4.2 AIR QUALITY

INTRODUCTION

This section addresses impacts of the proposed Community Plan on ambient air quality and the potential for exposure of people to unhealthful pollutant concentrations. Air pollutants of concern for Merced County include ozone (O_3), ozone precursors (reactive organic compounds and nitrous oxides), carbon monoxide (CO) and particulate matter 10 microns and 2.5 microns or less in size (PM10 and PM2.5). This section analyzes the type and quantity of emissions that would be generated by construction and operation of the proposed Community Plan. This section also addresses toxic air contaminants (TAC) and odors.

ENVIRONMENTAL SETTING

The Plan Area is located in the San Joaquin Valley Air Basin (SJVAB). The SJVAB is the second largest air basin by area in California, representing 16 percent of California's geographic area. Fresno, Western and Central Kern, Kings, Madera, Merced, San Joaquin, Stanislaus, and Tulare counties are all within the SJVAB. The SJVAB is approximately 250 miles long and 35 miles wide. It is bordered to the east by the Sierra Nevada Mountains, the Coast Ranges to the west, Tehachapi Mountains to the south and the Sacramento Valley to the north. The bowl-shaped topography of the air basin inhibits pollutant movement out of the valley.[1]

The ambient concentrations of air pollutants are determined by the amount of emissions released by sources and the atmosphere's ability to transport and dilute such emissions. Natural factors that affect transport and dilution include terrain, wind, atmospheric stability, and sunlight. Therefore, existing air quality conditions in the area are determined by such natural factors as topography, meteorology, and climate, in addition to the amount of emissions released by existing air pollutant sources.[2]

The SJVAB is part of a Mediterranean Climate Zone characterized by sparse rainfall occurring mainly in the winter. Maximum temperatures often exceed 100^{O}F in the valley. Additionally, wind in the SJVAB typically blows from the northwest especially during the summer. The winter results in periods of stagnation where winds are very weak again trapping pollutants in the valley.[3]

The San Joaquin Valley Air Pollution Control District (SJVAPCD) has jurisdiction over the entire SJVAB. Cities within the jurisdiction of the SJVAPCD include Stockton, Modesto, Merced, Madera, Fresno, Hanford, Visalia, and Bakersfield.[4]

Project Vicinity

The average annual temperatures in Winton, CA range from a low of 38^{o}F to a high of 97^{o}F. Summer (June through September) high and low temperatures are 97°F and 63°F, respectively. The average winter (November through February) high and low temperatures are 54°F and 38°F, respectively.[5]

1 SJVAPCD, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015.
2 SJVAPCD, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015.
3 SJVAPCD, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015.
4 SJVAPCD, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015.
5 Weather Spark, *Winton, California.* Available at https://weatherspark.com/y/1336/Average-Weather-in-Winton-California-United-States-Year-Round. Accessed March 2020.

Pollutants of Concern

To protect human health and the environment, the United States Environmental Protection Agency (USEPA) has set "primary" and "secondary" maximum ambient limits for each of the criteria pollutants. Primary standards were set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals suffering from chronic lung conditions such as asthma and emphysema. Secondary standards were set to protect the natural environment and prevent damage to animals, crops, vegetation, and buildings. Ozone (O_3) and nitrogen dioxide (NO_2) are considered regional pollutants because they (and their precursors) affect air quality on a regional scale.[6] Pollutants such as carbon monoxide (CO), sulfur dioxide (SO_2), and lead (Pb) are considered local pollutants that tend to accumulate in the air locally. Particulate matter (PM) is both a local and regional pollutant.[7]

The pollutants of concern within the SJVAB, including within the project area, are O_3 (including oxides of nitrogen [NO_X] and reactive organic gases [ROG]), CO, and PM. Principal characteristics surrounding these pollutants are discussed below. Toxic Air Contaminants (TACs) also are discussed, although no air quality standards exist for these pollutants.

Ozone

Ozone is a secondary pollutant formed by the chemical reaction of volatile organic compounds (VOCs) and nitrogen oxides (NOx) in the presence of sunlight under favorable meteorological conditions, such as high temperature and stagnation episodes. Ozone concentrations are generally highest during the summer months, when direct sunlight, light wind, and warm temperature conditions are favorable.

According to the USEPA, ozone can cause the muscles in the airways to constrict potentially leading to wheezing and shortness of breath.[8] Ozone can make it more difficult to breathe deeply and vigorously; cause shortness of breath and pain when taking a deep breath; cause coughing and sore or scratchy throat; inflame and damage the airways; aggravate lung diseases such as asthma, emphysema and chronic bronchitis; increase the frequency of asthma attacks; make the lungs more susceptible to infection; continue to damage the lungs even when the symptoms have disappeared; and cause chronic obstructive pulmonary disease.[9]

Long-term exposure to ozone is linked to aggravation of asthma, and is likely to be one of many causes of asthma development. Long-term exposures to higher concentrations of ozone may also be linked to permanent lung damage, such as abnormal lung development in children.[10] According to California Air Resources Board (CARB), inhalation of ozone causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms and exposure to ozone can reduce the volume of air that the lungs breathe resulting in shortness of breath.[11]

The USEPA states that people most at risk from breathing air containing ozone include people

6 For the purposes of this analysis, precursors are pollutants, such as NOx and ROG, that are directly emitted by vehicles and other sources, and then combine in the atmosphere to form other pollutants, such as ozone.
7 USEPA, Criteria Air Pollutants, 2018. Available: https://www.epa.gov/criteria-air-pollutants.
8 USEPA, 2019. Health Effects of Ozone Pollution, https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution, last updated October 10, 2018.
9 USEPA, 2019. Health Effects of Ozone Pollution, https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution, last updated October 10, 2018.
10 USEPA, 2019. Health Effects of Ozone Pollution, https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution, last updated October 10, 2018.
11 CARB, 2018. Ozone & Health, Health Effects of Ozone, https://ww2.arb.ca.gov/resources/ozone-and-health.

with asthma, children, older adults, and people who are active outdoors, especially outdoor workers.[12] Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure.[13] According to CARB, studies show that children are no more or less likely to suffer harmful effects than adults; however, children and teens may be more susceptible to ozone and other pollutants because they spend nearly twice as much time outdoors and engaged in vigorous activities compared to adults.[14] Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults and are less likely than adults to notice their own symptoms and avoid harmful exposures.[15] Further research may be able to better distinguish between health effects in children and adults.[16]

Reactive Organic Gases

ROG are compounds made up primarily of hydrogen and carbon atoms. Internal combustion associated with motor vehicle usage is the major source of hydrocarbons. Other sources of ROG are emissions associated with the use of paints and solvents, the application of asphalt paving, and the use of household consumer products such as aerosols. Adverse effects on human health are not caused directly by ROG but rather by reactions of ROG that form secondary pollutants such as ozone.[17]

Volatile Organic Compounds

VOCs are organic chemical compounds of carbon and are not "criteria" pollutants themselves; however, they contribute with NOx to form ozone, and are regulated to prevent the formation of ozone.[18] According to CARB, some VOCs are highly reactive and play a critical role in the formation of ozone, other VOCs have adverse health effects, and in some cases, VOCs can be both highly reactive and have adverse health effects.[19] VOCs are typically formed from combustion of fuels and/or released through evaporation of organic liquids (such as benzene, vinyl chloride and toluene), internal combustion associated with motor vehicle usage, and consumer products (e.g. architectural coatings, etc.).[20]

Nitrogen Oxides

NOx is a term that refers to a group of compounds containing nitrogen and oxygen. The primary compounds of air quality concern include nitrogen dioxide NO_2 and nitric oxide (NO). Ambient air quality standards have been promulgated for NO_2, which is a reddish-brown, reactive gas.[21] The principle form of NOx produced by combustion is NO, but NO reacts quickly in the atmosphere to form NO_2, creating the mixture of NO and NO_2 referred to as NOx. Major sources of NOx include emissions from cars, trucks and buses, power plants, and off-road equipment. The terms NOx and NO_2 are sometimes used interchangeably. However, the term NOx is typically used when discussing emissions, usually from combustion-related activities, and the

12 USEPA, 2019. Health Effects of Ozone Pollution, https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution, last updated October 10, 2018.
13 USEPA, 2019. Health Effects of Ozone Pollution, https://www.epa.gov/ground-level-ozone-pollution/health-effects-ozone-pollution, last updated October 10, 2018.
14 CARB, 2018. Ozone & Health, Health Effects of Ozone, https://ww2.arb.ca.gov/resources/ozone-and-health.
15 CARB, 2018. Ozone & Health, Health Effects of Ozone, https://ww2.arb.ca.gov/resources/ozone-and-health.
16 CARB, 2018. Ozone & Health, Health Effects of Ozone, https://ww2.arb.ca.gov/resources/ozone-and-health.
17 Center for Disease Control (CDC), *Air Pollutants*, November 24, 2014.
18 USEPA, 2017. Technical Overview of Volatile Organic Compounds, https://www.epa.gov/indoor-air-quality-iaq/technical-overview-volatile-organic-compounds, last updated April 12, 2017.
19 CARB, 2016. Toxic Air Contaminants Monitoring, Volatile Organic Compounds, https://www.arb.ca.gov/aaqm/toxics.htm, last reviewed June 9, 2016.
20 CARB, 2016. Toxic Air Contaminants Monitoring, Volatile Organic Compounds, https://www.arb.ca.gov/aaqm/toxics.htm, last reviewed June 9, 2016.
21 CARB. Nitrogen Dioxide & Health, https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health.

term NO_2 is typically used when discussing ambient air quality standards. Where NOx emissions are discussed in the context of the thresholds of significance or impact analyses, the discussions are based on the conservative assumption that all NOx emissions would oxidize in the atmosphere to form NO_2. According to the USEPA, short-term exposures to NO_2 can potentially aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions and visits to emergency rooms while longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections.[22] According to CARB, controlled human exposure studies that show that NO_2 exposure can intensify responses to allergens in allergic asthmatics.[23] In addition, a number of epidemiological studies have demonstrated associations between NO_2 exposure and premature death, cardiopulmonary effects, decreased lung function growth in children, respiratory symptoms, emergency room visits for asthma, and intensified allergic responses.[24] Infants and children are particularly at risk from exposure to NO_2 because they have disproportionately higher exposure to NO_2 than adults due to their greater breathing rate for their body weight and their typically greater outdoor exposure duration while in adults, the greatest risk is to people who have chronic respiratory diseases, such as asthma and chronic obstructive pulmonary disease.[25] CARB states that much of the information on distribution in air, human exposure and dose, and health effects is specifically for NO_2 and there is only limited information for NO and NOx, as well as large uncertainty in relating health effects to NO or NOx exposure.[26]

Carbon Monoxide

CO is primarily emitted from combustion processes and motor vehicles due to the incomplete combustion of fuel, such as natural gas, gasoline, or wood, with the majority of outdoor CO emissions from mobile sources.[27] According to the USEPA, breathing air with a high concentration of CO reduces the amount of oxygen that can be transported in the blood stream to critical organs like the heart and brain and at very high levels, which are possible indoors or in other enclosed environments, CO can cause dizziness, confusion, unconsciousness and death.[28] Very high levels of CO are not likely to occur outdoors; however, when CO levels are elevated outdoors, they can be of particular concern for people with some types of heart disease since these people already have a reduced ability for getting oxygenated blood to their hearts and are especially vulnerable to the effects of CO when exercising or under increased stress.[29] In these situations, short-term exposure to elevated CO may result in reduced oxygen to the heart accompanied by chest pain also known as angina.[30] According to CARB, the most common effects of CO exposure are fatigue, headaches, confusion, and dizziness due to inadequate oxygen delivery to the brain.[31] For people with cardiovascular disease, short-term CO exposure can further reduce their body's already compromised ability to respond to the increased oxygen demands of exercise, exertion, or stress; inadequate oxygen delivery to the

22 USEPA. Nitrogen Dioxide (NO_2) Pollution.
23 CARB. Nitrogen Dioxide & Health, https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health.
24 CARB. Nitrogen Dioxide & Health, https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health.
25 CARB. Nitrogen Dioxide & Health, https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health.
26 CARB. Nitrogen Dioxide & Health, https://ww2.arb.ca.gov/resources/nitrogen-dioxide-and-health.
27 CARB. Carbon Monoxide & Health, https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health. Accessed January 2019.
28 USEPA 2016. Carbon Monoxide (CO) Pollution in Outdoor Air, https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution, last updated September 8, 2016.
29 USEPA 2016. Carbon Monoxide (CO) Pollution in Outdoor Air, https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution, last updated September 8, 2016.
30 USEPA 2016. Carbon Monoxide (CO) Pollution in Outdoor Air, https://www.epa.gov/co-pollution/basic-information-about-carbon-monoxide-co-outdoor-air-pollution, last updated September 8, 2016.
31 CARB. Carbon Monoxide & Health, https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health. Accessed January 2019.

heart muscle leads to chest pain and decreased exercise tolerance.[32] Unborn babies, infants, elderly people, and people with anemia or with a history of heart or respiratory disease are most likely to experience health effects with exposure to elevated levels of CO.[33]

Localized areas where ambient concentrations of CO exceed state and/or federal standards are termed CO hotspots. Emissions of CO are produced in greatest quantities from motor vehicle combustion and are usually concentrated at or near ground level because they do not readily disperse into the atmosphere, particularly under cool, stable (i.e., low or no wind) atmospheric conditions. Carbon monoxide decreased dramatically in the SJVAB with the introduction of the catalytic converter in 1975. No exceedances of CO have been recorded at monitoring stations in the SJVAB for some time and the SJVAB is currently designated as a CO attainment area for both the California Ambient Air Quality Standards (CAAQS) and National Ambient Air Quality Standards (NAAQS). The SJVAB has been in attainment for so long that CO monitoring at the majority of sites has been discontinued.

