

4.3 AIR QUALITY

This section analyzes the effects of the proposed General Plan Update on air quality emissions and the associated impacts. This section analyzes both temporary air quality impacts relating to construction activity and possible long-term air quality impacts associated with General Plan build-out. The analysis herein is based partially on the traffic study prepared by Wood Rodgers, Inc. (September 2015). Greenhouse gas emissions and global climate change impacts are discussed in Section 4.7, Global Climate Change.

4.3.1 Setting

a. Local Climate and Air Quality. Tuolumne County is located within the Mountain Counties Air Basin (Basin). The general climate of the Mountain Counties Air Basin varies considerably with elevation and proximity to mountain peaks. The terrain features of the Basin make it possible for various climates to exist within the general area. The pattern of mountains and hills 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 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, have relatively high elevations, and 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.

While the residents of Tuolumne County enjoy some of the best air quality in the state, the growing population of the County is accompanied by routine sources of air pollution: vehicles, industrial facilities, open burning, woodstoves and earth-moving equipment. The air quality of the County is further diminished by the transport of pollutants from the more industrialized and populated San Joaquin Valley and Bay Area (Tuolumne County, 1996).

b. Pollutants. Primary criteria pollutants are emitted directly from a source (e.g., vehicle tailpipe, an exhaust stack of a factory, etc.) into the atmosphere. Primary criteria pollutants include carbon monoxide (CO), reactive organic gases (ROG), nitrogen oxides (NO), fine particulate matter (PM₁₀ and PM_{2.5}), sulfur dioxide (SO₂), and lead (Pb). Secondary criteria pollutants are created by atmospheric chemical and photochemical reactions; reactive organic gases (ROG) together with nitrogen oxides form the building blocks for the creation of photochemical (secondary) pollutants. Secondary pollutants include oxidants, ozone (O₃) and sulfate and nitrate particulates (smog). The characteristics, sources and effects of critical air contaminants are described below.

Ozone. Ozone is produced by a photochemical reaction (triggered by sunlight) between NO_x and ROG. Nitrogen oxides are formed during the combustion of fuels, while reactive organic compounds are formed during combustion and evaporation of fossil fuels and organic solvents. Because ozone requires sunlight to form, it mostly occurs in concentrations considered serious between the months of April and October. Ozone is a pungent, colorless, toxic gas with direct health effects on humans including respiratory and eye irritation and possible changes in



lung functions. Groups most sensitive to ozone include children, the elderly, people with respiratory disorders, and people who exercise strenuously outdoors.

Carbon Monoxide. CO is a local pollutant that is found in high concentrations only near the source. The major source of carbon monoxide, a colorless, odorless, poisonous gas, is automobile traffic. Elevated concentrations, therefore, are usually only found near areas of high traffic volumes. Carbon monoxide's health effects are related to its affinity for hemoglobin in the blood. At high concentrations, carbon monoxide reduces the amount of oxygen in the blood, causing heart difficulties in people with chronic diseases, reduced lung capacity, and impaired mental abilities.

Nitrogen Dioxide. NO₂ is a by-product of fuel combustion, with the primary source being motor vehicles and industrial boilers and furnaces. The principal form of nitrogen oxide produced by combustion is NO, but NO reacts rapidly to form NO₂, creating the mixture of NO and NO₂ commonly called NO_x. Nitrogen dioxide is an acute irritant. A relationship between NO₂ and chronic pulmonary fibrosis may exist, and an increase in bronchitis in young children at concentrations below 0.3 parts per million (ppm) may occur. Nitrogen dioxide absorbs blue light and causes a reddish brown cast to the atmosphere and reduced visibility. It can also contribute to the formation of PM₁₀ and acid rain.

Sulfur Dioxide. SO₂ is a colorless, pungent, irritating gas formed primarily by the combustion of sulfur-containing fossil fuels. In humid atmospheres, SO₂ can form sulfur trioxide and sulfuric acid mist, with some of the latter eventually reacting to produce sulfate particulates. This contaminant is the natural combustion product of sulfur or sulfur-containing fuels. Fuel combustion is the major source, while chemical plants, sulfur recovery plants, and metal processing are minor contributors. At sufficiently high concentrations, sulfur dioxide irritates the upper respiratory tract. At lower concentrations, when in conjunction with particulates, SO₂ appears able to do still greater harm by injuring lung tissues. Sulfur oxides, in combination with moisture and oxygen, can yellow the leaves of plants, dissolve marble and eat away iron and steel. Sulfur oxides can also react to form sulfates which reduce visibility.

