µg/m ³	(Revoked) ^(f)	
	24-hour	50 µg/m ³	150 µg/m ³	
Fine Particulate Matter (PM2.5)	AAM	12 µg/m ³	15 µg/m ³	
	24-hour	No Separate Standard	35 µg/m ³ ^(f)	
Carbon Monoxide (CO)	1-hour	20 ppm (23 mg/m ³)	35 ppm (40 mg/m ³)	None
	8-hour	9 ppm (10 mg/m ³)	9 ppm (10 mg/m ³)	
	8-hour (Lake Tahoe)	6 ppm (7 mg/m ³)	—	
Nitrogen Dioxide (NO ₂)	AAM	—	0.053 ppm (100 µg/m ³)	Same as Primary
	1-hour	0.25 ppm (470 µg/m ³)	—	
Sulfur Dioxide (SO ₂)	AAM	—	0.03 ppm (80 µg/m ³)	—
	24-hour	0.04 ppm (105 µg/m ³)	0.14 ppm (365 µg/m ³)	—
	3-hour	—	—	0.5 ppm (1,300 µg/m ³)
	1-hour	0.25 ppm (655 µg/m ³)	—	—
Lead	Rolling 3-Month	—	0.15 µg/m ³	Same as Primary
	30-day	1.5 µg/m ³	—	—
	Quarter	—	1.5 µg/m ³	Same as Primary
Sulfates	24-hour	25 µg/m ³	No Federal Standards	
Hydrogen Sulfide	1-hour	0.03 ppm (42 µg/m ³)		
Vinyl Chloride	24-hour	0.01 ppm (26 µg/m ³)		

¹ µg/m³ = Micrograms per cubic meter

² AAM = Annual Arithmetic Mean

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Pollutant	Averaging Time	California Standards (a, c)	National Standards (b, c)	
			Primary (d)	Secondary (e)
Visibility-Reducing Particle Matter	8-hour	Extinction coefficient of 0.23 per kilometer —visibility of 10 miles or more due to particles when relative humidity < 70%.		

a California standards for O₃, CO (except Lake Tahoe), sulfur dioxide (1- and 24-hour), nitrogen dioxide, PM (PM10 and PM2.5), and visibility-reducing particles are values that are not to be exceeded. All others are not to be equaled or exceeded.

b National standards (other than O₃, PM, and those based on annual averages or annual arithmetic means) are not to be exceeded more than once a year. The O₃ standard is attained when the fourth highest 8-hour concentration in a year, averaged over 3 years, is equal to or less than the standard. For PM10, the 24-hour standard is attained when the expected number of days per calendar year with a 24-hour average concentration above 150 µg/m³ is equal to or less than one. For PM2.5, the 24-hour standard is attained when 98 percent of daily concentrations, average over three years, are equal to or less than the standard.

c Concentration expressed first in units in which it was promulgated. Equivalent units given in parentheses are based on a reference temperature of 25°C and a reference pressure of 760 torr (a torr is a millimeter of mercury).

d The levels of air quality necessary to protect the public health.

e The levels of air quality necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant.

f Based on revised particulate standards adopted by the US EPA on September 21, 2006. Due to lack of evidence linking health problems to long-term exposure to coarse particulate pollution, the US EPA has revoked the annual PM10.

g The federal primary ozone standard, as averaged over an 8-hour period, was revised in 2008 to 0.075 ppm.

Source: ARB 2008; US EPA 2008

U.S. Environmental Protection Agency

The U.S. Environmental Protection Agency is responsible for enforcing the Federal Clean Air Act and the 1990 amendments to it ("Federal CAA"), and the national ambient air quality standards that the EPA establishes, as discussed above. As previously explained, these standards identify levels of air quality for six "criteria" pollutants, which are considered the maximum levels of ambient (background) air pollutants considered safe, with an adequate margin of safety, to protect public health and welfare. The EPA also has regulatory and enforcement jurisdiction over emission sources beyond state waters (outer continental shelf), and sources that are under the exclusive authority of the federal government, such as aircraft, locomotives, and interstate trucking.

Federal Hazardous Air Pollutant Program

Title III of the CAA requires EPA to promulgate national emissions standards for Hazardous Air Pollutants (HAPs). These adopted standards are referred to as NESHAP. The NESHAP may differ for major HAP sources than for area sources of HAPs (major sources are defined as stationary sources with potential to emit more than 10 tons per year [TPY] of any HAP or more than 25 TPY of any combination of HAPs; all other sources are considered area sources). The emissions standards are to be promulgated in two phases. In the first phase (1992–2000), EPA developed technology-based emission standards designed to produce the maximum emission reduction achievable. These standards are generally referred to as requiring maximum achievable control technology (MACT). For area sources, the standards may be different, based on generally available control technology. In the second phase (2001–2008), EPA was required to promulgate health risk-based emissions standards as necessary to address risks remaining after implementation of the technology based NESHAP standards.

The CAAA required EPA to promulgate vehicle or fuel standards containing reasonable requirements for the control of toxic emissions of benzene and formaldehyde at the very least. Performance criteria were established to limit mobile-source emissions of HAPs, including

benzene, formaldehyde, and 1, 3-butadiene. In addition, Section 219 required the use of reformulated gasoline in selected U.S. cities (those with the most severe ozone nonattainment conditions) to further reduce mobile-source emissions.

Greenhouse Gases

The EPA is also the federal agency responsible for implementing the CAA. Prior to 2007, the EPA did not have regulations addressing GHGs. The U.S. Supreme Court ruled on April 2, 2007 that CO₂ is an air pollutant as defined under the CAA, and that EPA has the authority to regulate emissions of GHGs. However, there are no federal regulations or policies regarding GHG emissions applicable at the time of writing.

STATE

California Air Resources Board

The California Air Resources Board (ARB), a department of the California Environmental Protection Agency (Cal EPA), oversees air quality planning and control throughout California. It is primarily responsible for ensuring implementation of the 1989 amendments to the California Clean Air Act (CCAA), responding to the federal CAA requirements, and for regulating emissions from motor vehicles and consumer products within the State. ARB has established emission standards for vehicles sold in California and for various types of equipment available commercially. It also sets fuel specifications to further reduce vehicular emissions.

The amendments to the CCAA establish ambient air quality standards for the State (state standards) and a legal mandate to achieve these standards by the earliest practical date. These standards apply to the same six criteria pollutants as the Federal CAA, and also include sulfate, visibility, hydrogen sulfide, and vinyl chloride. They are more stringent than the federal standards and, in the case of PM₁₀ and SO₂, far more stringent.

Tanner Air Toxics Act

California regulates toxic air contaminants (TACs) primarily through the Tanner Air Toxics Act (AB 1807) and the Air Toxics Hot Spots Information and Assessment Act of 1987 (AB 2588). The Tanner Act sets forth a formal procedure for ARB to designate substances as TACs. This includes research, public participation, and scientific peer review before ARB can designate a substance as a TAC. To date, ARB has identified more than 21 TACs and has adopted EPA's list of HAPs as TACs. Most recently, diesel PM was added to the ARB list of TACs.

Once a TAC is identified, ARB then adopts an Airborne Toxics Control Measure (ATCM) for sources that emit that particular TAC. If there is a safe threshold for a substance at which there is no toxic effect, the control measure must reduce exposure below that threshold. If there is no safe threshold, the measure must incorporate BACT to minimize emissions.

The Hot Spots Information and Assessment Act (AB 2588) requires that existing facilities that emit toxic substances above a specified level prepare a toxic-emission inventory, prepare a risk assessment if emissions are significant, notify the public of significant risk levels, and prepare and implement risk reduction measures. ARB has adopted diesel exhaust control measures and more stringent emission standards for various on-road mobile sources of emissions, including transit buses and off-road diesel equipment (e.g., tractors, generators). In February 2000, ARB adopted a new public-transit bus-fleet rule and emission standards for new urban buses. These rules and standards provide for (1) more stringent emission standards for some new urban bus

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engines, beginning with 2002 model year engines; (2) zero-emission bus demonstration and purchase requirements applicable to transit agencies; and (3) reporting requirements under which transit agencies must demonstrate compliance with the urban transit bus fleet rule. Current and upcoming milestones include the low-sulfur diesel-fuel requirement, and tighter emission standards for heavy-duty diesel trucks and off-road diesel equipment nationwide in 2011.

ARB also has adopted two ATCMs for naturally-occurring asbestos. The first is the Asbestos ATCM for Surfacing Applications and the second is the Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations. Also, while the U.S. EPA is responsible for enforcing regulations relating to asbestos renovations and demolitions, authority can be delegated to state and local agencies. ARB and local air districts have received delegated authority to enforce the federal NESHAPS regulations for asbestos.

Asbestos ATCM for Surfacing Applications

In 1990, ARB adopted the Asbestos Airborne Toxic Control Measure for Asbestos-Containing Serpentine (1990 Asbestos ATCM). ARB staff developed amendments to the 1990 Asbestos ATCM that were adopted by the Board on July 20, 2000, as the Asbestos Airborne Toxic Control Measure for Surfacing Applications, section 93106, title 17, California Code of Regulations (amended Asbestos ATCM or amended ATCM). The amended ATCM became effective on November 13, 2001. The amended Asbestos ATCM was developed to reduce the public's exposure to airborne asbestos emissions from surfacing applications, such as unpaved roads surfaced with aggregate containing naturally-occurring asbestos. The amended Asbestos ATCM prohibits the sale or use of restricted material (includes aggregate material extracted from an ultramafic (or ultrabasic) rock unit as shown on the geologic maps referenced in the amended ATCM, ultramafic rock including serpentine, aggregate material shown to have an asbestos content of 0.25 percent or more, or any mixture containing 10 percent of these materials) for unpaved surfacing unless it has been tested and found to have an asbestos content that is less than 0.25 percent. The test method required to determine the asbestos content is either ARB Test Method 435 or a method approved by the Executive Officer of ARB (ARB, 2002a).

Asbestos ATCM for Construction, Grading, Quarrying, and Surface Mining Operations

At its July 2001 hearing, ARB approved an Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations. This ATCM requires road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas where naturally-occurring asbestos is likely to be found to employ the best available dust mitigation measures. Areas are subject to the regulation if they are identified on maps published by the Department of Conservation as ultramafic rock units or if the Air Pollution Control Officer (APCO) or owner/operator has knowledge of the presence of ultramafic rock, serpentine, or naturally occurring asbestos on the site. The ATCM also applies if ultramafic rock, serpentine, or asbestos is discovered during any operation or activity.

The ATCM requires that road construction and maintenance operations use dust control measures for a specified set of emission sources and prevent visible emissions crossing the project boundaries. The local air pollution control or air quality management district must also be notified before any work begins. For construction and grading projects that will disturb one acre or less, the regulation requires several specific actions to minimize emissions of dust such as vehicle speed limitations, application of water prior to and during the ground disturbance, keeping storage piles wet or covered, and track-out prevention and removal. Construction

projects that will disturb more than one acre must prepare and obtain district approval for an asbestos dust mitigation plan. The plan must specify how the operation will minimize emissions and must address specific emission sources. Regardless of the size of the disturbance, activities must not result in emissions that are visible crossing the property line. Quarries and surface mines must also obtain district approval for an asbestos dust mitigation plan, which must address specific emission sources. In addition, they must meet specific opacity standards for certain types of equipment and ensure that there are no visible emissions crossing the property line (ARB, 2002b).

Asbestos NESHAP Program

The ARB Asbestos Program oversees implementation of and compliance with the Federal Asbestos National Emission Standard for Hazardous Air Pollutants (NESHAP), and investigates all related complaints, as specified by the California Health and Safety Code (HSC) Section 39658(b)(1). The Asbestos NESHAP regulation, 40 CFR, Subpart M, Section 61.145 requires written notification of demolition or renovation operations. Of the 35 air districts in California, 19 of these districts do not have an asbestos program in place. For these "non-delegated" districts, ARB reviews and investigates the demolition/renovation notifications for compliance with the Asbestos NESHAP. Amador County falls within a non-delegated air district. Therefore, ARB requires that a notification be sent to ARB and USEPA for those renovations and/or demolitions taking place in Amador County (ARB, 2009).

Air Quality and Land Use Handbook

As part of its Community Health Program, ARB has developed an Air Quality and Land Use Handbook, which is intended to serve as a general reference guide for evaluating and reducing air pollution impacts associated with new projects that go through the land use decision-making process. ARB is also developing related information and technical evaluation tools for addressing cumulative air pollution impacts in a community. Any recommendations or considerations contained in the Handbook are voluntary and do not constitute a requirement or mandate for either land use agencies or local air districts.

The primary goal in developing this document was to provide information that will help keep California's children and other vulnerable populations out of harm's way with respect to nearby sources of air pollution. Recent air pollution studies have shown an association between respiratory and other non-cancerous health effects and proximity to high traffic roadways. Other studies have shown that diesel exhaust and other cancer-causing chemicals emitted from cars and trucks are responsible for much of the overall cancer risk from airborne toxics in California.

ARB community health risk assessments and regulatory programs have produced important air quality information about certain types of facilities that should be considered when siting new residences, schools, day care centers, playgrounds, and medical facilities (i.e., sensitive land uses). Sensitive land uses deserve special attention because children, pregnant women, the elderly, and those with existing health problems are especially vulnerable to the non-cancerous effects of air pollution. There is also substantial evidence that children are more sensitive to cancer-causing chemicals.

The Handbook identifies ARB's recommendations regarding the siting of new sensitive land uses near freeways, distribution centers, rail yards, ports, refineries, chrome plating facilities, dry cleaners, and gasoline dispensing facilities. This list consists of these and other air pollution sources that have been evaluated from the standpoint of the proximity issue. It is based on

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available information and reflects ARB's primary areas of jurisdiction – mobile sources and toxic air contaminants.