Sulfur Dioxide (SO_2)

According to the USEPA, the largest source of SO_2 emissions in the atmosphere is the burning of fossil fuels by power plants and other industrial facilities. Smaller sources of SO_2 emissions include industrial processes such as extracting metal from ore; natural sources such as volcanoes; locomotives, and ships and other vehicles and heavy equipment that burn fuel with a high sulfur content.[34] In 2006, California phased-in the ultra-low-sulfur diesel regulation limiting vehicle diesel fuel to a sulfur content not exceeding 15 parts per million, down from the previous requirement of 500 parts per million, substantially reducing emissions of sulfur from diesel combustion.[35] According to the USEPA, short-term exposures to SO_2 can harm the human respiratory system and make breathing difficult.[36] According to CARB, health effects at levels near the State one-hour standard are those of asthma exacerbation, including bronchoconstriction accompanied by symptoms of respiratory irritation such as wheezing, shortness of breath and chest tightness, especially during exercise or physical activity and exposure at elevated levels of SO_2 (above 1 ppm) results in increased incidence of pulmonary symptoms and disease, decreased pulmonary function, and increased risk of mortality.[37] Children, the elderly, and those with asthma, cardiovascular disease, or chronic lung disease (such as bronchitis or emphysema) are most likely to experience the adverse effects of SO_2.[38,39]

Particulate Matter

Particulate matter air pollution is a mixture of solid particles and liquid droplets found in the air.[40]

32 CARB. Carbon Monoxide & Health, https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health. Accessed January 2019.

33 CARB. Carbon Monoxide & Health, https://ww2.arb.ca.gov/resources/carbon-monoxide-and-health. Accessed January 2019.

34 USEPA, 2018. Sulfur Dioxide (SO_2) Pollution, https://www.epa.gov/so2-pollution/sulfur-dioxide-basics, last updated June 28, 2018.

35 CARB, 2004. Final Regulation Order, Amendments to the California Diesel Fuel Regulations, Amend Section 2281, Title 13, California Code of Regulations, https://www.arb.ca.gov/regact/ulsd2003/fro2.pdf, approved July 15, 2004.

36 USEPA, 2018. Sulfur Dioxide (SO_2) Pollution, https://www.epa.gov/so2-pollution/sulfur-dioxide-basics, last updated June 28, 2018.

37 CARB, No Date. Sulfur Dioxide & Health, https://ww2.arb.ca.gov/resources/sulfur-dioxide-and-health. Accessed January 2019.

38 CARB, No Date3. Sulfur Dioxide & Health, https://ww2.arb.ca.gov/resources/sulfur-dioxide-and-health. Accessed January 2019.

39 USEPA, 2018. Sulfur Dioxide (SO_2) Pollution, https://www.epa.gov/so2-pollution/sulfur-dioxide-basics, last updated June 28, 2018.

40 USEPA, 2018. Particulate Matter (PM) Pollution, https://www.epa.gov/pm-pollution/particulate-matter-pm-basics, last updated November 14, 2018.

Some particles, such as dust, dirt, soot, or smoke, are large or dark enough to be seen with the naked eye while other particles are so small they can only be detected using an electron microscope.[41] Particles are defined by their diameter for air quality regulatory purposes: inhalable particles with diameters that are generally 10 micrometers and smaller (PM10); and fine inhalable particles with diameters that are generally 2.5 micrometers and smaller (PM2.5).[42] Thus, PM2.5 comprises a portion or a subset of PM10. Sources of PM10 emissions include dust from construction sites, landfills and agriculture, wildfires and brush/waste burning, industrial sources, and wind-blown dust from open lands.[43] In the community of Winton, which does not contain extensive industrial operations and is not prone to wildfire, PM10 is released primarily during grading of agricultural lands and construction sites. Sources of PM2.5 emissions include combustion of gasoline, oil, diesel fuel, or wood. PM10 and PM2.5 may be either directly emitted from sources (primary particles) or formed in the atmosphere through chemical reactions of gases (secondary particles) such as SO_2, NOx, and certain organic compounds.[44] According to CARB, both PM10 and PM2.5 can be inhaled, with some depositing throughout the airways; PM10 is more likely to deposit on the surfaces of the larger airways of the upper region of the lung while PM2.5 is more likely to travel into and deposit on the surface of the deeper parts of the lung, which can induce tissue damage, and lung inflammation.[45] Short-term (up to 24 hours of duration) exposure to PM10 has been associated primarily with worsening of respiratory diseases, including asthma and chronic obstructive pulmonary disease, leading to hospitalization and emergency department visits.[46] The effects of long-term (months or years) exposure to PM10 are less clear, although studies suggest a link between long-term PM10 exposure and respiratory mortality. The International Agency for Research on Cancer published a review in 2015 that concluded that particulate matter in outdoor air pollution causes lung cancer.[47] Short-term exposure to PM2.5 has been associated with premature mortality, increased hospital admissions for heart or lung causes, acute and chronic bronchitis, asthma attacks, emergency room visits, respiratory symptoms, and restricted activity days and long-term exposure to PM2.5 has been linked to premature death, particularly in people who have chronic heart or lung diseases, and reduced lung function growth in children.[48] According to CARB, populations most likely to experience adverse health effects with exposure to PM10 and PM2.5 include older adults with chronic heart or lung disease, children, and asthmatics and children and infants are more susceptible to harm from inhaling pollutants such as PM10 and PM2.5 compared to healthy adults because they inhale more air per pound of body weight than do adults, spend more time outdoors, and have developing immune systems.[49]

41 USEPA, 2018. Particulate Matter (PM) Pollution, https://www.epa.gov/pm-pollution/particulate-matter-pm-basics, last updated November 14, 2018.
42 USEPA, 2018. Particulate Matter (PM) Pollution, https://www.epa.gov/pm-pollution/particulate-matter-pm-basics, last updated November 14, 2018.
43 CARB, 2017. Inhalable Particulate Matter and Health (PM2.5 and PM10), https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm, last reviewed August 10, 2017.
44 CARB, 2017. Inhalable Particulate Matter and Health (PM2.5 and PM10), https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm, last reviewed August 10, 2017.
45 CARB, 2017. Inhalable Particulate Matter and Health (PM2.5 and PM10), https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm, last reviewed August 10, 2017.
46 CARB, 2017. Inhalable Particulate Matter and Health (PM2.5 and PM10), https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm, last reviewed August 10, 2017.
47 CARB, 2017. Inhalable Particulate Matter and Health (PM2.5 and PM10), https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm, last reviewed August 10, 2017.
48 CARB, 2017. Inhalable Particulate Matter and Health (PM2.5 and PM10), https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm, last reviewed August 10, 2017.
49 CARB, 2017. Inhalable Particulate Matter and Health (PM2.5 and PM10), https://www.arb.ca.gov/research/aaqs/common-pollutants/pm/pm.htm, last reviewed August 10, 2017.

Lead

Major sources of lead emissions include ore and metals processing, piston-engine aircraft operating on leaded aviation fuel, waste incinerators, utilities, and lead-acid battery manufacturers.[50] In the past, leaded gasoline was a major source of lead emissions; however, the removal of lead from gasoline has resulted in a decrease of lead in the air by 98 percent between 1980 and 2014.[51] Lead can adversely affect the nervous system, kidney function, immune system, reproductive and developmental systems and the cardiovascular system, and affects the oxygen carrying capacity of blood.[52] The lead effects most commonly encountered in current populations are neurological effects in children, such as behavioral problems and reduced intelligence, anemia, and liver or kidney damage.[53] Excessive lead exposure in adults can cause reproductive problems in men and women, high blood pressure, kidney disease, digestive problems, nerve disorders, memory and concentration problems, and muscle and joint pain.[54]

Air Toxics

Toxic Air Contaminants

Toxic air contaminants (TACs) are generally defined as those contaminants that are known or suspected to cause serious health problems, but do not have a corresponding ambient air quality standard. TACs are also defined as an air pollutant that may increase a person's risk of developing cancer and/or other serious health effects; however, the emission of a toxic chemical does not automatically create a health hazard. Other factors, such as the amount of the chemical, its toxicity, how it is released into the air, the weather, and the terrain, all influence whether the emission could be hazardous to human health. TACs are emitted by a variety of industrial processes such as petroleum refining, electric utility and chrome plating operations, commercial operations such as gasoline stations and dry cleaners, and motor vehicle exhaust and may exist as PM10 and PM2.5 or as vapors (gases). TACs include metals, other particles, gases absorbed by particles, and certain vapors from fuels and other sources.

The emission of toxic substances into the air can be damaging to human health and to the environment. Human exposure to these pollutants at sufficient concentrations and durations can result in cancer, poisoning, and rapid onset of sickness, such as nausea or difficulty in breathing. Other less measurable effects include immunological, neurological, reproductive, developmental, and respiratory problems. Pollutants deposited onto soil or into lakes and streams affect ecological systems and eventually human health through consumption of contaminated food. The carcinogenic potential of TACs is a particular public health concern because many scientists currently believe that there is no "safe" level of exposure to carcinogens. Any exposure to a carcinogen poses some risk of contracting cancer.

The public's exposure to TACs is a significant public health issue in California. The Air Toxics "Hotspots" Information and Assessment Act is a State law requiring facilities to report emissions of TACs to air districts. The program is designated to quantify the amounts of potentially hazardous air pollutants released, the location of the release, the concentrations to which the public is exposed, and the resulting health risks. The State Air Toxics Program (Assembly Bill

50 USEPA, 2017. Lead Air Pollution, https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution, last updated November 29, 2017.
51 USEPA, 2017. Lead Air Pollution, https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution, last updated November 29, 2017.
52 USEPA, 2017. Lead Air Pollution, https://www.epa.gov/lead-air-pollution/basic-information-about-lead-air-pollution, last updated November 29, 2017.
53 CARB. Lead & Health, https://ww2.arb.ca.gov/resources/lead-and-health.
54 CARB. Lead & Health, https://ww2.arb.ca.gov/resources/lead-and-health.

2588) identified over 200 TACs, including the 188 TACs identified in the Clean Air Act (CAA). The USEPA has assessed this expansive list of toxics and identified 21 TACs as Mobile Source Air Toxics (MSATs). MSATs are compounds emitted from highway vehicles and non-road equipment, (e.g. construction and agricultural equipment). Some toxic compounds are present in fuel and are emitted to the air when the fuel evaporates or passes through the engine unburned. Other toxics are emitted from the incomplete combustion of fuels or as secondary combustion products. Metal air toxics also result from engine wear or from impurities in oil or gasoline. USEPA also extracted a subset of these 21 MSAT compounds that it now labels as the six priority MSATs: benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases, acrolein, and 1,3-butadiene. While these six MSATs are considered the priority transportation toxics, USEPA stresses that the lists are subject to change and may be adjusted in future rules.

Diesel Particulate Matter

According to the 2006 California Almanac of Emissions and Air Quality, the majority of the estimated health risks from TACs can be attributed to relatively few compounds, the most important being particulate matter from the exhaust of diesel-fueled engines, i.e., diesel particulate matter (DPM). DPM differs from other TACs in that it is not a single substance, but rather a complex mixture of hundreds of substances.

Diesel exhaust is composed of two phases, gas and particle, and both phases contribute to the health risk. The gas phase is composed of many of the urban hazardous air pollutants, such as acetaldehyde, acrolein, benzene, 1,3-butadiene, formaldehyde and polycyclic aromatic hydrocarbons. The particle phase is also composed of many different types of particles by size or composition. Fine and ultra-fine diesel particulates are of the greatest health concern, and may be composed of elemental carbon with adsorbed compounds such as organic compounds, sulfate, nitrate, metals and other trace elements. Diesel exhaust is emitted from a broad range of diesel engines; the on road diesel engines of trucks, buses and cars and the off-road diesel engines that include locomotives, marine vessels and heavy duty equipment (e.g. construction and agricultural equipment). Although DPM is emitted by diesel-fueled internal combustion engines, the composition of the emissions varies depending on engine type, operating conditions, fuel composition, lubricating oil, and whether an emission control system is present.

The most common exposure to DPM is breathing the air that contains diesel exhaust. The fine and ultra-fine particles are respirable (similar to PM2.5), which means that they can avoid many of the human respiratory system defense mechanisms and enter deeply into the lung. Exposure to DPM comes from both on-road and off-road engine exhaust that is either directly emitted from the engines or lingering in the atmosphere.

Diesel exhaust causes health effects from both short-term or acute exposures, and long-term chronic exposures. The type and severity of health effects depends upon several factors including the amount of chemical exposure and the duration of exposure. Individuals also react differently to different levels of exposure. There is limited information on exposure to just DPM but there is enough evidence to indicate that inhalation exposure to diesel exhaust causes acute and chronic health effects.

Acute exposure to diesel exhaust may cause irritation to the eyes, nose, throat and lungs, some neurological effects such as lightheadedness. Acute exposure may also elicit a cough or nausea as well as exacerbate asthma. Chronic exposure to diesel PM in experimental animal inhalation studies have shown a range of dose-dependent lung inflammation and cellular changes in the lung and immunological effects. Based upon human and laboratory studies, there is considerable evidence that diesel exhaust is a likely carcinogen. Human epidemiological studies

demonstrate an association between diesel exhaust exposure and increased lung cancer rates in occupational settings.

Existing Conditions

Winton is an unincorporated, census-designated community located in Merced County, approximately two and a half miles north of Atwater and one and a half miles west of Merced County Castle Airport. The closest highway is Highway 99, approximately two miles to the south and west. Winton Way and Santa Fe Drive are the primary roadways that connect Winton to other adjacent communities. Santa Fe Drive bisects the Plan Area from the northwest to the southeast and is used as an alternative to Highway 99 for commuting. Winton Way bisects the Plan Area from north to south.

Winton is a small, agriculturally-based community surrounded by rural agricultural operations typical of Merced County, including orchards, row crops and grazing land. The present Winton Community Plan area is approximately 1,275 acres and includes 4,627 residential units and approximately 1,818,031 square feet of commercial, industrial, mix of residential and non-residential uses, and recreational buildings. The proposed Community Plan would add approximately 200 acres to the Plan Area, and 1,656 residential units and 1.23 million square feet of non-residential space.

SJVAPCD

The San Joaquin Valley Air Pollution Control District (SJVAPCD) currently operates 36 monitoring stations throughout the SJVAB. The closest monitoring stations to the Plan Area are the Merced-M Street and Merced-Coffee Avenue Stations. These are the only two stations in Merced County and they monitor for different pollutants. The M Street station monitors for PM10 and PM2.5 while the Coffee Street Station monitors for O_3, NO_2, and PM2.5. Neither station monitors for CO or SO_2; therefore, these criteria pollutants are not included in the data summary. CO and SO_2 are not currently monitored in the SJVAB, with the latest monitoring of CO and SO_2 being in 2012 and 2011 respectfully.[55] The historical ambient air data for monitored criteria pollutants from these two stations are shown in Table 4.2-1, SJVAPCD Air Quality Data Summary (2016-2018), for the three most recent years for which data are available (2016 to 2018).