Lead. Pb is a metal found naturally in the environment as well as in manufactured products. The major sources of lead emissions have historically been from fuels in on-road motor vehicles (such as cars and trucks) and industrial sources. Today, the highest levels of lead in air are usually found near lead smelters. The major sources of lead emissions to the air today are ore and metals processing and piston-engine aircraft operating on leaded aviation gasoline. Depending on the level of exposure, lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system. Lead exposure also affects the oxygen carrying capacity of the blood. Lead is persistent in the environment and accumulates in soils and sediments through deposition from air sources, direct discharge of waste streams to water bodies, mining, and erosion.

Suspended Particulates. PM₁₀ is particulate matter measuring no more than 10 microns in diameter, while PM_{2.5} is fine particulate matter measuring no more than 2.5 microns in diameter. Suspended particulates are mostly dust particles, nitrates and sulfates. Both PM₁₀ and PM_{2.5} are by-products of fuel combustion and wind erosion of soil and unpaved roads, and are directly emitted into the atmosphere through these processes. Suspended particulates are also



created in the atmosphere through chemical reactions. The characteristics, sources, and potential health effects associated with the small particulates (those between 2.5 and 10 microns in diameter) and fine particulates (PM_{2.5}) can be very different. The small particulates generally come from windblown dust and dust kicked up from mobile sources. The fine particulates are generally associated with combustion processes as well as being formed in the atmosphere as a secondary pollutant through chemical reactions. Fine particulate matter is more likely to penetrate deeply into the lungs and poses a health threat to all groups, but particularly to the elderly, children, and those with respiratory problems. More than half of the small and fine particulate matter that is inhaled into the lungs remains there. These materials can damage health by interfering with the body’s mechanisms for clearing the respiratory tract or by acting as carriers of an absorbed toxic substance.

c. Air Pollution Regulation. The federal and state governments have authority under the federal and state Clean Air Acts to regulate emissions of airborne pollutants and have established ambient air quality standards (AAQS) for the protection of public health. The U.S. Environmental Protection Agency (EPA) is the federal agency designated to administer air quality regulation, while the California Air Resources Board (ARB) is the state equivalent in California. Federal and state standards have been established for six criteria pollutants, including ozone (O₃), carbon monoxide (CO), nitrogen dioxide (NO₂), sulfur dioxide (SO₂), particulates less than 10 and 2.5 microns in diameter (PM₁₀ and PM_{2.5}), and lead (Pb). Table 4.3-1 lists the current federal and state standards for each of these pollutants. California air quality standards are identical to or stricter than federal standards for all criteria pollutants.

**Table 4.3-1
 Current Federal and State Ambient Air Quality Standards**

Pollutant	Federal Standard	California Standard
Ozone	0.07 ppm (8-hr avg)	0.09 ppm (1-hr avg) 0.07 ppm (8-hr avg)
Carbon Monoxide	35.0 ppm (1-hr avg) 9.0 ppm (8-hr avg)	20.0 ppm (1-hr avg) 9.0 ppm (8-hr avg)
Nitrogen Dioxide	0.10 ppm (1-hr avg) 0.053 ppm (annual avg)	0.18 ppm (1-hr avg) 0.030 ppm (annual avg)
Sulfur Dioxide	0.075 ppm (1-hr avg) 0.14 ppm (24-hr avg)	0.25 ppm (1-hr avg) 0.04 ppm (24-hr avg)
Lead	1.5 µg/m ³ (calendar quarter)	0.15 µg/m ³ (30-day avg)
Particulate Matter (PM ₁₀)	150 µg/m ³ (24-hr avg)	50 µg/m ³ (24-hr avg) 20 µg/m ³ (annual avg)
Particulate Matter (PM _{2.5})	35 µg/m ³ (24-hr avg) 12 µg/m ³ (annual avg)	12 µg/m ³ (annual avg)

ppm= parts per million
 µg/m³ = micrograms per cubic meter
 Source: CARB 2015a

Local control in air quality management is provided by the ARB through county-level or regional (multi-county) Air Pollution Control Districts (APCDs). The ARB establishes statewide air quality standards and is responsible for control of mobile emission sources, while the local APCDs are responsible for enforcing standards and regulating stationary sources. The ARB has



established 15 air basins statewide. Tuolumne County is located within the Mountain Counties Air Basin (Basin) which covers the mountainous area of the central and northern Sierra Nevada Mountains, from Plumas County south to Mariposa County. The basin comprises all or portions of seven air quality control districts: the Northern Sierra AQMD, and the Placer, El Dorado, Amador, Calaveras, Tuolumne and Mariposa County APCDs. The air basin is thinly populated, its communities separated from one another by the basin's complex terrain.