LOCAL

Amador Air Pollution Control District

The AAPCD adopts and enforces controls on stationary sources of air pollutants through its permit and inspection programs and regulates agricultural burning. Other District responsibilities include monitoring air quality, preparation of clean air plans, and responding to citizen air quality complaints.

The AAPCD is the agency responsible for preparing regional air quality plans under the state and federal Clean Air Acts. In addition to planning responsibilities, the District has permitting authority over stationary sources of pollutants. Authority over mobile sources of pollutants is given to the ARB. Because the air basin is non-attainment for ozone standards, the District is working with other districts in the Mountain Counties Air Basin to develop an attainment plan.

4.5.3 IMPACTS AND MITIGATION MEASURES

STANDARDS OF SIGNIFICANCE

Thresholds of Significance for Air Quality

The Air Quality Section of Appendix G of the CEQA Guidelines contains a list of effects that may be deemed potentially significant. As such, the proposed Project is considered to have a significant impact on air quality if planned growth would directly or indirectly:

- Conflict with or obstruct implementation of the applicable air quality plan;
- Violate any air quality standard or contribute substantially to an existing or projected air quality violation;
- Result in a cumulatively considerable net increase of any criteria pollutant for which the project is non-attainment under applicable federal or state ambient air quality standards;
- Expose sensitive receptors to substantial pollutant concentrations; or
- Create objectionable odors affecting a substantial number of people.

METHODOLOGY

This air quality analysis for the project EIR is based on land use designations identified in the General Plan Land Use Element and the projected traffic and residential uses. Construction-related emissions for potential future development projects were characterized using the ARB's URBEMIS 9.4.2 emissions model. Increases in long-term, regional criteria air pollutants from motor vehicles were calculated using the ARB's EMFAC 2007 emissions modeling software and other emission factors from the ARB's Local Government Protocol (ARB et al, 2008) utilizing data from the Traffic Impact Analysis (Fehr & Peers, 2009). In addition, emissions from stationary, area, and other mobile sources were calculated using technical air quality emission factors from ARB and

other entities paired with activity data (e.g., household, population projections) from the proposed project.

The City of Ione General Plan is intended to be a “self-mitigating” document, in that the General Plan policies are designed to mitigate or avoid impacts on the environment resulting from implementation of the proposed project. To that end, the relevant General Plan policies providing mitigation have been identified for each significant impact in this section. If the applicable General Plan policies were determined not to fully mitigate or avoid impacts, then additional mitigation measures have been provided. These additional mitigation measures have been written as policy statements that can be incorporated into the final General Plan. Each impact discussion includes a determination as to whether the impacts would be mitigated to a less than significant level or would remain significant and unavoidable after implementation of the updated General Plan policies.

PROJECT IMPACTS AND MITIGATION MEASURES ADDRESSING AIR QUALITY SIGNIFICANCE THRESHOLDS

Conflict with Implementation of Applicable Air Quality Plans or Contribute Substantially to an Existing Air Quality Violation

Impact 4.5.1 The proposed project would accommodate future growth in population, housing, commercial development, and jobs in the City of Ione. These activities would result in the emission of non-attainment pollutants within Amador County. Specific to the production of the pollutant, ozone, implementation of the General Plan and its associated project components would allow for population growth that may exceed projections assumed in the 2004 Amador County Regional Transportation Plan. Although there presently is no ozone attainment standard, traffic congestion in excess of projections may impair compliance with any ozone attainment plan adopted in the future. The traffic congestion could also increase particulate matter (PM10 and PM2.5) emissions in excess of State and federal standards. This impact is considered to be **potentially significant**.

Implementation of the proposed project will result in long-term emissions from a variety of sources, including motor vehicles and area source emissions from energy use associated with future growth. As illustrated in **Table 4.5-5**, emissions from motor vehicles citywide are generally decreasing over time, despite the growth in population, housing, and employment associated with the proposed project. This is largely due to advancements in motor vehicle engine technology.

TABLE 4.5-5
AVERAGE DAILY VEHICLE EMISSIONS (TONS/DAY)

Pollutant	2008	2030	Change in Emissions from 2008 to 2030	Percent Change in Emissions from 2008 to 2030
VMT (annual)	2,772,242	5,284,498	-	-
CO	24.31	8.46	-15.9	-65%
NOx	3.85	1.22	-2.6	-68%
SOx	0.01	0.03	+0.02	+200%

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Pollutant	2008	2030	Change in Emissions from 2008 to 2030	Percent Change in Emissions from 2008 to 2030
ROG	1.89	0.88	-1.0	-53%
PM10	0.13	0.22	+0.1	+69%
PM2.5	0.09	0.14	+0.1	+56%

Source: Fehr & Peers Traffic Analysis for Ione General Plan, 2009. Emfac 2007 model outputs. 2000 and 2025 VMT data provided by the traffic impact analysis. 2008 and 2030 VMT data extrapolated from the data provided in the traffic impact analysis.

The proposed project would also allow more growth that would increase emissions due to energy use and vehicle travel that would challenge the region's ability to meet ozone and PM standards. As shown in **Table 4.5-6**, emissions from electricity and natural gas use associated with planned growth would increase, primarily from residential heating in the winter, landscaping activity in the summer, consumer products, and architectural coatings. **Table 4.5-7** illustrates the total long-term emissions from both area sources and vehicles combined.

TABLE 4.5-6
AREA SOURCE EMISSIONS FROM ENERGY USE (TONS/DAY)

Pollutant	2008	2030	Change in Emissions from Existing to 2030	Percent Change in Emissions from Existing to 2030
ROG	0.1	0.6	+0.5	+473%
NOx	0.0	0.1	+0.1	+465%
CO	0.3	1.8	+1.5	+474%
SOx	0.0	0.01	+0.0	+474%
PM10	0.0	0.3	+0.2	+477%
PM2.5	0.0	0.3	+0.2	+478%

Source: URBEMIS 2007 v. 9.2.4 Outputs

TABLE 4.5-7
TOTAL LONG-TERM EMISSIONS (TONS/DAY)

Pollutant	2008	2030	Change in Emissions from Existing to 2030	Percent Change in Emissions from Existing to 2030
ROG	2.0	1.4	-0.6	-28%
NOx	3.9	1.3	-2.6	-66%
CO	24.6	10.3	-14.4	-58%
SOx	0.01	0.04	+0.02	+223%
PM10	0.2	0.5	+0.3	+178%
PM2.5	0.1	0.4	+0.3	+198%

Source: Emfac 2007 and URBEMIS 2007 v. 9.2.4 Outputs

Ultimately, the proposed project's impact on cumulative air quality in the region is determined by its consistency with applicable attainment plans. Currently, there is no ozone attainment

plan for Amador County, though the AAPCD plans to develop one by 2010 (Jim Harris, 2009). It should be noted that proposed population growth accommodated by the proposed project would exceed the population growth that was assumed by the Amador County Transportation Commission (ACTC) in the 2004 Regional Transportation Plan (RTP). The ACTC's growth projections could form the basis of the population assumptions to be included in any ozone plan. **Table 4.5-8** shows the estimated increase in population resulting from implementation of the proposed project. **Table 4.5-9** shows the population estimates from ACTC's 2004 RTP. **Table 4.5-10** compares the data from **Tables 4.5-8** and **4.5-9**.

TABLE 4.5-8
POPULATION GROWTH PROJECTIONS

	Projected Population Growth		
	2010	2020	2030
City of Ione	8,006	11,737	18,182

Sources: PMC, 2009; DOF, 2007

TABLE 4.5-9
SUMMARY OF 2004 ACTC RTP POPULATION FORECASTS

Land Uses	ACTC Population Forecast for the City of Ione			
	2000	2015	2025	2030
Population	7,129	7,782	10,301	11,561

Source: ACTC 2004 RTP. 2030 Data extrapolated from previous years' data.

TABLE 4.5-10
COMPARISON OF GENERAL PLAN 2030 POPULATION FORECASTS WITH REGIONAL AIR PLAN FORECASTS

Land Uses	ACTC RTP	General Plan	Difference
Population	11,561	18,182	+ 6,621

Although there will be a general reduction in long-term vehicle emissions, the General Plan update may have a **potentially significant** impact on regional ozone air quality, given that it would accommodate more growth through 2030 than is planned for in the 2004 ACTC RTP.

Proposed General Plan Policies and Action Items that Provide Mitigation

There are a number of key General Plan policies, objectives, and actions intended to directly or indirectly reduce criteria pollutant emissions associated with growth.

Land Use Element

- Policy LU-1.3: Phase growth based on infrastructure capacity, infrastructure financing, and the timing of the design, approval/permitting, and construction of transportation facilities and other infrastructure.
- Policy LU-1.5: Annexations, including but not limited to Policy Areas and Future Growth Areas (FGA), should contribute to the orderly planning of the community,

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including promoting the City's ultimate community vision and ensuring a well designed circulation system.

- Policy LU-2.3: Maintain a strong jobs-housing ratio with a diverse job base and corresponding housing stock within the Planning Area. Improve the relationship and proximity of jobs to housing and commercial services.
- Action LU-3.1.2: Encourage the intensification of land uses in Downtown Ione, including residential over retail and office, and new residential and commercial development Downtown.
- Action LU-3.1.3: Establish a Downtown Master Plan, Area Plan, or Specific Plan to ensure the long-term vibrancy of Downtown, protect its historic architecture, intensify land uses, enhance walkability, and develop bicycle and pedestrian linkages to surrounding areas. Include a Parking Plan as part of the Downtown Plan.

Circulation Element

- Action CIR-1.1.3: For major roadway projects, allow for improvement phasing such that roadway lanes are constructed based on traffic demand, with planned additional lanes being constructed once traffic demand reaches levels that require the additional lanes to be constructed in order to meet Level of Services specified in Policy CIR-1.3.
- Policy CIR-1.3: Seek to maintain operations on all roadways and intersections at Level of Service (LOS) E or better at all times, with the exceptions listed in Policy CIR-1.4. LOS E should be maintained even during peak travel times, unless maintaining this LOS would, in the City's judgment, be infeasible and/or conflict with the achievement of other goals or unless maintaining this LOS would not, in the City's judgment, adequately serve the City's circulation needs, per Policy CIR-1.4.
- Policy CIR-1.6: Where existing intersections cause traffic flow delays, consider modifying such intersections to round-about intersections if such improvements would improve traffic flows and livability.
- Policy CIR-1.11: Support the use of golf carts as a mode of transportation within the City by continuing to allow golf carts on specific roadways, and updating and expanding the number of roadways on which golf carts are allowed, in compliance with State and federal transportation safety laws.
- Policy CIR-1.12: Work with regional agencies and transit providers to support transit programs.
- Policy CIR-1.13: Evaluate potential crossings of Sutter Creek to alleviate traffic levels on existing roadways.
- Policy CIR-2.3: Require bicycle and pedestrian connections to public transit systems at stops; carpool/vanpool park-and-ride lots; and activity centers (e.g., schools, community centers, higher-density residential areas, Downtown, parks, employment centers, and commercial centers).
- Policy CIR-2.6: Provide safe and convenient bicycle access to all parts of the community.

- Policy CIR-2.7: Provide bike lanes or other bike facilities along all arterials, connectors, and on local roadways when necessary and feasible to provide for interconnected routes. On-street bike routes may be provided on roadways as deemed necessary by the City.
- Policy CIR-2.9: Consult with ACTC to ensure that local bikeways and trails connect to regional bikeways and trails to provide for a regional bikeway and trail system in support of the Amador County Bicycle and Pedestrian Master Plan.

Conservation & Open Space Element

- Policy CO-6.1: Promote infill development as a means to limit vehicle trips and reduce the environmental impacts of new development and land use patterns.
- Policy CO-6.2: Increase energy conservation Citywide.
- Action CO-6.2.2: Develop programs to conserve energy resources at City-operated facilities.
- Action CO-6.2.3: Encourage the development of energy efficient buildings and subdivisions.
- Action CO-6.2.4: Work with local utility providers to make the public aware of energy rebate programs.
- Action CO-6.2.5: Work with community organizations to encourage the inclusion of energy efficient systems in remodels and retrofits of existing development.
- Policy CO-6.3: Promote the development and use of advanced energy technology and building materials in Ione.
- Policy CO-6.4: Promote energy rebate programs offered by local energy providers as a way to bring energy efficiency into older neighborhoods and developments.
- Policy CO-10.4: Limit leapfrog development and support development in areas where a logical extension of public facilities is possible.

Economic Development Element

- Policy ED-2.2: The City shall strategically locate regional retail and commercial properties to take advantage of the local and regional transportation corridors (e.g., State Routes 104 and 124).
- Policy ED-3.4: The City shall utilize infrastructure strategies that support development in infill areas including vacant and under utilized lots within the downtown area.

Ultimately, in the absence of an updated ozone and particulate matter attainment plan, the project could impact the region's attempts to develop an ozone and particulate matter plan. This impact is **potentially significant**. The following mitigation measure could ensure that the proposed project does not adversely affect the region's upcoming plan to attain ozone standards and address particulate matter standards.

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Mitigation Measure

MM 4.5.1 The following policies shall be incorporated into the Conservation Element of the General Plan:

The City of lone shall suggest the AAPCD incorporate the updated growth forecasts from the 2030 General Plan in development of the region's ozone and particulate matter attainment plans.

This proposed mitigation measure should ensure that the City's proposed growth forecast can be accommodated in the regional ozone attainment plan. However, until such an attainment demonstration can be made that accommodates this level of growth, the project could conflict with future attainment plans for the region. This impact is considered **significant and unavoidable**.

Violate Any Air Quality Standard or Contribute Substantially to a Projected Air Quality Violation

Impact 4.5.2 The project would allow continued growth in population, housing, and jobs in the City of lone that would increase traffic volumes on local roadways over time. This could result in elevated CO emissions from motor vehicle congestion that violates federal CO standards. However, based on the projections of traffic congestion, this is not expected to exceed CO standards. As a result, this is considered to be a **less than significant** impact.