Both CARB and USEPA use this type of monitoring data to designate areas according to their attainment status for criteria air pollutants. The purpose of these designations is to identify the areas with air quality problems and thereby initiate planning efforts for improvement. The three basic designation categories are nonattainment, attainment, and unclassified. Unclassified is used in an area that cannot be classified on the basis of available information as meeting or not meeting the standards. In addition, the California designations include a subcategory of nonattainment-transitional, which is given to nonattainment areas that are progressing and nearing attainment. The SJVAB is currently classified as a federal nonattainment area for Ozone and PM2.5, and is a nonattainment area at the State level for Ozone, PM10 and PM2.5. The current attainment status for the SJVAB is provided in Table 4.2-2, Air Basin Attainment Status.

Sensitive Land Uses

Sensitive land uses, such as schools, children's daycare centers, hospitals, and convalescent homes are considered to be more sensitive to poor air quality than the general public, because

55 CARB, Top 4 Measurements and Days Above Standard (2016, 2017, and 2018). Available: http://www.arb.ca.gov/adam/topfour/topfour1.php.

TABLE 4.2-1
SJVAPCD Air Quality Data Summary (2016–2018)

Pollutant	Standard[a]	Monitoring Data by Year 2016	2017	2018
Ozone – Merced-S Coffee Avenue Station				
Highest 1 Hour Average (ppm)		0.097	0.093	0.104
Days over State Standard	0.09 ppm	2	0	4
Highest 8 Hour Average (ppm)		0.087	0.085	0.084
Days over National Standard	0.070 ppm	28	16	21
Days over State Standard	0.070 ppm	29	17	23
Nitrogen Dioxide – Merced-S Coffee Avenue Station				
Highest 1 Hour Average (ppm)		0.035	0.039	0.046
Days over National Standard	0.10 ppm	0	0	0
Days over State Standard	0.18 ppm	0	0	0
Annual Average (ppm)		0.006	0.007	0.007
Days over National Standard	0.053 ppm	0	0	0
Days over State Standard	0.03 ppm	0	0	0
Particulate Matter (PM10) – M Street Station				
Highest 24 Hour Average ($\mu g/m^3$)[b]		64.5	144	142.7
Days over National Standard (measured)	150 $\mu g/m^3$	0	0	0
Days over State Standard (measured)	50 $\mu g/m^3$	6	12	10
Annual Average ($\mu g/m^3$)	20 $\mu g/m^3$	29.5	35.8	24.6
Particulate Matter (PM2.5) - Merced-S Coffee Avenue Station				
Highest 24 Hour Average ($\mu g/m^3$)[c]		43	69.3	88.2
Days over National Standard (measured)	35 $\mu g/m^3$	5	18	21
Annual Average ($\mu g/m^3$)	12 $\mu g/m^3$	11.9	13.2	15.1
Particulate Matter (PM2.5) – M Street Station				
Highest 24 Hour Average ($\mu g/m^3$)[c]		42.8	66.7	94.7
Days over National Standard (measured)	35 $\mu g/m^3$	2	6	10
Annual Average ($\mu g/m^3$)	12 $\mu g/m^3$	11.1	12.6	14.2

ppm = parts per million; µg/m3 = micrograms per cubic meter.
* = information not available
a Generally, state standards and national standards are not to be exceeded more than once per year.
b Concentrations and averages represent federal statistics. State and federal statistics may differ because of different sampling methods.
c Concentrations and averages represent state statistics. State and federal statistics may differ because of different sampling methods.

Source: CARB, *Top 4 Measurements and Days Above Standard (2016, 2017, and 2018)*. Available: http://www.arb.ca.gov/adam/topfour/topfour1.php.

TABLE 4.2-2
Air Basin Attainment Status

	Attainment Status	
Pollutant	**California Standards**	**Federal Standards**
SCCAB		
Ozone	Nonattainment/Severe	Extreme Nonattainment
CO	Attainment/Unclassified	Attainment/Unclassified
NO_2	Attainment	Attainment/Unclassified
SO_2	Attainment	Attainment/Unclassified
PM10	Nonattainment	Attainment
PM2.5	Nonattainment	Nonattainment
Lead	Attainment	No Designation

Source: SJVAPCD, *Ambient Air Quality Standards & Valley Attainment Status.* Available at http://www.valleyair.org/aqinfo/attainment.htm. Accessed March 2020.

uses are considered moderately sensitive to air pollution. Exercise places a high demand on respiratory functions, which can be impaired by air pollution, even though exposure periods during exercise are generally short. In addition, noticeable air pollution can detract from the enjoyment of recreation.

Currently, sensitive receptors in the Plan Area include the existing and future residential development, parks and the elementary, middle, and high schools. Because the proposed Community Plan is a plan-level document and the exact layout of future development is not known, the distance from development activities to existing and future receptors is unknown.

REGULATORY SETTING

The project site is located in Merced County and within the SJVAB. Air quality in the project area is regulated by USEPA, CARB, and SJVAPCD. The Merced County General Plan also contains an Air Quality Element that establishes a policy foundation to implement local air quality improvement measures and provides a framework for coordination of air quality planning efforts with surrounding jurisdictions.

Federal

Clean Air Act

The Clean Air Act (CAA) establishes NAAQS and specifies future dates for achieving compliance. The CAA also mandates that the State submit and implement a State Implementation Plan (SIP) for local areas not meeting those standards. The plans must include pollution control measures that demonstrate how the standards would be met.

The 1990 amendments to the CAA identify specific emission-reduction goals for areas not meeting the NAAQS. These amendments require both a demonstration of reasonable further progress toward attainment and incorporation of additional sanctions for failure to attain or meet interim milestones. Title I provisions were established with the goal of attaining the NAAQS for criteria pollutants. Table 4.2-3, Ambient Air Quality Standards for Criteria Pollutants, shows the

TABLE 4.2-3
Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time[a]	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Ozone	1 hour	0.09 ppm	---	High concentrations can directly affect lungs, causing irritation. Long-term exposure may cause damage to lung tissue.	Formed when ROG and NO_X react in the presence of sunlight. Major sources include on-road motor vehicles, solvent evaporation, and commercial/industrial mobile equipment.
	8 hours	0.07 ppm[b]	0.070 ppm		
Carbon Monoxide (CO)	1 hour	20 ppm	35 ppm	Classified as a chemical asphyxiant, carbon monoxide interferes with the transfer of fresh oxygen to the blood and deprives sensitive tissues of oxygen.	Internal combustion engines, primarily gasoline-powered motor vehicles.
	8 hours	9.0 ppm	9.0 ppm		
Nitrogen Dioxide (NO_2)	1 hour	0.18 ppm	0.100 ppm	Irritating to eyes and respiratory tract. Colors atmosphere reddish-brown.	Motor vehicles, petroleum refining operations, industrial sources, aircraft, ships, and railroads.
	Annual Arithmetic Mean	0.030 ppm	0.053 ppm		
Sulfur Dioxide (SO_2)	1 hour	0.25 ppm	75 ppb	Irritates upper respiratory tract; injurious to lung tissue. Can yellow the leaves of plants, destructive to marble, iron, and steel. Limits visibility and reduces sunlight.	Fuel combustion, chemical plants, sulfur recovery plants, and metal processing.
	3 hours	---	0.50 ppm		
	24 hours	0.04 ppm	0.14 ppm		
	Annual Arithmetic Mean	---	0.03 ppm		
Respirable Particulate Matter (PM10)	24 hours	50 µg/m^3	150 µg/m^3	May irritate eyes and respiratory tract, decreases in lung capacity, cancer and increased mortality. Produces haze and limits visibility.	Dust and fume-producing industrial and agricultural operations, combustion, atmospheric photochemical reactions, and natural activities (e.g., wind-raised dust and ocean sprays).
	Annual Arithmetic Mean	20 µg/m^3	---		
Fine Particulate Matter (PM2.5)	24 hours	---	35 µg/m^3	Increases respiratory disease, lung damage, cancer, and premature death. Reduces visibility and results in surface soiling.	Fuel combustion in motor vehicles, equipment, and industrial sources; residential and agricultural burning; Also, formed from photochemical reactions of other pollutants, including NO_X, sulfur oxides, and organics.
	Annual Arithmetic Mean	12 µg/m^3	12 µg/m^3		
Lead (Pb)	30 Day Average	1.5 µg/m^3	---	Disturbs gastrointestinal system, and causes anemia, kidney disease, and neuromuscular and neurological dysfunction (in severer cases).	*Present source:* lead smelters battery manufacturing and recycling facilities. Past source: combustion of leaded gasoline
	Calendar Quarter	---	1.5 µg/m^3		
	Rolling 3-Month Average	---	0.15 µg/m^3		
Hydrogen Sulfide	1 hour	0.03 ppm	No National Standard	Nuisance odor (rotten egg smell), headache and breathing difficulties (higher concentrations)	Geothermal power plants, petroleum production and refining

TABLE 4.2-3
Ambient Air Quality Standards for Criteria Pollutants

Pollutant	Averaging Time[a]	State Standard	National Standard	Pollutant Health and Atmospheric Effects	Major Pollutant Sources
Sulfates (SO_4)	24 hour	25 µg/m^3	No National Standard	Decrease in ventilatory functions; aggravation of asthmatic symptoms; aggravation of cardio-pulmonary disease; vegetation damage; degradation of visibility; property damage.	Industrial processes.
Visibility Reducing Particles	8 hour	Extinction of 0.23/km; visibility of 10 miles or more	No National Standard	Reduces visibility, reduced airport safety, lower real estate value, and discourages tourism.	See PM2.5.
Vinyl Chloride	24 hour	0.01 ppm	No National Standard	Short-term exposure to high levels of vinyl chloride in the air can cause dizziness, drowsiness, and headaches. Long-term exposure through inhalation and oral exposure can cause liver damage. Cancer is a major concern from exposure to vinyl chloride via inhalation. Vinyl chloride exposure has been shown to increase the risk of angiosarcoma, a rare form of liver cancer in humans	Production of Polyvinyl chloride (PVC) plastic and vinyl products.

NOTE: ppm = parts per million; ppb = parts per billion; µg/m^3 = micrograms per cubic meter.
a The averaging time is the interval of time over which the sample results are reported.
b This concentration was approved by CARB on April 28, 2005 and became effective May 17, 2006.

Source: CARB 2016b. *Ambient Air Quality Standards*. Last revised: May 4, 2016. Available: https://ww2.arb.ca.gov/resources/california-ambient-air-quality-standards. Accessed: March 2020.

NAAQS currently in effect for each criteria pollutant.

Nonroad Diesel Rule

USEPA established a series of increasingly strict emission standards for new off-road diesel equipment, on-road diesel trucks, and harbor craft. Construction equipment used for the project, including heavy-duty trucks, and off-road construction equipment would be required to comply with the emission standards.

State

California Clean Air Act

The California Clean Air Act (CCAA), signed into law in 1988, requires all areas of the State to achieve and maintain the CAAQS by the earliest practical date. The CAAQS are established to protect the health of the most sensitive groups and apply to the same criteria air pollutants as the federal Clean Air Act and also includes State-identified criteria air pollutants, which are sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride. Table 4.2-3 shows the CAAQS currently in effect for each of the federally identified criteria air pollutants, as well as, state recognized pollutants, such as sulfates, visibility-reducing particles, hydrogen sulfide, and vinyl chloride.

Mobile Source Regulations
Mobile sources are a significant contributor to the air pollution in California. CARB has established exhaust emission standards for automobiles, which are more stringent than the federal emissions standards.

Through its Mobile Sources Program, CARB has developed programs and policies to reduce emissions from on-road heavy-duty diesel vehicles. Specifically, the On-Road Heavy-Duty Diesel Vehicle Regulation requires diesel trucks and buses that operate in the State to be upgraded to reduce emissions. By January 1, 2023, nearly all vehicles must have engines certified to 2010 model year engines or equivalent.

The Innovative Clean Transit Program (ICT) sets emissions reduction standards for new public transit vehicles and requires major transit agencies to only purchase zero emission buses after 2029. The Solid Waste Collection Vehicle Regulation requires solid waste collection vehicles and heavy diesel-fueled on-road single engine cranes to be upgraded. The Rule for On-Road Heavy-Duty Diesel-Fueled Public and Utility Fleets requires fleets to install emission control devices on vehicles or purchase vehicles that run on alternative fuels or use advanced technologies to achieve emissions requirements by specified implementation dates. CARB also established an In-Use Off-Road Diesel-Fueled Fleets Regulation to impose limits on idling and require fleets to retrofit or replace older engines.

California Air Resources Board
CARB, a department of the California Environmental Protection Agency, oversees air quality planning and control throughout California. CARB is responsible for coordination and oversight of state and local air pollution control programs in California and for implementation of the CCAA. The CCAA, which was adopted in 1988, requires CARB to establish the CAAQS. CARB has established CAAQS for sulfates, hydrogen sulfide, vinyl chloride, visibility-reducing particulate matter, and the above-mentioned criteria air pollutants. Applicable CAAQS are shown in Table 4.2-3.

The CCAA requires all local air districts in the state to endeavor to achieve and maintain the CAAQS by the earliest date practical. The act specifies that local air districts shall focus particular attention on reducing the emissions from transportation and area-wide emission sources, and provides districts with the authority to regulate indirect sources.

CARB's other responsibilities include overseeing compliance by local air districts with California and federal laws; approving local air quality plans; submitting SIPs to USEPA; monitoring air quality; determining and updating area designations and maps; and setting emissions standards for new mobile sources, consumer products, small utility engines, off-road vehicles, and fuels.

State Tailpipe Emissions Standards
To reduce emissions from off-road diesel equipment, on-road diesel trucks, and harbor craft, CARB established a series of increasingly strict emission standards for new engines. New construction equipment used for development of the proposed the project, potentially including heavy- duty trucks, off-road construction equipment, tugboats, and barges, would be required to comply with these standards.