d. Current Ambient Air Quality. The local APCDs and AQMDs are required to monitor air pollutant levels to ensure that air quality standards are met and, if they are not met, to develop strategies to meet the standards. Depending on whether the standards are met or exceeded, the local air basin is classified as being in "attainment" or "non-attainment." The Mountain Counties Air Basin violates the State ozone standard due to transport from the Sacramento Valley, the San Joaquin Valley and the San Francisco Bay Area. The region is in attainment for the federal one hour standard, except for the western portions of El Dorado and Placer counties which are part of the Sacramento federal nonattainment area. Because the region's ozone violations are the result of transport, the Mountain Counties' air quality planning process was not triggered by the California Clean Air Act. Instead the region is relying principally on emission reductions from the upwind areas (CARB, 2001).

The Tuolumne County portion of the Mountain Counties Air Basin is a non-attainment area for the state standards for ozone and is unclassified or in attainment for the federal standards for ozone and for the federal and state standards for carbon monoxide, nitrogen dioxide, sulfur dioxide, PM₁₀, PM_{2.5}, and lead (CARB, 2013b). The Tuolumne County APCD is responsible for implementing emissions standards and other requirements of federal and state laws regarding most types of stationary emission sources. CARB has determined that the ozone levels in Tuolumne County are caused by "overwhelming transport" of emissions into the air district (CAPCOA, 2015). Therefore, the APCD is relieved from preparing an attainment plan for ozone, and no other criteria air pollutant levels are high enough to require an attainment plan. Although there are no required attainment plans, or other local plans specifically addressing air quality, Tuolumne County must conform to existing state and federal air quality standards.

Air quality data from the Sonora-Barretta Street monitoring station, which is located in the City of Sonora, is summarized in Table 4.3-2. As shown in Table 4.3-2, the State and Federal eight-hour ozone standards were exceeded multiple times between 2012 and 2014. No exceedances of the one-hour ozone standard have occurred in the last three years.



**Table 4.3-2
 Ambient Air Quality Data**

Pollutant	2012	2013	2014
Ozone, ppm, 1-hour			
Number of days of State exceedances (>0.09 ppm)	0	0	0
Ozone, ppm, 8-hour			
Number of days of State exceedances (>0.070 ppm)	14	2	20
Number of days of Federal exceedances (>0.075 ppm)	3	1	2

*Sonora-Barretta Street Monitoring Station, 251 S. Barretta St, Sonora CA
 Source: CARB, 2015*

e. Sensitive Receptors. Ambient air quality standards have been established to represent the levels of air quality considered sufficient, with an adequate margin of safety, to protect public health and welfare. They are designed to protect that segment of the public most susceptible to respiratory distress, such as children under 14, the elderly over 65, persons engaged in strenuous work or exercise, and people with cardiovascular and chronic respiratory diseases. The majority of sensitive receptor locations are therefore residences, schools and hospitals. Sensitive receptors are located throughout Tuolumne County.

4.3.2 Impact Analysis

a. Methodology and Significance Thresholds. Pursuant to the *State CEQA Guidelines*, air quality impacts related to the proposed project would be significant if the project would:

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

As discussed above, there are no required attainment plans, or other local plans specifically addressing air quality within Tuolumne County. As such, this threshold will not be addressed further herein. The Tuolumne County APCD has developed specific numeric thresholds that apply to projects within the County. However, the Tuolumne County APCD thresholds apply to individual development projects and are not applicable at the programmatic level of the General Plan Update.



Short-Term Emissions Methodology. Emissions from construction activities represent temporary impacts that are typically short in duration, depending on the size, phasing, and type of project. Air quality impacts can nevertheless be acute during construction periods, resulting in significant localized impacts to air quality. To date, neither the Tuolumne County APCD nor the County of Tuolumne have adopted significance thresholds for construction-related emissions. Construction-related emissions are speculative at the General Plan level because such emissions are dependent on the characteristics of individual development projects. However, because construction associated with buildout under General Plan Update would generate temporary criteria pollutant emissions, primarily due to the operation of construction equipment (e.g., PM₁₀ from grading) and truck trips, a qualitative analysis is provided below.