Local mobile-source carbon monoxide emissions near roadway intersections are a function of traffic volume, speed, and delay. Transport of CO is extremely limited because it disperses rapidly with distance from the source under normal meteorological conditions. Under specific meteorological conditions, CO concentrations near roadways and/or intersections may reach unhealthy levels. These concentrations are also impacted by vehicle delay associated with roadways or intersections. As vehicles speeds slow to LOS E or F, or worsen from an existing LOS F, CO concentrations are increased, creating a scenario in which localized CO could possibly cause a hotspot.

According to the Caltrans CO Protocol, the proposed project is subject to local analysis requirements, given its location in an attainment area for carbon monoxide (Caltrans, 1997). As such, the proposed Project could have a significant impact on localized CO concentrations that requires further analysis if it would worsen air quality. Under the CO Protocol, projects are required to compare a "build" with a "no-build" scenario for congested intersections. For the purposes of this analysis, the "no-build" scenario represents the eight unsignalized, two-lane roadway segments that are expected to operate at congested LOS E or F in 2030 (Fehr & Peers, 2009). The "build" scenario would incorporate proposed mitigation measures at all eight roadway segments that call for widening of these roadways to accommodate future growth. Based on these assumptions, the proposed project would not result in significant localized CO impacts based on the CO Protocol for the following reasons:

- The proposed project would not significantly increase the percentage of vehicles operating in cold start mode. The traffic analysis for this project does not assume any increase in vehicles operating in cold start mode on the eight congested roadways when compared to a 2030 no-build scenario.

- The proposed project would not significantly increase traffic volumes by more than 5 percent. The traffic analysis for this project does not assume any increase in traffic volumes on the eight congested roadways when compared to a 2030 no-build scenario.
- The proposed project would not worsen traffic flow, as potential increases in roadway capacity to four-lane roads would improve level of service when compared to a 2030 no-build scenario.

Proposed General Plan Policies and Action Items that Provide Mitigation

Circulation Element

Action CIR-1.1.3: For major roadway projects, allow for improvement phasing such that roadways lanes are constructed based on traffic demand, with planned additional lanes being constructed once traffic demand reaches levels that require additional lanes to be constructed in order to meet Level of Services specified in Policy CIR-1.3.

Policy CIR-1.3: Seek to maintain operations on all roadways and intersections at Level of Service (LOS) E or better at all times, with the exceptions listed in Policy CIR-1.4. LOS E should be maintained even during peak travel times, unless maintaining this LOS would, in the City's judgment, be infeasible and/or conflict with the achievement of other goals or unless maintaining this LOS would not, in the City's judgment adequately serve the City's circulation needs, per Policy CIR-1.4.

Policy CIR-1.6: Where existing intersections cause traffic flow delays, consider modifying such intersections to round-about intersections if such improvements would improve traffic flows and livability.

Further analysis of CO impacts is not required under the Caltrans CO Protocol, and the proposed project's impact on localized CO concentrations is considered **less than significant**.

Mitigation Measure

None required.

Create Objectionable Odors

Impact 4.5.3 Implementation of the proposed project may result in future siting of land uses that create objectionable odors or expose future sensitive receptors to existing odor sources. This impact is **potentially significant**.

Generically, there are several types of projects that could create objectionable odors, including: wastewater treatment plant, sanitary landfill, transfer stations, composting facilities, petroleum refineries, asphalt batch plants, chemical manufacturing, fiberglass manufacturing, auto body shops, rendering plants, and coffee roasters. Most of these land uses are not accommodated by the City's current or proposed General Plan Land Use Map, with the exception of expansion of the existing wastewater treatment plant. Nevertheless, impacts resulting from odors can occur when sensitive receptors are located near new odor sources, or vice-versa. For example, locating residential growth adjacent to existing agricultural operations on unincorporated County lands could expose future City residents to odors.

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Implementation of the General Plan and its associated project components may locate sensitive receptors near potential existing and future sources of odors. For example, in the southeast region of the lone Planning Area, there is a proposed heavy industrial land use designation adjacent to proposed public institutes, as well as varying densities of residential development. In the northwest and northeast areas of the Planning Area, residential land uses are planned near agricultural land uses. This is a **potentially significant** impact.

Existing or proposed policies would help reduce the potential for odors impacts. AAPCD Rule 205 governs nuisances for existing or future land uses that produce intermittent odors that adversely affect nearby persons. However, it does not apply to agricultural facilities that process poultry or other potentially odorous materials.

Proposed General Plan Policies and Action Items that Provide Mitigation

The proposed General Plan includes one key policy that would indirectly limit the potential for incompatible land uses that would generate odors:

Policy LU-2.4: Promote high quality, efficient, and cohesive land utilization that minimizes negative impacts (e.g., traffic congestion and visual blight) and environmental hazards (e.g. flood, soil instability) on adjacent areas and infrastructure and preserve existing and future residential areas from encroachment of incompatible activities and land uses.

This policy would indirectly strengthen the City's commitment to minimize incompatibility between land uses that could expose persons to objectionable odors. However, the potential to locate land uses that produce noxious odors near sensitive receptors remains and this impact is **potentially significant**. As such, the following mitigation measure is recommended:

Mitigation Measures

MM 4.5.3a The following policy shall be incorporated into the Land Use Element of the General Plan:

Residential development projects and projects categorized as sensitive receptors shall be located an adequate distance from existing and potential sources of toxic emissions such as freeways, major arterials, industrial sites, and hazardous material locations. "Adequate distance" will be based on site-specific conditions, on the types and amounts of potential toxic emissions, and other factors.

MM 4.5.3b The following policy shall be incorporated into the Land Use Element of the General Plan:

The City shall require new air pollution point sources (such as, but not limited to, industrial, manufacturing, and processing facilities) to be located an adequate distance from residential areas and other sensitive receptors. "Adequate distance" will be based on site-specific conditions, the type and location of sensitive receptors, on the types and amounts of potential toxic emissions, and other factors.

With implementation of proposed General Plan policies, AAPCD Rule 205, and **MM 4.5.3a** and **MM 4.5.3b**, the proposed Project's impact on odor would be reduced to **less than significant**.

Expose Sensitive Receptors to Toxic Air Contaminants (TACs)

Impact 4.5.4 Implementation of the proposed project may result in the siting of future land uses that emit TACs or expose future sensitive receptors to existing TAC sources. This impact is **significant**.

Implementation of the proposed project may locate sensitive receptors near potential existing and future sources of TACs. For example, in the southeast region of the lone planning area, there is proposed heavy industrial land use designation adjacent to proposed public institutes, as well as varying densities of residential development. In addition to possible processes which will emit toxics, heavy industrial land uses also can have diesel truck traffic that can generate diesel-based particulate matter that has been designated a TAC by the State.

Stationary sources of TACs are required to obtain permits from AAPCD through Regulation IV and other appropriate source-specific rules. The largest point sources of TACs in the City of lone are shown in **Table 4.5-1**.

Another source of TACs is naturally-occurring asbestos (NOA). As discussed in Section 4.11 (Geology and Soils), trenching, grading, and excavation associated with future development could expose zones of asbestos containing rock and possibly cause airborne releases of fibrous minerals in areas containing ultramafic rocks or potentially in areas containing undivided Mesozoic volcanic and metavolcanic rocks. Implementation of the SOI amendment/annexations could result in releases of and exposure to NOA. This impact is potentially significant.

NOA occurs often in association with ultramafic rocks and the presence of ultramafic rocks within a region indicates the possibility of NOA materials. The Planning Area contains undivided Mesozoic volcanic and metavolcanic rocks which may contain some metamorphosed minerals such as serpentinite. Because no safe asbestos exposure has been established for residential areas, public exposure to any amount of asbestos poses a potential health risk.

General Plan Land Use Map

Areas Within and Outside of Existing City Limits

The proposed General Plan Land Use Map allows for expansion of urbanization in the currently undeveloped areas within the existing city limits. In addition, the proposed General Plan Land Use Map designates land uses within the Planning Area outside the existing city limits, primarily in the form of residential, industrial, and public facilities to the north/northwest and industrial, office, and commercial land use designations in the Triangle SPA. Trenching, grading, and other excavations associated with future development could expose zones of asbestos-containing rock and possibly cause airborne releases of fibrous minerals in areas containing ultramafic rocks or potentially in areas containing undivided Mesozoic volcanic and metavolcanic rocks. Therefore, implementation of the proposed General Plan Land Use Map could result in releases of, and exposure to, NOA. This is a **significant** impact.

Sphere of Influence Amendment/Annexation

The City's plans to amend its SOI and annex certain parcels, and these are policy decisions that would not directly result in NOA release and exposure. However, these actions would allow the future development of additional and/or expanded facilities on the parcels. Therefore,

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implementation of the SOI amendment/annexations could result in releases of and exposure to NOA. This is a **significant** impact.

West Ione Roadway Improvement Strategy

The proposed project includes the West Ione Roadway Improvement Strategy (WIRIS), which consists of both improvements to existing roadways and the construction of new roadway segments in order to create a bypass to provide traffic relief through downtown. Therefore, implementation of the proposed WIRIS would result in the construction of new infrastructure. Grading, earthmoving, and other site preparation activities associated with the construction of new roadway segments could expose zones of asbestos-containing rock and possibly cause airborne releases of fibrous minerals in areas containing ultramafic rocks or potentially in areas containing undivided Mesozoic volcanic and metavolcanic rocks. This impact is considered a **significant** impact.

Proposed General Plan Policies and Action Items that Provide Mitigation

There is one key proposed policy that would limit the potential for incompatible land uses that would generate TAC issues:

Policy LU-2.4: Promote high quality, efficient, and cohesive land utilization that minimizes negative impacts (e.g., traffic congestion and visual blight) and environmental hazards (e.g. flood, soil instability) on adjacent areas and infrastructure and preserve existing and future residential areas from encroachment of incompatible activities and land uses.

This policy would strengthen the City's commitment to minimize incompatibility between land uses that could expose persons to unhealthful TAC levels, particularly for industrial land uses that could emit TACs from diesel vehicles or stationary source processes.

However, there are no other proposed General Plan policies that would provide specific mitigation for NOA impacts. As previously discussed, the ATCM for Construction, Grading, Quarrying, and Surface Mining Operations requires road construction and maintenance activities, construction and grading operations, and quarrying and surface mining operations in areas where naturally-occurring asbestos is likely to be found to use dust control measures for a specified set of emission sources and prevent visible emissions crossing the project boundaries.

Mitigation Measures

As recommended in Section 4.11, mitigation measure **MM 4.11.6** would require an Asbestos Hazard Dust Mitigation Plan that addresses the handling and remediation for NOA sites in accordance with all local, state, and federal regulations for potential hazardous materials. The Asbestos Hazard Dust Mitigation Plan shall include practices to eliminate, to the greatest extent possible, the emission of fugitive dust from grading, excavation, and construction activity in order to protect workers and area residents.

Implementation of the mitigation measure **MM 4.11.6** would minimize the amount of asbestos fiber emissions into the atmosphere during grading and construction, and reduce exposure of construction workers to asbestos. Mitigation would notify future residents to hazards posed by potential NOA.

In addition to the above referenced mitigation measures future development projects in areas containing potential sources of NOA would be subject to ARB's ATCM for naturally-occurring asbestos. The applicant for development would be required to notify the AAPCD before any work could begin. For construction and grading projects that would disturb one acre or less, the regulation requires several specific actions to minimize emissions of dust such as vehicle speed limitations, application of water prior to and during the ground disturbance, keeping storage piles wet or covered, and track-out prevention and removal. Construction projects that would disturb more than one acre are required to prepare and obtain district approval for an asbestos dust mitigation plan. The plan must specify how the operation will minimize emissions and must address specific emission sources. Regardless of the size of the disturbance, activities must not result in emissions that are visible crossing the property line.

Implementation of mitigation measure **MM 4.11.6**, along with compliance with ARB's ATCM for naturally-occurring asbestos, would reduce impacts to a **less than significant** level after mitigation.

Increases in Short-term Construction Emissions

Impact 4.5.5 Implementation of the proposed project will lead to development that may expose sensitive receptors to short-term emissions of particulates and contribute to the region's non-attainment status for the PM₁₀ standard. This impact is **potentially significant**.

The proposed project includes land use designations that would allow for future construction of residential, commercial, industrial, and other projects. This will result in construction-related emissions from future projects that would generally be short-term in duration, but may still cause adverse air quality impacts. Inhalable PM₁₀ is the pollutant of greatest concern associated with construction activities. PM₁₀ emissions can result from construction activities facilitated by the proposed General Plan, including excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle and equipment exhaust. Particulate emissions from construction activities can lead to adverse health effects as well as nuisance concerns such as reduced visibility and soiling of exposed surfaces.

Construction emissions of PM₁₀ can vary greatly depending on the level of activity, the specific operations taking place, the equipment being operated, local soils, weather conditions, and other factors. **Table 4.5-12** illustrates a profile of construction-related emissions from a hypothetical one-acre development site with moderate grading and construction activities. This table demonstrates that even a hypothetical one-acre site can produce substantial emissions of PM₁₀ and other criteria pollutants, though there can be great variability in emissions depending upon the amount of earthmoving activities are necessary.

Despite this variability in emissions, there are a number of feasible control measures that can be reasonably implemented to significantly reduce PM₁₀ emissions from construction.

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TABLE 4.5-12
CONSTRUCTION EMISSIONS FROM TYPICAL ONE-ACRE CONSTRUCTION SITE
(POUNDS/DAY)

	ROG	NOx	CO	SOx	PM10	PM2.5	CO2
Construction Emissions (2030)							
Fine Grading	2	11	9	0	5	1.5	2,350
Paving	1	6	7	0	0.5	0.4	1,163
Construction	1	4	5	0	0.2	0.2	1,379
Coating	7	0	0	0	0	0	8
Total	10.4	21	21	0	6	2	4,900

Source: URBEMIS 2007 v. 9.2.4 Outputs

AAPCD Rule 218 (Fugitive Dust Emissions) regulates emissions of fugitive particulates by calling for good housekeeping and/or work practices. This would apply to all construction activities associated with future growth. Compliance with this regulation would ensure that fugitive emissions remain below 20 percent opacity.