California Air Resources Board On-Road and Off-Road Vehicle Rules
In 2004, CARB adopted an Airborne Toxic Control Measure (ATCM) to limit heavy-duty diesel motor vehicle idling in order to reduce public exposure to diesel PM and other TACs. The measure applies to diesel-fueled commercial vehicles with gross vehicle weight ratings greater than 10,000 pounds that are licensed to operate on highways, regardless of where they are

registered. This measure does not allow diesel-fueled commercial vehicles to idle for more than 5 minutes at any given time.

In 2008, CARB approved the Truck and Bus Regulation to reduce NOx, PM10, and PM2.5 emissions from existing diesel vehicles operating in California. The requirements were amended in December 2010 and apply to nearly all diesel fueled trucks and busses with a gross vehicle weight rating greater than 14,000 pounds. For the largest trucks in the fleet (i.e., those with a gross vehicle weight rating greater than 26,000 pounds), there are two methods to comply with the requirements. The first method is for the fleet owner to retrofit or replace engines, starting with the oldest engine model year, to meet 2010 engine standards, or better. This requirement is phased over eight years, starting in 2015 and would be fully implemented by 2023, meaning that all trucks operating in the State subject to this option would need to meet or exceed the 2010 engine emission standards for NOx and PM by 2023. The second option, if chosen, requires fleet owners, starting back in 2012, to retrofit a portion of their fleet with diesel particulate filters achieving at least 85 percent removal efficiency, so that by January 1, 2016, their entire fleet is equipped with diesel particulate filters. However, diesel particulate filters do not typically lower NOx emissions. Thus, fleet owners choosing the second method must still comply with the 2010 engine emission standards for their trucks and busses by 2023. Beginning January 1, 2020, this requirement, for diesel particulate filters, will be enforced by the California Department of Motor Vehicles (DMV). Additionally, in 2017, Senate Bill 1 (SB1), the Road Repair and Accountability Act of 2017, authorized the DMV to check that vehicles are compliant with, or exempt from CARB's Truck and Bus Regulation. If a vehicle is not compliant with the rule, DMV will no longer register that vehicle starting January 1, 2023.

In addition to limiting exhaust from idling trucks, CARB promulgated emission standards for off-road diesel construction equipment of greater than 25 horsepower such as bulldozers, loaders, backhoes and forklifts, as well as many other self-propelled off-road diesel vehicles. The regulation aims to reduce emissions by installation of diesel soot filters and encouraging the retirement, replacement, or repower of older, dirtier engines with newer emission controlled models. Implementation is staggered based on fleet size (which is the total of all off-road horsepower under common ownership or control), with the largest fleets to begin compliance by January 1, 2014. Each fleet must demonstrate compliance through one of two methods. The first option is to calculate and maintain fleet average emissions targets, which encourages the retirement or repowering of older equipment and rewards the introduction of newer cleaner units into the fleet. The second option is to meet the Best Available Control Technology (BACT) requirements by turning over or installing Verified Diesel Emission Control Strategies (e.g., engine retrofits) on a certain percentage of its total fleet horsepower. The compliance schedule requires that BACT turn overs or retrofits be fully implemented by 2023 in all equipment in large and medium fleets and across 100 percent of small fleets by 2028.

Title 24, Building Standards (Cal Green) Code

In 1978, the Energy Efficiency Standards for Residential and Nonresidential Buildings (CCR, Title 24, Part 6) were adopted in response to a legislative mandate to reduce energy consumption in the state. The standards are updated periodically (typically every three years) to allow for the consideration and inclusion of new energy efficiency technologies and methods.

Part 11 of the Title 24 is referred to as the California Green Building Standards (CALGreen) Code. The purpose of the CALGreen Code is to "improve public health, safety and general welfare by enhancing the design and construction of buildings through the use of building concepts having a positive environmental impact and encouraging sustainable construction practices in the following categories: (1) Planning and design; (2) Energy efficiency; (3) Water efficiency and conservation; (4) Material conservation and resource efficiency; and (5)

Environmental air quality" (California Building Standards Commission, 2010). In 2019, the CALGreen Code was updated to include new mandatory measures for residential and nonresidential uses including energy efficiency, water conservation, material conservation, planning and design, and overall environmental quality (California Building Standards Commission, 2010). The 2019 CALGreen Code took effect in January 2020.

Toxic Air Contaminants

California regulates TACs primarily through the Toxic Air Contaminant Identification and Control Act (Tanner Act) and the Air Toxics "Hot Spots" Information and Assessment Act of 1987 ("Hot Spots" Act). In the early 1980s, CARB established a statewide comprehensive air toxics program to reduce exposure to air toxics. The Tanner Act created California's program to reduce exposure to air toxics. The "Hot Spots" Act supplements the Tanner Act by requiring a statewide air toxics inventory, notification of people exposed to a significant health risk, and facility plans to reduce these risks.

The CARB identified DPM as a TAC in 1998. Shortly thereafter, the CARB approved a comprehensive Diesel Risk Reduction Plan to reduce emissions from both new and existing diesel-fueled engines and vehicles. The goal of the plan is to reduce DPM emissions and the associated health risk by 85% by 2020. The key elements of the plan are to clean up existing engines through retrofit emission control devices, adopt more stringent standards for new diesel engines, and implement the use of lower sulfur fuels.

Sustainable Communities and Climate Protection Act of 2008 (SB 375)

SB 375 directs CARB to set regional targets for reducing greenhouse gas emissions from cars and light trucks.[56] As part of the transportation planning process, each region's Metropolitan Planning Organization (MPO) is responsible for preparing a Sustainable Communities Strategies (SCS) that integrates transportation, land-use, and housing policies to plan for achievement of the emissions target for their region. Specifically, SB 375 focuses on reducing VMT and encouraging more compact, complete, and efficient communities. Further, SB 375 established CEQA streamlining and relevant exemptions for projects that are determined to be consistent with the land use assumptions and other relevant policies of an adopted SCS.

Regional

San Joaquin Valley Air Pollution Control District

Criteria Air Pollutants

SJVAPCD attains and maintains air quality conditions in the SJVAB through a comprehensive program of planning, regulation, enforcement, technical innovation, and promotion of the understanding of air quality issues. The clean air strategy of SJVAPCD includes preparation of plans for attainment of ambient air quality standards, adoption and enforcement of rules and regulations concerning sources of air pollution, and issuance of permits for stationary sources of air pollution. SJVAPCD also inspects stationary sources of air pollution and responds to citizen complaints; monitors ambient air quality and meteorological conditions; and implements programs and regulations required by the federal Clean Air Act, CAAA, and CCAA.

The SJVAPCD has developed the following plans to attain and maintain the State and Federal standards:

56 Office of Planning and Research (OPR), 2011. Senate Bill 375 CEQA Provision Flow Charts. February 2011.

1. The 2018 Plan for the 1997, 2006, and 2012 PM2.5 Standard.
2. The 2016 Plan for the 2008 8-hr Ozone Standard.
3. The 2013 Plan for the Revoked 1-hour Ozone Standard.
4. The 2004 Revisions to the Carbon Monoxide Maintenance Plan.

SJVAPCD Rules and Regulations

All projects within the SJVAB are subject to SJVAPCD rules and regulations in effect at the time of construction. The following rules and regulations address construction and operational emissions from development anticipated to occur under the proposed Community Plan. Operational activities include emissions resulting from boilers and other stationary sources. Plan Area development would be required to comply with these provisions pursuant to Merced County General Plan Policy AQ-2.1 (see below). Note that these rules and policies are not intended to be an exhaustive or all-inclusive list and it is the responsibility of each individual project applicant to ensure that their project adheres to all applicable SJVAPCD rules and policies.

Rule 2010: Requires that any person constructing, altering, replacing or operating any source operation which emits, may emit, or may reduce emissions to obtain an Authority to Construct or a Permit to Operate.

Rule 2201: New and Modified Stationary Source Review: Provides for review of new and modified stationary sources of air pollution, and requires no net increase in emissions above specified thresholds.

Rule 4001, New Source Performance Standards and Rule 4002, National Emissions Standards for Hazardous Air Pollutants: Identifies the standards, criteria and requirements that new sources of air pollution must comply with, including toxic air contaminants. Evaluation of individual projects that include sources of toxic air contaminants would include at a minimum a screening analysis and, if the screening analysis results in a score of 10 or greater, would require a refined health risk analysis.[57]

Rule 4101 – Visible Emissions. A person shall not discharge into the atmosphere from any single source of emission whatsoever, any air contaminant, other than uncombined water vapor, for a period or periods aggregating more than three (3) minutes in any one (1) hour which is[58]:

1. As dark or darker in shade as that designated as No. 1 on the Ringelmann Chart, as published by the United States Bureau of Mines.
2. Of such opacity as to obscure an observer's view to a degree equal to or greater than the smoke described in Section 5.1 of this rule.

Rule 4102 – Nuisance. A person shall not discharge from any source whatsoever such quantities of air contaminants or other materials which cause injury, detriment, nuisance or annoyance to any considerable number of persons or to the public or which endanger the comfort, repose, health or safety of any such person or the public or which cause or have a natural tendency to cause injury or damage to business or property.[59]

Rule 4601 – Architectural Coatings. Limits volatile organic compound emissions from architectural coatings, including the storage, cleanup and labeling of such coatings.

57 The Prioritization calculator can be found at: http.www.valleyair.org/busind/pto/emission_factors/Criteria/Toxics/Utilities/PRIORITIZATION%20RMR%202016.XLS.

58 SJVAPCD, *Rule 4101 Visible Emissions,* February 17, 2005.

59 SJVAPCD. *Rule 4102 Nuisance.* December 17, 1992.

Rule 4641 – Cutback, Slow Cure, and Emulsified Asphalt Paving and Maintenance Operations. Restricts the application and manufacturing of certain types of asphalt for paving and maintenance operations (would apply to both construction and post-construction activities)..

Rule 4901 – Wood Burning Fireplaces and Wood Burning Heaters. The rule limits emissions of CO and PM from wood burning fireplaces, wood burning heaters and outdoor wood burning devices.

District Rule 9410 (Employer Based Trip Reduction): Requires that employers with at least 100 employees (exclusive of certain types of employees) implement an Employer Trip Reduction Implementation Plan, and provides targets to be met.

Rule 9510 – Indirect Source Review. Reduces NOx and PM10 emissions through placing reduction requirements on applicable development projects including onsite mitigation, offsite SJVAPCD administered projects, or a combination of the two. Requires that development projects meeting certain criteria (e.g., a minimum of 50 dwelling units, 2,000 square feet of commercial space, and/or 25,000 square feet of light industrial space) submit an Air Impact Assessment application when applying for a final discretionary approval with a public lead agency. Establishes standards for reduction of NOx and PM10 emissions that must be met by such projects.

Regulation VIII – Fugitive PM10 Prohibitions. Reduce ambient concentrations of fine particulate matter (PM10) by requiring actions to prevent, reduce or mitigate anthropogenic fugitive dust emissions.

The Rules contained in this Regulation have been developed pursuant to United States Environmental Protection Agency guidance for Serious PM10 Nonattainment Areas. The rules are applicable to specified anthropogenic fugitive dust sources. Fugitive dust contains PM10 and particles larger than PM10. Controlling fugitive dust emissions when visible emissions are detected will not prevent all PM10 emissions, but will substantially reduce PM10 emissions.[60]

Merced County General Plan

The following policies from the General Plan Air Quality Element are relevant to the proposed Community Plan**:**

Policy AQ-1.1: Energy Consumption Reduction
Encourage new residential, commercial, and industrial development to reduce air quality impacts from energy consumption.

Policy AQ-1.6: Air Quality Improvement
Support and implement programs to improve air quality throughout the County by reducing emissions related to vehicular travel and agricultural practices.

Policy AQ-1.11: Truck-Related Development
Discourage development that causes significant increases in truck traffic on roads that are not capable of accommodating truck traffic due to pavement section deficiency or other capacity limitations, unless adequate mitigation through fees or improvements in required as part of the permit approval.

Policy AQ-2.1: Air Quality Plan Compliance
Require all development projects to comply with applicable regional air quality plans and policies.

60 SJVAPCD, Regulation VIII Fugitive PM10 Prohibitions, August 19, 2004.

Policy AQ-2.3: Cumulative Impacts
Encourage the reduction of cumulative air quality impacts produced by projects that are not significant by themselves, but result in cumulatively significant impacts in combination with other development.

Policy AQ-2.4: Mitigation
Require that local and regional air quality impacts identified during CEQA review for projects reviewed and approved by the County are consistently and fairly mitigated.

Policy AQ-2.5: Innovative Mitigation Measures
Encourage innovative mitigation measures and project redesign to reduce air quality impacts by coordinating with the San Joaquin Valley Air Pollution Control District, project applicants, and other interested parties.

Policy AQ-3.2: Clean Fleet Vehicles
Require vehicle replacement practices that prioritize the replacement of older higher emission vehicles and the purchasing of the lowest emission technology vehicles, consistent with cost-effective management of the program.

Policy AQ-3.3: Teleconferencing
Use teleconferencing in lieu of employee travel to conferences and meetings when feasible.

Policy AQ-4.1: Decrease Vehicle Miles Traveled
Require diverse, higher-density land uses (e.g., mixed-use and infill development) to decrease vehicle miles traveled.

Policy AQ-4.3: Public Transport Use Incentives
Prepare incentives and programs to encourage use of public transit and decrease vehicle miles traveled.

Policy AQ-4.4: Transportation Alternatives
Require employers and developers to provide employees and residents with attractive, affordable transportation alternatives, such as transit stops, van pool pick-up and dropoff locations, and biking paths/storage.

Policy AQ-4.5: Public Education and Awareness
Support programs that educate the public regarding the impact of individual transportation, lifestyle, and land use decisions on air quality.

Policy AQ-4.6: Non-Motorized Transportation
Encourage non-motorized transportation corridors within and between communities.

Policy AQ-4.7: Planning Integration
Require land use, transportation, and air quality planning to be integrated for the most efficient use of resources and a healthier environment.

IMPACTS AND MITIGATION MEASURES

Method of Analysis

Project-related air quality impacts fall into two categories: short-term impacts due to construction, and long-term impacts due to operations. First, during construction (short-term), the proposed Community Plan would affect local particulate concentrations primarily due to fugitive dust sources and diesel exhaust. Under operations (long-term), the proposed Community Plan would result in an increase in emissions primarily due to motor vehicle trips.

Other sources include minor area sources, such as landscaping equipment and use of consumer products.