Long-Term Emissions Methodology. The methodology for determining the significance of air quality impacts is to compare 2015 existing conditions to the General Plan Update conditions in the year 2040, as required in CEQA Guidelines Section 15126.2(a). The analysis of air quality also includes a comparison between the expected 2040 future conditions and the proposed General Plan Update, and the expected 2040 future conditions if no plan were adopted ('No Project' scenario). State and federal clean air laws require that emissions of pollutants for which federal or state ambient air quality standards are violated be reduced from current levels. Therefore, the project's long term impacts to air quality is considered significant if the project results in mobile source emissions that significantly exceed existing levels. In this case, the pollutants of concern are ozone precursors (NO_x and ROG) and particulate matter (PM_{2.5} and PM₁₀), as these are the primary pollutants associated with land development and vehicle transportation.

Projected air emissions from mobile sources were calculated using the Emission FACTors (EMFAC) 2014 model emissions factors and were multiplied by vehicle miles traveled (VMT). The EMFAC emissions factors are established by CARB and accommodate certain mobility assumptions (e.g., vehicle speed, delay times, average trip lengths, and total travel time). VMT was extracted from the Tuolumne County Transportation Council (TCTC) Travel Demand Model and provided in the traffic study prepared by Wood Rodgers, Inc. (September 2015). Default VMT by speed class distributions for Tuolumne County were extracted from EMFAC 2014. Projected vehicle emissions for the year 2040 under the General Plan Update were compared with 2015 existing conditions and with future conditions under the 'No Project' scenario in 2040. If county-wide criteria pollutant emissions caused by the General Plan Update do not exceed the 2015 baseline, impacts to long-term air quality will not be considered significant.

b. Project and Cumulative Impacts.

Impact AQ-1 Construction activities associated with future development envisioned by the General Plan Update would have the potential to result in temporary adverse impacts on air quality in Tuolumne County. Impacts would be Class II, significant but mitigable.



There are three primary sources of short term emissions which would be generated by future development envisioned by the Land Use Element of the General Plan Update. These sources include: operation of construction vehicles, (i.e., scrapers, loaders, dump trucks); the creation of fugitive dust during clearing and grading; and the use of asphalt or other oil based substances during the final construction phases. The significance of daily emissions, particularly ROG and NOx emissions, generated by future development under the General Plan Update would depend on the quantity of equipment used and the hours of operation. The significance of fugitive dust (PM_{2.5} and PM₁₀) emissions would depend upon the following factors: 1) the aerial extent of disturbed soils; 2) the length of disturbance time; 3) whether existing structures are demolished; 4) whether excavation is involved (including the potential removal of underground storage tanks); and, 5) whether transport of excavated materials offsite is necessary. The amount of ROG emissions generated by oil-based substances such as asphalt is dependent upon the type and amount of asphalt utilized. Asbestos can also be of concern during demolition activity associated with construction; however, the demolition, renovation, or removal of asbestos-containing materials is subject to the limitations of the National Emissions Standards for Hazardous Air Pollutants (NESHAP) regulations as listed in the Code of Federal Regulations, requiring notification and inspection.

Future development or any transportation improvements under the General Plan Update may involve grading and paving, or the construction of permanent facilities. All grading and excavation would be required to conform to Tuolumne County grading approvals and comply with Tuolumne County APCD Rules. The precise quantity of emissions would need to be determined at the time of proposed construction of a given transportation improvement or development project. Although any individual improvement or development project may not generate significant short-term emissions, it is probable that several projects would be under construction simultaneously, generating cumulative construction emissions which could impact air quality. Tuolumne County is currently in nonattainment for the state ozone standards, and as such, impacts may be potentially significant.

The Air Quality Element of the Tuolumne County General Plan Update includes policies and implementation programs which would reduce emissions of criteria air pollutants associated with future development under the General Plan:

Policy 12.A.1: Accurately determine and fairly mitigate the local and regional air quality impacts of land development projects proposed in the County.

Implementation Program 12.A.b: Require significant air quality impacts identified during California Environmental Quality Act review to be consistently and fairly mitigated.

Implementation Program 12.A.c: Require all air quality mitigation measures to be feasible, implementable and verifiable.

Implementation Program 12.A.e: Encourage developers to implement innovative measures to reduce air quality impacts.