Proposed General Plan Policies, Objectives and Actions That Provide Mitigation

There are no proposed General Plan policies associated with reducing construction emissions. This impact is **potentially significant**.

Mitigation Measures

MM 4.5.5a The following policy shall be incorporated into the Conservation Element of the General Plan:

The City shall ensure that construction projects incorporate the following good housekeeping and/or work practices, as applicable, pursuant to AAPCD Rule 218:

- Application of water and/or approved chemicals to control emissions in the demolition of existing buildings or structures, construction operations, solid waste disposal operations, the grading of roads and/or the clearing of land.
- Application of asphalt, water and/or approved chemicals to road surfaces.
- Application of water and/or suitable chemicals to material stockpiles and other surfaces that may generate fugitive dust emissions.
- Paving and/or re-paving roads.
- Maintenance of roadways in a clean condition by washing with water or sweeping promptly.
- Covering or wetting material stockpiles and open-bodied trucks, trailers, or other vehicles transporting materials that may generate fugitive dust emissions when in motion.

- Installation and use of paved entry aprons or other effective cleaning techniques to remove dirt accumulating on a vehicle's wheels on haul or access roads to prevent tracking onto paved roadways.
- For process equipment, the installation and use of hoods, fans, and filters to enclose, collect, and clean the emissions prior to venting.
- Ceasing operations until fugitive emissions can be reduced and controlled.
- Using vegetation and other barriers to contain and to reduce fugitive emissions.
- Using vegetation for windbreaks.
- Instituting good housekeeping practices by regularly removing piles of material that have accumulated in work areas and/or are generated from equipment overflow.
- Maintaining reasonable vehicle speeds while driving on unpaved roads in order to minimize fugitive dust emissions.
- Other precautions not specifically listed in this rule but have been approved in writing by the APCO prior to implementation.

MM 4.5.5b The following policy shall be incorporated into the Conservation Element of the General Plan:

- Prohibit the idling of work vehicles for sustained periods.

Implementation of these mitigation measures would substantially reduce most construction-related emissions of PM₁₀. This impact after mitigation is considered **less than significant**.

4.5.4 CUMULATIVE SETTING, IMPACTS AND MITIGATION MEASURES

AIR QUALITY CUMULATIVE SETTING

The land use policies in the proposed City of Ione General Plan update would provide direction for growth within the city limits, while the Amador County General Plan policies provides direction for growth outside the city limits, but within the Planning Area boundaries (until land areas are annexed into the City). Thus, the setting for this cumulative analysis consists of the Mountain Counties Air Basin and associated growth and development anticipated in the Basin (regional anticipated development is described in Section 4.0). This includes consideration of attainment efforts for the Basin under full buildout of the City of Ione General Plan Planning Area as proposed in the General Plan update (occurring after year 2030), as development in the region identified in Section 4.0 would change the intensity of land uses in the region.

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CUMULATIVE IMPACTS AND MITIGATION MEASURES

Cumulative Air Quality Impacts on Attainment Plans

Impact 4.5.6 Implementation of the proposed project, in combination with cumulative development in the Air Basin, would contribute to a cumulative air quality impacts and could conflict with ozone and particulate matter attainment efforts. This is considered a **cumulatively considerable** impact.

As described under Impact 4.5.1, subsequent development under the proposed General Plan update and its associated project components could exceed growth projections used in regional air quality planning and attainment efforts under year 2030 conditions. Development of the Planning Area would generate additional emissions beyond 2030 and could further conflict with attainment efforts. This impact is therefore **cumulatively considerable**.

Proposed General Plan Policies and Action Items that Provide Mitigation

The proposed General Plan update contains several goals, policies, and action items that would assist in reducing this air quality impact. The following list contains those policies and action items that contain specific, enforceable requirements and/or restrictions and corresponding performance standards that assist in reducing (though not eliminating) this impact. Since these policies and action items have been described in detail in prior impact discussions for this section, the following is limited to only listing the policy and action item numbers.

Land Use Element

Policy LU-1.3, Policy LU-1.5, Policy LU-2.3, Action LU-3.1.2, Action LU-3.1.1

Circulation Element

Action CIR-1.1.3, Policy CIR-1.3, Policy CIR-1.6, Policy CIR-1.11, Policy CIR-1.12, Policy CIR-1.13, Policy CIR-2.3, Policy CIR-2.6, Policy CIR-2.7, Policy CIR-2.9

Conservation & Open Space Element

Policy CO-6.1, Policy CO-6.2, Action CO-6.2.2, Action CO-6.2.3, Action CO-6.2.4, Action CO-6.3.5, Policy CO-6.3, Policy CO-6.4, Policy CO-10.4

Economic Development Element

Policy ED-2.2, Policy ED-3.4

Mitigation Measures

While implementation of the above policies and action items would include measures to reduce particulate matter and ozone emissions, buildup anticipated under the proposed project would exceed growth protections used in attainment plan development as well as result in substantial increase in emissions. There are no feasible mitigation measures to offset the proposed project's increase in emissions. Thus, this impact is **cumulatively considerable** and **significant and unavoidable**.

GREENHOUSE GAS AND CLIMATE CHANGE

The California Environmental Quality Act (CEQA) requires that lead agencies consider the reasonably foreseeable adverse environmental effects of projects they are considering for approval. Emissions of greenhouse gases (GHGs) have the potential to adversely affect the environment because such emissions contribute, on a cumulative basis, to global climate change. In turn, global climate change has the potential to cause sea level rise, which can inundate low-lying areas; to affect rain and snow fall, leading to changes in water supply; to affect habitat, leading to adverse affects on biological resources, etc.

As noted previously, cumulative impacts are the collective impacts of one or more past, present, and future projects, that, when combined, result in adverse changes to the environment. When the adverse change is substantial, the cumulative impact is considered significant. The cumulative project list for this issue (global climate) comprises anthropogenic (i.e., man-made) GHG emission sources across the entire globe. No project alone would cause any noticeable incremental change to the global climate. However, legislation and executive orders on the subject of climate change in California have established a statewide context for GHG emissions, and an enforceable statewide cap on GHG emissions. Given the nature of environmental consequences from GHGs and global climate change, CEQA requires the evaluation of the cumulative impacts of GHGs. Even relatively small (on a global basis) additions need to be considered, and small contributions to this cumulative impact (from which significant effects are occurring and are expected to worsen over time) may be potentially considerable (and therefore, significant). Thus, the City of Ione has concluded that GHG emissions require consideration under CEQA.

Existing Climate Setting

To fully understand global climate change it is important to recognize the naturally occurring "greenhouse effect" and to define the greenhouse gases (GHG) that contribute to this phenomenon. The temperature on Earth is regulated by this greenhouse effect, which is so named because the Earth's atmosphere acts like a greenhouse, warming the planet in much the same way that an ordinary greenhouse warms the air inside its glass walls. Like glass, the gases in the atmosphere let in light yet prevent heat from escaping.

GHG are naturally occurring gases such as water vapor, carbon dioxide (CO₂), methane (CH₄), and nitrous oxide (N₂O) that absorb heat radiated from the Earth's surface. GHGs carbon dioxide, methane, nitrous oxide, and others – are transparent to certain wavelengths of the sun's radiant energy, allowing them to penetrate deep into the atmosphere or all the way to the Earth's surface. Clouds, ice caps, and particles in the air reflect about 30 percent of this radiation, but oceans and land masses absorb the rest (70 percent of the radiation received from the sun) before releasing it back toward space as infrared radiation. GHG and clouds effectively prevent some of the infrared radiation from escaping; they trap the heat near Earth's surface where it warms the lower atmosphere. If this natural barrier of atmospheric gases were not present, the heat would escape into space, and Earth's average global temperatures could be as much as 61 degrees Fahrenheit cooler (NASA, 2007).

Human activities are exerting a major and growing influence on climate by changing the composition of the atmosphere and by modifying the land surface. Particularly, the increased consumption of fossil fuels (natural gas, coal, gasoline, etc.) has substantially increased atmospheric levels of greenhouse gases because such fuels when burned release GHG. Measured atmospheric levels of certain GHG such as carbon dioxide, methane, and nitrous oxide have risen substantially in recent decades (Miller, 2000). This increase in atmospheric levels

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of GHG unnaturally enhances the greenhouse effect by trapping more infrared radiation as it rebounds from the Earth's surface, thus trapping more heat near the Earth's surface. Prominent GHGs contributing to the greenhouse effect and climate change include carbon dioxide (CO₂), methane (CH₄), ozone, nitrous oxide (N₂O), and chlorofluorocarbons (CFCs). Emissions of these gases are attributable to human activities associated with the industrial/manufacturing, utilities, transportation, residential, and agricultural sectors (California Energy Commission, 2006a).

According to the EPA, the Earth's average surface temperature has increased by about 1.2 to 1.4°F since 1900. The warmest global average temperatures on record have all occurred within the past 15 years, the warmest two years being 1998 and 2005. Eleven of the last 13 years rank among the hottest years on record (since 1850, when reliable worldwide temperature measurements began) (IPCC, 2007). This warming trend of recent decades is likely the result of human activities. The warming has affected other aspects of the climate, such as rainfall patterns, snow and ice cover, and sea level.

Global Implications

Recognizing the problem of global climate change, the World Meteorological Organization (WMO) and the United Nations Environment Program (UNEP) established the Intergovernmental Panel on Climate Change (IPCC) in 1988. It is open to all members of the United Nations and WMO. The role of the IPCC is to assess on a comprehensive, objective, open, and transparent basis the scientific, technical, and socio-economic information relevant to understanding the scientific basis of risk of human-induced climate change, its potential impacts, and options for adaptation and mitigation. According to climate models, the IPCC projects that the Earth's average surface temperature should rise 1.8–6.3 °F before 2100. If the atmospheric concentration of CO₂ doubles from its late 1700s level of 280 parts per million (ppm) to 560 ppm, the most likely rise in temperature would be about 3.6 °F. This may not seem like a significant increase, yet even at the lowest projected increase of 1.8 °F, the Earth would be warmer than it has been for 10,000 years (Miller, 2000) and environmental changes are expected to occur as a result.

The IPCC Fourth Assessment Report's Working Group I Summary for Policymakers (Report) synthesizes current scientific understanding of global climate change and projects future climate change using the most comprehensive set of well-established global climate models. The Report incorporates findings of the current effects of global climate change. These findings include:

- The intensity of tropical cyclones (hurricanes) in the North Atlantic has increased over the past 30 years, which correlates with increases in tropical sea surface temperatures.
- Droughts have become longer and more intense and have affected larger areas since the 1970s, especially in the tropics and subtropics.
- Since 1900 the Northern Hemisphere has lost 7 percent of the maximum area covered by seasonally frozen ground.
- Mountain glaciers and snow cover have declined worldwide.
- Satellite data since 1978 show that the extent of Arctic sea ice during the summer has shrunk by more than 20 percent.

- Since 1961, the world's oceans have been absorbing more than 80 percent of the heat added to the climate, causing ocean water to expand and contributing to rising sea levels. Between 1993 and 2003, ocean expansion was the largest contributor to sea level rise.
- Melting glaciers and losses from the Greenland and Antarctic ice sheets have also contributed to recent sea level rise.

An enhanced greenhouse effect will generate new patterns of microclimate and will have significant impacts on the economy, environment, and transportation infrastructure and operations due to increased temperatures, intensity of storms, sea level rise, and changes in precipitation. Impacts may include flooding of tunnels, coastal highways, runways, and railways, buckling of highways and railroad tracks, submersion of dock facilities, and a shift in agriculture to areas that are more hospitable to crop production. Such prospects will have strategic security as well as transportation implications.

Climate change affects public health and the environment. Increased smog and emissions, respiratory disease, reduction in the state's water supply, extensive coastal damage, and changes in vegetation and crop patterns have been identified as effects of climate change. The impacts of climate change are broad-ranging and interact with other market failures and economic dynamics, giving rise to many complex policy problems. The findings are the latest in a string of reports warning that the rate of carbon dioxide accumulating in the atmosphere is increasing at an alarming pace.

California Implications

Climate change is a global problem, and GHGs are global pollutants, unlike criteria air pollutants and TACs, which are pollutants of regional and local concern. Worldwide, California is the 12th to 16th largest emitter of CO₂ and is responsible for approximately 2 percent of the world's CO₂ emissions (CEC, 2006a, 2006b). In 2004, California produced 492 million gross metric tons of carbon dioxide-equivalent (CEC, 2006a).

Increased ocean temperature could result in increased moisture flux into the state; however, since this would likely increasingly come in the form of rain rather than snow in the high elevations, increased precipitation could lead to increased potential and severity of flood events, placing more pressure on California's flood control system. Sea level has risen approximately 7 inches during the last century and, according to the CEC report, it is predicted to rise an additional 22–35 inches by 2100, depending on the future GHG emissions levels (CEC, 2006c). If this occurs, resultant effects could include increased coastal flooding, saltwater intrusion, and disruption of wetlands (CEC, 2006c). As the existing climate throughout California changes over time, mass migration of species, or worse, failure of species to migrate in time to adapt to the perturbations in climate, could also result.

According to the California Environmental Protection Agency, the climate changes for global warming could affect agriculture, the fishing industry, California's coastline, forests, and ecosystems, increase air pollution, and energy production (CalEPA, 2002).

Agriculture

Potential impacts, such as reduced water supply, more severe droughts, more winter floods, and drier growing seasons will affect California's agriculture. Many farms, especially in the fruit and nut business, require long-term investments, making fast adaptation difficult, and could thus

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experience serious losses if decisions continue to be made with no regard to expected climate changes.