Construction

Criteria Pollutant Emissions

Construction emissions are considered short-term and temporary, but have the potential to represent a significant impact with respect to air quality. Particulate matter (i.e., PM10 and PM2.5) are among the pollutants of greatest localized concern with respect to construction activities. Particulate emissions from construction activities can lead to adverse health effects and nuisance concerns, such as reduced visibility and soiling of exposed surfaces. Particulate emissions can result from a variety of construction activities, including excavation, grading, demolition, vehicle travel on paved and unpaved surfaces, and vehicle and equipment exhaust. Construction emissions of PM can vary greatly depending on the level of activity, the specific operations taking place, the number and types of equipment operated, local soil conditions, weather conditions, and the amount of earth disturbance.

Emissions of ozone precursors ROG and NOx are primarily generated from mobile sources and vary as a function of vehicle trips per day associated with debris hauling, delivery of construction materials, vendor trips, worker commute trips, and the types and number of heavy-duty, off-road equipment used and the intensity and frequency of their operation. A large portion of construction-related ROG emissions also result from the application of architectural coatings and vary depending on the amount of coatings applied each day.

It is mandatory for all construction projects in the SJVAB to comply with SJVAPCD Regulation VIII for controlling fugitive dust. Incorporating Regulation VIII into the project would reduce regional PM10 and PM2.5 emissions from construction activities. Specific Regulation VIII control requirements include, but are not limited to, applying water in sufficient quantities to prevent the generation of visible dust plumes, applying soil binders to uncovered areas, reestablishing ground cover as quickly as possible, utilizing a wheel washing system to remove bulk material from tires and vehicle undercarriages before vehicles exit the project site, covering all trucks hauling soil with a fabric cover and maintaining a freeboard height of 12 inches, and maintaining effective cover over exposed areas. Compliance with Regulation VIII was accounted for in the construction emissions modeling.

Construction emissions for the proposed Community Plan were estimated using the most recent version of the California Emissions Estimator Model (CalEEMod), version 2016.3.2, and California Emissions Factor Model (EMFAC2017)[61], as applicable. Modeling was based on project-specific data, where available. Where project-specific information was not available (for example, the age and fuel efficiencies of the vehicle fleet) default model settings and/or reasonable assumptions based on other similar projects were used to estimate criteria pollutant emissions. Modeling assumptions, calculations, and input and output files are provided in Appendix C.

The proposed Community Plan is a program-level document that does not have a specific development plan. The Winton Community Plan is intended to be built out over a fifteen-year period. However, to be conservative, emissions estimates assume that ten percent of the Plan would be built out in one year. As a conservative assumption, the year 2020 was chosen for modeling purposes as construction equipment becomes more efficient in subsequent years.

61 EMFAC2017 was updated to take into account the new SAFE Rule 1 increases in emissions.

Because the proposed Community Plan would not result in one large development, but provides for numerous smaller projects, there could be more than one project occurring at the same time during the year therefore increasing the amount of equipment used. As a conservative estimate of emissions, the analysis assumes that 10 percent of the Community Plan would be built out in one year in five year-long projects. Even if less than ten percent is built, it is possible that similar construction schedules could be used for the individual projects constructed.

Criteria pollutant emissions as estimated are compared to the SJVAPCD's construction thresholds. Where emissions are determined to exceed regulatory thresholds, mitigation is provided to reduce these emissions.

Odors

Odor impacts are determined qualitatively based on the nature of construction activities and the proximity to off-site receptors.

Cumulative Impacts

According to the SJVAPCD's guidance, if the mitigated project exceeds the regional thresholds for any criteria pollutant, then that project emissions should be considered cumulatively considerable.

Even if the project is less than significant with respect to all regional thresholds, it could still be cumulatively considerable if it violates any of the AAQS. To determine if a project exceeds any of the AAQS, on-site emissions from construction activities are compared to a 100 pounds per day screening threshold for each criteria pollutant.[62] If the threshold is not exceeded the project is determined to be less than significant. If the threshold is exceeded, then an ambient air quality analysis is performed. An ambient air quality analysis uses dispersion modeling to determine if the emission increases from project construction would contribute to a violation of the ambient air quality standards.[63]

Operation

Criteria Pollutant Emissions

CalEEMod and EMFAC2017 was also used to estimate operational emissions from project build out, assumed to occur in 2035. For on-road vehicles, the trip generation rates provided in the proposed Community Plan traffic study (see Section 4.8) were used, and CalEEMod defaults for heavy duty trucks was adjusted to account for the non-agricultural nature of the Community Plan compared to the heavily agricultural nature of the County. Additionally, the entrained road dust was adjusted from the CalEEMod default to the county-specific value. Energy use was adjusted to take into account 2019 Title 24 values and water use assumes 100 percent non-septic wastewater disposal. Solid waste was adjusted to take into account the achievement of AB 341's diversion/recycling goals. Appendix C provides detailed CalEEMod information and model results for determining criteria pollutant emissions as well as each analysis described below.

Criteria pollutant emissions as estimated are compared to the SJVAPCD's operational thresholds. Where emissions are determined to exceed regulatory thresholds, mitigation is provided to reduce these emissions.

62 SJVAPCD, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015.
63 SJVAPCD, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015.

CO Hotspots

As discussed above, CO emissions decreased dramatically in the SJVAB with the introduction of the catalytic converter in 1975, and the SJVAB has been in attainment for so long that CO monitoring at the majority of sites has been discontinued. Thus, it is not expected that CO levels at intersections would rise to the level of an exceedance of these standards with the additional traffic generated by the buildout of the Community Plan. Nonetheless, the SJVAB does set standards for CO, so it is analyzed in this EIR. This analysis used the project traffic study[64] to evaluate potential for CO hotspots. Based on guidance from the SJVAB, for intersections that do not experience a decrease in LOS to E or F, or, if already operating at LOS F, do not significantly worsen, the intersection is not considered to have the potential to result in a CO hotspot.

For intersections where LOS worsens to E or F, a qualitative analysis associated with traffic levels was used to determine if CO thresholds would be exceeded. As discussed under the Existing Conditions section above, CO levels are not currently monitored in the SJVAB and CO is in attainment for both CAAQS and NAAQS. Additionally, CO levels have decreased dramatically in the SJVAB with the introduction of the catalytic converter in 1975. For example, as of the 2004 Revision to the California State Implementation Plan for Carbon Monoxide (2004 SIP), the Attainment Level for CO within the Fresno and Modesto Maintenance Areas was 9.4 ppm and the monitored value in 2003 was 4.3 ppm and 3.7. These values are 54 percent (Fresno) and 61 percent (Modesto) below attainment levels as of 2003.[65] State-wide emissions trends show CO reducing overall from 23,630 tons per day in 1993 to an estimated 8,800 tons per day in 2018 with on-road mobile source emissions reducing from 17,230 tons per day to 2,850 tons per day respectively.[66] Emissions in the Fresno maintenance area were anticipated to be reduced from 627 tons per day in 1993 to 244 tons per day in 2018; and in the Modesto maintenance area reductions were anticipated from 331 to 120 tons per day.[67] The analysis shows that these areas will be able to maintain the CO standard even with the projected 84 percent increase in vehicle miles traveled between 1993 and 2018.[68] Typically, the CAA requires maintenance plans to identify contingency measures to offset an unexpected increase in emissions to ensure that the standards are maintained. However, as part of the 1996 Plan, the EPA approved California's approach with respect to not providing contingency measures for CO as the measures in the 1996 Plan "would provide sufficient reductions in future years to guarantee an ample margin of safety to ensure maintenance."[69]

The South Coast Air Quality Management District (SCAQMD) provides another example of the unlikelihood of CO levels exceeding standard. CO modeling was conducted by the SCAQMD during preparation of its air quality management plan (AQMP) to determine if CO hotspots

64 KD Anderson and Associates, Inc., Traffic Impact Analysis for Winton Community Plan, July 27, 2020.

65 CARB, 2004b. 2004 Revision to the California State Implementation Plan for Carbon Monoxide. Updated Maintenance Plan for Ten Federal Planning Areas. July 22. Available: https://ww3.arb.ca.gov/planning/sip/co/final_2004_co_plan_update.pdf; Accessed: April 2020.

66 CARB, 2004b. 2004 Revision to the California State Implementation Plan for Carbon Monoxide. Updated Maintenance Plan for Ten Federal Planning Areas. July 22. Available: https://ww3.arb.ca.gov/planning/sip/co/final_2004_co_plan_update.pdf; Accessed: April 2020.

67 CARB, 2004b. 2004 Revision to the California State Implementation Plan for Carbon Monoxide. Updated Maintenance Plan for Ten Federal Planning Areas. July 22. Available: https://ww3.arb.ca.gov/planning/sip/co/final_2004_co_plan_update.pdf; Accessed: April 2020.

68 CARB, 2004b. 2004 Revision to the California State Implementation Plan for Carbon Monoxide. Updated Maintenance Plan for Ten Federal Planning Areas. July 22. Available: https://ww3.arb.ca.gov/planning/sip/co/final_2004_co_plan_update.pdf; Accessed: April 2020.

69 CARB, 2004b. 2004 Revision to the California State Implementation Plan for Carbon Monoxide. Updated Maintenance Plan for Ten Federal Planning Areas. July 22. Available: https://ww3.arb.ca.gov/planning/sip/co/final_2004_co_plan_update.pdf; Accessed: April 2020.

would occur. The four worst-case intersections in the South Coast Air Basin were modeled: (1) Wilshire Boulevard and Veteran Avenue; (2) Sunset Boulevard and Highland Avenue; (3) La Cienega Boulevard and Century Boulevard; and (4) Long Beach Boulevard and Imperial Highway. In the 2003 AQMP, SCAQMD notes that the intersection of Wilshire Boulevard and Veteran Avenue is the most congested intersection in Los Angeles County, with an average daily traffic volume of approximately 100,000 vehicles per day.[70] This intersection is located near the on- and off-ramps to Interstate 405 in West Los Angeles. The 2003 AQMP (Table 4-10 of Appendix V) shows that the peak modeled CO concentration due to vehicle emissions at these four intersections was 4.6 ppm (1-hour average) and 3.2 (8-hour average) at Wilshire Boulevard and Veteran Avenue.[71] When added to the existing background CO concentrations, the screening values would be 7.6 ppm (1-hour average) and 6.2 ppm (8-hour average).[72] Because of the urban nature of the Los Angeles County, the pollutant emissions at intersections will disperse slower than those of more rural settings such as Merced County. Therefore, concentrations at intersections in the vicinity of the plan area have less of a potential to result in local exceedances from added traffic congestion.

SJVAPCD has not conducted quantified modeling for intersection analysis. However, as the 2004 SIP demonstrated continued area-wide reductions despite a projected 84 percent increase in vehicle miles traveled, and SCAQMD's has demonstrated that intersections with 100,000 vehicles per day would not cause an exceedance of the AAQS. Therefore, a screening threshold of 100,000 vehicles per day is used to determine potential for CO hotspots.

Toxic Air Contaminants

The analysis of toxic air contaminants (TACs) is qualitatively based on the type of development anticipated to occur within the Plan Area, and an assessment of future development's adherence to existing County General Plan policies and SJVAPCD regulations. It is not anticipated that the nature of the community development would result in the development of stationary emissions sources beyond a potential for a boiler or back-up generator, which are regulated by SJVAPCD and therefore would not exceed regulatory thresholds.

For vehicle-related TAC, CARB recommends a 500-foot buffer between sensitive receptors and roadways carrying more than 100,000 vehicles per day.

Odors

Odor impacts are determined qualitatively based on the nature of the community plan land uses and the proximity to existing off-site sources, including agricultural land uses.

Cumulative Impacts

According to the SJVAPCD's guidance, if a proposed Community Plan exceeds the regional thresholds for any criteria pollutant after application of mitigation, then that project's contribution to cumulative air quality impacts would be cumulatively considerable. Even if the project is less than significant with respect to all regional thresholds, it could still be cumulatively considerable if it violates any of the AAQS.

To determine if a project exceeds any of the AAQS, on-site emissions from operational activities

70 South Coast Air Quality Management District. 2003. 2003 Air Quality Management Plan. August 2003. Available: https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/2003-aqmp.

71 South Coast Air Quality Management District. 2003. 2003 Air Quality Management Plan. August 2003. Available: https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/2003-aqmp.

72 South Coast Air Quality Management District. 2003. 2003 Air Quality Management Plan. August 2003. Available: https://www.aqmd.gov/home/air-quality/clean-air-plans/air-quality-mgt-plan/2003-aqmp.

are compared to a 100 pounds per day screening threshold for each criteria pollutant. If the threshold is not exceeded, the project is determined to be less than significant. If the threshold is exceeded, then an ambient air quality analysis is performed. An ambient air quality analysis uses dispersion modeling to determine if the emission increases from project operation would contribute to a violation of the ambient air quality standards.[73]

Health Effects

In Sierra Club v. County of Fresno (S219783) (Sierra Club) the Supreme Court held that CEQA requires lead agencies to either (i) make a "reasonable effort" to substantively connect the estimated amount of a given air pollutant a project will produce and the health effects associated with that pollutant, or (ii) explain why such an analysis is infeasible (6 Cal.5th at 1165-66). However, the Court also clarified that that CEQA "does not mandate" that EIRs include "an in-depth risk assessment" that provides "a detailed comprehensive analysis … to evaluate and predict the dispersion of hazardous substances in the environment and the potential for exposure of human populations and to assess and quantify both the individual and population wide health risks associated with those levels of exposure."[74]

USEPA and CARB have established AAQS at levels above which concentrations could be harmful to human health and welfare, with an adequate margin of safety. Further, California air districts, like SJVAPCD, have established emission-based thresholds that provide project-level estimates of criteria air pollutant quantities that air basins can accommodate without affecting the attainment dates for the AAQS, and therefore, providing indicators of significance for regional and localized air quality impacts from both construction and operation of projects. SJVAPCD thresholds take into account that the SJVAB is a distinct geographic area that has critical air pollution problems for which AAQS have been established to protect human health and welfare.[75]

Typically, the health effect of a particular criteria pollutant is analyzed by air districts on a regional scale based on how close the area is to attaining the NAAQS. As shown by the attainment plan emissions data, it takes a large amount of additional precursor emissions to demonstrate a modeled increase in ambient levels over an entire region. Because air districts' attainment plans and supporting air model tools are regional in nature, they are not typically used to evaluate the impacts to ambient concentrations of criteria air pollutants, or to correlate those impacts to the potential resultant impacts to public health effects, from an individual project. The complex nature of criteria air pollutant dispersion and the complex atmospheric chemistry that occurs (especially in the case of ozone and fine particulate matter) limits the usefulness of applying the available models to predict health effects at a project-level. Therefore, correlating a project's criteria air pollutant emissions to specific health effects, particularly with respect to ozone, is speculative.