In addition, Implementation Program 12.E.I designed to reduce greenhouse gas emissions (GHG) would also reduce emissions of ozone precursors associated with future development under the General Plan:

*Implementation
Program 12.E.I:*

Encourage the following to reduce Greenhouse Gas emissions from construction equipment:

- *Substitute electrical equipment for diesel- and gasoline-powered equipment where practical.*
- *Use alternatively fueled construction equipment on-site, where feasible, such as compressed natural gas (CNG), liquefied natural gas (LNG), propane, or biodiesel.*
- *Avoid the use of on-site generators by connecting to grid electricity or utilizing solar-powered equipment.*
- *Limit heavy-duty equipment idling time to a period of 3 minutes or less, exceeding the California Air Resources Board regulation minimum requirements of 5 minutes.*

In order to quantify the level of emissions associated with individual development projects, specific information regarding the size and type of development and the location of receptors would be needed. Therefore, impacts related to construction emissions are potentially significant and mitigation measures are required for construction activities associated with the General Plan Update.

Mitigation Measures. Temporary construction impacts associated with development envisioned by the General Plan would be reduced through implementation of AQ-1.

AQ-1: Air Quality Element Policies and Actions for Construction Emissions. The following implementation program should be added to the General Plan's Air Quality Element:

Implementation Program 12.A.m: *The following shall be adhered to during project construction to reduce air quality impacts:*

- *Exposed soils shall be watered as needed to control wind borne dust.*
- *Exposed piles of dirt, sand, gravel, or other construction debris shall be enclosed, covered and/or watered as needed to control wind borne dust.*
- *Vehicle trackout shall be minimized through the use of rubble strips and wheel washers for all trucks and equipment leaving the site.*
- *Sweep streets once a day if visible soil materials are carried to adjacent streets (recommend water sweepers with reclaimed water)*
- *On-site vehicle speed shall be limited to 15 miles per hour on unpaved surfaces.*
- *Loads on all haul/dump trucks shall be covered securely or at least two feet of freeboard shall be maintained on trucks hauling loads.*



- Construction equipment shall be maintained and tuned at the interval recommended by the manufacturers to minimize exhaust emissions.
- Equipment idling shall be kept to a minimum when equipment is not in use.
- Construction equipment shall be in compliance with the California Air Resources Board off-road and portable equipment diesel particulate matter regulations.

Alternative construction-related air quality measures may be adopted by the decision-making body after considering a project-specific air quality analysis prepared by a qualified consultant.

Significance after Mitigation. Impact would be less than significant with implementation of mitigation measure AQ-1.

Impact AQ-2 Implementation of the General Plan Update would result in an overall reduction of on-road vehicle emissions when compared to baseline conditions and would not result in an increase in emissions as compared to the 'No Project' scenario. Therefore, long-term operational impacts would be Class III, less than significant.

Long-term emissions associated with future development in Tuolumne County in accordance with the General Plan Update would be those associated with mobile (vehicle trips) and area sources (wood burning stoves and electricity consumption).

Mobile Sources

Projected on-road vehicle emissions for the year 2040 under the proposed General Plan Update were compared to 2015 baseline conditions and a 'No Project' scenario. The 'No Project' scenario accounts for future growth, but the transportation improvements and land use scenario identified in the General Plan Update are not implemented. The on-road vehicle source emissions estimates for the proposed General Plan Update were produced with the EPA approved EMFAC2014 emission inventory model developed by CARB for use in California. Table 4.3-3 shows the results of the long-term emissions analysis based on annual VMT which were computed for each scenario using TCTC's Travel Demand Model.

**Table 4.3-3
Regional Emissions Analysis†**

Scenario	VMT (Daily)	PM ₁₀ (tons/day)	PM _{2.5} (tons/day)	NOx (tons/day)	ROG (tons/day)	CO (tons/day)	SOx (tons/day)
Baseline	1,829,654	0.14	0.07	2.64	1.51	11.46	0.01
'No Project' Scenario	2,188,733	0.12	0.05	0.41	0.35	1.81	0.01
Proposed General Plan Update	2,170,502	0.12	0.05	0.41	0.34	1.80	0.01

†The on-road mobile source criteria pollutant emissions estimates for the General Plan Update were calculated using CARB's EMFAC2014 emission inventory model. VMT data were extracted from the TCTC Travel Demand Model. VMT data includes pass-through trips from vehicles travelling through Tuolumne County that do not have an origin or destination within the county and therefore represent a worst-case scenario. NOx and CO emissions are presented above using winter values and ROG emissions are presented above using summer values to provide a worst case estimate based on the seasons in which individual criteria pollutant emissions are highest. Emissions for PM₁₀, PM_{2.5}, and SOx were the equal in both seasons.