Fishing

Studies found that as a result of changes in ocean conditions, the distribution and abundance of major fish stocks will change substantially. Impacts to fisheries related to El Niño/Southern Oscillation illustrate how climate directly impacts marine fisheries on short-term scales. Higher sea surface temperatures in 1997–1998 during the El Niño had a great impact on market squid, California’s largest fishery by volume. The California Regional Assessment reports that landings fell to less than 1,000 metric tons in that season, down from 110,000 tons in the 1996–1997 season. Other unusual events also occurred such as poor salmon returns, a series of plankton blooms, and seabird die-offs.

Coastline

With climate changes, recreational facilities and developed coastlines will also be more vulnerable to hurricanes, storm surges, and flooding. Increasing population growth in coastal areas is a reason for further concern, since these areas could be more vulnerable to climate change impacts. Impacts of expected sea level rise and increased storm surges are numerous. Beachfront homes and harbors as well as wetlands may flood. Sewage systems may be overwhelmed by storm runoff and high tides. Jetties and seawalls may have to be raised and strengthened to protect harbors which are used for shipping, recreation, and tourism.

Forests

The California Regional Assessment notes an increase in the number and extent of areas burned by wildfires in recent years, and modeling results under changing climate conditions suggest that fires may be hotter, move faster, and be more difficult to contain under future climate conditions. The factors which contribute to the risk of catastrophic fires (fuel loads, high temperatures, dry conditions, and wind) are typically present already in summer and fall seasons in California, but can exist at other times of the year, especially in drought conditions. Public safety is an issue as more home and tourism developments on coastal hills and mountains, and the foothills and higher elevations in the Sierra Nevada are highly susceptible to catastrophic wildfires.

Ecosystems

The current distribution, abundance, and vitality of species and habitats are strongly dependent on climatic (and microclimatic) conditions. Climate change is expected to result in warmer temperatures year-round, accompanied by substantially wetter winters. Rising sea level will significantly affect coastal wetlands because they are mostly within a few feet of sea level. As the sea rises, these wetlands will move inland. The overall acreage of wetlands will be reduced due to constraints by existing urban development and steeper slopes immediately inland of existing wetlands. Tidal rivers, estuaries, and relatively flat shoreline habitats will be more subject to damage by flooding and erosion. More severe storm surges from the ocean, due to higher sea levels, combined with higher river runoff could significantly increase flood levels by more than the rise in sea level alone. Erosion of beaches would decrease habitat for beach-dependent species, such as seals, shorebirds, and endangered species (for example, snowy plover and least tern).

The timing and amounts of water released from reservoirs and diverted from streams are constrained by their effects on various native fish, especially those that are listed under the federal and state endangered species acts as threatened or endangered. Several potential hydrological changes associated with global climate change could influence the ecology of aquatic life in California and have several negative effects on cold-water fish (Department of Water Resources [hereafter "DWR"] 2006). For example, if climate change raises air temperature by just a few degrees Celsius, this change could be enough to raise the water temperatures above the tolerance of salmon and trout in many streams, favoring instead non-native fishes such as sunfish and carp (DWR 2006). Unsuitable summer temperatures would be particularly problematic for many of the threatened and endangered fish that spend summers in cold-water streams, either as adults, juveniles, or both (DWR 2006). In short, climate change could significantly affect threatened and endangered fish in California. It could also cause non-threatened and non-endangered fish to reach the point where they become designated as such (DWR 2006).

Changes in temperature and precipitation patterns would also shift California's current climate zones, and thus habitats associated with these zones, northward by approximately 100–400 miles, as well as upwards in elevation by 500–1,500 feet. Global climate change would alter the composition, structure, and arrangement of the vegetation cover of the state (forest and wildland). Species distribution would move geographically as the climate changes, with forest stands, woodlands, and grassland species predicted to move northward and higher in elevation. The entire vegetative community may be affected if non-native invasive species occupy sites and replace native plants. Outbreaks of insects and diseases could compromise forest health and the capability of the forest stands to reproduce and to store carbon on a landscape basis. Forest fires are likely to become more frequent and severe if soils become drier. Changes in pest populations could further increase the stress on forests.

Air Quality

Projected climate changes will impact the quality of California's air, public health, and environment. Higher temperatures increase the formation and retention of ground-level ozone and particulate matter, making it more difficult to meet the health-base air quality standards for these pollutants. Ground-level ozone has been shown to aggravate existing respiratory illnesses such as asthma, reduce lung function, and induce respiratory inflammation. Ambient ozone also reduces agricultural crop yields and impairs ecosystem health.

The particulate matter of most concern – PM₁₀ – has a diameter smaller than 10 micrometers and can easily pass into the lungs, contributing to lung tissue damage. PM₁₀ has been implicated in exacerbation of cardiovascular disease, asthma, and other respiratory diseases and associated with increased mortality. Air pollution is also made worse by increases in natural hydrocarbon emissions and evaporative emissions of fuels and solvents which lead to higher levels of ozone and PM₁₀ during hot weather. Warmer temperatures that cause increased use of air conditioners, which release pollutants, can cause increased air pollutants from power plants meeting cooling energy needs, and from vehicle operation. In addition, warming, drying, and increased winds could mean hotter, harder-to-control wildfires. These wildfires could result in increased levels of fine particulate matter that could also exceed state and federal standards and harm public health.

Electricity Generation

California's electricity generation is currently relatively efficient when it comes to emissions of greenhouse gases. The national average for the electricity generation share of total

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greenhouse gas emissions is approximately 40 percent, while California electricity accounts for only 16 percent of statewide emissions. This is in part due to California's significant amount of imported electricity, mild climate, and lack of energy-intensive industry. Over the past two decades, California has developed one of the largest and most diverse renewable electricity generation industries in the world. However, changes in climate of the magnitude predicted by the Intergovernmental Panel of Climate Change would substantially affect electricity generation throughout California and the entire western states grid, particularly for hydroelectric facilities.

A decrease in snowpack due to warmer temperatures and less rainfall would result in lower stream levels in the summer and fall seasons due to reduced runoff in those seasons, reducing hydro-electric capabilities. Additional hydropower may be available during the winter and the spring, but is more useful and valuable within the grid mix of generation sources when it is available throughout the peak summer and fall seasons. Flooding could also impact pipelines, wells, and related petroleum extraction equipment. Warmer weather would result in an increased demand for electricity for cooling appliances in homes and businesses.

Water Supply

While most climate model simulations project relatively moderate changes in precipitation over this century, rising global temperatures are expected to result in reductions in snowpack for the Sierra Nevada Mountains (i.e., precipitation changing in the form of rain from snow). By the 2035 to 2064 period, the Sierra Nevada snowpack could decrease from 12% to 40% as compared to historic levels (depending on the climate scenario) (Cal/EPA, 2006). The Sierra Nevada Mountains snowpack acts as a natural water storage facility (equal to approximately half of the storage capacity of California's major human-made reservoirs) by holding the winter precipitation and releasing it during the spring and early summer months as the snow melts. The reduction of this natural water storage during the winter could mean water shortages in the future and would require the alteration of the management of existing reservoirs (while not losing flood control capacity or hydropower generation capacity) and/or the construction of additional human-made reservoirs to compensate for this storage loss.

Potential impacts of climate change on water supply and availability could directly and indirectly affect a wide range of institutional, economic, and societal factors (Gleick 1997). Much uncertainty remains, however, with respect to the overall impact of global climate change on future water supplies. For example, models that predict drier conditions (i.e., parallel climate model [PCM]) suggest decreased reservoir inflows and storage and decreased river flows, relative to current conditions. By comparison, models that predict wetter conditions (i.e., HadCM2) project increased reservoir inflows and storage, and increased river flows (Brekke 2004). Both projections are equally probable based on which model is chosen for the analyses. Much uncertainty also exists with respect to how climate change will affect future demand of water supply (DWR 2006). Still, changes in water supply are expected to occur and many regional studies have shown that large changes in the reliability of water yields from reservoirs could result from only small changes in inflows (Kiparsky and Gleick 2003; see also Cayan et al. 2006a).

Minimal research has been conducted on the effects of climate change on specific groundwater basins, groundwater quality, or groundwater recharge characteristics. Changes in rainfall and changes in the timing of the groundwater recharge season would result in changes in recharge. Warmer temperatures could lead to higher evaporation as well as prolonged drought periods that would reduce the amount of water entering the ground that could further limit deficient water supply conditions. However, warmer and wetter winters could increase the amount of runoff available for groundwater recharge. Additional winter runoff, however, could

be occurring at a time when groundwater basins are being recharged at their maximum capacity. However, the extent to which climate will change and the impact of that change on groundwater are both unknown at this time.

Increased Flooding

Currently, there is no accurate information to accurately assess the impact of climate change for flood frequency or severity, because of the absence of detailed regional precipitation information from climate models and because water-management choices can substantially influence overall flood risk. However, increased amounts of winter runoff could be accompanied by increases in flood event severity and warrant additional dedication of wet season storage space for flood control as opposed to water supply storage. This need to manage water storage facilities to handle increased runoff could in turn lead to water shortages during high water demand. It is recognized that these impacts would result in increased challenges for reservoir management and balancing the competing concerns of flood protection and water supply.

Sudden Climate Change

Most global climate models project that anthropogenic climate change will be a continuous and fairly gradual process through the end of this century (DWR 2006). California is expected to be able to adapt to the water supply challenges posed by climate change, even at some of the warmer and dryer projections for change. Sudden and unexpected changes in climate, however, could leave water managers unprepared and could, in extreme situations, have significant implications for California and its water supplies. For example, there is speculation that some of the recent droughts that occurred in California and the western United States could have been due, at least in part, to oscillating oceanic conditions resulting from climatic changes. The exact causes of these events are, however, unknown, and evidence suggests such events have occurred during at least the past 2000 years (DWR 2006).

REGULATORY FRAMEWORK

STATE

Assembly Bill 1493

Assembly Bill (AB) 1493 required that the ARB develop and adopt, by January 1, 2005, regulations that achieve "the maximum feasible reduction of greenhouse gases emitted by passenger vehicles and light-duty truck and other vehicles determined by the ARB to be vehicles whose primary use is noncommercial personal transportation in the state."

Assembly Bill 32, the California Global Warming Solutions Act of 2006

Assembly Bill (AB) 32 requires that statewide GHG emissions be reduced to 1990 levels by the year 2020. The gases that are regulated by AB 32 include carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF₆). The reduction to 1990 levels will be accomplished through an enforceable statewide cap on GHG emissions that will be phased in, starting in 2012. To effectively implement the cap, AB 32 directs ARB to develop and implement regulations to reduce statewide GHG emissions from stationary sources. AB 32 specifies that regulations adopted in response to AB 1493 should be used to address GHG emissions from vehicles. However, AB 32 also includes language stating

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that if the AB 1493 regulations cannot be implemented, then ARB should develop new regulations to control vehicle GHG emissions under the authorization of AB 32.

AB 32 requires that ARB adopt a quantified cap on GHG emissions representing 1990 emissions levels and disclose how it arrives at the cap, institute a schedule to meet the emissions cap, and develop tracking, reporting, and enforcement mechanisms to ensure that the state achieves reductions in GHG emissions necessary to meet the cap. AB 32 also includes guidance to institute emissions reductions in an economically efficient manner and conditions to ensure that businesses and consumers are not unfairly affected by the reductions.

Climate Change Proposed Scoping Plan

In October of 2008, ARB published its *Climate Change Proposed Scoping Plan (Proposed Scoping Plan)*, which is the State's plan to achieve GHG reductions in California required by AB 32 (ARB 2009f). The *Proposed Scoping Plan* contains the main strategies California will implement to achieve reduction of 169 million metric tons (MMT) of carbon dioxide equivalents (CO₂e), or approximately 30% from the state's projected 2020 emission level of 596 MMT of CO₂e under a business-as-usual scenario (this is a reduction of 42 MMT CO₂e, or almost 10%, from 2002-2004 average emissions). The *Proposed Scoping Plan* also includes ARB-recommended GHG reductions for each emissions sector of the state's GHG inventory. The largest proposed GHG reduction recommendations are from improving emission standards for light-duty vehicles (estimated reductions of 31.7 MMT CO₂e), implementation of the Low-Carbon Fuel Standard (15.0 MMT CO₂e), energy efficiency measures in buildings and appliances and the widespread development of combined heat and power systems (26.3 MMT CO₂e), and a renewable portfolio standard for electricity production (21.3 MMT CO₂e). ARB has not yet determined what amount of GHG reductions it recommends from local government operations; however, the *Proposed Scoping Plan* does state that land use planning and urban growth decisions will play an important role in the State's GHG reductions because local governments have primary authority to plan, zone, approve, and permit how land is developed to accommodate population growth and the changing needs of their jurisdictions (ARB is also developing an additional protocol for community emissions). ARB further acknowledges that decisions on how land is used will have large impacts on the GHG emissions that will result from the transportation, housing, industry, forestry, water, agriculture, electricity, and natural gas emission sectors. The *Proposed Scoping Plan* states that the ultimate GHG reduction assignment to local government operations is to be determined (ARB 2009f). With regard to land use planning, the *Proposed Scoping Plan* expects approximately 5.0 MMT CO₂e will be achieved associated with implementation of SB 375, which is discussed further below. The *Proposed Scoping Plan* was approved by ARB on December 11, 2008.

Senate Bill 1368

SB 1368 is the companion bill of AB 32. SB 1368 required the California Public Utilities Commission (CPUC) to establish a greenhouse gas emission performance standard for baseload generation from investor owned utilities by February 1, 2007. The California Energy Commission (CEC) established a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the greenhouse gas emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC.