Generally, models that correlate criteria air pollutant concentrations with specific health effects focus on regulatory decision-making that will apply throughout an entire air basin or region. These models focus on the region-wide health effects of pollutants so that regulators can assess the costs and benefits of adopting a proposed regulation that applies to an entire category of air pollutant sources, rather than the health effects related to emissions from a specific proposed project or source. Because of the scale of these analyses, any one project is

73 SJVAPCD, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015.

74 Sierra Club v. County of Fresno. 6 Cal.5th 502, 517-522 (2018). Available: https://www.leagle.com/decision/incaco20181224020. Accessed December 2019.

75 SJVAPCD. 2016. 2016 Plan for the 2008 8-Hour Ozone Standard. Available: http://valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm. Accessed January 2020.

likely to have only very small incremental effects which may be difficult to differentiate from the effects of air pollutant concentrations in an entire air basin. In addition, such modeling efforts are costly, and the value of a project-specific analysis may be modest in relation to that cost. Furthermore, the results, while costly to produce, may not be particularly useful. For regional pollutants, it is difficult to trace a particular project's criteria air pollutant emissions to a specific health effect. Moreover, the modeled results may be misleading because the margin of error in such modeling is large enough that, even if the modeled results report a given health effect, the model is sufficiently imprecise that the actual effect may differ from the reported results; that is, the modeled results suggest precision, when in fact available models cannot be that precise on a project level.

Writing as amicus curiae in Sierra Club, the SJVAPCD explained that "[r]unning the photochemical grid model used for predicting ozone attainment with emissions solely from one project would thus not be likely to yield valid information given the relative scale involved".76 Ozone is not directly emitted into the air, but is instead formed as ozone precursors undergo complex chemical reactions through sunlight exposure.77 Given the complex nature of this process, and the fact that ozone can be transported by wind over long distances, "a specific tonnage amount of NOx or ROGs emitted in a particular area does not equate to a particular concentration of ozone in that area".78 For this reason, the photochemical analysis for ozone is done on a regional scale, and it is inappropriate to analyze ozone impacts at a local or project-level basis because a localized analysis would at most be speculative, and at worst be misleading.

Speculative analysis is not required by CEQA. The SJVAPCD stated that even a project with criteria pollutant emissions above its CEQA thresholds does not necessarily cause localized human health effects as, even with relatively high levels of emissions, the SJVAPCD cannot determine "whether and to what extent emissions from an individual project directly impact human health in a particular area".79 The SCAQMD also, as amicus curiae in Sierra Club, made similar points, reiterating that "an agency should not be required to perform analyses that do not produce reliable or meaningful results".80 With regard to particulate matter, the SCAQMD noted that while the CARB has created a methodology to predict expected mortality from large amount of PM2.5, the primary author of the methodology has reported that it "may yield unreliable results due to various uncertainties" and CARB staff has been directed by its Governing Board to reassess and improve it, which factor "also counsels against setting any hard-and-fast rule" about conducting this type of analysis.81 SCAQMD agrees that it is very difficult to quantify health effects, opining that the only possible means of successfully doing so is for a project so large that emissions would essentially equate to levels comparable to all combined regional emission increases.82 Because the proposed project does not emit that

76 SJVAPCD. 2015. Application for Leave to File Amicus Curiae Brief of SJVAPCD in Support of Defendant and Respondent, County of Fresno and Real Party in Interest and Respondent, Friant Ranch, L.P., April 13.
77 SJVAPCD. 2015. Application for Leave to File Amicus Curiae Brief of SJVAPCD in Support of Defendant and Respondent, County of Fresno and Real Party in Interest and Respondent, Friant Ranch, L.P., April 13.
78 SJVAPCD. 2015. Application for Leave to File Amicus Curiae Brief of SJVAPCD in Support of Defendant and Respondent, County of Fresno and Real Party in Interest and Respondent, Friant Ranch, L.P., April 13.
79 SJVAPCD. 2015. Application for Leave to File Amicus Curiae Brief of SJVAPCD in Support of Defendant and Respondent, County of Fresno and Real Party in Interest and Respondent, Friant Ranch, L.P., April 13.
80 SCAQMD, Application of the SCAQMD for Leave to File Brief of Amicus Curiae in Support of Neither Party and Brief of Amicus Curiae, April 6, 2015.
81 SCAQMD, Application of the SCAQMD for Leave to File Brief of Amicus Curiae in Support of Neither Party and Brief of Amicus Curiae, April 6, 2015.
82 SCAQMD, Application of the SCAQMD for Leave to File Brief of Amicus Curiae in Support of Neither Party and Brief of Amicus Curiae, April 6, 2015.

magnitude of daily emissions, the usage of photochemical modeling to determine specific health effects of this individual project is not warranted.

The mass emissions thresholds developed by the SJVAPCD and used by CEQA lead agencies throughout the SJVAPCD to determine potential significance of project-related regional changes in the environment are not directly indicative of exceedances of applicable ambient air standards. Meteorology, the presence of sunlight, and other complex chemical factors all combine to determine the ultimate concentration and location of ozone or PM. The effects on ground-level ambient concentrations of pollutants that may be breathed by people are also influenced by the spatial and temporal patterns of the emission sources. In other words, the effect on ozone and PM concentrations from a given mass of pollutants emitted in one location may vary from the effect if that same mass of pollutants was emitted in an entirely different location in the SJVAB. The same effect may be observed when the daily and seasonal variation of emissions is taken into account. Regional-scale photochemical modeling, typically performed only for NAAQS attainment demonstration and rule promulgation, account for these changes in the spatial, temporal, and chemical nature of regional emissions.

SJVAPCD attainment plans indicate the existing level of regional pollutants and the levels that are needed to meet AAQS through photochemical modeling. These inventories indicate the daily emissions levels that are necessary to limit health effects of the region to levels that are considered appropriate for protecting human health. The most recent EPA-approved SJVAPCD emissions inventory shows ROG emissions at 337.3 tons per day and NOx emissions at 339.6 tons per day for the baseline year of 2012. In 2031, forecasted emissions associated with SJVAPCD are 296.7 tons per day and NOx emissions at 131.9 tons per day, a reduction of 40.6 and 207.7 tons per day, respectfully. SJVAPCD's Ozone Attainment Plan shows that reducing the baseline 2012 NOx and ROG emissions by 41 tons per day and 208 tons per day respectively, would reduce ozone levels at the Merced-S Coffee Avenue Station from 86 to 69 ppb (17 ppb).[83] As seen by the forecasted reductions it requires near 100s of tons per day to noticeably change the concentrations observed by the monitoring stations, and thereby, noticeably effect the concentration of ozone and other criteria pollutants.

For further comparison, the most recent EPA-approved SCAQMD basin wide emissions inventory shows VOC emissions at 162.4 tons per day and NOx emissions at 293.1 tons per day for the baseline year of 2012.[84] SCAQMD's AQMP shows that reducing the baseline 2008 NOx and VOC emissions by 432 tons per day and 187 tons per day respectively, would only reduce ozone levels at the monitor stations with the greatest ozone concentrations by 9 parts per billion (ppb).[85] Additionally, SCAQMD modeling that accounts for increases in emissions due to new or modified sources within the SCAQMD between 2010 and 2030 show an increase of 6,620 pounds per day of NOx and 89,947 pounds per day of VOC. The results of this analysis show that this level of daily pollutant increase would only increase ozone concentrations in the SCAB by 2.6 ppb and less than 1 ppb of NO_2.[86]

83 SJVAPCD. 2016. 2016 Plan for the 2008 8-Hour Ozone Standard. Available: http://valleyair.org/Air_Quality_Plans/Ozone-Plan-2016.htm. Accessed January 2020.

84 SCAQMD, Final 2016 AQMP, Figure 3-1, March 2017, www.aqmd.gov/docs/default-source/clean-air-plans/air-quality-management-plans/2016-air-quality-management-plan/final-2016-aqmp/final2016aqmp.pdf?sfvrsn=15.

85 SCAQMD, Final 2012 AQMP, February 2013, www.aqmd.gov/home/library/clean-air-plans/air-quality-mgt-plan/final-20212-air-quality-management-plan; then follow "Appendix V: Modelling & Attainment Demonstrations" hyperlink, pp. v-4-2, v-7-4, v-7-24.

86 South Coast Air Quality Management District (SCAQMD), Final Program Environmental Assessment for Re-Adoption of Proposed Rule 1315, 2011 (pg 1-11). https://www.aqmd.gov/home/research/documents-reports/lead-agency-scaqmd-projects/aqmd-projects---year-2011/re-adoption-of-proposed-rule-1315.

Both the SJVAPCD and SCAQMD state that exceedance of regulatory thresholds does not necessarily cause localized human health effects as, even with relatively high levels of emissions. However, the Air Basin is a distinct geographic area that has critical air pollution problems for which AAQS have been established to protect human health and welfare. Therefore, analyzing a project against these thresholds conservatively assesses whether these emissions directly contribute to regional or local exceedances of AAQS and assesses their potential to be harmful to human health. Thus, in order to determine the potential for adverse health effects, project emissions are compared to the SJVAPCD's regulatory thresholds.

Thresholds of Significance

The proposed Community Plan would have a significant impact on air quality if it could:

- Conflict with or obstruct implementation of the applicable air quality plan (see Impact 4.2-1, below);
- Result in a net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (see Impact 4.2-2, below);
- Expose sensitive receptors to substantial pollutant concentrations (see Impact 4.2-3, below);
- Result in other emissions (such as those leading to odors adversely affecting a substantial number of people (see Impact 4.2-4, below).

The CEQA Guidelines (Section 15064.7) provide that, when available, the significance criteria established by the applicable air quality management district or air pollution control district may be relied upon to make determinations of significance. The potential air quality impacts of the project are, therefore, evaluated according to thresholds developed by SJVAPCD.[87] Table 4.2-4, Regional Air Quality Significance Thresholds, identifies the Air Quality Significance.

TABLE 4.2-4
Regional Air Quality Significance Thresholds

Pollutant	Mass Daily Thresholds[a] (tons/yr)	
	Construction	Operations
Oxides of Nitrogen (NO_X)	10	10
Reactive Organic Gases (ROG)	10	10
Respirable Particulate Matter (PM10)	15	15
Fine Particulate Matter (PM2.5)	15	15
Oxides of Sulfur (SO_X)	27	27
Carbon Monoxide (CO)	100	100
TACs (including carcinogens and non-carcinogens	Maximum Incremental Cancer Risk ≥ 10 in 1 million people Chronic & Acute Hazard Index ≥ 1.0 (project increment)	

Note: As the proposed Community Plan would not involve the development of any major lead emissions sources, lead emissions are not analyzed further in this report.

Source: SJVAPCD, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015.

87 SJVAPCD, Final Draft Guidance for Assessing and Mitigating Air Quality Impacts, March 19, 2015.

In addition to regional emissions criteria, the SJVAPCD has criteria in place to determine whether construction and operational activities would create significant adverse localized air quality impacts on nearby sensitive receptors. These are their Ambient Air Quality thresholds in which a project would be considered to have a significant impact if its emissions are predicted to cause or contribute to a violation of an ambient air quality standard by exceeding any of the CAAQS, NAAQS or Significant Impact Level (SIL). The SJVAPCD has an Ambient Air Quality Analysis Screening Tool such that if the emissions from on-site activities increase emissions by more than 100 pounds per day, impacts may be significant. If emissions exceed the 100 pounds per day threshold, then an ambient air quality analysis should be performed.

For the purposes of analyzing CO hotspots, intersections are considered to have the potential to result in a CO hotspot if the Level of Service (LOS) on one or more streets or at one or more intersections in the plan will be reduced to LOS E or F, or, for intersections or roadways already operating at LOS F, congestion would substantially worsen. For intersections where the LOS worsens, the daily traffic through the intersection is used to determine the potential for CO hotspots based on a 100,000 vehicle per day screening level. If either of these conditions are met a CO hotspot analysis must be conducted to determine the project's significance with respect to CO.

Project-Specific Impacts and Mitigation Measures

4.2-1 The proposed Community Plan could conflict with or obstruct implementation of the applicable air quality plans.