As previously noted, Tuolumne County is currently classified as being a non-attainment area for the state standards for ozone due to "overwhelming transport" of emissions into the air district (CAPCOA, 2015). As shown in Table 4.3-3, emissions levels are forecast to decline between 2015 and 2040 despite projected future growth. These estimates are consistent with the state-wide continuing downward trend in emissions levels caused by CARB rules designed to reduce emissions from cars and trucks.

As shown in Table 4.3-3, data indicates that emission levels for ROG and CO would be reduced and emission levels for PM₁₀, PM_{2.5}, NO_x, and SO_x would not increase as compared to the 'No Project' scenario levels with the implementation of the General Plan Update (Distinctive Communities scenario). The decrease in ROG and CO emissions is primarily due to the reduced daily VMT resulting from the future land use scenario envisioned by the General Plan Update which is intended to encourage land use growth in/near the urbanized, high-density population centers such as the City of Sonora and community of Jamestown, ultimately increasing density and improving circulation and multimodal connections. The 'No Project' scenario is based on current land use designations and does not incorporate increased density and other VMT-reducing land use strategies included under the General Plan Update. Therefore, the General Plan Update would have a beneficial effect on air quality. Since the General Plan would result in an overall reduction of on-road vehicle emissions when compared to baseline conditions and would not result in an increase in emissions as compared to the 'No Project' scenario, long-term operational impacts associated with the Distinctive Communities scenario (the General Plan Update) would be less than significant.

In addition, the Air Quality Element of the Tuolumne County General Plan Update includes policies and implementation programs which would support the reduction of criteria pollutant air emissions from mobile sources associated with future development under the General Plan:

Implementation

Program 12.B.h:

Encourage new development to be planned to result in smooth flowing traffic conditions for major roadways. This includes traffic signals and traffic signal coordination, parallel roadways and connections within and between neighborhoods where significant reductions in overall emissions can be achieved.

Impacts associated with emissions from mobile sources resulting from implementation of the General Plan Update would be less than significant.

Area Sources

Build-out under the General Plan Update would result in a net increase of 5,159 dwelling units, 938,000 square feet of commercial development, and 196,000 square feet of industrial development above existing conditions (year 2015). This represents a 24 percent increase in dwelling units, 20 percent increase in commercial development, and 11 percent increase in industrial development above existing conditions. New development under the General Plan Update would result in criteria pollutant air emissions due to electricity and consumption. In addition, new residential development would result in criteria pollutant air emissions due to



the development of additional sources that produce smoke (i.e., fireplace installations in new development). Therefore, the General Plan Update would facilitate proportional increases in area source criteria pollutants as a result of increased energy usage from new development.

It is important to note that new development would continue to occur throughout the County regardless of whether the General Plan Update is adopted or not. However, criteria pollutant emissions levels under the General Plan Update would be reduced from the 'No Project' scenario levels. Under the 'No Project' scenario the County would experience a total of 26,415 dwelling units, 5,562,000 square feet of commercial development, 1,915,000 square feet of industrial development, and 11,042 acres of public lands. Development under the General Plan Update would result in a net decrease of 16 dwelling units, 1,000 square feet of industrial development, and one acre of public lands as compared to the 'No Project' scenario. In addition, the General Plan Update would not result in an increase in commercial development over the 'No Project' scenario. Therefore, the General Plan Update would result in proportional decreases in area source criteria pollutants compared to the 'No Project' scenario. Long-term area source emissions associated with future development under the General Plan Update would be reduced from levels anticipated under the 'No Project' scenario.

In addition, the Air Quality Element of the Tuolumne County General Plan Update includes a goal, policy and implementation programs which would further reduce criteria pollutant air emissions associated with fireplace installations and energy use resulting from future development under the General Plan Update compared to existing conditions:

Goal 12.C: Minimize air pollutant emissions from woodburning fireplaces and appliances.

Policy 12.C.1: Promote development that minimizes the use of energy sources that produce smoke and maximizes the use of energy conservation and clean or renewable energy sources.

Implementation Program 12.C.a: Continue to limit non EPA-certified fireplace installations in new developments in areas of the County where resulting air quality impacts would be cumulatively significant.

Implementation Program 12.C.b: Continue to require the installation of low-emitting, EPA-certified fireplaces, woodstoves or pellet stoves where such wood-burning devices are desired by the developers and/or future homeowners except where prohibited due to cumulative air quality impacts.

Implementation Program 12.C.c: Encourage the incorporation of energy conservation into the design of residential and commercial buildings; such as Tier 1 and Tier 2 of the Green Building Code.



With adherence to the goal, policy and implementation programs listed above, impacts associated with emissions from area sources resulting from implementation of the General Plan Update would be less than significant.