California Climate Action Registry

The California Climate Action Registry (CCAR) was established in 2000 by Senate Bill 1771 and modified in 2001 by Senate Bill 527 as a nonprofit voluntary registry for GHG emissions (See Stats. 2000, ch. 1018 (enacting Health & Safety Code, Sections 42800–42870 and Pub. Resources Code, § 25730) and Stats. 2001, ch. 769 (amending Health and Safety Code, Sections 42810, 42821–42824, 42840–42843, 42860, and 42870)). The purpose of CCAR is to help companies and organizations with operations in the state to establish GHG emissions baselines against which any future GHG emissions reduction requirements may be applied. CCAR has developed a general protocol and additional industry-specific protocols that provide guidance on how to inventory GHG emissions for participation in the registry.

Senate Bill 97

Senate Bill (SB) 97, signed August 2007, acknowledges that climate change is a prominent environmental issue that requires analysis under CEQA (Stats. 2007, ch. 185 (enacting Pub. Resources Code, Sections 21083.05 and 21097)). This bill directs the State Office of Planning and Research (OPR) to prepare, develop, and transmit to the Resources Agency guidelines for the feasible mitigation of GHG emissions or the effects of GHG emissions, as required by CEQA by July 1, 2009. OPR met this requirement when it transmitted proposed guidelines to the Resources Agency in April 2009. The Resources Agency is now required to certify and adopt those guidelines by January 1, 2010. This bill also removes, both retroactively and prospectively, as legitimate litigation causes of action any claim of inadequate CEQA analysis of effects of GHG emissions associated with environmental review for projects funded by the Highway Safety, Traffic Reduction, Air Quality and Port Security Bond Act of 2006, or the Disaster Preparedness and Flood Protection Bond Act of 2006 (Proposition 1B or 1E). This provision will be repealed by operation of law on January 1, 2010, at which time such projects, if any remain unapproved, will no longer enjoy the protection against litigation claims based on failure to adequately address climate change issues.

Senate Bill 1078

SB 1078 addresses electricity supply and requires that retail sellers of electricity, including investor-owned utilities and community choice aggregators, provide a minimum 20% of their supply from renewable sources by 2017. SB 1078 changed the target date of this bill's implementation to 2010. This Senate bill would affect statewide GHG emissions associated with electricity generation.

Senate Bill 375

SB 375, signed in September 2008, aligns regional transportation planning efforts, regional GHG reduction targets, and land use and housing allocation. SB 375 requires Metropolitan Planning Organizations (MPOs) to adopt a Sustainable Communities Strategy (SCS) or Alternative Planning Strategy (APS), which will prescribe land use allocation in that MPO's Regional Transportation Plan (RTP). ARB, in consultation with MPOs, will provide each affected region with reduction targets for GHGs emitted by passenger cars and light trucks in the region for the years 2020 and 2035. These reduction targets will be updated every 8 years, but can be updated every 4 years if advancements in emissions technologies affect the reduction strategies to achieve the targets. ARB is also charged with reviewing each MPO's SCS or APS for consistency with its assigned targets. If MPOs do not meet the GHG reduction targets, transportation projects would not be eligible for funding programmed after January 1, 2012.

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This bill also extends the minimum time period for the Regional Housing Needs Allocation (RHNA) cycle from 5 years to 8 years for local governments located within an MPO that meets certain requirements. City or County land use policies (including General Plans) are not required to be consistent with the RTP (and associated SCS or APS). However, new provisions of CEQA would incentivize qualified projects that are consistent with an approved SCS or APS, categorized as "transit priority projects."

Executive Order S-3-05

Executive Order S-3-05 proclaims that California is vulnerable to the impacts of climate change. It declares that increased temperatures could reduce the Sierra's snowpack, further exacerbate California's air quality problems, and potentially cause a rise in sea levels. To combat those concerns, the Executive Order established total greenhouse gas emission targets. Specifically, emissions are to be reduced to the 2000 level by 2010, the 1990 level by 2020, and to 80 percent below the 1990 level by 2050.

The Executive Order directed the Secretary of the California Environmental Protection Agency (CalEPA) to coordinate a multi-agency effort to reduce greenhouse gas emissions to the target levels. The Secretary will also submit biannual reports to the governor and state legislature describing (1) progress made toward reaching the emission targets, (2) impacts of global warming on California's resources, and (3) mitigation and adaptation plans to combat these impacts. To comply with the Executive Order, the Secretary of the CalEPA created a Climate Act Team (CAT) made up of members from various state agencies and commission. CAT released its first report in March 2006. The report proposed to achieve the targets by building on voluntary actions of California businesses, local government and community actions, as well as through state incentive and regulatory programs.

Executive Order S-13-08: The Climate Adaptation and Sea Level Rise Planning Directive³

On November 14, 2008, Governor Arnold Schwarzenegger issued Executive Order (EO) S-13-08 in order to reduce and assess California vulnerability to climate change and sea level rise. The EO initiated four major actions:

1. Initiate California's first statewide climate change adaptation strategy that will assess the state's expected climate change impacts, identify where California is most vulnerable and recommend climate adaptation policies by early 2009;
2. Request the National Academy of Science establish an expert panel to report on sea level rise impacts in California to inform state planning and development efforts;
3. Issue interim guidance to state agencies for how to plan for sea level rise in designated coastal and floodplain areas for new projects; and
4. Initiate a report on critical existing and planned infrastructure projects vulnerable to sea level rise.
5. The EO will provide consistency and clarify to state agencies on how to address sea level rise in current planning efforts.

³ California Climate Change Portal, "California Climate Adaptation Strategy", <http://www.climatechange.ca.gov/adaptation/index.html>

Thresholds of Significance for GHG Emissions Contributing to Climate Change

On April 13, 2009, the Office of Planning and Research (OPR) submitted to the Secretary for Natural Resources its proposed amendments to the state CEQA Guidelines for greenhouse gas emissions, as required by Senate Bill 97 (as discussed above). These proposed CEQA Guideline amendments would provide guidance to public agencies such as the City of Ione regarding the 1) significance analysis and 2) mitigation of the effects of greenhouse gas emissions in draft CEQA documents, such as Environmental Impact Reports. The Natural Resources Agency will conduct formal rulemaking in 2009, prior to certifying and adopting the amendments, as required by Senate Bill 97. Although these amendments have not yet been formally adopted, such adoption is anticipated within the year. Therefore the City of Ione intends to take all feasible and appropriate steps to comply with the proposed GHG amendments to the CEQA Guidelines.

Presently, the OPR proposes that lead agencies consider the following when determining the significance of impacts from greenhouse gas emissions (OPR, 2009)⁴:

1. The extent to which the project may increase or reduce greenhouse gas emissions as compared to the existing setting;
2. Whether the project emissions exceed a threshold of significance that the lead agency determines applies to the project;
3. The extent to which the project complies with regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions. Such regulations or requirements must be adopted by the relevant public agency through a public review process and must include specific requirements that reduce or mitigate the project's incremental contribution of greenhouse gas emissions. If there is substantial evidence that the possible effects of a particular project are still cumulatively considerable notwithstanding compliance with the adopted regulations or requirements, an EIR must be prepared for the project

GREENHOUSE GAS AND CLIMATE CHANGE IMPACTS AND MITIGATION MEASURES

Thresholds of Significance

Under CEQA, an environmental impact report must identify and focus on the significant environmental effects of a project. Significant effect on the environment means a substantial, or potentially substantial, adverse change in the environment (Pub. Resources Code, § 21068). CEQA further states that the CEQA Guidelines shall specify certain criteria to be used in determining whether projects would have a significant effect on the environment. However, as of the writing of this EIR, the agencies with jurisdiction over air quality regulation and GHG emissions such as the ARB and the Amador Air Pollution Control District (AAPCD) have not established regulations, guidance, methodologies, significance thresholds, standards or analysis protocols for the assessment of GHG emissions and climate change. A standardized, statewide methodology to establish an appropriate baseline, such as a project-level (regional GHG emissions) inventory, to evaluate the significance of GHG emission changes has not yet been

⁴ Proposed CEQA Guidelines, section 15064.4(b)

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established. This places the burden for establishing a methodology, and determining significance standards, on local lead agencies, such as the City of Ione.

Given the challenges associated with determining project-specific significance criteria for this global-scale issue, and the fact that regulatory agencies best suited for developing the methodology have not yet established any criteria, a quantified significance threshold was not used in this EIR.

This EIR provides full disclosure by quantifying GHG emissions that are expected to result from the proposed General Plan Update using the methodologies and strategies employed in the AB 32 Climate Change Proposed Scoping Plan (discussed above). Increases in long-term GHG emissions from motor vehicles were calculated using the ARB's EMFAC 2007 emissions modeling software and emission factors from the ARB's Local Government Protocol (ARB et al, 2008) utilizing data from the Traffic Impact Analysis (Fehr & Peers, 2009). In addition, emissions from area sources were calculated using technical air quality emission factors from ARB paired with activity data (e.g., household, population projections) from the proposed General Plan Update.

The proposed General Plan Update contribution to global climate change would be considered significant if it would:

- Be inconsistent with AB 32's and other related state activities for reducing greenhouse gas emissions from sources associated with projected growth (i.e., motor vehicles, direct energy use, waste-related activities); or
- Expose future development to significant environmental effects associated with the effects of global climate change.

This methodology is appropriate because it discloses as much information about the proposed General Plan Update's impact on climate change and the impact of climate change on the proposed General Plan Update as is practicable given reasonably available technical information. This approach quantifies GHG emissions from motor vehicles, a major source category for GHG emissions utilizing ARB-certified emission factors for CO₂. It also relies on ARB's CO₂ emission factors for natural gas energy needs associated with future growth. These estimates are augmented by the State's emission factors for the other five primary greenhouse gases.

Like any methodology for evaluating air quality impacts of a complex project, the methodology for analyzing climate change impacts is limited by three key policy, technical, and practical issues. First, in the absence of any consensus on how to assess impacts of a global phenomenon, the determination of significance is somewhat subjective. Second, any forecast of future GHG emissions is based on today's assumptions about future GHG emission rates from motor vehicles and energy use; as new regulatory and/or technological changes occur, these estimates could become outdated. Finally, actual GHG emissions for the planning area over time will be a function of actual development and vehicle activity.

PROJECT IMPACTS AND MITIGATION MEASURES ADDRESSING GREENHOUSE GAS EMISSIONS SIGNIFICANCE THRESHOLDS

Conflict or Obstruct with Implementation of Greenhouse Gas Reduction Measures

Impact 4.5.7 Implementation of the proposed project would substantially increase emissions of CO₂e over existing (2008) conditions. This increase in GHG

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emissions would be inconsistent with state efforts to reduce greenhouse gas emissions. This impact is considered to be **cumulatively considerable**.

CO₂e emissions associated with growth in the City of lone's Planning Area are projected to increase from 2008 to 2030. **Table 4.5-11** illustrates that most of these increases are likely to come from increases in housing associated with the City's population growth. These increases would increase the carbon footprint of lone in 2030. At buildout (post 2030), greenhouse gas emissions would further increase beyond those estimated in **Table 4.5-11**. Even with the proposed policies intended to help reduce GHG emissions from motor vehicles and energy use associated with growth, the net increase in emissions will further contribute to climate change.

TABLE 4.5-11
GREENHOUSE GAS CO₂E EMISSIONS (2008 AND 2030)
(METRIC TONS/YEAR)

	2008 Existing Conditions	2030 General Plan Conditions	Change 2008 to 2030	
			Metric Tons	Percentage
Vehicle CO ₂ e Emissions	888,181	1,760,163	+ 871,982	+ 98%
Area Source CO ₂ e Emissions	7,302	40,610	+ 33,308	+ 456%
Electricity	3.32	3.35	+ 0	+ 1%

Sources: Vehicle emissions from Emfac 2007 model run. VMT input data provided by Fehr and Peers, 2009.

Area source emissions from Urbemis 9.2.4 model run.

Electricity emissions factors provided by the Draft Local Government Operations Protocol issued by California Air Resources Board, California Climate Action Registry, ICLEI - Local Governments for Sustainability, and the Climate Registry (June 2008)

NOTES:

CO₂e emissions rates are based on ARB Local Government Operations Protocol Table C.10, 2008.

Energy emissions based on Urbemis 9.2.4 outputs and <http://ecdms.energy.ca.gov/gasbycounty.asp#results>.

In addition to the emissions illustrated in **Table 4.5-11**, there will also be increases in the emissions associated with water usage and waste disposal associated with the increase in population and housing within the City. These volumes would further increase CO₂e emissions from the City of lone and this impact would be **cumulatively considerable**.

The Climate Action Team (CAT) developed a report that "proposes a path to achieve the Governor's targets that will build on voluntary actions of California businesses, local government and community actions, and State incentive and regulatory programs" (CAT 2006). The report indicates that the strategies will reduce California's emissions to the levels proposed in Executive Order S-3-05.

The strategies that apply to the proposed project are contained in **Table 5.0-12**. These strategies are broad in their scope and address a wide range of industries and GHG emission sources. Therefore, most of the strategies are not applicable to the proposed project. Also, for those strategies that are applicable, specific regulations or detailed guidance regarding their implementation is typically not available. Thus, the project's compliance with these measures was evaluated by the City qualitatively with the understanding that exact compliance can only be determined once specifically applicable regulations are adopted. The analysis included in this table focuses on the ability of the General Plan Update to substantially comply with the applicable strategies.