Applicable Regulations: SJVAPCD Rule 4101 – Visible Emissions, Rule 4102 – Nuisance and Regulation VIII – Fugitive PM10 Prohibitions

Significance: Significant

Mitigation included in the proposed Community Plan: None

Significance after Mitigation in the proposed Community Plan: Significant

Additional Mitigation: Mitigation Measure 4.2-1:

(a) Construction Emission Reductions

i. All on-site construction equipment greater than 50 hp shall use Tier 4 rated engines or have emissions levels equivalent to or more stringent than that of Tier 4 rated engines. During construction activities, the construction contractor shall keep a record of the equipment used on site, including, at a minimum, the type of equipment, its engine certification, and all maintenance records. If Tier 4 final equipment is not available for use by the contractor, and the contractor has demonstrated the lack of availability sufficiently, the contractor shall at a minimum require all off-road diesel equipment greater than 50 hp to meet USEPA Tier 3 off-road emission standards or equivalent and be outfitted with BACT devices including a California Air Resources Board certified Level 3 DPF or equivalent.

ii. On-site construction equipment shall be electric or alternatively fueled to the greatest extent feasible. Priority shall be given to contractors with alternative fleets.

iii. Temporary electricity shall be provided at project site unless it is infeasible to do so based on existing infrastructure constraints. This will reduce or eliminate the need for diesel generators during construction.

iv. Preference for contracted haul fleets shall be given to those contractors with the newest/cleanest fleets available.

v. All new development shall provide outdoor electrical connections for landscaping needs and associated with any loading docks.

vi. All new construction projects within the Community Plan area that do not meet the SJVAPCD's small project definition shall conduct a project specific construction air quality analysis to ensure the project, with the implementation of the above mitigation, or equally effective measures, and/or additional measures as needed, will not exceed SJVAPCD's construction thresholds. Projects of the following size are subject to this requirement:

- *Residential projects of 50 dwelling units or less;*
- *Commercial projects of 2,000 square feet or less;*
- *Light industrial projects of 25,000 square feet or less;*
- *Heavy Industrial projects of 100,000 square feet or less;*
- *Medical Office projects of 20,000 square feet or less;*
- *General Office projects of 39,000 square feet or less;*
- *Educational projects of 9,000 square feet or less;*
- *Governmental projects of 10,000 square feet or less; or*
- *Recreational projects of 20,000 square feet or less.*

(b) Operational Emission Reductions

i. Any fireplaces included as part of the Community Plan development shall be electric or natural gas.

ii. Low VOC paints shall be required for all maintenance and upkeep activities, that includes 50 g/l or less for interior non-residential coating; 10 g/l or less for interior multi-family residential interior (encouraged for single family residential); and 100 g/l or less for exterior coating applications for all land uses (encouraged only for single family residential).

iii. Use of electric landscaping equipment shall be required of all non-residential and multi-residential properties and shall be encouraged for all single family residential properties.

iv. All individual projects that do not meet the SJVAPCD's small project definition shall conduct a project specific air quality analysis to ensure the project, with the implementation of the above mitigation, or equally effective measures, and/or additional measures as needed, will not exceed SJVAPCD's operational thresholds. Projects of the following size are subject to this requirement:

- *Residential projects of 50 dwelling units or less;*
- *Commercial projects of 2,000 square feet or less;*
- *Light industrial projects of 25,000 square feet or less;*
- *Heavy Industrial projects of 100,000 square feet or less;*
- *Medical Office projects of 20,000 square feet or less;*
- *General Office projects of 39,000 square feet or less;*

- *Educational projects of 9,000 square feet or less;*
- *Governmental projects of 10,000 square feet or less; or*
- *Recreational projects of 20,000 square feet or less.*

Residual Significance: Significant and Unavoidable

According to the SJVAPCD's guidance, a project would be considered consistent with the applicable air quality plans if it would not exceed the regulatory thresholds for any of the criteria pollutants.

As detailed in Impact 4.2-2 below, the proposed Community Plan would exceed NOx emissions for construction. As shown in Table 4.2-6, Mitigated Annual Construction-Related Pollutant Emissions (tons/year), in Impact 4.2-2, with the implementation of Mitigation Measure 4.2-1(a), emissions of NOx would be reduced to below the regulatory thresholds and therefore construction activities would not conflict with the implementation of the applicable air quality plans.

With respect to operational activities, Impact 4.2-2 details the emissions estimate for the proposed Community Plan. As shown in Table 4.2-8, Annual Mitigated Operational Emissions (tons/year), in Impact 4.2-2, operational emissions for the Community Plan would exceed the applicable thresholds for ROG, NO_x, CO and PM_{10}. The restrictions on fireplaces, VOC-emitting paints and landscaping equipment would reduce these emissions, but the reduction cannot be quantified because the specifics of each project are unknown at this time. Mitigation Measure 4.2-2(a)(iv) would ensure that individual projects meet the applicable standards for ROG, NO_x, CO and $PM_{10.}$ However, it is possible that collectively air emissions within the Plan Area would exceed the thresholds at buildout, even if individual projects do not. Therefore, the impact would remain significant and unavoidable.

4.2-2: The proposed Community Plan would result in a net increase in criteria pollutants for which the SJVAB is non-attainment.

Applicable Regulations: SJVAPCD Rule 4101 – Visible Emissions, Rule 4102 – Nuisance and Regulation VIII – Fugitive PM10 Prohibitions

Significance: Significant

Mitigation included in the proposed Community Plan: None

Significance after Mitigation in the proposed Community Plan: Significant

Additional Mitigation: Implement Mitigation Measure 4.2-1

Residual Significance: Significant and Unavoidable

The focus of this impact is largely on non-attainment pollutants. However, because the SJVAPCD also provides thresholds of significance for non-attainment pollutants, this section discusses the emissions of all pollutants of concern at the regional level and uses the comparison of project emissions to the thresholds of significance to inform the significance finding.

Construction

Construction activities would generate pollutant emissions from the following construction activities: (1) demolition; (2) excavation and grading; (3) construction workers traveling to and from project site; (4) delivery and hauling of construction supplies and debris to and from the project site; (5) fuel combustion by on-site construction equipment; (6) building construction, application of architectural coatings, and paving. These construction activities would temporarily create emissions of dust, fumes, equipment exhaust, and other air contaminants. The amount of emissions generated on a daily basis would vary, depending on the intensity and types of construction activities occurring simultaneously at the time.

Table 4.2-5, Unmitigated Annual Construction-Related Pollutant Emissions (tons/year), summarizes the modeled peak emissions of criteria air pollutants and ozone precursors associated with construction of the Community Plan's worst-case construction scenario. The construction schedule was adjusted to assume that one tenth of the Community Plan would be built out within a year and that up to 5 projects (each consisting of one tenth of each land use to be constructed) would occur in any one year. Default CalEEMod construction equipment was used for each construction sub phase.

As shown in Table 4.2-5, the maximum annual construction emissions generated by the modeled construction scenario would exceed SJVAPCD's regional significance threshold NOx but not for any other criteria pollutants. Therefore, construction emissions would have the potential to result in significant regional impacts.

Implementation of Mitigation Measure 4.2-1(a) would reduce NOx emissions by regulating the engine efficiency of on-site construction equipment and use of alternatively fueled construction equipment (i.e. electrical, or natural gas). While this mitigation measure is meant to reduce NOx impacts, it would also reduce the emissions of most other criteria pollutants. In the case of CO emissions, there is an increase between the unmitigated and mitigated scenarios, but this does not result in a significant impact or increase emissions to near the significance threshold. Mitigation Measure 4.2-1(a) also provides for a reduction in emissions from on-road heavy-duty vehicles, however, as with the implementation of alternative fueled equipment, the extent to which implementation for each individual project can and will be implemented is unknown. Therefore, as a conservative estimate of mitigation effectiveness, only the use of Tier 4 equipment has been quantified for the mitigated results. Table 4.2-6, Mitigated Annual Construction-Related Pollutant Emissions (tons/year), summarizes the modeled mitigated peak annual emissions of criteria air pollutants and ozone precursors associated with the project's worst-case construction scenario. As shown, the mitigated construction emissions would be reduced to below SJVAPCD's significance thresholds for NOx, and CO emissions would remain less than significant. Therefore, while impacts are anticipated to be less than those reported due to the use of alternatively fueled equipment and cleaner on-road vehicles, mitigated construction impacts would be less than significant.

Operation

Buildout of the proposed Community Plan would result in long-term regional emissions of criteria air pollutants and ozone precursors associated with area sources, such as natural gas consumption, landscaping, applications of architectural coatings, and consumer products, in addition to operational mobile emissions. According to the traffic impact analysis prepared for the project, development of the project would result in an increase up to 34,607 daily vehicle trips.

Modeled operations emissions for the Plan Area at buildout are presented in Table 4.2-7, Annual Unmitigated Operational Emissions (tons/year). As shown, the Program would result in

TABLE 4.2-5
Unmitigated Annual Construction-Related Pollutant Emissions (tons/year)

Scenario	ROG	NOx	CO	SOx	PM10	PM2.5
Residential (2 projects)	5	7	6	<1	1	<1
Retail	1	3	3	<1	<1	<1
Commercial	<1	1	<1	<1	<1	<1
Industrial	1	3	3	<1	<1	<1
Total Annual Emissions	**7**	**14**	**12**	**<1**	**1**	**1**
SJVAPCD Construction Threshold	10	10	100	27	15	15
Significant Impact?	No	**Yes**	No	No	No	No

Source: Refer to CalEEMod Output Sheets, Appendix C.

TABLE 4.2-6
Mitigated Annual Construction-Related Pollutant Emissions (tons/year)

Scenario	ROG	NOx	CO	SOx	PM10	PM2.5
Residential (2 projects)	5	2	6	<1	<1	<1
Retail	<1	1	3	<1	<1	<1
Commercial	<1	1	2	<1	<1	<1
Industrial	1	1	3	<1	<1	<1
Total Annual Emissions	**6**	**4**	**14**	**<1**	**1**	**<1**
SJVAPCD Construction Threshold	10	10	100	27	15	15
Significant Impact?	No	No	No	No	No	No

Source: Refer to CalEEMod Output Sheets, Appendix C.

TABLE 4.2-7
Annual Unmitigated Operational Emissions (tons/year)

	ROG	NOx	CO	SOx	PM10	PM2.5
Area Source	21	1	13	<1	<1	<1
Energy	<1	2	1	<1	<1	<1
Mobile Source	9	20	95	<1	43	12
Project Total	**30**	**23**	**109**	<1	44	12
SJVAPCD Operational Threshold	10	10	100	27	15	15
Significant Impact?	**Yes**	**Yes**	**Yes**	No	**Yes**	No

Source: Appendix C.

TABLE 4.2-8
Annual Mitigated Operational Emissions (tons/year)

	ROG	NOx	CO	SOx	PM10	PM2.5
Area Source	20	<1	12	<1	<1	<1
Energy	<1	2	1	<1	<1	<1
Mobile Source	9	20	95	<1	43	12
Project Total	**29**	**23**	**108**	<1	44	12
SJVAPCD Operational Threshold	10	10	100	27	15	15
Significant Impact?	**Yes**	**Yes**	**Yes**	No	**Yes**	No

Source: Appendix C.

long- term regional emissions that exceed the SJVAPCD's applicable thresholds for ROG, NOx, CO and PM10. Therefore, operational emissions for the Program would result in potentially significant impacts. Implementation of Mitigation Measures 4.2-1(b), and GHG-1 would reduce operational emissions from buildout of the proposed Community Plan as shown in Table 4.2-8, Annual Mitigated Operational Emissions (tons/year). However, because detailed operational characteristics associated with the proposed Community Plan have not been fully defined, emissions reductions associated with implementation of GHG-1 cannot be accurately quantified. Emissions may be further reduced as more detailed operational characteristics are established and implemented. Further, as discussed in Impact 4.2-1, while individual projects may comply with the applicable standards, the total emissions within the plan area at buildout may not. Therefore, even though mitigation would reduce operational air emissions, they would not necessarily be reduced to a less than significant level for the proposed Community Plan. Therefore, mitigated operational impacts would remain significant and unavoidable.

Localized Health Impacts

California air districts, like SJVAPCD, have established emission-based thresholds that provide project-level estimates of criteria air pollutant quantities that air basins can accommodate without affecting the attainment dates for the AAQS. The State and federal ambient air quality standards were established at levels that provide public health protection and allow an adequate margin of safety, including protecting the health of sensitive populations such as asthmatics, children and the elderly.

As shown in Table 4.2-5, Unmitigated Annual Construction-Related Pollutant Emissions (tons/year), unmitigated project-related construction emissions due to Plan buildout would potentially exceed regional thresholds for NOx. All other criteria pollutants would be below regulatory thresholds. Accordingly, elevated levels of criteria air pollutants as a result of a project's emissions could cause adverse health effects associated with this pollutant. However, implementation of Mitigation Measure 4.2-1 would reduce both localized and regional project generated construction emissions (with the exception of CO which increases slightly with mitigation but still remains below regulatory thresholds), and therefore would reduce the potential to result in regional health effects associated with O_3 precursors (VOC and NOx). As shown in Table 4.2-6, Mitigated Annual Construction-Related Pollutant Emissions (tons/year), mitigated project construction emissions would not exceed regulatory thresholds. Therefore, they would not have the potential to result in additional quantifiable health impacts.

As shown in Table 4.2-7, Annual Unmitigated Operational Emissions (tons/year), unmitigated project-related operational emissions at plan buildout would exceed regional thresholds for ROG, NOx, CO, and PM10 (SO_2 and PM2.5 would not exceed unmitigated regional thresholds). Accordingly, elevated levels of criteria air pollutants as a result of a project's emissions could cause adverse health effects associated with these pollutants. Implementation of Mitigation Measures 4.2-1(b) and 4.5-1 (GHG) would reduce pollutant emissions and therefore reduce the potential regional health effects associated with O_3 precursors (VOC and NOx). Emissions of CO would increase slightly. As shown in Table 4.2-8, Annual Mitigated Operational Emissions (tons/year), mitigated project operational emissions would remain above regulatory thresholds given available reduction quantifications. Therefore, there is the potential for impacts on localized receptors.

As discussed in the methodology, meteorology and location data are needed to determine the potential for localized health impacts associated with a project. However, the Community Plan is a program level analysis that does not identify the nature and location of individual projects that could be developed. Therefore, it would be speculative to attempt to quantify health effects to localized receptors because the size, nature, and location of the individual projects is unknown.

Nevertheless, by ensuring that each project comply with the applicable standards, as required by Mitigation Measures 4.2-2, those individual projects would not be expected to generate criteria pollutants at levels substantial enough to cause localized adverse health effects.

4.2-3: The proposed Community Plan could expose sensitive receptors to substantial pollutant concentrations.

Applicable Regulations: None

Significance: Significant

Mitigation included in the proposed Community Plan: None

Significance after Mitigation in the proposed Community Plan: Significant

Additional Mitigation: Mitigation Measures 4.2-1, above; 4.2-3, below, and 4.5-1 in Section 4.5-1, Greenhouse Gas Emissions

Mitigation Measure 4.2-3

(a) Projects developed under the Community Plan that would require six months or more of active construction activities with diesel operated onsite equipment shall be required to either:

i. Provide documentation that there are no sensitive receptors within 1,000 feet of the development area; or

ii. For projects that do not require soil remediation or have any known history of toxic air contaminants (TAC), establish temporary electrical use at the project site and provide, at a minimum, the following electrified equipment: Cranes, forklifts, aerial lifts, air compressors, cement and mortar mixers, concrete/industrial saws, and welders. Additionally, all non-electrified equipment shall be non-diesel fueled to the greatest extent feasible. Certifications for all equipment shall be maintained onsite; or

iii. Conduct a detailed health risk assessment that demonstrates health risk to nearby sensitive receptors would be less than significant based on the project-specific equipment to be used for construction.