Mitigation Measures. None required.

Significance after Mitigation. Impacts would be less than significant without mitigation.

Impact AQ-3 **The General Plan Update would facilitate residential development in proximity to local roadways and other potential sources of toxic air pollutants, which may increase exposure of sensitive receptors to hazardous air pollutants that may cause health risks and odors that may be a nuisance. Local roadways within Tuolumne County have low traffic volumes and would not represent a significant source of hazardous pollutants. In addition, implementation of the General Plan Update would not result in a regional increase in toxic air emissions when compared to the ‘No Project’ scenario. However, siting of new sensitive receptors within close proximity to toxic emissions generating facilities may occur as a result of development facilitated by the General Plan Update. Impacts would be Class II, *significant but mitigable.***

The future land use scenario envisioned by the General Plan Update is intended to encourage land use growth in/near the urbanized, high-density population centers such as the City of Sonora and community of Jamestown, ultimately increasing density and improving circulation and multimodal connections. As a result, the General Plan Update would facilitate residential development in proximity to local roadways and other potential sources of toxic air pollutants (e.g., distribution centers, dry cleaning facilities, gas stations, etc.).

The population residing close to highways or busy roadways may experience adverse health effects beyond those typically found in urban areas. Proximity to highways increases cancer risk and exposure to particulate matter. Similarly, proximity to heavily travelled transit corridors and intersections would expose residents to higher levels of diesel particulate matter and carbon monoxide. CARB, in the *Air Quality and Land Use Handbook: A Community Health Perspective* (June 2005) recommends avoiding siting new sensitive land uses, such as residences, schools, daycare centers, playgrounds, or medical facilities, within 500 feet of a freeway, urban roads with 100,000 vehicles/day, or rural roads with 50,000 vehicles/day. There are no roadways within Tuolumne County that meet the definition of typical urban freeways (truck traffic of 10,000-20,000/day). The most heavily travelled roadways in Tuolumne County are two-lane highways including State Route 49 (SR 49), State Route 108 (SR 108), and State Route 120 (SR 120). According to the traffic study provided by Wood Rodgers, the existing average daily traffic (ADT) on SR 49, SR 108, and SR 120 did not exceed 23,500 ADT in 2014. Due to the low ADT of roadways within Tuolumne County, sensitive receptors residing close to roadways would not experience adverse health effects beyond those typically found in urban areas or higher than regional averages. In addition, siting of sensitive receptors within close proximity to



the Sierra Railroad would not represent a significant adverse health effect as modern capacity freight cars are not able to access lumber mills and passenger trains have been curtailed due to safety concerns. Impacts related to health risks within any given distance of mobile sources in the region would be less than significant.

Furthermore, an analysis of 2040 on-road mobile source diesel PM₁₀, diesel PM_{2.5}, diesel NO_x, diesel ROG, diesel CO, and diesel SO_x emissions is shown in Table 4.3-4. Model results indicate that for all criteria pollutants diesel emissions for the General Plan Update would be below or equal to the 'No Project' scenario. In addition, projected General Plan Update diesel emissions would be reduced below 2015 baseline conditions. Therefore, impacts related to diesel particulate matter exposure at the regional level would be less than significant under the Distinctive Communities scenario (the General Plan Update).

**Table 4.3-4
 On-Road Mobile Source Toxics Comparison[‡]**

Scenario	Diesel PM ₁₀ (tons/day)	Diesel PM _{2.5} (tons/day)	Diesel NO _x (tons/day)	Diesel ROG (tons/day)	Diesel CO (tons/day)	Diesel SO _x (tons/day)
Baseline	0.04	0.03	1.26	0.06	0.27	0.00
'No Project' Scenario	0.02	0.01	0.25	0.01	0.06	0.00
Proposed General Plan Update	0.02	0.01	0.24	0.01	0.06	0.00

[‡]The on-road mobile source criteria pollutant emissions estimates for the General Plan Update were calculated using CARB's EMFAC2014 emission inventory model. VMT data were extracted from the TCTC Travel Demand Model and provided in the traffic study prepared by Wood Rodgers, Inc. (September 2015). VMT data includes pass-through trips from vehicles travelling through Tuolumne County that do not have an origin or destination within the county and therefore represent a worst-case scenario. NO_x and CO emissions are presented above using winter values and ROG emissions are presented above using summer values to provide a worst case estimate based on the seasons in which individual criteria pollutant emissions are highest. Emissions for PM₁₀, PM_{2.5}, and SO_x were the equal in both seasons.