TABLE 5.0-12
PROPOSED GENERAL PLAN UPDATE COMPLIANCE WITH
CAT GREENHOUSE GAS EMISSION REDUCTION STRATEGIES

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Strategy and Description	Proposed General Plan Update Compliance
California Air Resources Board	
Vehicle Climate Change Standards AB 1493 (Pavley) required the State to develop and adopt regulations that achieve the maximum feasible and cost-effective reduction of climate change emissions emitted by passenger vehicles and light duty trucks. Regulations were adopted by the ARB in September 2004.	<p>Not Applicable.</p> <p>This measure applies to passenger vehicles and light duty trucks. The City does not manufacture, sale or purchase these vehicles. Vehicles used onsite would be required to comply with applicable State and federal regulations, once implemented.</p>
Other Light Duty Vehicle Technology New standards would be adopted to phase in beginning in the 2017 model year	<p>Not Applicable.</p> <p>The City does not manufacture, sale or purchase light duty vehicles. Light duty trucks that access the site would be required to be in compliance with applicable State and federal regulations.</p>
Diesel Anti-Idling In July 2004, the ARB adopted a measure to limit diesel-fueled commercial motor vehicle idling.	<p>Not Applicable.</p> <p>Businesses operators in the City would be subject to this requirement.</p>
Hydrofluorocarbon Reduction (1) Ban retail sale of HFC in small cans. (2) Require that only low GWP refrigerants be used in new vehicular systems. (3) Adopt specifications for new commercial refrigeration. (4) Add refrigerant leak-tightness to the pass criteria for vehicular inspection and maintenance programs. (5) Enforce federal ban on releasing HFCs.	<p>Not applicable.</p> <p>Retail uses, businesses and City operations would be subject to this requirement.</p>
Transportation Refrigeration Units (TRUs), Off-Road Electrification, Port Electrification Strategies to reduce emissions from TRUs, increase off-road electrification, and increase use of shore-side/port electrification.	<p>Not applicable.</p> <p>Implementation of the General Plan does not involve transportation refrigeration units.</p>
Manure Management Strategies to reduce volatile organic compounds from confined animal facilities.	<p>Not Applicable.</p> <p>Applicable businesses operators in the City would be subject to this requirement.</p>
Alternative Fuels: Biodiesel Blends ARB would develop regulations to require the use of 1 to 4% biodiesel displacement of California diesel fuel.	<p>Not Applicable.</p> <p>The proposed General Plan Update does not specifically propose any fuel-dispensing facilities.</p>
Alternative Fuels: Ethanol	<p>Not Applicable.</p> <p>The proposed General Plan Update does not specifically propose</p>

Strategy and Description	Proposed General Plan Update Compliance
Increased use of ethanol fuel.	any fuel-dispensing facilities.
Heavy-Duty Vehicle Emission Reduction Measures Increased efficiency in the design of heavy-duty vehicles and an education program for the heavy-duty vehicle sector.	Not Applicable. Applicable businesses operators in the City would be subject to this requirement.
Reduced Venting and Leaks in Oil and Gas Systems Rule considered for adoption by the Air Pollution Control Districts for improved management practices.	Not Applicable. The proposed General Plan Update does not specifically propose any fuel-dispensing or motor vehicle maintenance facilities.
Hydrogen Highway The California Hydrogen Highway Network (CA H2 Net) is a State initiative to promote the use of hydrogen as a means of diversifying the sources of transportation energy.	Not Applicable. The proposed General Plan Update does not involve highway related planning.
Achieve 50 Percent Statewide Recycling Goal Achieving the State's 50 percent waste diversion mandate as established by the Integrated Waste Management Act of 1989, (AB 939, Sher, Chapter 1095, Statutes of 1989), will reduce climate change emissions associated with energy-intensive material extraction and production as well as methane emission from landfills. A diversion rate of 48 percent has been achieved on a statewide basis. Therefore, a 2 percent additional reduction is needed.	Compliant. The Amador County Integrated Waste Management Agency (ACIWMA), which includes Ione, Amador City, Jackson, Plymouth, Sutter Creek, and unincorporated Amador County, had a diversion rate (percentage of solid waste recycled) of 62 percent in 2006. Therefore the proposed General Plan Update would be consistent with this strategy.
Landfill Methane Capture Install direct gas use or electricity projects at landfills to capture and use emitted methane.	Not Applicable. The proposed General Plan Update does not involve or require improvements to any landfill.
Department of Forestry	
Urban Forestry A new statewide goal of planting 5 million trees in urban areas by 2020 would be achieved through the expansion of local urban forestry programs.	Compliant. The proposed General Plan Update policies CO-3.1 and CO-3.3 address this goal.
Reforestation Projects Reforestation projects focus on restoring native tree cover on lands that were previously forested and are now covered with other vegetative types.	Compliant. The proposed General Plan Update policies CO-3.1 and CO-3.3 address this item.

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Strategy and Description	Proposed General Plan Update Compliance
Department of Water Resources	
Water Use Efficiency Approximately 19% of all electricity, 30% of all natural gas, and 88 million gallons of diesel are used to convey, treat, distribute and use water and wastewater. Increasing the efficiency of water transport and reducing water use would reduce greenhouse gas emissions.	Compliant. The proposed General Plan Update Policy PF-3.1 and Action PF-4.1.3 address this item.
Energy Commission (CEC)	
Building Energy Efficiency Standards in Place and in Progress Public Resources Code 25402 authorizes the CEC to adopt and periodically update its building energy efficiency standards (that apply to newly constructed buildings and additions to and alterations to existing buildings).	Compliant. Construction and operation of all of the proposed buildings in the City would be required to comply with the energy efficiency standards included in Title 24 of the California Code of Regulations. Title 24 identifies specific energy efficiency requirements for building construction and systems operations that are intended to ensure efficient energy usage over the long-term life of the building.
Appliance Energy Efficiency Standards in Place and in Progress Public Resources Code 25402 authorizes the Energy Commission to adopt and periodically update its appliance energy efficiency standards (that apply to devices and equipment using energy that are sold or offered for sale in California).	Compliant. Construction and operation of all of the proposed buildings in the City would be required to comply with the energy efficiency standards included in Title 24 of the California Code of Regulations. Title 24 identifies specific energy efficiency requirements for building construction and systems operations that are intended to ensure efficient energy usage over the long-term life of the building.
Cement Manufacturing Cost-effective reductions to reduce energy consumption and to lower carbon dioxide emissions in the cement industry.	Not Applicable
Municipal Utility Strategies Includes energy efficiency programs, renewable portfolio standard, combined heat and power, and transitioning away from carbon-intensive generation.	Not Applicable
Alternative Fuels: Non-Petroleum Fuels Increasing the use of non-petroleum fuels in California's	Not Applicable

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Strategy and Description	Proposed General Plan Update Compliance
transportation sector, as recommended in the CEC's 2003 and 2005 Integrated Energy Policy Reports.	
Business Transportation and Housing	
<p>Smart Land Use and Intelligent Transportation Systems (ITS)</p> <p>Smart land use strategies encourage jobs/housing proximity, promote transit-oriented development, and encourage high-density residential/commercial development along transit corridors.</p> <p>ITS is the application of advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods, and services.</p> <p>Governor Schwarzenegger is finalizing a comprehensive 10-year strategic growth plan with the intent of developing ways to promote, through State investments, incentives and technical assistance, land use, and technology strategies that provide for a prosperous economy, social equity, and a quality environment.</p> <p>Smart land use, demand management, ITS, and value pricing are critical elements in this plan for improving mobility and transportation efficiency. Specific strategies include promoting jobs/housing proximity and transit-oriented development; encouraging high-density residential/commercial development along transit/rail corridor; valuing and congestion pricing; implementing intelligent transportation systems, traveler information/traffic control, and incident management; accelerating the development of broadband infrastructure; and comprehensive, integrated, multimodal/intermodal transportation planning.</p>	Compliant. <p>The subsequent development would be required to comply with applicable General Plan Update policies that encourage smart land use development. These policies are listed further below in the impact discussion.</p>
<p>Measures to Improve Transportation Energy Efficiency</p> <p>Builds on current efforts to provide a framework for expanded and new initiatives, including incentives, tools, and information that advance cleaner transportation and reduce climate change emissions.</p>	Not applicable. <p>This measure is implemented at the statewide level.</p>
Department of Food and Agriculture	
<p>Enteric Fermentation</p> <p>Cattle emit methane from digestion processes. Changes in diet could result in a reduction in emissions.</p>	Not Applicable <p>The proposed General Plan Update does not include agricultural operations.</p>
State and Consumer Services Agency	

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Strategy and Description	Proposed General Plan Update Compliance
Green Buildings Initiative Green Building Executive Order, S-20-04 (CA 2004), sets a goal of reducing energy use in public and private buildings by 20 percent by the year 2015, as compared with 2003 levels. The Executive Order and related action plan spell out specific actions State agencies are to take with State-owned and -leased buildings. The order and plan also discuss various strategies and incentives to encourage private building owners and operators to achieve the 20 percent target.	Compliant. As discussed above, the General Plan Update would be required through Title 24 requirements.
Public Utilities Commission (PUC)	
Accelerated Renewable Portfolio Standard The Governor has set a goal of achieving 33 percent renewables in the State's resource mix by 2020. The joint PUC/Energy Commission September 2005 Energy Action Plan II (EAP II) adopts the 33 percent goal.	Not Applicable
Investor-Owned Utility This strategy includes energy efficiency programs, combined heat and power initiative, and electricity sector carbon policy for investor owned utility.	Not Applicable

In June of 2008, the California Governor's Office of Planning and Research (OPR) published a technical advisory entitled "CEQA and Climate Change: Addressing Climate Change Through California Environmental Quality Act (CEQA) Review." As a part of this document, OPR included examples of recommended measures that lead agencies may wish to consider to reduce GHG emissions. The recommendations from OPR are contained in **Table 5.0-13**. As with the CAT strategies identified above, the OPR recommendations are broad in their scope and address a wide range of industries and GHG emission sources. Therefore, most of the recommendations are not applicable to the development and operation of any single residential project, but rather as general development policies. Also, for those recommendations that are applicable, specific regulations or detailed guidance regarding their implementation is typically not available. Thus, the proposed project's compliance with these measures was evaluated by the City qualitatively with the understanding that exact compliance can only be determined once specifically applicable regulations are adopted.

TABLE 5.0-13
PROPOSED GENERAL PLAN UPDATE COMPLIANCE WITH OPR GREENHOUSE GAS EMISSION REDUCTION RECOMMENDATIONS

Recommendation and Description	General Plan Update Compliance
Land Use and Transportation	

Recommendation and Description	General Plan Update Compliance
Implement land use strategies to encourage jobs/housing proximity, promote transit-oriented development, and encourage high density development along transportation corridors. Encourage compact, mixed-use projects, forming urban villages designed to maximize affordable housing and encourage walking, bicycling and the use of public transit systems,	Compliant. The subsequent development would be required to comply with applicable General Plan Update policies that encourage smart land use development. These policies are listed further below in the impact discussion.
Encourage infill, redevelopment, and higher density development, whether in incorporated or unincorporated settings.	Compliant. The subsequent development would be required to comply with applicable General Plan Update policies that encourage smart land use development as well as infill development. These policies are listed further below in the impact discussion.
Encourage new developments to integrate housing, civic and retail amenities (jobs, schools, parks, shopping opportunities) to help reduce VMT resulting from discretionary automobile trips.	Compliant. The subsequent development would be required to comply with applicable General Plan Update policies that encourage mixed use development in Downtown Ione. These policies are listed further below in the impact discussion.
Apply advanced technology systems and management strategies to improve operational efficiency of transportation systems and movement of people, goods and services.	Compliant. The proposed General Plan Update includes transportation policies to improve and diversify the City's transportation system. These policies are listed further below in the impact discussion.
Incorporate features into project design that would accommodate the supply of frequent, reliable and convenient public transit.	Compliant. The subsequent development would be required to comply with applicable General Plan Update policies that encourage smart land use development, infill development, public transportation, pedestrian and bicycle use. These policies are listed further below in the impact discussion.
Implement street improvements that are designed to relieve pressure on a region's most congested roadways and intersections.	Compliant. The proposed General Plan Update includes transportation policies to improve and diversify the City's transportation system. These policies are listed further below in the impact discussion.
Limit idling time for commercial vehicles, including delivery and construction vehicles.	Not Applicable. Applicable businesses operators in the City would be subject to this provision.
Urban Forestry	

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Recommendation and Description	General Plan Update Compliance
<p>Plant trees and vegetation near structures to shade buildings Compliant. and reduce energy requirements for heating/cooling.</p>	<p>The City currently implements landscape requirements for development as part of its Zoning Code (Title 17).</p>
<p>Preserve or replace onsite trees (that are removed due to Compliant development) as a means of providing carbon storage.</p>	<p>The proposed General Plan Update policies CO-3.1 and CO-3.3 address this item.</p>
Green Buildings	
<p>Encourage public and private construction of LEED Compliant. (Leadership in Energy and Environmental Design) certified (or equivalent) buildings.</p>	<p>The construction and operation of all buildings in the City would be required to comply with the energy efficiency standards included in Title 24 of the California Code of Regulations. Title 24 identifies specific energy efficiency requirements for building construction and systems operations that are intended to ensure efficient energy usage over the long-term life of the building.</p>
Energy Conservation Policies and Actions	
<p>Recognize and promote energy savings measures beyond Title 24 requirements for residential and commercial projects.</p>	<p>The proposed General Plan Update policies CO-6.1, 6.2, 6.4, and PF-11.3, and Action Items CO-6.2.2, 6.2.3, and 6.2.5 address this item.</p>
<p>Where feasible, include in new buildings facilities to support the use of low/zero carbon fueled vehicles, such as the charging of electric vehicles from green electricity sources.</p>	<p>The proposed General Plan Update policies CO-6.1, 6.2, 6.4, and PF-11.3, and Action Items CO-6.2.2, 6.2.3, and 6.2.5 address this item.</p>
<p>Educate the public, schools, other jurisdictions, professional associations, business and industry about reducing GHG emissions.</p>	<p>The proposed General Plan Update Policy PF-8.3 addresses this item.</p>
<p>Replace traffic lights, street lights, and other electrical uses to Compliant. energy efficient bulbs and appliances.</p>	<p>The proposed General Plan Update Policy CO-6.2 and Action Item CO-6.2.2 address this item.</p>
<p>Purchase Energy Star equipment and appliances for public agency use.</p>	<p>The proposed General Plan Update policies CO-6.2 and, and</p>

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Recommendation and Description	General Plan Update Compliance
	Action Items CO-6.2.2, 6.2.4, and 6.2.5 address this item.
Incorporate on-site renewable energy production, including installation of photovoltaic cells or other solar options.	The proposed General Plan Update policies CO-6.1, 6.2, 6.4, and PF-11.3, and Action Items CO-6.2.2, 6.2.3, and 6.2.5 address this item.
Execute an Energy Savings Performance Contract with a private entity to retrofit public buildings. This type of contract allows the private entity to fund all energy improvements in exchange for a share of the energy savings over time.	The proposed General Plan Update policies CO-6.1, 6.2, 6.4, and PF-11.3, and Action Items CO-6.2.2, 6.2.3, and 6.2.5 address this item.
Design, build, and operate schools that meet the Collaborative for High Performance Schools (CHPS) best practices.	This measure is applicable to the local school districts that are responsible for the design, construction and operation of school facilities.
Retrofit municipal water and wastewater management systems with energy efficient motors, pumps, and other equipment, and recover wastewater treatment methane for energy production.	The proposed General Plan Update Policy CO-6.2 and Action Item CO-6.2.2 address this item.
Convert landfill gas into energy sources for use in fueling vehicles, operating equipment, and heating buildings.	This measure is applicable to the landfill operator to the City (the City does not provide its own landfill service).
Purchase government vehicles and buses that use alternative fuels or technology, such as electric hybrids, biodiesel and ethanol. Where feasible, require fleet vehicles to be low emission vehicles. Promote the use of these vehicles in the general community.	The proposed General Plan Update Policy CO-6.2 and Action Item CO-6.2.2 address this item.
Offer government incentives to private businesses developing buildings with energy and water efficient features and recycled materials. The incentives can include expedited plan checks and reduced permit fees.	The proposed General Plan Update policies CO-6.1, 6.2, 6.4, PF-3.1, PF-7.1 and PF-11.3, and Action Items CO-6.2.2, 6.2.3, 6.2.5, PF-4.1.3, PF-7.1.1, and PF-7.1.2 address this item.
Offer rebates and low-interest loans to residents that make energy-savings improvements on their homes.	The City does not provide loan programs.