(b) All industrial and commercial transition development under the Community Plan shall provide the County either documentation that operating processes and practices do not include the implementation of new TAC sources (either permitted or unpermitted); are greater than 1,000 feet from existing and proposed new sensitive receptors; provide copies of SJVAPCD permits to demonstrate that new TAC sources would comply with SJVAPCD requirements; or to provide a detailed health risk assessment that documents that exposure of nearby sensitive receptors would not exceed applicable standards.

Residual Significance: Less than Significant

CO Hotspots

A total of 27 local intersections were analyzed within the traffic analysis (TIA) (See Appendix G) prepared for the proposed Community Plan. The TIA indicates that eleven of those intersections would result in a decrease in LOS to E or F under Existing plus Project conditions. Based on

SJVAPCD's methodology, these intersections have the potential to result in a CO hotspot. The 11 intersections are as follows:

1. Intersection #7: Cypress Ave/ Walnut Ave (decrease from C to F / B to F [AM/PM]),
2. Intersection #8: Santa Fe Dr/Walnut Ave (decrease from D to F / C to F [AM/PM]),
3. Intersection #9: Winton Way/Walnut Ave (decrease from B to F),
4. Intersection #12: Santa Fe Dr/Winton Way (decrease from C to E),
5. Intersection #13: Cypress Ave/Almond Ave (decrease from C to F),
6. Intersection #17: Winton Way/Gertrude Ave (Decrease from B to E / B to F [AM/PM]),
7. Intersection #18: Santa Fe Dr/Schaffer Rd (Decrease from E to F / D to F [AM/PM]),
8. Intersection #19: Winton Way/Camellia Ave (Decrease from C to E),
9. Intersection #21: Winton Way/Bellevue Road (Decreases from C to E),
10. Intersection #23: Winton Way/Olivia Ave (Decrease from D to F), and
11. Intersection #25: Winton Way/Sycamore Ave (Decrease from D to E).

As discussed in existing conditions and methodology above, CO is not currently monitored in the SJVAB and CO is in attainment for both CAAQS and NAAQS. Thus, it is not expected that CO levels at any intersection would exceed these standards. Based on the TIA, of the studied intersections, Winton Way and Bellevue Road would have the greatest daily volumes--approximately 24,190 vehicles per day, which is less than the 100,000 vehicles per day screening level. As a result, CO concentrations are not expected to exceed CAAQS or NAAQS. This comparison demonstrates that even the largest increases in traffic attributable to the proposed Community Plan would not result in the formation of CO hotspots. Therefore, impacts associated with CO hotspots would be less than significant.

Localized Air Quality Impacts –TACs

With respect to TACs the SJVAPCD considers two types of scenarios—(1) new projects that would place new toxic sources in the vicinity of existing sensitive receptors, and (2) land use development that would place new receptors within the vicinity of existing toxic sources. While CEQA does not require identification of the impacts of the environment on the project (i.e. receptors placed within the vicinity of existing toxic sources), this analysis includes this discussion for informational purposes. However, the discussion of impacts from the existing environment on new receptors does not inform the significance findings.

Construction TACs

Construction-related activities have the potential to expose nearby sensitive receptors to substantial health risk. Project construction would result in short-term emissions of diesel PM, which is a TAC, and could pose a carcinogenic health risk. Health risk is measured using an exposure period of 70 years. The exhaust of off-road heavy-duty diesel equipment would emit diesel PM during site grading; paving; installation of utilities, materials transport and handling; building construction; and other miscellaneous activities.

The dose to which receptors are exposed is the primary factor used to determine health risk (i.e., the potential exposure to TACs to be compared to applicable standards). Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. Dose is positively correlated with time, meaning that a longer exposure period would result in a higher exposure level for the maximally exposed individual. Thus, the risks estimated for a maximally exposed individual are higher if a fixed exposure occurs over a longer period of time. According to OEHHA, carcinogenic health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be

based on a 70-year exposure period; however, such assessments should be limited to the period or duration of activities associated with the project.

The SJVAPCD does not require health risk assessments for construction-related activities. However, health risk assessments for longer construction projects are suggested to ensure health risk impacts are minimized. According to OEHHA, projects lasting less than 2 months should not be evaluated due to uncertainties in assessing cancer risk from very short-term exposures.

The primary source of TACs during construction would be diesel equipment. If such equipment operated in proximity to a sensitive receptor for a prolonged period, there could be an increased cancer risk for that receptor. Typically, construction equipment does not remain in one location for an extended period of time. However, because the extent of development at any one location within the Plan Area is unknown at this time, the potential exposure to nearby sensitive receptors cannot be quantified. If construction activities were to occur for long enough periods in proximity to residences or other sensitive receptors, there could be an increased cancer risk. This is considered a significant impact.

Mitigation Measure 4.2-1(a) requires that projects developed under the proposed Community Plan use off-road diesel-powered construction equipment that meets or exceeds the most stringent and environmentally protective CARB and USEPA Tier 4 off-road emissions standards, and/or incorporate alternative fuel vehicles into the project construction fleet. This would substantially reduce TAC emissions, in the form of DPM emissions, from construction equipment. The Tier 4 standards would reduce DPM emissions by approximately 81 to 96 percent as compared to equipment that meets the Tier 2 off-road emissions standards, depending on the specific horsepower rating of each piece of equipment. Using alternative fuel vehicles, such as electric or CNG, remove all DPM emissions associated with those vehicles. This substantially increases the length of time equipment can operate before health risks occur.

Mitigation Measure 4.2-3 would reduce health impacts from construction activities to less-than-significant levels by either distancing activities from sensitive receptors, implementing electric and alternative fueled construction equipment, or by demonstrating that the project-specific construction fleet and schedule would not result in health risk to nearby sensitive receptors.

Operation TACs

The proposed Community Plan provides for development of residential, commercial, and retail land uses. These land uses do not typically result in the emission of TACs with the exception of permitted sources (such as emergency generators, boilers, or land uses such as gas stations). While it is unknown at this time if such uses will be developed under the proposed Community Plan, the fact that any of the sources would be permitted means that the SJVAPCD would ensure that their emissions would be below regulatory standards. Additionally, while gas stations can be a TAC source, typically they are not placed within boundary distances of sensitive receptors.

The proposed Community Plan will also include limited industrial development in proximity to residential uses. For example, the Industrial land use designation is bounded on one side by areas designated for residential development (see Figure 3-3 in Chapter 3, Project Description). Depending on the type of industrial land uses, these have the potential to expose nearby receptors to potential TAC sources. Implementation of Mitigation Measure 4.2-4 would reduce the potential for impacts to nearby sensitive receptors by ensuring that either: (1) no new TAC sources operate on site; (2) are distanced from sensitive receptors such that no new impacts could occur; (3) permitted sources have an SJVAPCD permit to operate for each new TAC

source; or (4) demonstrate that the operation of new TAC sources are would not result in a health risk for nearby sensitive receptors. Therefore, with the implementation of mitigation, impacts from operational activities are anticipated to be less than significant.

Occupants of new development in the Plan Area are not expected to be exposed to substantial levels of TACs from existing sources. The Plan Area does not include existing, known sources of un-permitted TAC sources and is surrounded by agricultural uses, which, with the exception of the potential for permitted sources, are not TAC emitters. The closest large transportation facility is Highway 99, which is over a mile south of the Plan Area, which is far enough away that Plan Area residents would not be exposed to TACs from freeway traffic.[88]

4.2-4: The proposed Community Plan could result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Applicable Regulations: None

Significance: Less than Significant

Mitigation included in the proposed Community Plan: None

Significance after Mitigation in the proposed Community Plan: Less than significant

Mitigation: None required.

Residual Significance: Less than Significant

During construction, exhaust from construction equipment may produce discernible odors typical of most construction sites. Such odors could be a temporary nuisance to adjacent uses, but would be intermittent and would not affect a substantial number of people. Additionally, odors dissipate with distance. Therefore, these emissions would be minimal.

Land uses that are associated with odor complaints typically include agricultural uses (animal husbandry), wastewater treatment plants, food processing plants, chemical plants, composting, refineries, landfills, dairies, and fiberglass molding. As the operational activities associated with the proposed Community Plan are not typically associated with substantial production of odors, the proposed Community Plan is not expected to result in objectionable odors for the neighboring uses.

The Winton Community is surrounded by active agricultural uses; however, most of the surrounding uses are for crop growth and are not associated with animal agriculture such as dairy or cattle ranches. Therefore, odors associated with the surrounding agricultural land would be consistent with that associated with construction, minor, temporary emissions from equipment exhaust. While such odors could be a temporary nuisance to adjacent uses, it would be intermittent and would not affect a substantial number of people. In addition, Merced County Zoning Code Section 18.12.040 A (3)(b) requires that new residential dwellings and/or other habitable structures in residential developments in a designated urban community adjacent to agricultural designated lands provide a minimum 200-foot buffer from agricultural uses unless a variance is provided. This distance will help to reduce nuisance type odors associated with farming activities.

88 CARB. 2005. *Air Quality and Land Use Handbook: A Community Health Perspective.* April. Available: https://ww3.arb.ca.gov/ch/handbook.pdf.

The Community Plan would not result in odors that have the potential to impact a substantial number of people. Therefore, this impact would be less than significant.

Cumulative Impacts and Mitigation Measures

The SJVAB is the geographic area that is considered in the evaluation of cumulative impacts. . However, TAC and odor exposure must occur within proximity to sensitive receptors. The Plan Area is surrounded by existing residential development and farmland, and there are no areas designated for industrial or other substantial TAC-emitting uses in proximity to the Plan Area. Therefore, there are no cumulative impacts associated with TACs or odors.

4.2-5: The proposed Community Plan would contribute to cumulative increases in criteria air pollutants.

Applicable Regulations: SJVAPCD Rule 4101 – Visible Emissions, Rule 4102 – Nuisance and Regulation VIII – Fugitive PM10 Prohibitions

Significance: Significant

Mitigation included in the proposed Community Plan: None

Significance after Mitigation in the proposed Community Plan: Significant

Mitigation: Mitigation measures 4.2-1, above, and 4.5-1 in Section 4.5, Greenhouse Gas Emissions

Residual Significance: Significant and Unavoidable.

Because the SJVAB is currently classified as a state nonattainment area for ozone PM10 and PM2.5, cumulative development outside of the Plan Area could also violate air quality standards, contribute to air quality violation and/or interfere with achievement of air quality standards. This is a significant cumulative impact.

Based on SJVAPCD's cumulative air quality impact methodology, if a project is projected to exceed regional thresholds, it would be determined to contribute considerably to this cumulative air impact. If a project does not exceed regional thresholds, its contribution to cumulative air emissions could still be significant if it would exceed the AAQS.

As discussed in Impact 4.2-2, above, the proposed Community Plan would exceed regional thresholds for NOx during construction. With the implementation of Mitigation Measure 4.2-1(a), NOx impacts would be reduced below regional thresholds. Even though construction emissions would be below regional thresholds, there is the potential that these emissions could exceed the AAQS. As seen in Table 4.2-9, Mitigated AAQS Screening Analysis (pounds/day), if multiple projects were constructed on the same day, there would be the potential to exceed the 100 pounds/day regulatory threshold for CO, even with mitigation. While an individual project would not exceed SJVAPCD's AAQS screening levels, the potential for construction of several large projects to occur simultaneously could contribute considerably to cumulative CO levels.

As shown in Table 4.2-9, the proposed Community Plan would exceed daily regional thresholds for operational activities for ROG, NOx, CO and PM10 even with the implementation of Mitigation Measures 4.2-2 and 4.5-1. While the emissions for individual projects cannot be determined at this time, the total emissions are significant enough, particularly for CO and PM10, that it is possible that large residential and or commercial projects could individually

exceed the thresholds. Therefore, the proposed Community Plan would result in cumulatively considerable impacts with respect to operational activities.

TABLE 4.2-9
Mitigated AAQS Screening Analysis (pounds/day)

	ROG	NOx	CO	SOx	PM10	PM2.5
Construction Emissions	57	35	**128**	<1	8	3
Operational Emissions	**161**	**128**	**596**	**1**	**239**	**66**
SJVAPCD Threshold	100	100	100	100	100	100

Note: Emissions levels that exceed the threshold are in bold face type.
Source: Appendix C.

Criteria pollutants that exceed 100 pounds per day for either construction or operational activities require dispersion modeling to ensure that the AAQS are not violated, and therefore are not contributing considerably to a cumulative impact. In this case, dispersion modeling cannot be completed because the exact nature and location of the individual projects within the Plan Area are unknown. Furthermore, the 100 pounds per day threshold are set for individual project analysis and were not designed to determine emissions concentrations at the Community Plan level. Mitigation Measures 4.2-1 and 4.5-1 would reduce the potential for individual projects to result in a cumulatively contributable contribution. However, because the size, location, timing, and duration of construction and operation of individual projects is unknown, it is possible that the combined nature of emissions from projects located near each other, would result in the potential to cause a cumulative impact. Therefore, as a conservative determination, cumulative impacts for construction activities remain significant and unavoidable even with the implementation of appropriate mitigation measures.

As discussed above under Impact 4.2-3, emissions associated with the construction and operational activities have the potential to result in localized health impacts. Because it would be speculative to estimate localized emissions levels without project-specific details, it is not known if there would be projects developed under the proposed Community Plan that would result in such effects on local receptors.

CO Hotspot

A total of 27 local intersections were analyzed within the traffic impact analysis (TIA, in Appendix G) prepared for the proposed Community Plan, for the Cumulative plus Buildout conditions. The TIA indicates that fifteen of the intersections would result in either a decrease in LOS to E or F or worsen an intersection already operating at a LOS of F under the cumulative condition. As discussed in existing conditions and methodology above, CO is not currently monitored in the SJVAB and CO is in attainment for both CAAQS and NAAQS. Thus, it is not expected that CO levels at LOS-impacted intersections would rise to the level that would exceed these standards. Of the studied intersections that are predicted to worsen LOS under cumulative plus project conditions, Winton Way and Bellevue Road would have the greatest daily volumes of approximately 32,700 vehicles per day, which is less than the 100,000 vehicles per day screening level. As a result, CO concentrations are not expected to exceed CAAQS or NAAQS. Thus, this comparison demonstrates that the increase in traffic would not contribute considerably to the formation of CO hotspots, and therefore, impacts associated with the implementation of CO hotspots would not be cumulatively considerable.