As discussed above, a strategy of the proposed General Plan land use scenario (the Distinctive Communities Scenario) is to direct growth in/near the urbanized, high-density population centers. This could result in more people being exposed to elevated health risks as compared to areas of the region more distant from such facilities. The location and pattern of the proposed General Plan growth would influence travel behavior, and provide a means to determine the impact of future vehicle emissions in the proposed plan area. A compact growth pattern served by an efficient and diverse transportation system facilitates a reduction in automotive travel and increases walking, bicycling, and transit use – all of which reduce individual vehicle trips and associated VMT. Reduced VMT and vehicle trips are directly linked to reduced regional criteria air pollutant emissions and toxic air emissions from mobile sources. It is important to note that a variety of other factors contribute to the decline in contaminant emissions compared to existing conditions, including vehicle technology, cleaner fuels, and fleet turnover. However, in order to achieve the greatest VMT reductions from a compact growth pattern, development must also be in close proximity to public transit and major roadway corridors. Although the precise location and density of such development is not known at this time, the proposed General Plan may result in new sensitive receptors close to existing and new hazardous air pollutant sources including toxic emissions generating facilities (e.g., distribution centers, dry cleaning facilities, gas stations, etc.), which may result in an increase in exposure of sensitive receptors to elevated health risks as compared to areas of the region more distant from such



facilities. In addition, new sensitive receptors may be exposed to nuisance odors. Therefore, impacts would be potentially significant.

The Air Quality Element of the Tuolumne County General Plan Update includes policies and implementation programs which would reduce impacts to sensitive receptors associated with future development under the General Plan Update:

Policy 12.A.1: Accurately determine and fairly mitigate the local and regional air quality impacts of land development projects proposed in the County.

Implementation Program 12.A.j: Establish buffer zones to separate new residential development projects and projects categorized as sensitive receptors (e.g., hospitals, convalescent homes and schools) from industrial sites and/or sites that may emit toxic or hazardous pollutants.

Implementation Program 12.A.k: Establish buffer zones to create an adequate distance between new air pollution point sources such as, but not limited to, industrial, manufacturing and processing facilities, and residential areas and sensitive receptors.

Implementation Programs 12.A.j and 12.A.k do not specifically establish buffer zones to separate sensitive receptors from sources of toxic or hazardous pollutants. Therefore, impacts would remain potentially significant and mitigation measures are required for future development associated with the General Plan Update.

Mitigation Measures. Potential impacts to sensitive receptors associated with development envisioned by the General Plan Update would be reduced through implementation of Mitigation Measure AQ-2.

AQ-2: Air Quality Element Policies and Implementation Programs for Sensitive Receptors. The following implementation programs should be added to Policy 12.A.1 of the General Plan Update Air Quality Element:

Implementation Program 12.A.n: Do not locate new urban residential development projects and projects categorized as sensitive receptors (e.g., hospitals, convalescent homes and schools) within 500 feet from industrial sites and/or sites that may emit toxic or hazardous pollutants. If a 500 foot buffer is not feasible, compliance with Implementation Program 12.A.o shall be required. Implementation Program 12.A.n is no longer applicable once buffer zones are established per Implementation Program 12.A.j and 12.A.k.

Implementation Program 12.A.o: The following measures (as appropriate and feasible) shall be incorporated into any project building design for residential, school and other sensitive uses located within 500 feet of toxic emissions generating facilities (e.g., distribution centers, dry cleaning facilities, gas stations, etc.) and other sources of diesel particulate matter and other known carcinogens. The project applicant shall retain a qualified consultant to prepare a health risk assessment in accordance with CARB and the



Office of Environmental Health and Hazard Assessment requirements to determine the exposure of project residents/occupants/users to stationary air quality pollutants prior to issuance of a demolition, grading, or building permit. The health risk assessment shall be submitted to the County for review and approval. The County shall implement any approved health risk assessment recommendations to a level which would not result in exposure of sensitive receptors to substantial pollutant concentrations. Implementation Program 12.A.o is no longer applicable once buffer zones are established per Implementation Program 12.A.j and 12.A.k.

Significance after Mitigation. Mitigation measure AQ-2 would assure that sensitive receptors would not be exposed to substantial pollutant concentrations through a variety of measures that would feasibly avoid or minimize exposure to public health impacts as identified in the *CARB Air Quality and Land Use Handbook* (June 2005). With the implementation of the above mitigation, impacts related to potential health risks would be less than significant.



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