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Recommendation and Description	General Plan Update Compliance
<p>Create bicycle lanes and walking paths directed to the Compliant. location of schools, parks and other destination points.</p>	<p>The proposed General Plan Update includes policies for the provision of bicycle and pedestrian facilities.</p>
PROGRAMS TO REDUCE VEHICLE MILES TRAVELED	
<p>Offer government employees financial incentives to carpool, Compliant. use public transportation, or use other modes of travel for daily commutes.</p>	<p>The proposed General Plan Update includes transportation policies to improve and diversify the City's transportation system. These policies are listed further below in the impact discussion.</p>
<p>Encourage large businesses to develop commute trip Not Applicable. reduction plans that encourage employees who commute alone to consider alternative transportation modes.</p>	
<p>Develop shuttle systems around business district parking Not Applicable. garages to reduce congestion and create shorter commutes.</p>	<p>The City does not provide transit services.</p>
<p>Create an online ridesharing program that matches potential Non Compliant. carpoolers immediately through email.</p>	<p>The City does not currently propose a ridesharing program.</p>
<p>Develop a Safe Routes to School program that allows and Compliant. promotes bicycling and walking to school.</p>	<p>The proposed General Plan Update includes Policy CIR-3.7 that addresses this item.</p>
PROGRAMS TO REDUCE SOLID WASTE	
<p>Create incentives to increase recycling and reduce generation Compliant. of solid waste by residential users.</p>	<p>The Amador County Integrated Waste Management Agency (ACIWMA), which includes Lodi, Amador City, Jackson, Plymouth, Sutter Creek, and unincorporated Amador County, had a diversion rate (percentage of solid waste recycled) of 62 percent in 2006. Therefore the proposed General Plan Update would be consistent with this strategy.</p>
<p>Implement a Construction and Demolition Waste Recycling Not Applicable. Ordinance to reduce the solid waste created by new development.</p>	<p>The Amador County Integrated Waste Management Agency (ACIWMA), which includes Lodi, Amador City, Jackson, Plymouth, Sutter Creek, and unincorporated Amador County, had a diversion rate (percentage of solid waste recycled) of 62 percent in 2006. The General Plan Update also promotes recycling of construction debris. Therefore the proposed General Plan Update</p>

Recommendation and Description	General Plan Update Compliance
	would be consistent with this strategy.
Add residential/commercial food waste collection to existing greenwaste collection programs.	Not Applicable

Proposed General Plan Policies and Action Items that Provide Mitigation

The following proposed policies and actions that would directly help mitigate Citywide GHG emissions from five key sources, including motor vehicles, energy use, water use, waste, and construction:

Conservation & Open Space Element

- Policy CO-6.5: The City supports local, regional, and statewide efforts to reduce the emission of greenhouse gases linked to climate change.
- Action CO-6.5.1 The City will complete a Greenhouse Gas Inventory that provides an inventory of greenhouse gas emissions from manmade sources in the City.
- Action CO-6.5.2 The City will prepare a Climate Action Plan (CAP) that identifies desired goals for reducing manmade greenhouse gas (GHG) emissions, establishes resiliency and adaptation programs to prepare for potential impacts of climate change, and provides a phased implementation plan to achieve these goals. The CAP will establish a greenhouse gas emissions reduction target of 15% percent below 2007 levels by 2020, consistent with California Assembly Bill 32, the Global Warming Solutions Act of 2006 (AB32) and the guidance provided in the associated California Air Resources Board Climate Change Scoping Plan approved in December 2008. The CAP will also outline a strategy to achieve 1990 GHG levels by 2020 and an 80% reduction from 1990 GHG levels by 2050 in accordance with California State Executive Order S-3-05.
- Policy CO-6.6 The City shall collaborate and consult with regional organizations and local jurisdictions within the City to reduce greenhouse gas emissions.

Land Use Element

- Policy LU -1.1 Ensure future land use and growth within the Planning Area adheres to the City's Land Use Principles, as described in this Element.
- Policy LU-1.3 Phase growth based on infrastructure capacity, infrastructure financing, and the timing of the design, approval/permitting, and construction of transportation facilities and other infrastructure.
- Policy LU-1.5 Annexations, including but not limited to Policy Areas and Future Growth Areas (FGA), should contribute to the orderly planning of the community, including promoting the City's ultimate community vision and ensuring a well designed circulation system.

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- Policy LU-2.3 Maintain a strong jobs-housing ratio with a diverse job base and corresponding housing stock within the Planning Area. Improve the relationship and proximity of jobs to housing and commercial services.
- Action LU-3.1.1 Encourage the upgrading, beautification, revitalization, infill development, and appropriate reuse of existing commercial areas Downtown.
- Action LU-3.1.2 Encourage the intensification of land uses in Downtown Ione, including residential over retail and office, and new residential and commercial development Downtown.
- Action LU-3.1.3 Establish a Downtown Master Plan, Area Plan, or Specific Plan to ensure the long-term vibrancy of Downtown, protect its historic architecture, intensify land uses, enhance walkability, and develop bicycle and pedestrian linkages to surrounding areas. Include a Parking Plan as part of the Downtown Plan.

Circulation Element

- Policy CIR-1.11 Support the use of golf carts as a mode of transportation within the City by continuing to allow golf carts on specific roadways, and updating and expanding the number of roadways on which golf carts are allowed, in compliance with State and federal transportation safety laws.
- Policy CIR-1.12 Work with regional agencies and transit providers to support transit programs.
- Policy CIR-2.3 Require bicycle and pedestrian connections to public transit systems at stops; carpool/vanpool park-and-ride lots; and activity centers (e.g., schools, community centers, higher-density residential areas, Downtown, parks, employment centers, and commercial centers).
- Policy CIR-2.6 Provide safe and convenient bicycle access to all parts of the community.
- Policy CIR-2.7 Provide bike lanes or other bike facilities along all arterials, connectors, and on local roadways when necessary and feasible to provide for interconnected routes. On-street bike routes may be provided on roadways as deemed necessary by the City.
- Policy CIR-2.9 Consult with ACTC to ensure that local bikeways and trails connect to regional bikeways and trails to provide for a regional bikeway and trail system in support of the Amador County Bicycle and Pedestrian Master Plan.
- Policy CIR-3.7 Continue participation in the Safe Routes To School Program to help fund pedestrian and bicycle improvements that provide routes to schools.

Conservation & Open Space Element

- Policy CO-3.1 Conserve existing native and non-invasive trees for their historic, economic, aesthetic, educational, and environmental value.
- Policy CO-3.3 Promote trees as economic and environmental resources for the use, education, and enjoyment of current and future generations. Encourage property owners to plant and maintain healthy stands of trees.

- Policy CO-4.1 Promote water conservation within existing and future urban uses.
- Policy CO-6.1 Promote infill development as a means to limit vehicle trips and reduce the environmental impacts of new development and land use patterns.
- Policy CO-6.2 Increase energy conservation Citywide.
- Action CO-6.2.2 Develop programs to conserve energy resources at City-operated facilities.
- Action CO-6.2.3 Encourage the development of energy efficient buildings and subdivisions.
- Action CO-6.2.4 Work with local utility providers to make the public aware of energy rebate programs.
- Action CO-6.2.5 Work with community organizations to encourage the inclusion of energy efficient systems in remodels and retrofits of existing development.
- Policy CO-6.3: Promote the development and use of advanced energy technology and building materials in lone.
- Policy CO-6.4: Promote energy rebate programs offered by local energy providers as a way to bring energy efficiency into older neighborhoods and developments.
- Policy CO-10.4 Limit leapfrog development and support development in areas where a logical extension of public facilities is possible.

Economic Development Element

- Policy ED-2.2 The City shall strategically locate regional retail and commercial properties to take advantage of the local and regional transportation corridors (e.g., State Routes 104 and 124).
- Policy ED-3.4 The City shall utilize infrastructure strategies that support development in infill areas including vacant and under utilized lots within the downtown area.

Public Facilities Element

- Policy PF-3.1 Increase efficiencies in water use, wastewater generation and the handling of storm water runoff through best practices in sustainable water management.
- Action PF-4.1.3 The City shall consult with state agencies and AWA to integrate surrounding land uses into the water service network as appropriate. The City shall work with AWA to consider expanding potable water service to areas outside of the city boundary for those lands concurrently being considered for annexation into the city. This action shall not be interpreted to limit AWA and the City's desires to provide and expand non-potable, including recycled water service to properties near lone.
- Action PF-6.1.5 The City will establish Low Impact Development (LID) standards through either the Stormwater Master Plan or the Municipal Code.

4.5 AIR QUALITY AND CLIMATE CHANGE

- Policy PF-7.1 The City shall work with Amador County, the Regional Agency, and the solid waste contractors to promote solid waste reduction, recycling, and composting of wastes to minimize residential, commercial, and industrial waste disposal.
- Action PF-7.1.1 The City shall encourage the recycling of construction debris.
- Action PF-7.1.2 The City shall encourage businesses to take a more active role in recycling and composting, focusing on businesses that generate a large amount of compostable or recyclable waste.
- Policy PF-8.3 The City shall include the following criteria in assisting the ACUSD in school site selection and provision of utilities:
- Traffic impacts on nearby roadways and effect on City standards for Level of Service.
 - Interrelatedness of school sites with churches, parks, greenways, and off-street paths.
 - Walking distance to the greatest number of students.
 - Safe walking routes to and from school.
 - Joint use potential of new school sites with existing and planned community recreation and parks programs and facilities.
 - Linkages with trails, bikeways, and pedestrian paths.
- Policy PF-11.3 The City shall encourage, support, and evaluate the provision of proven, cost-effective, and feasible alternate forms of energy, including solar and wind power in lone.

Implementation of the proposed project would be generally consistent with current state measures to reduce greenhouse gas emissions. However, due to the expected substantial increase in GHG emissions resulting from the growth associated with the proposed General Plan Update, this impact remains **cumulatively considerable** and is considered **significant and unavoidable**.

Mitigation Measures

No further feasible mitigation available.

Climate Change Environmental Effects on the City

- Impact 4.5.8** Implementation of the proposed project could substantially increase emissions of greenhouse gas emissions over existing conditions that could result in environmental effects to the City. This impact is considered to be **less than cumulatively considerable**.

As identified above under the "Climate Setting" discussion, there have several technical studies regarding the environmental effects of climate change on across the Earth as well as California. Several adverse environmental effects have been identified that are projected to impact

California over the next century. However, the extents of these environmental effects are still being defined as climate modeling tools become more refined. Potential environmental effects of climate change that could impact the City could include the following (which were previously noted above):

- Adverse impacts on water supply availability;
- Increased severity of flooding events;
- Increased wildland fire hazards;
- Alteration of natural habitats for special-status plant and animal species; and,
- Air quality impacts.

Because considerable uncertainty remains with respect to the overall impact of global climate change California and the City, it is unknown whether these impacts would be significant. This also includes the uncertainty to what degree global climate change may adversely impact future Amador County water supply and availability. However, based on consideration of the recent climate change studies, and based that Amador Water Agency's surface source is anticipated to largely remain intact (though the form of precipitation in the Sierra Nevada Mountains is expected to come from rain rather than snow), it is reasonably expected that the impacts of global climate change on the City would be **less than cumulatively considerable**.

Proposed General Plan Policies and Action Items that Provide Mitigation

There are no proposed General Plan policies associated with reducing future environmental impacts of climate change.

Mitigation Measures

While no significant environmental impact was identified, the following mitigation measures are recommended.

MM 4.5.8a The following policies shall be incorporated into the Conservation & Open Space Element of the General Plan:

The City of Ione shall work with ACTC and other partners to address vulnerability of the city's infrastructure and appropriate adaptation strategies to protect those resources that are likely to be impacted by adverse effects associated with global climate change.

MM 4.5.8b The following policies shall be incorporated into the Conservation & Open Space Element of the General Plan:

The City shall consider including mitigation measures to reduce impacts related to significant storm events and flooding resulting from global climate change, as applicable.

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